Participatory Methods in Community-based Coastal Resource Management

Volume I
Introductory Papers
Volumes 2 and 3
Tools and Methods
Participatory Methods in Community-based Coastal Resource Management
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IIRR

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Acknowledgement

Publications such as the "Participatory Methods in Community-based Coastal Resource Management" are products based on knowledge acquired from direct field experience of individuals and institutions operating at the community level. IIRR relied heavily on the experience of partners and peers engaged in the field of community-based natural resource management. These supporters include a large number of people who have contributed in various capacities over time.

First on the scene were Ken Mackay, International Development and Research Centre of Canada (IDRC); Julian Gonsalves, International Institute of Rural Reconstruction (IIRR); and Gary Newkirk, Dalhousie University's Coastal Resources Research Network (IDRC/CoRR). Together they recognized the need for a publication that documents participatory methods used specifically for coastal settings. At that time, it was felt that IIRR's experience with participatory methods for rural development would play an important role in the overall project. Similarly, it was felt that the wealth and depth of experience in community-based coastal resource management in the Philippines warranted its selection as the venue for the participatory workshop.

An organizing committee was initiated including (in addition to those above) Gregory Ira and Joy Rivaca-Caminade (IIRR); Bob Pomeroy, International Center for Living Aquatic Resource Management (ICLARM); Francisco Fellizar, SEAMEO Regional Center for Graduate Study and Research in Agriculture (SEARCA); Rathin Roy, Bay of Bengal Programme (BoBP); Rebecca Rivera, Tambuyog Development Center (TDC); Annette Junio-Menez, University of the Philippines at Diliman, Marine Sciences Institute (UP-MSI); Elmer Ferrer, University of the Philippines at Diliman, College of Welfare and Social Work and Community Development (UP-CWSWCD), Geoff Brown, Voluntary Service Overseas (VSO); Marie Grace Madamba-Nu Philippine Partnership for the Development of Human Resources in Rural Areas (PhilDHRRRA); Alan White, Coastal Resource Management Project (CRMP); Herman Ongkiko, Small Islands Agricultural Support Services Programme (SMISLE); and Minerva Gonzales, Community Extension and Research for Development (CERD).

The documentation of the experiences of these committed individuals and each of the contributing authors into the final sourcebook could not have taken place without the financial support of donors. We are grateful to the following organizations and their representatives for recognizing the value of the sourcebook and having confidence in our capacity to produce it. Initial financial support came from Ken Mackay of IDRC. Additional financial support came from Mr. Paul Huddleston and Zenaida Cuenca-Forbes of the Canadian International Development Agency (Environment Development Fund), Ambassador Eric T.J.T. Kwint of the Royal Netherlands Embassy (Small Embassy Projects Programme), Herman Ongkiko of SMISLE and David J. Moles of the Western Samar Agricultural Development Programme (WESAMAR).

IIRR also remains appreciative of the support it has received (over the years) from the United States Agency for International Development (USAID) and the Ford Foundation (FF). Such
institutional support allows IIRR to leverage resources and foster partnerships with other institutions.

The entire list of participants is provided in this sourcebook. Their contributions go well beyond their respective papers. Each participant added value to the work of their colleagues.

There are, however, certain individuals that deserve special mention for the special effort they provided. First, we would like to thank the VSO volunteers who provided editorial support during the workshop: Arlene Brooks, Cathy Rosario, Sarah Jane Curran, Maeve Nightingale, Stuart James Green and John Purvis. Arlene Brooks and Cathy Rosario extended their stay with us to help integrate third round revisions into the papers. Their voluntary support was characteristic of the commitment of VSO to assist local organizations in the pursuit of CBCRM.

Marie Grace Madamba-Nunez provided IIRR staff with critical technical support in the post-workshop editing of the papers. Dr. Gary Newkirk provided extremely valuable comments to the various drafts.

The International Institute of Rural Reconstruction would like to thank these individuals and each of the authors and support staff for contributing their time and experience toward the successful completion of this publication.

Mabuhay!
Introduction

The need for a sourcebook on participatory methods for community-based coastal resource management (CBCRM) arose from the absence of practical field-tested reference materials that merge the participatory nature of CBCRM with the unique conditions of the coastal zone. Field workers from government, non-government, community-based and even research organizations are increasingly applying participatory and community-based approaches (developed primarily in terrestrial settings) to work in the coastal zone.

While the general principles of participatory methods for conservation and development apply equally well to coastal conditions, the specific tools and their applications will differ. Practitioners of CBCRM have been developing and adapting participatory tools to their unique environments for many years now.

There is no one way to do community-based coastal resource management. Its concepts and processes continue to evolve as field practitioners relentlessly explore, innovate and generate new ideas and techniques in managing the coastal environment. This sourcebook is an attempt to document the various tools and methods developed in the course of doing CBCRM as actually and effectively employed by field practitioners in countries like the Philippines, Indonesia, India and other Asian countries.

The sourcebook is heavily biased towards participatory methods because the authors believe that such processes not only intend to empower, but do empower. Participatory approaches also generate relevant information from local and indigenous knowledge that is crucial to community-based coastal resource management.
The sourcebook is designed for use by people working directly with coastal communities to help strengthen their capability to manage, protect and develop their local resources. These include community organizers, community leaders, researchers, other field workers who may come from NGOs, GOs or research and training institutions. The tools are meant to guide users and not to be taken as rigid formulas. The tools can generally be applied or adapted to all types of coastal settings with a little resourcefulness and creativity.

**The first booklet**

The first section of the sourcebook zooms in on the coastal zone, the principles and components of community-based coastal resource management, community organizing as an underlying and integrating component to CBCRM and an overview of participation. This section differs from the rest of the sourcebook because it is more of a "reader" with basic background information; a foundation for the rest of the sourcebook.

The paper on the coastal zone emphasizes the challenges of the terrestrial and marine interface including the following characteristics: the prevalence of open access conditions; predominance of common pool resources; the mobile nature of many of the resources; the unique influence of temporal (e.g., lunar) cycles; the frequently strong gender differentiation in productive roles; and the dual (i.e., terrestrial and marine) nature of coastal livelihoods.

The paper on community-based natural resource management presents the evolution, principles, stages and strategies of CBCRM. CBCRM is presented as a framework for coastal conservation and development in partnership with community based organizations, local governments, nongovernmental organizations and others.

Community organizing (CO) is covered in the introduction because of its central role in integrating CBCRM activities. Participants recognized the diversity in CO approaches and the
political and administrative obstacles in some countries. Nevertheless, the depth of experience and central role of CO in the Philippines (a recognized leader in CBCRM) supported its inclusion in the introduction.

Finally, the issue of participation itself is presented. The rationale for participation, the forms of participation, the obstacles to participation and the relationship between participatory approaches and non-participatory approaches are discussed. General guidelines for using participatory methods are also included.

The types of participatory methods presented in the sourcebook and the degree to which they promote participation varied greatly. The methods range from survey type questionnaires (less participatory) to locally designed wealth ranking tools (more participatory). A common sentiment was that the only "correct" level of participation is that which is acceptable to the local community members.

The second booklet

The main section of the sourcebook is the step by step description of various participatory methods field-tested by the authors and their organizations. A simple outline was devised for most of the topics in this section and include the following headings: definition, purpose, materials, suggested approach, outputs, strengths, weaknesses and variations. Examples were commonly used to illustrate key points. In most cases, the examples were based on actual experiences. Cautions highlight areas where potential problems are likely to occur. Icons were also used for these special considerations.

The methods can be categorized in a number of ways: 1) the type of tool employed (e.g., matrix, diagram, timeline); 2) the purpose of the tool (e.g., temporal analysis, spatial analysis, comparison); and 3) the stage in the project cycle when it is applied (e.g., analysis, planning, implementation). Eventually, the final groupings adopted for the sourcebook emphasize the type of tool and its purpose. The judicious use of cross-referencing was used to address any weakness in the categorization of the topics.

The sourcebook is not intended to be read from cover-to-cover. The organization of the book does not imply a sequential order for using the tools or any relative importance of particular tools. is no cutting edge science or even new knowledge. The strength of the sourcebook is its ability to simplify and communicate ideas clearly to a particular audience.
The third booklet

While the primary focus of the book is on methods for analysis, planning, monitoring and evaluation, the authors felt strongly that a description of a few critical "implementation interventions" was warranted. Hence, the topics on mangrove reforestation and establishment of marine protected areas. The sourcebook also recognizes the importance of gender and indigenous knowledge as cross cutting themes, thus their inclusion.

In addition, appendices including a list of relevant equipment and a matrix of livelihood options for CBCRM are included.

A distillation of practical field experiences

The sourcebook - like most of IIRR publications - is a distillation of practical field experiences of a committed group of conservation and development practitioners. There is no cutting edge science or even knowledge. The strength of the sourcebook is its ability and communicate ideas clearly to a particular audience.

There is, however, an inherent contradiction in such undertakings. It is often difficult to balance the site-specific nature of field-tested experiences with the need to provide useful information to a wider audience. Authors were encouraged to be specific in describing the tools and methods they used. At the same time, they were reminded to avoid or explain local terms, norms or institutions. In general, the steps or the suggested approaches are written in generic terms and selected examples are used to illustrate the specific experiences from which the method was derived. Ultimately, it is the reader that will determine the local relevance of the methods.

The success of the publication will be measured by the creases on the binding and the amount of salt spray that forms on its cover as practitioners regularly turn to it in the field.

Figure
The creativity and ingenuity of the users will determine the life-span of the sourcebook. Improvements and adaptations are welcome and expected. Indeed, we look forward to working again with the original contributors as well as future users of the sourcebook to continually provide relevant and practical materials in support of CBCRM.
How this sourcebook was produced

This sourcebook is the final output of the workshop conducted at the International Institute of Rural Reconstruction (IIRR) in Silang, Cavite, Philippines on 28 July - 08 August 1997. The workshop, organized by IIRR, brought together about 35 community-based coastal resource management (CBCRM) practitioners in Asia. They worked closely with a production team of editors, artists and desktop publishing staff.

It is during the workshop that these participatory tools in CBCRM were compiled and participatory edited. This publication is aimed at community workers, researchers, community leaders, extension agents and field teams of various government, non-government and community-based organizations.

Workshop objectives

Process, participation and product were the 3Ps stressed in the workshop which recognized the following objectives:

1. To compile participatory field methodologies, tools and approaches used in coastal communities into a sourcebook for use, testing and adaptation by other practitioners and organizations involved in CBCRM.

2. To produce a sourcebook based on successful practices.

Workshop process

Planning and preparation for the production of the sourcebook started long before the workshop. With the members of the steering committee (representing various organizations in Asia), the focus of the publication was decided on. The steering committee also assisted IIRR in the identification of topics and resource persons for the workshop.
The workshop used a process developed and pioneered by IIRR. This process had been used to produce information kits on a range of topics related to agriculture and natural resources management, including agroforestry technologies in the Philippines, integrated agriculture-aquaculture in Asia, ethnoveterinary medicine in Asia and environmental concepts and actions.

During the workshop, each participant presented his or her draft paper, using overhead transparencies of each page. Copies of each draft were also provided to all other participants who critiqued the draft and suggested revisions.

After the first presentation, an editor-artist team helped the author revise and edit the draft and draw illustrations to accompany the text. The edited draft and artwork were then desktop published to produce a second draft.
Each participant then presented his or her revised draft to the group for the second time, also using transparencies. Again, the audience critiqued it and suggested revisions. After the presentation, the editors, artists and desktop publishing staff again helped the author revise it and develop the third draft. Toward the end of the workshop, the third draft was made available to the participants for final comments and revisions.

The workshop allowed inputs from all participants to be incorporated, taking advantage of the diverse experience and expertise of all present. The concentration of resource persons, editors, artists and desktop publishing staff at one time and place enabled materials to be produced more quickly than is typical for similar publications. And the sharing of experiences among participants allowed the development of networks that would continue to be fruitful long into the future and would lead to concrete follow-up activities.
Coastal communities living with complexity and crisis in search for control

Coastal communities are people living on the thin strip of land or on the water along the fluctuating line where the sea meets the land. Trying to otherwise define either this group of people or delimiting the resources upon which they depend is an elusive task.

The coastal zone may be defined "ecologically" as the land area influenced by the sea; politically by some arbitrary distance inland from high tide level; or socially as the area occupied by people dependent on the sea for livelihood. For any means except setting an arbitrary distance, the exact extent of the coastal zone defies rigorous definition due to the interconnectedness of ecosystems and human activities in this productive strip between land and sea.

In this chapter, aspects of the nature of the overall coastal system, including people and their coastal environment, will be discussed. It is dangerous to generalize but some aspects seem to be common enough to warrant comment. Understanding the nature of the complex system can help the outsider better work with people who are part of the system and may not themselves consciously think about the overall system. This should help the outsider contextualize work with coastal communities and "probe beneath the surface."

Common assumption: "Coastal resources" are living and non-living things found below the surface of the sea.

Reality: Livelihoods of coastal communities also depend on "terrestrial" resources for food or income.
Since terrestrial resources are essential for coastal communities and they affect the health of, or the use of, marine resources, they are considered by some to be "coastal resources" along with the living and non-living resources in the sea.

**Coastal communities**

Coastal communities have multiple sources of income but there are often serious threats to food security.

*They live at the edge of the "bountiful sea" but they are generally poor, crowded and marginalized.*

*However, they are resourceful when resources are degraded; they may lack monetary resources but they survive.*

Fishers have traditionally been migratory, as families or as individuals. Recently, the increased population pressures in many countries have pushed inland people to the coast in the hopes of maintaining a livelihood based on marine resources which are often considered common property. Some of these migrants, either as families or individually, move to cities or foreign countries in search of work. All of these migrants contribute to change in local populations, mixing ethnic groups, cultures and language. Whether from inland or from other coastal areas, these migrants are people without previous ties to the locality, which means less local ecological knowledge but they add richness to the communities with different cultures.

**Complexity**

*The ecological and human systems which form the coastal zone are ecologically and demographically highly complex.*
The interface of land and sea is a dynamic habitat where energy, nutrients and populations of plants and animals mix and are recycled. This results in some of the most productive areas on earth characterized by complex food chains that maintain high production potential. Anecdotal evidence speaks of the historically high levels of productivity of coastal areas, especially high levels of fish stocks. There is good reason to believe that the current dismal nature of some coastal areas is primarily due to the chaotic destruction of the complex ecological networks. By reversing the overexploitation of key parts of the food chain, which are often commercially valuable predatory species, the ecological balance can be restored.

Flow is an important part of the complexity of the marine and estuarine habitats. The complexity and flow of coastal resources and coastal communities make assessment or information gathering by outsiders a difficult task.

It is hard to observe resources that are: mobile, underwater, change seasonally and move between different habitats.

Such movement is often predictable on a seasonal, monthly or daily cycle but knowledge of the exact location or size of fish stocks is not easily obtained although local knowledge may be available. However, if the ecology has changed through overexploitation or habitat degradation, traditional ecological knowledge may no longer be relevant, or young, active fishers may not
have experienced the richness of the habitat prior to its devastation. One option is to seek information from older residents but it is difficult to cross check such information. Fish catches many years ago occurred under very different market conditions and it may not be possible to obtain a good estimate of the potential yield of the resources even if the habitat is restored. Furthermore, if those active in fishery have recently moved to the area, their depth of knowledge of the local ecology may be limiting.

There is less isolation of marine ecosystems than one finds on land even when the marine habitats differ in appearance. The aquatic medium connecting different places in the sea is itself habitat and provides connectivity among distant locations. Many species spend different life cycle stages in very different habitats and fish move along the three dimensions of the sea.

Although they may be physically distinct, ecosystems such as coral reefs, mangroves and marshes are highly interactive with surrounding marine habitats. Outsiders may view the coastal ecosystem in separate units and not appreciate the level of interaction among them.

The ecological links between land and sea are tremendously important. Aside from the flow of people, possibly the most important connection, is the flow of water and silt from rivers to the estuaries and coastal areas. Under natural conditions in the uplands, this flow of nutrients would maintain a healthy coastal ecosystem. However, degradation of uplands, primarily due to deforestation, causes increased erosion and siltation, resulting in degradation of coastal ecosystems. Further impacts from the land come in the form of water pollution from cities and intensive farm lands.

Figure

Resources which are mobile, nocturnal and difficult to see pose problems for the researcher or change agent working with coastal communities. It is difficult to assess the range of available and potentially-available resources under these conditions.
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<td>Nutrients from land run-off</td>
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**Crisis**

Ecosystems and coastal communities are in crisis due to overexploitation and overpopulation. Much of this crisis is due to lack of control of resources, however, local people can take control.

The devastation of coastal resources has been increasing in recent years. Degradation of coral reefs, mangrove forests and estuaries is caused by: poverty driven over-exploitation, destructive fishing methods, pollution, erosion and other impacts of land-based "development".

Few coral reefs near populated areas are healthy. They have lost biological and structural diversity and the abundance of life they should support. Many mangrove forests are gone. Many estuaries have become sewers. It might be argued that the main crisis is that of control.

**Who owns this sea?**

There is a tremendous diversity of systems throughout the world determining who "owns" or has "rights to" coastal resources. However, the harvest of fish stocks is often subject to a competitive scramble in an open access system. There are few or no tenurial systems recognized by central governments outside of the national policies. Informal rules for use of the resources are sometimes difficult to determine.
Case study: Mangrove degradation

Mangrove forests have sustained some communities for generations but with increases in population, the threats have mounted. The uses of mangroves by local communities are often so dispersed as to be considered unimportant in the national economy. Much of the "value" of mangroves is in non-market goods and services such as erosion control, nursery for species harvested elsewhere, providing nutrients, subsistence use of wood and food species, etc. Nevertheless, the major pressure on the mangroves has been a result of demands from distant "markets" or users. The open access of most mangrove forests make them easy targets for removal of wood for charcoal production. The demands of urban populations create attractive markets which are difficult for local people to resist in the face of no restrictions on mangrove use. Extensive areas have been turned over to national or international companies to raise shrimp for export markets. This free-for-all system results from the "nationalization" of resources by colonial and subsequently central governments. Local control of mangrove management has been lost but is essential for sustainability.

The uncertainty of rights of access or tenure of coastal resources has often left the poor fishing communities with little choice except to take what they can, when they can. Without assurance that young fish left to grow will return benefits to the one who practices conservation, there is no incentive. However, it has been demonstrated that when people have incentives and reasons to expect that investments in conservation will bring future benefits, they do protect the environment.

Although the coastal zone is currently seen as being seriously impacted and fishing is often considered an occupation of last resort, the potential productivity may be recaptured and provide support for well-being of local people. This productive area can continue to support many communities but control and management are essential.
Coastal resource management

Who is involved?

The sea goes from the beach in one village past the next village, around the country, and connects to the rest of the world. "Everyone" should be involved in managing the resources of the Sea or coastal resource management.

International agreements regulate some activities in the open sea. National agencies are often involved in Coastal Zone Management (CZM).

In recent years, a number of integrated approaches to CZM have been adopted. These include consideration of jointly managing all the activities of commerce, housing, fisheries, recreation, government, etc. which take place in the coastal zone. This process includes all the "stakeholders" in CZM in variations such as: Integrated Coastal Management (ICM), Integrated Coastal Zone Management (ICZM), Integrated Coastal Area Management (ICAM), and Integrated Management of Coastal Zone Environment (IMCZE).

Although details of these variations differ, they are almost universally initiated by governments and include different levels of government. Because the USERS are involved, these "integrated" approaches to management may generally be described as CO-MANAGEMENT. More and more, the user groups include "community groups".

However, the degree and effectiveness of "involvement", "sitting at the table " or being a "stakeholder" depends on the social and cultural context, the ability of local people to negotiate with the political and economic interests, and the political will of the government to ACT.

As in many natural resource areas, the management of coastal resources through central authorities has failed to curtail overexploitation and destructive impacts. However, many countries are turning to local control of many natural resources because those who directly depend on resources are often the most committed, conscious and capable guardians.

There are some problems that are difficult to control locally such as global market pressures and pollution. However, there are many issues that can be addressed locally.

Community-based coastal resource management

Community-based coastal resource management (CBCRM) is a process of involving local communities in managing the coastal resources upon which they depend. As more and more users of resources are directly included in management decisions and the scale of responsibility becomes local, the "ownership" of responsibility increases and the compliance to rules increases.

CBCRM is a movement to address the problems through more local control of resource management. As CBCRM becomes more sophisticated, it addresses the issues of coastal communities in a more holistic way. CBCRM is a conscious effort for the "community" to have control.
A perspective of sustainable livelihoods rather than a more restricted "alternative livelihoods" approach encompasses social, cultural and political dimensions impacting peoples' well-being in addition to those which are considered economic and environmental. If people are to take responsibility for management, the benefits have to be obvious, real, equitable and not result in unacceptable trade-offs. A holistic assessment is essential. Most of the degraded ecosystems can be recovered. Control of use and abuse will bring back the productive potential of the coastal zone, and coastal communities, with care and concern, can improve their well-being and that of their children.

The sea has sustained people for a long, long time.  
We have mistreated this gift.  
It no longer provides what it could.  
If we treat it well, the sea will respond and coastal communities may live "sustainably" again.

_Prepared by Gary F. Newkirk_
Community-based coastal resource management

Community-based coastal resource management (CBCRM), is a comprehensive strategy that seeks to address the multi-faceted issues affecting the coastal environment through the active and meaningful participation of coastal communities. More importantly, it seeks to address the core issue of open-access, with all its inefficient and iniquitous consequences, by strengthening the community's access and control over their resources.

Underlying the term "community-based" is the principle that primary resource users should also be the rightful managers of their resources. This makes it distinct from other natural resource management strategies which are either highly centralized or fail to involve communities who are directly dependent on the resource.

Experiences in many countries show that centralized management systems have not been very effective in managing coastal resources in a sustainable manner. As a result, many coastal communities have lost their sense of "ownership" and responsibility over their coastal areas. Through its various processes, CBCRM hopes to restore this sense of "ownership" and responsibility.
CBCRM is also a process through which coastal communities are empowered politically and economically so that they can assert and gain rightful access and management control over their coastal resources.

Ideally, the move to initiate such a process should come from the community itself. Given their disempowered situation, however, most communities lack the capacity to initiate the process of change by themselves. This, among other factors, has led outside agencies and organizations to facilitate the processes involved in CBCRM, including community organizing work.

**Principles of CBCRM**

Following are the generally accepted principles governing CBCRM:

**Empowerment**

In coastal communities, empowerment is the development of the ability (power) to exercise management control of resources and institutions to enhance own livelihoods and secure sustainable use of resources upon which communities depend. This is often done in conjunction with established agencies of government.

By strengthening the communities' access and control over coastal resources, there is greater chance that economic benefits will accrue locally. The successful management of the resources by community-based organizations can also contribute to their recognition as legitimate partners in coastal resource management.

Empowerment also means building the capability and the capacity of the community to efficiently and effectively manage their resources in a sustainable manner.

**Equity**

The principle of equity is linked with the principle of empowerment. Equity means that there is equal access to opportunities among people and among classes. Equity would be attained when
small fishers have equal access to the opportunities that exist for the development, protection and management of coastal resources.

CBCRM also ensures that there is equity between the present and future generation by providing for mechanisms that ensure the protection and conservation of coastal resources for future use.

**Ecological soundness and sustainable development**

CBCRM promotes technologies and practices that are not only appropriate to the socio-cultural and economic needs of the community, but are also ecologically-sound. That is, technologies that recognize the carrying or absorptive capacity of resource and ecosystems.

Sustainable development, on the other hand, means seriously considering the state and nature of the natural environment while pursuing economic development that does not compromise the welfare of future generations. Caring for the environment is integral to the principle of stewardship which recognizes that people are simply guardians of this earth.

**Respect for traditional/indigenous knowledge**

CBCRM recognizes the value of indigenous knowledge and wisdom. It encourages the adoption and use of traditional/indigenous knowledge in its various activities and processes.
Gender-fairness

CBCRM recognizes the unique roles and contributions of men and women in the productive and reproductive spheres. CBCRM promotes equal opportunities for meaningful participation of both women and men in resource management.

Components of CBCRM

Resource tenure improvement

Resource tenure improvement means gaining/ensuring access and management control by the community over productive resources. This is also called the clarification of use rights or community property rights. Operationally, this means institutionalizing access and control through national or local policies or legislation. This is largely achieved through effective community organizing and policy advocacy work.
Capability building

Capability-building means empowering the community through education, training and organizational development. Environmental or conservation education is a critical part of capacity building. It helps to build a common understanding of the often complex and interrelated aspects of coastal resource management. By emphasizing local issues, environmental education can build awareness and skills that contribute to the capacity of individuals and communities to effect change.

Community leaders build their confidence through the acquisition of knowledge and skills. It also includes building and strengthening the people's organizational capacity (e.g., training its leaders, expanding its membership, acquiring funds and assets, installing organizational systems, networking). All these efforts are directed towards achieving greater autonomy and self-reliance for the community-based organizations and the community as a whole.

Environmental conservation

Coastal habitats support the coastal resource base. Once habitats are degraded or destroyed, there is an immediate impact on resource productivity. The health of coastal habitats is directly related to the intensity and type of activities carried out to exploit the resources.
Environmental conservation focuses on the rehabilitation, enhancement and protection of the coastal habitats. Examples of these measures include the establishment of marine reserves and sanctuaries, and mangrove reforestation and rehabilitation.

Environmental conservation should cover the various coastal ecosystems because these ecosystems are interconnected, from the watershed to the open sea. Environmental conservation is closely linked with regulation and strict enforcement of environmental laws to minimize the damaging impact of some activities on the coastal resource base.

**Sustainable livelihood development**

Food security is a primary concern of CBCRM. Sustainable livelihood development plays a key role in ensuring the economic and food security of fishers. Livelihood is the main point of interaction between the fisher and the coastal resource. The type of interaction determines whether the use is Sustainable or not.
Sustainable livelihood development may involve introduction of alternative land- or sea-based livelihoods (e.g., pig or livestock dispersal, mariculture), promotion of existing sustainable livelihoods, modifications or improvements to existing livelihoods and campaigns against destructive methods. Promotion of household and village food security is an important aspect of this component.

**CBCRM components**

The CBCRM cycle

The CBCRM cycle has four major phases: planning, implementation, monitoring and evaluation (PIME). The phases vary in length and level of complexity depending on the capability of the community to undertake the activities in each phase. This is a continuous process which the community undertakes with or without assistance from an external facilitator. The process discussed in the text below is for a comprehensive CBCRM cycle, but there can be smaller, focused cycles for specific projects (e.g., mangrove rehabilitation).
Planning phase

Assessment or pre-planning

During the assessment phase, a comprehensive coastal community profile is compiled to serve as the basis for planning activities and, at the same time, to provide baseline data for future monitoring and evaluation. The data can be broadly categorized into ecological, social, economic, institutional and cultural aspects of the coastal community. The type and extent of information collected must serve the basic needs of future resource management processes but must also reflect community priorities that arise during problem and issue analysis. In CBCRM, social and economic issues are seen as part of resource management challenges, not as separate issues.

Secondary data is collected, and a participatory analysis of these data is conducted at the community level to validate the existing information and identify data gaps and further information needs. Through this process of interaction and collaboration, community leaders and key sectors (e.g., fishers' organizations) may be identified. These leaders or key sectors may be given additional training and can be encouraged to play key roles in CBCRM. Initial environmental education can be conducted during the assessment stage.

The data gaps/needs are filled using a variety of different participatory methods and techniques. The participatory methods to be used depend on the capability of the community and/or facilitators. Different community sectors are encouraged to share their knowledge and experiences.
At the end of this stage, there should be sufficient information available to prepare a comprehensive coastal community profile. The community may also start to identify potential options for developing CBCRM.

Once the coastal community profile has been consolidated, the CBCRM facilitator focuses on participatory methods that assist the community to:

- identify issues and problems of common concern; and
- identify strategic objectives (desired changes).

<table>
<thead>
<tr>
<th>Coastal community profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental data</td>
</tr>
<tr>
<td>• Assessment of existing coastal habitats and resources (land and sea)</td>
</tr>
<tr>
<td>• Bio-geographical features, presence of watersheds and other connecting ecosystems</td>
</tr>
<tr>
<td>• Climate, conditions, oceanographic information</td>
</tr>
<tr>
<td>• Polluting industries and other major impacts in the area</td>
</tr>
<tr>
<td>Socio-economic data</td>
</tr>
<tr>
<td>• Demography</td>
</tr>
<tr>
<td>• Health</td>
</tr>
<tr>
<td>• Education</td>
</tr>
<tr>
<td>• Religion, history and culture</td>
</tr>
<tr>
<td>• Economy (household and community levels)</td>
</tr>
<tr>
<td>• Infrastructure</td>
</tr>
<tr>
<td>• Peace and order situation</td>
</tr>
<tr>
<td>• Gender roles</td>
</tr>
<tr>
<td>Resource use data</td>
</tr>
<tr>
<td>• Resource-based livelihoods (fishers, farmers, etc.)</td>
</tr>
<tr>
<td>• Commodity flows, marketing</td>
</tr>
<tr>
<td>• History of resource use and analysis of trends</td>
</tr>
<tr>
<td>Institutions and legal framework</td>
</tr>
<tr>
<td>• Land ownership and tenure</td>
</tr>
<tr>
<td>• Coastal resource access and existing management</td>
</tr>
<tr>
<td>• Existing support services, institutions and organizations</td>
</tr>
<tr>
<td>• Community structure, political situation</td>
</tr>
</tbody>
</table>
Planning proper

In this phase, the coastal community uses the information generated to formulate various plans using participatory methods. These plans should be structured around the four CBCRM components (capability building, sustainable livelihood development, resource tenure improvement, environmental conservation).

A long-term community development plan (e.g., a 3-5 year strategic development plan) is prepared first. This plan should reflect in operational terms the community's vision and goals. It should also contain its strategic objectives and targets. The community must determine whether the plan is feasible and if the impacts/risks (environmental and socio-economic) are manageable and/or acceptable. Any additional data needed for this risk and feasibility assessment should be gathered using participatory methods.

The community development plan is then translated into specific action plans that describe the different activities to be undertaken over shorter periods of time.

The community must be able to identify sources of funds and potential partners (e.g., non-government organizations, government, academe, donor agencies) for their plans and activities.

Implementation

During this stage, the community members execute their CBCRM action plans. This can include community capability building activities, environmental education, resource and ecosystem conservation initiatives and sustainable livelihood development projects. Identified appropriate strategies and technologies are researched, developed, tested, and when successful, adopted and replicated. Education and other technical inputs are often required to successfully implement the CBCRM plan.

Implementation mechanisms, either in the form of task forces or committees or multisectoral councils, should be put in place. Program management systems must also be installed (e.g., communication, finance, administrative policies).
Networking and establishing linkages between the community and external organization/individuals must be initiated to lend additional support to CBCRM activities.

**Monitoring**

Monitoring is done to record the progress of the project or certain changes in particular indicators at certain regular intervals during the project implementation. It allows adjustments to be made in the targets and plans, or to employ appropriate interventions midstream, if necessary, in order to achieve certain targets on time.

Key to effective monitoring is the selection of appropriate indicators earlier on during the planning phase. The indicators will eventually define the degree of success achieved (or not achieved) by the program or project.

**Evaluation**

The evaluation stage aims to establish the effectiveness of the CBCRM process by assessing the capability of the coastal community and the accomplishment (or if sufficient time has passed, the impact) of the individual projects/activities measured against the project's objectives and targets. It allows for critical changes to be done following the analysis of end results vis a vis the program targets and objectives.

![Figure](Image)

Various aspects of monitoring and evaluation are usually carried out by different organizations, committees, volunteers and external facilitators. Training on participatory monitoring and evaluation methods will be needed by these different groups. All of the groups will need to feedback the monitoring and evaluation results to the wider community.
At the end of the CBCRM project cycle, there may be a more extensive strategic evaluation to look at more qualitative indicators or impact.

Failures should not be hidden. The community should analyze these to ensure that the mistakes are not repeated and to gain insights into how they can adjust and improve. Lessons learned from the successes and failures should be incorporated into the planning cycle and shared with other communities.

References


Community organizing and development process

Definition

Community organizing and development is a process by which a community empowers itself by working to identify its needs and to resolve its problems in a collective manner. This process develops the confidence and capability of community members to organize themselves. The processes involved in CBCRM are best facilitated through effective community organizing work.

Purpose

- To enable coastal communities become more aware of their situation and their environment and to realize their collective abilities and responsibility to manage themselves and their environment in a sustainable manner.

- To provide opportunity for participation of men and women in decisions and actions that will affect their lives, thus developing a sense of ownership and collective responsibility for such decisions and actions.

- To strengthen community capacity to access internal and external funds to support viable and sustainable socio-economic projects.

- To enable a community to link and form alliances for advocacy and technology sharing.

- To build and sustain permanent organizational structures for resource management.
The community organizer

The community organizer (CO) is a vital person in facilitating the whole community organizing process.

A community organizer should have:

- an understanding of development theories and concepts and processes of community organizing
- good social and community relation skills to promote social integration in the community
- an ability to work with other teams of professionals
- the knowledge and skills to enable communities to access specialized technical assistance in instances when this is needed
- sensitivity to the local culture
- gender-sensitivity.

Questions to ask yourself as a community organizer

- Do I talk to both men and women in the community?
- Do I feel comfortable living in the community with minimum amenities?
- Do I dress appropriately for community work?
• Am I sensitive to the culture of the people?
• Is my presence felt in the community?

**Time frame**

Community organizing is a process, hence the time-frame varies depending on the objectives and outcomes set by the people, community organizer and the support agency. This can range from one to several years and the level of effort may change from beginning to end.

**Commonly-used approach**

This is not a prescribed formula or process to do community organizing. Every community has its own unique situation and context and this should determine the community organizing process for that particular community.

**Pre-entry**

Do the following activities before entry into the community.

1. Community organizing training and orientation in CBCRM.

2. Site selection including establishing a set of criteria for the choice of the area or community to be organized. It is essential that community members are receptive to the non-government organizations (NGOs) and the type of project they are proposing. This is done through consultations with the leaders of the community.

Other considerations include the peace and order situation in the area, interest and willingness of the local government to establish partnership with the project and accessibility of the project site.

This also involves gathering of secondary data about the community from the local government, selected key informants or NGOs that have done organizing work in the area.

3. Administrative preparations on the part of the implementing agency (e.g., setting up a local office, hiring of personnel).

Ideally, a request for assistance in implementing a program should come from the community itself. However, in reality, the initiative almost always comes from NGOs.
Entry into the community/integration phase

Community discussion at the site of a mangrove reforestation project

At this stage, the community organizer integrates into the community and establishes a relationship based on mutual trust and respect. Other activities may include:

- courtesy calls to existing leaders
- identification of potential leaders
- data gathering done through involvement in the community's social and livelihood activities, e.g., fishing activities or the use of participatory coastal resource assessment approach.
- formation of a core group that could initiate CBCRM activities. The community may have various ways of working together. These existing networks must be considered when forming a core group.
- leadership training for the core group

Much can be learned from informal conversations.
Community planning and implementation

Once the community organizer has already established rapport with the community and has involved them in assessing their situation through the leadership of the core group, the organizer helps the community in strategic and action planning. The community organizer facilitates the process and provides information that could be used as input for planning. The output of the process would include strategies and action plans, series of activities for organization development, capability-building and resource management. The community decides the time frame and mechanics for actual implementation of the plan.

Example of activities

<table>
<thead>
<tr>
<th>Organization development</th>
<th>Capacity building/education and training</th>
<th>Resource management</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Recruitment of members</td>
<td>• Gender sensitivity training</td>
<td>• Engaging the community in resource enhancement activities, e.g., setting up of marine sanctuaries</td>
</tr>
<tr>
<td>• Leadership formation, training and team building</td>
<td>• Study tours on CBCRM</td>
<td></td>
</tr>
<tr>
<td>• Organizational development in management and administration to support economic/livelihood generation projects</td>
<td>• Conflict resolution and management</td>
<td></td>
</tr>
<tr>
<td>• Strengthening and formalizing the organization by registering it with an appropriate agency through a local government accreditation process, if appropriate</td>
<td>• Skills training and development</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Advocacy and social mobilization</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Environmental education</td>
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</tr>
</tbody>
</table>

Conflict resolution in the community

A community in Bohol, Philippines has an oyster culture project that makes a good profit every harvest. At one harvest, the cash profit was missing after being collected by the chairperson and treasurer. The community organizer called a meeting to discuss the problem. Although the other members of the organization were unhappy about what had happened, they were unwilling to confront the treasurer and the chair person as they were related to a higher official in the barangay. Also, majority of the members were family-related to them.

The community organizer realized that meeting the problem head-on would weaken the
organization. She, therefore, decided to wait until the forthcoming general assembly. There, both she and another member suggested that an 'auditor' be elected which would help ease the workload of the treasurer and the chairperson. The auditor's function would be to feedback to the organization on the accounts every month. Since then, the financial mismanagement has stopped.

**Strengthening the organization**

Strengthening the organization is crucial in sustaining the operations of the organization. This entails building the capacity of the organization's leaders and members to take on roles currently assumed by the community organizer. The organizer should then undertake any of the following activities to further institutionalize the processes and mechanisms initiated:

- training of leaders and/or community volunteers to do organizing work themselves
- consolidating organization's operating procedures (e.g., drawing up of policies for membership, refining the organizational structure and functions of each committee, etc.)
- networking and building alliances with other organizations
- strengthening socio-economic services and resource accessing
- specialized training for organizational development training of potential trainers and second-line leaders formation of women's groups
- maintenance and monitoring of resource enhancement measures (e.g., marine sanctuary, mangrove reforestation project)

![Figure](image)

**Caution**

Often, strengthening the organization in the community organizing process is overlooked. Some NGOs think that once plans have already been implemented and some success has been felt by
the community, it is time for phasing out. However, experiences have shown that the initial success achieved by the community is not a guarantee that it can sustain the organization and its activities. The community needs time to consolidate the changes they have initiated, assess their capability to handle more complicated issues and tasks and reflect on the degree of community solidarity that has already been established.

**Monitoring and evaluation**

Monitoring refers to periodic assessment undertaken within the implementation period to measure progress. Evaluation assesses the degree to which the implementation of community plans has been successfully achieved. Both processes are used as basis for future planning which include changes in the strategies being adopted. (Refer to the topic on evaluation and monitoring tools.)

![Figure](image)

The community organization, with the help of the organizer, must continuously go through the cycle of planning, implementing, monitoring and evaluating their organization and their activities. This will help them keep track of their vision, mission, goals and objectives.

**Phase-out/Termination phase**

This is the phase when the community organizer already starts to withdraw from the community because goals set by the community and the organizer at the start of the process have been achieved. At this stage, it is assumed that the community has reached a certain level of capability with which they can sustain existing operations, expand or initiate new projects. The community now takes full responsibility for managing their resources.

It is likely that the community organizer and the assisting agency will not fully phase out from the community but simply modify their roles in the partnership.
For example, the community organizer may be less physically present in the community but still makes himself/herself available for some technical assistance or guidance when the community needs it.

A formal community turn-over can be an important ritual for highlighting the phasing out of the community organizer and the autonomy of the organization from the supporting agency.

**Reminders**

- The different activities identified at each stage are not mutually exclusive. Many of the activities, especially under the entry and planning and implementation phase, actually run throughout the process.

- The formation of a people's organization is not the end-goal of this whole undertaking, but a means of providing the people with a venue for collective action and for strengthening their capability to continuously deal with needs and problems.

- Most people's organizations usually require some external support mechanism to ensure sustainability.

- The organizing process does not always start with organizing a new group. Oftentimes, when community organizers enter into the area, there may already be existing groups and/or organizations. The role of the community organizer here is to assess the viability of existing groups/organizations and start from there.

- Economic, social and other incentives are often crucial in maintaining the viability of community groups, e.g., seed money for a cooperative economic undertaking can help strengthen the confidence of leaders.

- Gender issues and concerns, as well as indigenous knowledge and practices, should be consciously integrated throughout the process.
Participation and participatory methods

What is participation?

Participation means taking part in an activity. People "participate" in local development every day through their family life, livelihood activities and community responsibilities. The degree of control that men and women have over these activities varies. The same holds true for initiatives that are initiated or involve "outsiders" such as conservation projects, development programs or advocacy campaigns.

Figure

There is no single correct example of participation. However, control over the rationale for participating and the degree of participation is the choice of the individual.

Why participation?

The rationale for participation involves two main themes. One suggests that participation is a necessary input to improve the chances of success of conservation and development initiatives. The other suggests that participation and the process of participation is a goal in itself and is not simply a means to improving conservation and development initiatives.
There are a large number of purported benefits of using participatory methods for conservation and development:

These suggest that participation will result in:

• an increased sense of *ownership* of conservation or development initiatives by local communities;

• improved *productivity* and *efficiency* (i.e., greater benefits per unit of external assistance);

• increased *coverage of impact*;

• increased *equity and self determination*;

• an increased likelihood of *project continuation, maintenance or sustainability* after formal project support is withdrawn;

• increased *cost sharing and effectiveness* of conservation or development initiatives;

• increased *appropriateness and relevance* of conservation or development initiatives;

• greater emphasis in *non-violent forms of social action and change*, and

• fullfillment of *basic human needs and rights*.

Participation, however, is not without its own set of potential costs and weaknesses. These may include the following:

• raised expectations;
• possible distrust by national governments or local elites;

• increased time necessary to permit participation of significant stakeholder groups, and to build capacity of these groups to take advantage of participatory approaches;

• increased cost associated with planning, coordination, staff time and tailoring of interventions; and

• increased complexity of interventions as a result of adaptive processes.

It has been widely assumed - and occasionally documented - that the benefits of participation outweigh the costs. As a result, participation has been widely accepted as a means of achieving development.

The other theme that suggests that participation is an end in itself is based on the belief that powerlessness and the lack of control over resources and decisions related to family, livelihood and community life are the major causes of underdevelopment. This theme is also supported by the belief that participation is a basic human need and basic human right.

Figure

**Degrees of participation**

In order to assess the effectiveness of various forms of participation, it is necessary to have acceptable indicators or measures of participation. Some commonly-used indicators include the following:

• **timing of participation** (i.e., when does participation take place?). Participation can take place at any stage of the project cycle, but the most useful participation will occur at all stages.
• **who participates**
Is it the local elite, the men only, the educated, those living closest to the village center? These questions raise an extremely important point about the equitability of participation.

• **extent of participation** (i.e., what activities do people participate in)

• **Probably the most important indicator, however, is the degree to which the community/household or individual has control over decision making related to the initiative.**

Who initiated the project? Whose research agenda is used? Whose needs are being met? Whose project design is being used? Who controls the budget? Who controls the direction of the project? These questions address the degree to which community members have control or are empowered. With these indicators, it is possible to make general assessments of the degree of participation taking place in a given project or activity. It also allows for some degree of comparison between objects.

While these indicators allow some means by which to assess or compare the degree of participation of a project or projects, they should not suggest that there is a "best" time to participate, "best" group to be involved in, or "best" set of activities to participate in. Each form of participation has some value and degree of effectiveness. What is more important is the overall extent of empowerment or control that the community has over decisions that affect their lives.

This is what distinguishes meaningful participation from superficial participation. With this in mind, the various forms of participation can properly be compared (refer to tables 1 and 2).

**Table 1. Typology of participation in development programs**

<table>
<thead>
<tr>
<th>Typology</th>
<th>Components of each type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Passive</td>
<td>People participate by being told what is going to happen, or has already</td>
</tr>
</tbody>
</table>
participation happened. It is a unilateral announcement by the administration or project management, without listening to people's responses. The information being shared belongs only to external professionals.

2. Participation in information giving
People participate by answering questions posed by extractive researchers using questionnaire surveys or similar approaches. People do not have the opportunity to influence proceedings, as the findings of the research are neither shared nor checked for accuracy.

3. Participation by consultation
People participate by being consulted, and external agents listen to views. These external agents define both problems and solutions, and may modify these in the light of people's responses. Such a consultative process does not concede any share in decision-making, and professionals are under no obligation to take on board people's views.

4. Participation for material incentives
People participate by providing resources, for example, labor, in return for food, cash or other material incentives. Much on-farm research falls into this category, as farmers provide the fields but are not involved in the experimentation or the process of learning.

5. Functional participation
People participate by forming groups to meet predetermined objectives related to the project, which can involve the development or promotion of externally initiated social organization. Such involvement usually occurs not at early stages of project cycles or planning but after major decisions have been made. These institutions tend to be dependent on external initiators and facilitators, but may become self-reliant.

6. Interactive participation
People participate in joint analysis, which leads to action plans and the formation of new local institutions or the strengthening of existing ones. It tends to involve interdisciplinary methodologies that seek multiple perspectives and make use of systematic and structured learning processes. These groups take control over local decisions, and so people have a stake in maintaining structures or practices.

7. Self-mobilization
People participate by taking initiatives independent of external institutions to change systems. They develop contracts with external institutions for resources and technical advice they need, but retain control over how resources are used. Such self-initiated mobilization and collective action may or may not challenge existing inequitable distributions of wealth and power.

*Pretty, et. al, 1995*

Another typology of participation examines the specific relationship between farmers and scientists.

**Table 2. Types of farmer participation in research**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractual</td>
<td>Scientists contract farmers to provide land or service</td>
</tr>
<tr>
<td>Consultative</td>
<td>Scientists consult farmers about their problems and then develop solutions</td>
</tr>
</tbody>
</table>
Collaborative
Scientists and farmers collaborate as partners in the research process

Collegial
Scientists work to strengthen farmers' informal research and development systems in rural areas

Pretty, et. al, 1995

These typologies may be of use when evaluating the degree of participation in on-going projects. They can also be used as guide for designing new CBCRM initiatives.

Obstacles to participation

The degree of participation varies greatly from site to site and country to country. There are a large number of factors that can facilitate participation or hinder it. These factors can be external to the community such as the type of political system, or they can be internal to the community such as local cultural norms.

Oakley (1991) identifies three main categories of obstacles to participation: 1) political; 2) administrative; and 3) social.

Political obstacles can occur in centrally planned countries or in de facto authoritarian regimes. Participation that empowers local groups to chart their own directions for development could challenge the status quo and may be perceived as threatening.

Similarly, administrative systems that are highly centralized and dependent on controlled planning and blueprint approaches are not conducive to participatory and adaptive approaches.

Finally, social and cultural and historical obstacles may prove to be extremely challenging especially to the question of who participates. Equitable participation by marginal groups
(women, tribal minorities, uneducated, etc.) will require efforts to address cultural norms that relegate these groups to the periphery.

**Participatory methods and other research methods**

The rationale for participatory methods provides a strong foundation for their promotion. It does not, however, imply that non-participatory methods lack utility or should be disregarded. Participatory methods should be seen as part of a larger set of research methods each with its own strengths and weaknesses. Participatory methods are often most valuable at the early stages of a project when the research questions and needs are still being formulated. The outputs of these participatory methods may suggest the need for additional and more detailed data on a particular topic. At that point, other more formal methods could be considered.

**References**


*Prepared by Gregory C. Ira*
General guidelines for using participatory tools

A large number of participatory approaches for assessing local conditions, problems and opportunities have been developed. This book provides a "basket" of tools and techniques for meaningful community participation in a wide range of CBCRM activities. These tools can be used to help mobilize and organize local people around issues they consider important.

Although the tools are generally applicable to all coastal communities, the following guidelines should be taken into careful consideration when choosing and using the tools presented:

√ Set your objectives first so that you can select the most appropriate tool. You will not use a hammer to catch a fish. Be conscious in selecting and adapting tools that fit your objectives.

√ Build on previous information gathered. As each tool is completed, the results generated will give you an idea which tool to use next to expand on the information gathered.
For example, a timeline might yield information about previous interventions made by other agencies. A venn diagram could then be used to further analyze what these agencies achieved or why they failed and what the community thinks about the agency and their activities.

√ Cross-check and probe to ensure reliability of information. Use different sources of information, different tools and ask probing questions to ensure reliability.

√ Analyze and validate on the spot. Immediate analysis and validation of information gathered by those present is an integral part of participatory methods. Cross refer between tools for more in-depth analysis. Hold a community validation meeting to have the information and the analysis validated. This can become the basis for important community decisions.

√ Avoid collecting information that is not necessary. It wastes everybody’s time and effort. You have to decide when you have sufficient accuracy and quantity, or when discrepancies have been sorted out.

√ Avoid bias. Actively include members of the community who may otherwise not have enough opportunity to speak, e.g., women, the elderly, children or those living far away. Recognize your own biases, mistakes or omissions and avoid making value judgements about others. Avoid generalisations based on limited information and too few informants.

√ Listen to the community leaders but recognize that they may be the local elites and have their own biases.

√ Acknowledge the value of indigenous knowledge, skills and practice. Recognize that this is a two-way learning process. The community might have their own way of naming and doing things that may serve to enhance the use of the tools. Always use or adopt local names and concepts whenever possible. (Refer to topic on building on indigenous knowledge.)
√ Be creative. Shells, stones, seeds, leaves, twigs, or even the ground can be used when applying the tools. Innovate on the suggested approaches to suit the situation, environment and culture. Learning should be fun.

**Guidelines for facilitating groups**

Most of the methods presented will appear to be facilitated by one person but several people can work together. Preference should be given to having a local resident - who has been trained or has experience - serve as the facilitator. The use of an interdisciplinary team helps to draw out and document different aspects of the subject.

The following are some of the standard operating procedures when facilitating groups and/or participatory sessions:

√ Always begin by introducing facilitators and participants.

√ If the community is particular with certain religious or cultural practices, start the session with a prayer or appropriate ritual.
√ Use the local language or ask the participants if they can understand and are comfortable with the language you're speaking. If not, find an interpreter and allow time for translation.

√ Start the session by explaining the nature and objective of the activity or tool to be used. Describe the output expected at the end of the activity.

√ Explain the process that the group will undergo, and the amount of time involved. If certain roles will be assigned, explain clearly how the roles will be played (e.g., role of observers in the manta tow technique, role of volunteers in key informant interviews or monitoring of mangrove projects/sanctuary).

√ Document discussions and outputs. Leave a copy for the community and/or participants. Assign a documentor; the facilitator should not be tasked to document.

√ Be resourceful and creative. Use various audio-visual aids to help make discussions more interesting and effective. Use local materials whenever possible.

√ Always be sensitive to participants' needs. If the participants are becoming restless, take a break. Be flexible. If something comes up that was not anticipated, trust the process. Do not feel obliged to follow previously-prepared guidelines rigidly.

√ Choose an appropriate time and place for the community to participate. Avoid times when important activities are being done. The setting should be familiar to all and informal.

√ Do not rush. Activities can last from half an hour to half a day and the whole process in the CBCRM cycle can take a very long time. The whole process can be more effective if done at the speed of the community and not to fit the facilitator's schedules.

√ Encourage participation. Draw responses from each participant, as much as possible. Control or neutralize participants who try to dominate discussions.
√ Always listen to answers and do not interrupt. Respect the opinions given. Repeat responses if needed to further clarify points raised.

![Figure](image)

√ Always include names of participants and date of activity on the output.

√ Settle disagreements through dialogue and consensus-building. Clarify contentious issues and get the opinion of everybody, if possible. Exhaust all arguments until contending parties are convinced or until they change their views or one party withdraws its position, and a compromise or consensus is reached. Both participants and facilitators must have the patience to go through this long, but rewarding process.

√ Be gender-sensitive. Be conscious of your language and gestures. Group men and women separately if the issue to be discussed is sensitive to either or simply as a way of identifying various perspectives. Avoid jokes that are offensive to either or both sexes.

**Reminder**

People do not live day to day by considering in sequence ecology, economics, equity, nutrition, health, etc. Life is holistic and complex. Do not artificially dissect it!

**While working with a community...**

√ Foster the right attitude. Be humble. Do not act like you are more knowledgeable than the community members. Remember, they too have a lot of knowledge and wisdom to share. Do not be arrogant. Be aware of your body language as it can give away your feelings. Be modest and friendly. Always observe and adapt.
Facilitate learning. The community does the information gathering, planning, implementing, monitoring and decision-making themselves. Their ideas and opinions, much more their decisions, should be given primacy over others, especially "outsiders". Facilitate, do not impose.

Fit into the community and establish rapport. Follow the local dress codes, make jokes, share meals. Be sensitive to the local culture (i.e., religious rituals, community affairs). Put people at ease and do not set yourself apart or act superior.

Tips for teams

- An interdisciplinary team requires its own social organization and set of relationships.

- Team work requires work and patience.

- "Disciplines" view the world in different slices. Information collected in "slices" must be pieced together.
• Listen to the people in the community; they do not work and play in "disciplines".

• The team should develop its own group norms, for example, they should not be seen to be disagreeing with one another in front of the participants or community.

• Roles and responsibilities should be assigned and agreed on in advance.

• Regular meetings should be held to discuss progress and issues.

• Everyone should know what the other team members are working on.

• During team formation, pre-testing of methods will help build relationships.

Prepared by Karen Hampson
Glossary

This glossary is designed to provide both general definition of terms used in the sourcebook as well as special forms of usage that have been adopted for this particular publication.

A

ancestral waters marine areas claimed by indigenous peoples as having been part of their territory since time immemorial

approach a systematic strategy or methodology for addressing a development or conservation concern

For example, community based coastal resource management is an approach to addressing integrated conservation and development in coastal areas.

artesinal fisheries usually small-scale, local, subsistence fisheries conducted by individuals or small groups

assessment a review or informal evaluation of a selected condition

associated species living things (e.g., plants, animals) that are commonly found or interact with a given organism, habitat or ecosystem

B

baseline information usually the first measurement of an indicator taken at the beginning of a project and used to compare with subsequent measures taken after some intervention has been implemented

biases a prejudiced outlook of an individual or group of individuals based on a perspective or pre-conceived notion that does not fairly represent the larger population.

biodiversity the variety of living things found in a given area

This includes the variety of genes (i.e., genetic diversity), the variety of species (species diversity) or the variety of ecosystems (ecosystem diversity). In addition, the variety of functions (e.g., producers, consumers and decomposers) and the variety of cultures or cultural diversity (e.g., distinct ethnolinguistic groups) are also considered part of biodiversity.

buffer strips lengths of land or water that serve to provide protection to an area in need of protection from some external threat

For example, a five-meter wide strip of land running alongside a river may serve as a buffer strip to prevent surface erosion from entering the river.
**buffer zone** an area of land or water that serves to provide protection to a conservation area (usually surrounding it) designated for protection from some external threat

For example, an area one hundred meters wide surrounding a marine sanctuary that may have some regulations regarding productive activities.

**case study** a short description of a particular project, situation or condition that serves to communicate key messages to the reader

Case studies are commonly used to document experiences and share them more widely through training or workshops.

**community** an association of people living in a given area or sharing some general commonality in addition to geographic proximity

An ecological community refers to an association of plants and animals living in a given ecosystem.

**comparative information** data that relies on other data as a point of reference (i.e., relative measures) and that can not provide a precise measure of accuracy in and of itself

For example, trend analysis may indicate that fish yields are decreasing every year, but will not necessarily provide the absolute figures for yield for each year. Similarly, local preferences may rank choices by comparison and not necessarily by some independent quantitative measure. This information may be all that is necessary to initiate some action, in other cases, more absolute information may be required.

**consensus** agreement by a large majority of a population or group

It is considered ideal when the entire population or group is in agreement.

**conservation** the maintenance of careful regulation of a resource or area through sustainable use

The term conservation has been commonly and mistakenly been used as a synonym for preservation which refers to strict protection of a resource or area.

**coping mechanisms** ways in which individuals, households or groups adjust to or deal with difficult or changing conditions

For example, during periods of peak labor requirement, children may be taken out of school to provide additional labor. For projects, coping mechanisms may refer to ways in which project staff address problems that may impede the implementation of planned activities.
**customary laws** rights, regulations and norms that have been established over time and are generally accepted by a group as a framework for governing social behavior

Contrast with State law, which refers to an official legal system of a nation.

**cross-check** a way of ensuring accuracy of data collection by comparing information on a given subject from one source or method with information on the same subject from another source or method

**cyclical periods** specific lengths of time that are established by naturally occurring cycles or rhythms

For example, the length of time required for the earth to make one complete revolution (orbit) around the sun is referred to as an annual or solar cycle. Depending on latitude and regional climate, this will result in regular seasonal patterns. Similarly, the length of time required for the moon to revolve (orbit) the earth is referred to as a lunar cycle. This cycle influences tides and associated phenomena.

**E**

**emphasize** the ability to understand the feelings of another person or group by trying to put oneself in the position of the other person and feel the emotions from this perspective

**enhancement** the improvement of some condition based on a human perspective of what constitutes improvement

**F**

**fish fry** recently-hatched fishes

**G**

**gender** "the socially constructed roles and responsibilities of women and men, in a given culture or location" *(CEDPA/Gender and Development Training Manual, 1996)*

**gender analysis** "an organized approach for considering gender issues in the entire process of program development" *(CEDPA/Gender and Development Training Manual, 1996)*

**gender and development** an approach which seeks to empower women and transform unequal relations between women and men" *(CEDPA/Gender and Development Training Manual, 1996)*

**genera** plural form of *genus* which is a category or level used to classify living things according to biological and structural similarities and differences

**gleaners** individuals or groups that collect or harvest resources from the wild without cultivation or propagation
indicative data data that implies, demonstrates or suggests a certain condition

For example, the existence of coral rubble in a circular pattern is indicative data suggesting the occurrence of dynamite fishing.

indicator species a specific organism that implies, demonstrates or suggests a certain condition

For example, the occurrence of large numbers of crown of thorns starfish. indigenous knowledge information, practices, technologies, beliefs, tools, materials, experimentation, skills, pedagogy, communication systems and other social systems or institutions that people in a given group, community or area have tested, adapted and continue to adapt over time

indigenous taxonomies systems and categories of organizing or associating living and non-living resources

For example, local groups will classify or categorize soil, fish and other resources into locally-recognized groupings.

informal community organizations organizations that are not officially registered or recognized by national or local governments

informant a person who provides information

intertidal zone the area between above the lowest low tide mark up to the point where tidal influence continues (commonly the highest high tide mark) or slightly beyond

juveniles fish or aquatic organisms usually characterized by the incomplete development of reproductive organs

legend a description of symbols or abbreviations used on a map

letter-petition a formal and organized request for change or action by preparing a letter of request and having it signed by a large number of people who support the specific contents of the letter

local ecological knowledge refer to indigenous knowledge

logbook a notebook used to record in chronological order the events considered important based on local needs and preferences
manta tow a shallow water survey method that employs towing a swimmer behind a boat by a length of rope with a wooden board at the swimmers' end that is used for stability, maneuverability and recording observations

marine reserve an area of ocean protected from specified or all uses for any number of reasons including unique biodiversity, its support as habitat for local fisheries, educational purposes, rehabilitation and resoration

marketing the entire process of identifying, creating addressing and supplying the demand for any given product

This may involve market research, product development, pricing, advertising and determining methods of sales.

media any or all of three forms of information dissemination: 1. print (e.g., newspapers), 2. audio (e.g., radio) and audio-visual (e.g., television)

media campaign a systematic effort to use the media to gain support for a particular position or objective

medium a channel of communication or information dissemination (refer to media)

methodology a general approach or framework that employs a related collection or body of methods consistent with the overall approach

For example, CBCRM can be seen as a methodology.

methods a systematic procedure employed to achieve a certain objective

For example, participatory methods are procedures that follow certain guidelines to maximize participation, minimize bias, ensure validity and balance precision with time and effort. The methods described in this sourcebook make use of more specific tools such as matrices or diagrams and are part of a larger methodology.

monitoring the process of measuring changes in specific indicators at regular intervals over time

morphology relating to the shape (i.e., form or structure) of an organism

numeric data information presented in quantitative form or using numbers
O

**organization** a group or association of people bound by a common interest

P

**paralegal** a person with training in the law but not licensed to practice the law officially

**permanent belt** a permanent transect distinguished by two parallel lines

**point of first sale** the site at which a product (e.g., marine resource) is first transferred from the person who caught or produced the product to a person who pays for the product

**preservation** the strict protection (i.e., no use) of all resources (living and non-living) in a defined area

**process** a predetermined and systematic series of steps, actions or operations used by an individual or group to achieve specific objectives and move toward a general goal

**productive roles** the activities, responsibilities and expectations of an man or woman related to providing the basic economic needs of a household (e.g., food production, wage employment, etc.)

**property rights** the official or legal interest of an individual or group to access or control a certain area of land or water or resource

**protected area** the generic term used to describe an area of land or sea that is governed by some form of protection from use or degradation

This may be in the form of conservation or strict preservation.

Q

**quadrats** a rectangular plot or frame used to assist in the measurement and study of ecological conditions

R

**rehabilitation** the process of improving the conditions of an area of land or sea so that they are more favorable to conditions suitable to humans

**reproductive roles** the activities, responsibilities and expectations of a man or woman related to the care and maintenance of the household (reproduction, child care, education, health, home maintenance, security, etc.)
respondent a person who provides information to another person often through completing a survey questionnaires but also through participating in group discussions or participatory methods of analysis

restoration the process of returning a given area of land or sea as closely as possible to the specific conditions (i.e., specific species, relative abundance, etc.) that existed in an earlier time

S

sanctuary an area of land or sea that is often governed by strict protection (i.e., no activities or resource use allowed) often placed within a larger marine reserve

spatial related to geographic area

For example, spatial tools look at where things occur in a given area or in relation to each other. Compare with temporal tools which means having to do with or related to time.

spawn the production or deposition of eggs or young of aquatic organisms

species a category of formal scientific biological classification that describes organisms that are biologically and morphologically similar and capable of interbreeding

stakeholder usually groups of individuals - within a larger population (e.g., community) - that share a common interest, perspective, worldview or background

T

temporal related to time

For example, a time line is a temporal tool that looks at the significant events in the history of community.

tenure the right to access or control over a resource or area of land or sea

terrestrial related to land as opposed to sea

tools specific analytical techniques (matricies, diagrams, transects) that assist in the collection and analysis of data

For example, a matrix is a tool that can be used for participatory livelihood analysis which is a participatory method and is part of an overall methodology that is community-based coastal resource management.

triangulation (validation) the process of confirming, validating, or improving the precision of data by seeking separate and independent confirmation of the data
Triangulation can be done by using different methods to collect the same data or seeking different respondents or both.

**triangulation (geographic)** the process of determining or locating a specific point on a plane using landmarks to determine the intersection of two lines

**transect** a length of land or sea - usually a straight line - that is used as the basis for sampling plants, animals or other indicators of interest using various sampling techniques

V

**village assembly** a meeting open to all residents of a village for the purpose of sharing views and disseminating public information

W

**watchdog groups** informal groups or formal organizations that serve to monitor activities related to a particular issue

For example, a small group of residents may form a group to monitor the occurrence of illegal fishing operations in sanctuary.

**watershed** an area of land that shares a common point where water drains - usually to the ocean

Watersheds are commonly divided into functional (although arbitrary) sections such as upland, lowland and coastal ecosystems. Another functional grouping looks at catchment areas, service areas and drainage areas.

Z

**zoning** the process of determining and assigning specific purposes, uses or regulations to specific portions of land or sea in order to optimize land-use

For example, a zoning plan for a bay may be developed to ensure the optimal and equitable allocation of space for often competing uses such as aquaculture, recreation, transportation, conservation or preservation, etc.
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VOLUME 2
Tools and methods

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Voluntary Service Overseas (VSO)

SEAMEO Regional Center for Graduate Study and Research in Agriculture

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Acknowledgement

Publications such as the “Participatory Methods in Community-based Coastal Resource Management” are products based on knowledge acquired from direct field experience of individuals and institutions operating at the community level. IIRR relied heavily on the experience of partners and peers engaged in the field of community-based natural resource management. These supporters include a large number of people who have contributed in various capacities over time.

First on the scene were Ken Mackay, International Development and Research Centre of Canada (IDRC); Julian Gonsalves, International Institute of Rural Reconstruction (IIRR); and Gary Newkirk, Dalhousie University’s Coastal Resources Research Network (IDRC/CoRR). Together they recognized the need for a publication that documents participatory methods used specifically for coastal settings. At that time, it was felt that IIRR’s experience with participatory methods for rural development would play an important role in the overall project. Similarly, it was felt that the wealth and depth of experience in community-based coastal resource management in the Philippines warranted its selection as the venue for the participatory workshop.

An organizing committee was initiated including (in addition to those above) Gregory Ira and Joy Rivaca-Caminade (IIRR); Bob Pomeroy, International Center for Living Aquatic Resource Management (ICLARM); Francisco
Fellizar, SEAMEO Regional Center for Graduate Study and Research in Agriculture (SEARCA); Rathin Roy, Bay of Bengal Programme (BoBP); Rebecca Rivera, Tambuyog Development Center (TDC); Annette Junio-Menez, University of the Philippines at Diliman, Marine Sciences Institute (UP-MSI); Elmer Ferrer, University of the Philippines at Diliman, College of Welfare and Social Work and Community Development (UP-CWSWCD), Geoff Brown, Voluntary Service Overseas (VSO); Marie Grace Madamba-Nuñez, Philippine Partnership for the Development of Human Resources in Rural Areas (PhilDHRRA); Alan White, Coastal Resource Management Project (CRMP); Herman Ongkiko, Small Islands Agricultural Support Services Programme (SMISLE); and Minerva Gonzales, Community Extension and Research for Development (CERD).

The documentation of the experiences of these committed individuals and each of the contributing authors into the final sourcebook could not have taken place without the financial support of donors. We are grateful to the following organizations and their representatives for recognizing the value of the sourcebook and having confidence in our capacity to produce it. Initial financial support came from Ken Mackay of IDRC. Additional financial support came from Mr. Paul Huddleston and Zenaida Cuenca-Forbes of the Canadian International Development Agency (Environment Development Fund), Ambassador Eric T.J.T. Kwint of the Royal Netherlands Embassy (Small Embassy Projects Programme), Herman Ongkiko of SMISLE and David J. Moles of the Western Samar Agricultural Development Programme (WESAMAR).
IIRR also remains appreciative of the support it has received (over the years) from the United States Agency for International Development (USAID) and the Ford Foundation (FF). Such institutional support allows IIRR to leverage resources and foster partnerships with other institutions.

The entire list of participants is provided in this sourcebook. Their contributions go well beyond their respective papers. Each participant added value to the work of their colleagues.

There are, however, certain individuals that deserve special mention for the special effort they provided. First, we would like to thank the VSO volunteers who provided editorial support during the workshop: Arlene Brooks, Cathy Rosario, Sarah Jane Curran, Maeve Nightingale, Stuart James Green and John Purvis. Arlene Brooks and Cathy Rosario extended their stay with us to help integrate third round revisions into the papers. Their voluntary support was characteristic of the commitment of VSO to assist local organizations in the pursuit of CBCRM.

Marie Grace Madamba-Nunez provided IIRR staff with critical technical support in the post-workshop editing of the papers. Dr. Gary Newkirk provided extremely valuable comments to the various drafts.

The International Institute of Rural Reconstruction would like to thank these individuals and each of the authors and support staff for contributing their time and experience toward the successful completion of this publication.

Mabuhay!
Introduction

The need for a sourcebook on participatory methods for community-based coastal resource management (CBCRM) arose from the absence of practical field-tested reference materials that merge the participatory nature of CBCRM with the unique conditions of the coastal zone. Field workers from government, non-government, community-based and even research organizations are increasingly applying participatory and community-based approaches (developed primarily in terrestrial settings) to work in the coastal zone.

While the general principles of participatory methods for conservation and development apply equally well to coastal conditions, the specific tools and their applications will differ. Practitioners of CBCRM have been developing and adapting participatory tools to their unique environments for many years now.
There is no one way to do community-based coastal resource management. Its concepts and processes continue to evolve as field practitioners relentlessly explore, innovate and generate new ideas and techniques in managing the coastal environment. This sourcebook is an attempt to document the various tools and methods developed in the course of doing CBCRM as actually and effectively employed by field practitioners in countries like the Philippines, Indonesia, India and other Asian countries.

The sourcebook is heavily biased towards participatory methods because the authors believe that such processes not only intend to empower, but do empower. Participatory approaches also generate relevant information from local and indigenous knowledge that is crucial to community-based coastal resource management.

The sourcebook is designed for use by people working directly with coastal communities to help strengthen their capability to manage, protect and develop their local resources. These include community organizers, community leaders, researchers, other field workers who may come from NGOs, GOs or research and training institutions. The tools are meant to guide users and not to be taken as rigid formulas. The tools can generally be applied or adapted to all types of coastal settings with a little resourcefulness and creativity.
The first booklet

The first section of the sourcebook zooms in on the coastal zone, the principles and components of community-based coastal resource management, community organizing as an underlying and integrating component to CBCRM and an overview of participation. This section differs from the rest of the sourcebook because it is more of a "reader" with basic background information; a foundation for the rest of the sourcebook.

The paper on the coastal zone emphasizes the challenges of the terrestrial and marine interface including the following characteristics: the prevalence of open access conditions; predominance of common pool resources; the mobile nature of many of the resources; the unique influence of temporal (e.g., lunar) cycles; the frequently strong gender differentiation in productive roles; and the dual (i.e., terrestrial and marine) nature of coastal livelihoods.

The paper on community-based natural resource management presents the evolution, principles, stages and strategies of CBCRM. CBCRM is presented as a framework for coastal conservation and development in partnership with community based organizations, local governments, non-governmental organizations and others.

Community organizing (CO) is covered in the introduction because of its central role in integrating CBCRM activities. Participants recognized the diversity in CO approaches and the political and administrative obstacles in some countries. Nevertheless, the depth of experience and central role of CO in the Philippines (a recognized leader in CBCRM) supported its inclusion in the introduction.
Finally, the issue of participation itself is presented. The rationale for participation, the forms of participation, the obstacles to participation and the relationship between participatory approaches and non-participatory approaches are discussed. General guidelines for using participatory methods are also included.

The types of participatory methods presented in the sourcebook and the degree to which they promote participation varied greatly. The methods range from survey type questionnaires (less participatory) to locally designed wealth ranking tools (more participatory). A common sentiment was that the only "correct" level of participation is that which is acceptable to the local community members.

The second booklet

The main section of the sourcebook is the step by step description of various participatory methods field-tested by the authors and their organizations. A simple outline was devised for most of the topics in this section and include the following headings: definition, purpose, materials, suggested approach, outputs, strengths, weaknesses and variations. Examples were commonly used to illustrate key points. In most cases, the examples were based on actual experiences. Cautions highlight areas where potential problems are likely to occur. Icons were also used for these special considerations.
The methods can be categorized in a number of ways: 1) the type of tool employed (e.g., matrix, diagram, timeline); 2) the purpose of the tool (e.g., temporal analysis, spatial analysis, comparison); and 3) the stage in the project cycle when it is applied (e.g., analysis, planning, implementation). Eventually, the final groupings adopted for the sourcebook emphasize the type of tool and its purpose. The judicious use of cross-referencing was used to address any weakness in the categorization of the topics.

The third booklet

While the primary focus of the book is on methods for analysis, planning, monitoring and evaluation, the authors felt strongly that a description of a few critical “implementation interventions” was warranted. Hence, the topics on mangrove reforestation and establishment of marine protected areas. The sourcebook also recognizes the importance of gender and indigenous knowledge as cross cutting themes, thus their inclusion.

In addition, appendices including a list of relevant equipment and a matrix of livelihood options for CBCRM are included.

A distillation of practical field experiences

The sourcebook – like most of IIRR publications – is a distillation of practical field experiences of a committed group of conservation and development practitioners. There
is no cutting edge science or even new knowledge. The strength of the sourcebook is its ability to simplify and communicate ideas clearly to a particular audience.

There is, however, an inherent contradiction in such undertakings. It is often difficult to balance the site-specific nature of field-tested experiences with the need to provide useful information to a wider audience. Authors were encouraged to be specific in describing the tools and methods they used. At the same time, they were reminded to avoid or explain local terms, norms or institutions. In general, the steps or the suggested approaches are written in generic terms and selected examples are used to illustrate the specific experiences from which the method was derived. Ultimately, it is the reader that will determine the local relevance of the methods.

The success of the publication will be measured by the creases on the binding and the amount of salt spray that forms on its cover as practitioners regularly turn to it in the field.

The creativity and ingenuity of the users will determine the life-span of the sourcebook. Improvements and adaptations are welcome and expected. Indeed, we look forward to working again with the original contributors as well as future users of the sourcebook to continually provide relevant and practical materials in support of CBCRM.

Participatory Methods in Community-based Coastal Resource Management
How this sourcebook was produced

This sourcebook is the final output of the workshop conducted at the International Institute of Rural Reconstruction (IIRR) in Silang, Cavite, Philippines on 28 July - 08 August 1997. The workshop, organized by IIRR, brought together about 35 community-based coastal resource management (CBCRM) practitioners in Asia. They worked closely with a production team of editors, artists and desktop publishing staff.

It is during the workshop that these participatory tools in CBCRM were compiled and participatorily edited. This publication is aimed at community workers, researchers, community leaders, extension agents and field teams of various government, non-government and community-based organizations.
Workshop objectives

Process, participation and product were the 3Ps stressed in the workshop which recognized the following objectives:

1. To compile participatory field methodologies, tools and approaches used in coastal communities into a sourcebook for use, testing and adaptation by other practitioners and organizations involved in CBCRM.

2. To produce a sourcebook based on successful practices.

Workshop process

Planning and preparation for the production of the sourcebook started long before the workshop. With the members of the steering committee (representing various organizations in Asia), the focus of the publication was decided on. The steering committee also assisted IIRR in the identification of topics and resource persons for the workshop.

The workshop used a process developed and pioneered by IIRR. This process had been used to produce information kits on a range of topics related to agriculture and natural resources management, including agroforestry technologies in the Philippines, integrated agriculture-aquaculture in Asia, ethnoveterinary medicine in Asia and environmental concepts and actions.
During the workshop, each participant presented his or her draft paper, using overhead transparencies of each page. Copies of each draft were also provided to all other participants who critiqued the draft and suggested revisions.

After the first presentation, an editor-artist team helped the author revise and edit the draft and draw illustrations to accompany the text. The edited draft and artwork were then desktop published to produce a second draft.

Each participant then presented his or her revised draft to the group for the second time, also using transparencies. Again, the audience critiqued it and suggested revisions. After the presentation, the editors, artists and desktop publishing staff again helped the author revise it and develop the third draft. Toward the end of the workshop, the third draft was made available to the participants for final comments and revisions.

The workshop allowed inputs from all participants to be incorporated, taking advantage of the diverse experience and expertise of all present. The concentration of resource persons, editors, artists and desktop publishing staff at one time and place enabled materials to be produced more quickly than is typical for similar publications. And the sharing of experiences among participants allowed the development of networks that would continue to be fruitful long into the future and would lead to concrete follow-up activities.
Matrices
Preference ranking

Definition

Preference ranking is a tool that helps a community prioritize a number of available options according to a set of established criteria or individual preferences. Preference ranking is usually used after an area of interest or set of options has been identified through some other process, e.g., using semi-structured interviews or focus group discussions.

We only have time to cover five topics in our environmental education program, which one should we prioritize?
Purpose

Almost every activity related to CBCRM involves deciding between options. Choosing between a number of options can be done arbitrarily or systematically. Preference ranking helps groups to systematically choose between options. Some of the more important reasons for preference ranking are limited availability of resources or the need to ensure participation in decision-making (either through consensus or majority decision making).

Requirements

Materials

✓ chalkboard, flipchart paper or other material for producing a matrix and recording data
✓ pentel pens
✓ list of options (if already determined)

Suggested approach

1. Select and clarify the topic. (e.g., most appropriate fishing gear for a particular area; most serious problem affecting the group; most preferred product for a micro-enterprise project. Write this topic on the materials used for documentation.

2. Gather a relevant group of stakeholders (refer to topic on stakeholder analysis)

3. List the options that are relevant to the topic.
Ask the participants to add additional options that they feel exist but have not been covered. Write these on a large sheet of paper.

4. Ask community members to think of criteria that can be used to analyze the potential value of each option. Write the criteria on a large sheet of paper.

5. Ask each participant to give a score to each of the options based on the criteria set with the most preferred option receiving the highest score. Use a scale to do this.

   5: very best option
   4: very good but not best option
   3: reasonably good option
   2: marginal option
   1: poor option

6. Repeat the steps for each different person and tabulate their responses (see table below).

   Be consistent in scoring options. Clarify if the participants must use each score only once, or if the same score can be repeated.

7. Add up the scores given to each option. The highest score should be given the highest rank and the least score should be given the lowest rank.

8. Build consensus based on the results of the preference ranking.
Output

★ Ranking of available options: individual ranking

Example

A group of coral reef stakeholders (fishers, local NGO, tourism operator, fish trader) are discussing the merits of various fishing gears, and whether the use of some gears should be restricted. They decide to evaluate existing options on the basis of potential daily catch rate, risk of damaging the reef and market quality of fish caught.

<table>
<thead>
<tr>
<th>Options</th>
<th>NGO Rep.</th>
<th>Tourism Rep.</th>
<th>Fish seller</th>
<th>Young fisher</th>
<th>Old fisher</th>
<th>Gillnet fisher</th>
<th>Total Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish trap</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>Handline</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>25</td>
<td>1</td>
</tr>
<tr>
<td>Gillnet</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>24</td>
<td>2</td>
</tr>
<tr>
<td>Beach seine</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>Baby trawl</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>5</td>
</tr>
</tbody>
</table>

Results: The handline received the highest score which indicates it was the most preferred gear. The baby trawl received the lowest score.

Strength

- Allows every participant to share his/her view of the preferred option. Dominant personalities cannot control the outcome.
Limitation

- It takes time to go through documenting each person's input. Consensus-building on the outcome may also take a lot of time.

Variation

Instead of single respondents, ask groups of stakeholders (divided by age, sex, economic sector, education level, work experience, etc.) to rank the options. Record the score given to each option by each group, then tabulate as above. When discussing the results with community members, look at both the average community score as well as the differences among groups.

Alternative approach

This method can also be used with individuals or with groups of any size, either multi-stakeholder or divided by sector, sex, etc. .

1. Follow the first four steps of the previous approach.

2. Once criteria for judging the options have been identified, list these across the top of the matrix . List the options vertically in the matrix. Ask the group to assign relative values to each option based on their criteria (see example).
Example: group ranking

In an exercise ranking options for craft business expansion, participants list the following criteria to be considered: access to raw materials, level of skill (i.e., training effort) required, number of potential jobs, number of markets and selling price. They give each option a relative score (one to four Xs) for each criterion (see criteria chart). With this in mind, the group then proceeds to rank each option to determine the most preferred (highest ranking) option. The results (see final table below) show that the preferred option is to increase production of straw hats, with wood bowls also being considered a good option (i.e., ranked second).

### Ranking tool

<table>
<thead>
<tr>
<th></th>
<th>Materials</th>
<th>Skills</th>
<th>Jobs</th>
<th>Market</th>
<th>Price</th>
<th>Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basket</td>
<td>XXX</td>
<td>XXX</td>
<td>XXX</td>
<td>XX</td>
<td>XXX</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>Hat</td>
<td>XXXXXX</td>
<td>XX</td>
<td>XXXX</td>
<td>XXXX</td>
<td>XXXX</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>Wooden bowl</td>
<td>XX</td>
<td>XXXX</td>
<td>XX</td>
<td>XXXX</td>
<td>XXXX</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>Mat</td>
<td>XXXX</td>
<td>X</td>
<td>XXXX</td>
<td>XX</td>
<td>X</td>
<td>12</td>
<td>4</td>
</tr>
</tbody>
</table>

3. To make the process easier and quicker, ask the group to choose between each pair of options in turn, using a two-way choice matrix (see example below). The option that “wins” the two-way choice most often is given the highest rank.
Output

★ Two-way choice matrix

Topic: Handicraft options
Purpose: Identify the most preferred handicraft product among four feasible options.

<table>
<thead>
<tr>
<th></th>
<th>Basket</th>
<th>Hat</th>
<th>Wooden bowl</th>
<th>Mat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basket</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hat</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wooden bowl</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Mat</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Score  Rank
---    ---
0      4
3      1
2      2
1      3

Results: The hat handicraft option was most preferred.

Strengths

- If participants are strongly divided, options are very close in degree of preference. If there are lots of options, the tool makes the process of decision-making easier.
- It involves an extra step that displays criteria more clearly than in the first method.
- Dealing with options a pair at a time is easier than trying to rank a large number all at once.
Limitations

- The extra steps take more time. However, time may be saved in terms of avoiding lengthy arguments among participants.

- The specific criteria that individuals use to choose their preference may vary and they may not be applied consistently.
Socio-economic ranking

Definition

Socio-economic ranking is a tool used to assess and rank village families in terms of relative socio-economic status, in this case, through the perception of a number of key informants drawn from the community. The informants determine the criteria for describing socio-economic classes, decide how many different classes exist in the village, and then assign village families to each defined class.

Purpose

- To identify and prioritize potential participants in a prospective project or program.
• To obtain a numerical index allowing comparisons to be made among villages in a project area to assist project or program planning.

• To determine the level of socio-economic inequality in the village, which could have an impact on project/program planning.

• To monitor whether or not a project creates an impact on the socio-economic life of a community using an identified set of indicators. In this case, a socio-economic assessment should be conducted prior to the implementation of the program, to establish baseline data for monitoring purposes in the course of program implementation.

• To investigate relationships between socio-economic factors such as type of work, level of education, family size, family health indicators, etc.

Requirements

Materials

✓ cartolina or paperboards cut into 3 x 5 inches cards (one for each household in the village.)

✓ paper cut into larger pieces (6 x 10 inches)

✓ cleared area (table, floor or ground)

✓ felt marker (fine tip), pencil or pen
Suggested approach

1. Get a list of village residents from the village government office, census list or through a social mapping exercise.

2. Write the name of each family on a card (one card for one family). In some cases a nickname will be more appropriate than the formal family name.

3. Identify and list key informants.

4. Schedule a meeting with each informant. Explain that the purpose of the activity is to gather information on the socio-economic status of village families.

5. Invite each informant to suggest criteria that could be used to describe a socio-economic class. Typical variables include: income level and sources of income; assets such as land, housing, boats, other vehicles; educational attainment; ability to send children to school; quantity and quality of daily food.
6. Ask the informants to identify the different socio-economic classes in their community. Define each socio-economic class by using indicators such as income bracket (e.g., rich-with incomes ranging from P15,000-25,000 a month; poor - with incomes of P3,000 and below a month) and type of boats (motorized and non-motorized.)

Use these as categories. Note down the criteria used by the participants to define each category.

7. Write the name of each category on a large card and display them all on the table/or floor.

8. Give the informants the cards on which each family's name is written. Ask each participant to identify under which category each family belongs. Place the cards next to the appropriate category. If there is hesitation, remind the participants of the criteria.
Analyzing the data from key informants

1. If different informants have used different numbers of categories, their information must be standardized. If most or all informants have distinguished five categories, assign a score to each family as follows: very poor: 20; poor: 40; average: 60; rich: 80; very rich: 100. If standardization is required, then the informants will have to do it all over again.

2. Compile the results of the ranking, showing the scores given to each family by each informant.

3. Calculate the average score for each family.

4. Group the average scores into brackets or ranges, e.g., for a five category system:

   - very rich (90-100)
   - rich (70-89)
   - average (50-69)
   - poor (30-49)
   - very poor (less than 30)

5. Calculate the percentage of families in each category and present this using a pie chart (see example). This will give an overall view of the perceived socio-economic status of families in a particular community.
**Output**

* An assessment of the socio-economic status of the village residents.

**Example: Socio economic ranking**

<table>
<thead>
<tr>
<th>Family</th>
<th>Respondent</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td><strong>Description of categories</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VERY RICH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sahertian</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Sopacua</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Pattipawae</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Loupatty</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>RICH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patty</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>Silawane</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Tuhumena</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Adam</td>
<td>80</td>
<td>60</td>
</tr>
<tr>
<td>Latumaerissa</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Manupassa</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Wattimena</td>
<td>80</td>
<td>60</td>
</tr>
<tr>
<td>Soukotta</td>
<td>80</td>
<td>60</td>
</tr>
<tr>
<td>AVERAGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barends</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Saija</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Sangaji</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Matira</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Musila</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Rupassa</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Mailoa</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>Manuputty</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>Marantika</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>Siahaya</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>Telussa</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>POOR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tehuayo</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>VERY POOR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>La muri</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

Participatory Methods in Community-based Coastal Resource Management
Example

Representation of the socio-economic ranking of the village.

Strengths

- The process is private and confidential and prevents the embarrassment of any particular family or group of families.
- Each set of informant data can be compared with other data sets and checked for obvious biases.
- The data can be analyzed to see how the perception of socio-economic position varies with the type of respondent.

Limitations

- Interviewing many individuals may take more time compared to a group interview.
- Categorization is based on perception and may not be very accurate. Validation can be done using actual surveys.
- One or more informants may not be familiar with everyone in the village, especially if the village is large. Information may be biased.
• Key informants may not reflect the general thinking of the population. This risk can be minimized by increasing the number of informants.

**Variation: Socio-economic ranking by large group consensus approach (the ABC method)**

**Definition**

Socio-economic ranking by large group consensus approach is a variation of the previous method by which a large group of informants, e.g., the entire community, assesses and ranks the socio-economic status of village families.

**Caution**

The facilitator must be very familiar with the community and must have established a certain level of rapport with the community. The community members must be comfortable working with the facilitator.

**Suggested approach**

1. Lead a discussion on the concept of socio-economic condition and ask the participants to form three socio-economic categories of households (i.e., A = better off, B = medium and C = poor).
2. Invite community members to define what is meant by each category.

3. Give each person one card - not their own - and ask them to place it in one of three piles according to the wealth category they think that family belongs. If participants have trouble deciding, remind them of the criteria they have identified.

4. Once the cards have been placed, read each card placed in each category and ask the group as a whole whether they agree with how that family has been ranked. Take note of the important points raised during the discussion.

5. Document how each family has been categorized and count the number of families in each category.

6. Present each category as a proportion of the total population using a pie chart. Show this to the participants and invite their comments.
Strengths

- The ABC method is rapid, enjoyable and easy.
- Provides insights into the extent of poverty incidence in a particular community.

Limitations

- There is always the risk of causing embarrassment to the various members of the community who are being publicly classified by their peers. The first method is preferred in areas where this is a sensitive issue.
- There may be manipulation of the ranking for the perceived benefit of some families. This may be a particular problem where the objective is to identify potential participants for a project.

Prepared by Ricky Palyama
Problem ranking

Definition

Problem ranking is a tool used by a community to identify and rank problems in order of priority by assessing their relative importance using a set of criteria. Problem ranking is often followed by an analysis using either a problem tree or a web chart.

Purpose

- To help the people in the community prioritize their problems so that they can focus their energies and resources to the most important problems.
## Requirements

<table>
<thead>
<tr>
<th>Human resources</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ facilitator</td>
<td>✓ small cards/pieces of paper</td>
</tr>
<tr>
<td>✓ record keeper</td>
<td>✓ flip chart</td>
</tr>
<tr>
<td>✓ participants</td>
<td>✓ marker pens</td>
</tr>
<tr>
<td></td>
<td>✓ masking tape</td>
</tr>
</tbody>
</table>

## Suggested approach

1. Ask the community to brainstorm and list down identified problems or issues. Ask them to write these on small pieces of paper and place these in a vertical column on the floor or board.

   This activity often takes two to three hours. However, time should not be limited if discussion is not yet complete after this time.
The facilitator should be able to distinguish between core (or underlying) problems and symptoms/effects.

2. Suggest and explain possible criteria for ranking the problems:
   - extent or scope (number of people or areas affected by the problem)
   - degree of impact on a particular resource (how serious are the effects of the problem on the resource) e.g., destruction of reefs, decline in fish stocks
   - occurrence or regularity (how frequent does the problem occur, during what season, etc.)

The participants may suggest other criteria in addition to those mentioned above.

3. Let the participants analyze each problem according to the criteria set.

4. Ask the participants to compare each problem. Score each problem using a predetermined scale (e.g., 1-5 with 5 representing the highest number, severity or frequency). Use drawings, seeds or other local materials to record each score.

5. Add the total score for each problem and place the sum in the second to the last column. The sum reveals the relative importance of the problem across all criteria and determines how it ranks compared to the other problems.
6. Use the last column to rank the problems based on their respective score.
   The problem with the highest number of total marks is considered the number one problem. If two problems have the same number of marks, they are considered to be of equal importance.

7. Some of the descriptions may be qualitative, e.g., degree of impact and occurrence. In this case, ask participants to explain and clarify the meaning of the marks made. The documentor should note down the key points mentioned.

8. Copy the entire matrix. If time permits, present it to a larger group for further discussion and analysis.

The priorities may change over time. Depending on their needs and objectives, the community may determine how often they should conduct this activity.

Sample output

<table>
<thead>
<tr>
<th>Problems</th>
<th>Extent (no of people/area affected)</th>
<th>Degree of impact or effect (how severe)</th>
<th>Occurrence (how frequent)</th>
<th>Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low fish catch</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Dynamite fishing</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Overfishing due to fine mesh nets</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Mangrove deforestation</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Environmental pollution</td>
<td>0</td>
<td>0</td>
<td>—</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Variation: Paired ranking variation

1. Prepare a matrix on craft paper with 10 rows, 10 columns. Place an “x” or shade the first box in upper left and continue diagonally to bottom right.

2. Let the participants list down problems related to a particular topic or theme (e.g., fisheries or fish stock depletion).

3. When the list of problems is completed, list them across the top row and left most column in the same order.

4. Start with the problem listed in the first column second row. Compare this problem with each problem listed in the second row. Then ask each participant which one is more important (i.e., which is a more serious problem).

5. Write the name of the more important problem in the box where to two problems being compared intersect. If two problems are considered to be equally important, press the group to examine the problems more closely to determine one that is more serious.

6. Continue this process until all the boxes are filled up.

7. Add the number of occurrences of each problem. Write the sum in the column under SCORE.

8. Based on the frequency of occurrence, rank the problems. The greater the number of occurrences, the more important the problem. That is, the number 1 problem is the one with the highest score, the number 2 problem the second highest score and so on.
9. Copy the entire matrix. If time permits, present it to a larger group for further discussion and analysis.

Output

★ A matrix of problems ranked from highest to lowest in terms of importance according to a specific set of criteria.

<table>
<thead>
<tr>
<th></th>
<th>Overfishing due to fine mesh size</th>
<th>Low fish catch</th>
<th>Dynamite fishing</th>
<th>Overfishing due to fine mesh size</th>
<th>Environmental pollution</th>
<th>Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overfishing due to fine mesh size</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Low fish catch</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Dynamite fishing</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Mangrove deforestation</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Environmental pollution</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

Strengths

- Helps the community focus on the most important problems.
- Provides a systematic way of prioritizing community problems.
- Increases the community's awareness of the breadth and depth of certain problems that significantly affect them.

Tip

Problem ranking is best followed by an analysis of the problems using problem trees and webs. Because it creates a sense of urgency among members of the community, it should also be followed by planning and implementing a course of action to address the identified problem.

Prepared by Dipankar Saha
SWOT analysis

Definition

SWOT stands for Strengths, Weaknesses, Opportunities and Threats. Strengths and weaknesses focus on the internal factors, while opportunities and threats reflect the influences of the external environment affecting the organization, community or activity. These may include socio-cultural, political, economic, environmental, technical and other dimensions. The SWOT analysis can complement other tools including institutional analysis and stakeholder analysis.

Purpose

- To identify strengths and opportunities and consider how to optimize these, and to identify weaknesses and threats and how these can be overcome.
• To analyze the capability of community-based organizations to carry out a particular project (e.g., conservation or livelihood) and to consider options on how they can be more effective.

• To assess a particular organization, activity or site in relation to a desired use such as the following:
  - assessing the capability of an organization to undertake community organization activities;
  - assessing potential sites for activities such as mangrove reforestation; and
  - evaluating a particular program or activity for its relevance to community needs.

• A tool used as part of strategic planning processes.

Requirements

Materials

✓ board (whiteboard, blackboard, corkboard)
✓ craft paper
✓ blank cards (4"x 8")
✓ masking tape

Possible approach

1. Clarify with the participants the specific item to be assessed using SWOT analysis, and write it on the board.

Example: To do a SWOT analysis on the group's ability to carry out a mangrove reforestation program. (An example of a possible output of this topic is given at the end of this section)
2. Define terms, (i.e., strengths, weaknesses, opportunities, threats) in the context of the internal and external environments of the organization, activity or site.

Emphasize that strengths and weaknesses refer to the internal aspects of the organization, site or activity. Similarly, explain that opportunities and threats refer to the external influences affecting the site, activity or organization.

3. Ask the participants to list strengths and post these under a column labelled strengths. Clarify and discuss the items listed. Group or cluster similar items.

Repeat the same process for weaknesses, opportunities and threats.

4. Analyze the results. Use the following questions to lead the discussion.

   - How can strengths be employed to take advantage of development opportunities or counteract threats?
• How can weaknesses be overcome?
• How can the organization or activity maximize opportunities?
• How can threats be avoided?

5. Record responses and summarize major points. This will be the basis for identifying various actions and/or options.

6. Develop strategies and/or courses of action based on the responses.

**Output**

★ A matrix that summarizes the key internal and external factors that influence a project, organization or site. Analysis of this information can generate various courses of action.
## Example: SWOT analysis of a Mangrove Reforestation Project

<table>
<thead>
<tr>
<th>Activity/Organization/Site</th>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
</table>
| The capacity of a community-based organization to implement a mangrove reforestation project | • We have a youth group that is willing to work on the replanting  
• Rico has plenty of bamboo offcuts that could be used as stakes | • We do not know how to do the transplantation  
• We have no money for the project  
• Most community members are more interested in their own activities |

### Opportunities
• We do not need to buy propagules because we can collect them for free  
• We have the abandoned fish pond which we could use for the project  
• The new Mayor supports environmental projects  
• The university has people who know about mangrove reforestation  
• An NGO is providing livelihood assistance in the area

### Strategies/Actions
• Contact the university to ask assistance in training and environmental education  
• Discuss the problem about the fish pond owners with the Mayor  
• Hold a meeting with the youth group and other members of the community  
• Design an incentive scheme for those who would be planting and maintaining the plantation  
• Link with NGOs for possible assistance in livelihood program

### Threats
• Fish pond operators want to clear more of the mangroves  
• Some community members cut mangroves for firewood

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**SWOT analysis**

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Strengths

- It is a simple, systematic and participatory tool that can be applied to a wide range of situations.

- It encourages participants to consider often neglected external factors that influence CBCRM activities.

Reference

Stakeholder analysis

Definition

Stakeholder analysis is a method by which people generate insights into the characteristics of individuals and/or groups, and their respective relationship to a particular resource or project. Stakeholder analysis goes beyond the simple identification of stakeholders. It examines the interests of stakeholders vis a vis a particular resource or project and the impact of the activity on the stakeholder.

Stakeholder analysis also tries to identify coping strategies to minimize or eliminate negative impacts of activities on stakeholders.
Who are stakeholders?

Stakeholders are individuals, groups or organizations of men and women who are in one way or another interested, involved or affected (positively or negatively) by a particular conservation or development project. They are motivated to take action on the basis of their interests or values.

Stakeholders are important because they can support and sustain a particular resource. They could be potential partners or threats in managing and developing coastal resources.

The fisher community or organization is considered a primary stakeholder of coastal resources. Other examples of stakeholders include government agencies, private/business organizations, non-academic organizations, academic or research institutions, religious/cultural groups and donors.

Stakeholder groups can be divided into smaller and smaller sub-groups depending on the particular purpose for stakeholder analysis. Ultimately, every individual is a stakeholder, but that level of detail is rarely required.
Purpose

- To identify potential partners in managing a particular resource or project.
- To explore possible approaches in relating to a particular person or groups who can be supportive or potentially hostile to a particular undertaking.
- To provide valuable insights into the dynamics and relationships of individuals and groups with various interests in a particular resource or project.

The stakeholder analysis is usually done by key informants from primary stakeholders (i.e., members of the fisher community). The facilitator should be a trained community leader or a person from a non-government organization working in the community.

Requirements

Human resources
✓ facilitator
✓ key informants

Materials
✓ manila paper or black board
✓ colored paper or cartolina
✓ pens
✓ metacards
✓ masking tape
✓ paper circles
✓ scissors or cutting blade
Suggested approach

**Note**

This exercise can be done with participants from a single stakeholder group or with members of various stakeholder groups. It is important to recognize and document the composition of the participants in order to objectively analyze the results.

1. Identify resource, project or activity to be analyzed. The project or activity may be on-going or proposed.

2. Identify and list stakeholders. Write their names on paper circles. Use larger circles for stakeholders with greater influence or power (refer also to topic on venn diagram).

3. Prepare a stakeholder analysis matrix on the board or on a piece of manila paper.

**Stakeholder analysis matrix**

<table>
<thead>
<tr>
<th>Proposed action: Enterprise project in national park</th>
<th>Positively affected (+)</th>
<th>Negatively affected (−)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directly affected</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indirectly affected</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. Place the circles in the appropriate square on the stakeholder analysis matrix. There are four possible locations based on the matrix:

a. stakeholders that are directly affected in a positive way [direct and (+)];

b. stakeholders that are directly affected in a negative way [direct and ( – )];

c. stakeholders that are indirectly affected in a positive way [indirect and + ]

d. stakeholders that are indirectly affected in a negative way [indirect and – ]

5. Draw lines between the stakeholders to indicate the existence of some form of relationship. Use plus or minus symbols to indicate the nature of the relationship.
6. Prepare a stakeholder analysis and coping matrix.

<table>
<thead>
<tr>
<th>Stakeholder group</th>
<th>Describe the impact of the proposed action on the stakeholder group</th>
<th>Describe the potential reaction of the group and the implications for the proposed action</th>
<th>Can the proposed action be modified to reduce or mitigate the negative impact on the stakeholder group?</th>
<th>Describe the recommended course of action (coping strategy)</th>
</tr>
</thead>
</table>

7. Begin with the stakeholders identified as being directly and negatively affected, then move on to those indirectly and negatively affected. For each of these stakeholder groups, examine the questions found in the analysis and coping matrix:

- Describe the potential impact of the proposed action on the stakeholder group.
- Describe the potential reaction of the affected group and the implications for the proposed action.
- Can the proposed action be modified to reduce or mitigate the negative impact? If so, how?
- Describe the recommended course of action (coping strategy).
8. Write the information for each column on the metacards (or directly on the board) and place metacards on the appropriate columns.

9. After the participants have filled up the matrices and tables with information, discuss observations, issues/problems and insights.

10. Formulate strategies or courses of action for addressing various stakeholder interests especially for those negatively affected.

11. Discuss other possible uses of the information derived from the exercise.

Factors affecting the values and characteristics of stakeholders

- Age and sex
- Gender
- Religion
- Political affiliation
- Occupation
- Education
- Familial relationships
- Geographic location
- Length of residency
- Income and social status
The following tools also described in this sourcebook may be of particular relevance to stakeholder analysis: venn diagram, institutional analysis, resource use mapping, key informants.

## Outputs

- Data/information on various stakeholders (especially those negatively affected).
- Coping strategies/courses of action which could be used as input into an overall plan of action.

### Sample output: Stakeholder analysis and coping matrix

<table>
<thead>
<tr>
<th>Proposed action: Implementation of a community-based herbal medicine collection and processing enterprise in Coastal National Park</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stakeholder group</strong></td>
</tr>
<tr>
<td><strong>Resort owners</strong></td>
</tr>
</tbody>
</table>

---

40 Participatory Methods in Community-based Coastal Resource Management
Strengths

- Provides useful background information on different stakeholders.
- Gives the community or organization ideas on how to relate to particular stakeholders.
- Provides insight into the dynamics and relationships of different stakeholders.

Limitation

- Some information/data about the stakeholders may not be readily available and, therefore, based solely on the perceptions of participants.

Tips

- Participants must be discreet and tactful in handling or using information derived from the exercise.
- This exercise can be done before initiating a partnership or joint activity (e.g., participatory coastal zoning, marine sanctuary establishment).
- This exercise should be repeated at key points in the project or program cycle to check on possible changes in the number and characteristics of the stakeholders.

Prepared by Marie Grace Madamba-Nuñez and Gregory C. Ira
Group methods
Focus group discussion

Definition

Focus group discussion (FGD) is a discussion with a selected group of four to eight community members (chosen for their background or knowledge relevant to the objectives of the study) following a set of detailed guidelines designed to generate discussion on a particular set of topics.

Purpose

- To generate information, build consensus, clarify information in documents lacking details or gather different opinions on certain issue.

- To gather information on certain issues in fishing, farming and other livelihood practices, leadership structures and decision-making patterns, health practices and delivery systems, labor sharing arrangements, local indicators of poverty and socio-economic standing, indigenous taxonomies (e.g., how people group or categorize fish, seaweed, etc.) and other information.
Requirements

Human resources
- trained facilitator/moderator
- note taker

Materials
- note pad
- pencil or pen
- chalk/marking pens
- poster paper/chalk board/white board
- guide questions or guidelines for the focus group discussion (FGD)
- attendance sheet
- cassette recorder and blank tapes (optional)

Possible approach

Preparation
1. Set and discuss with the community the objectives of the discussion.

2. Determine target participants (e.g., fishers, farmers, women, etc.) and discuss with community leaders and various sectors of the community, the
criteria for group selection. Ideally, group members come from various walks of life and socio-economic categories, representing formal and informal community organizations.

3. Let the community leaders identify people in the community who fit the criteria. Be on the lookout for biases (refer to topic on key informants).

4. Plan the time frame and schedule of the session.

5. Design the focus group guidelines.

---

Possible criteria in selecting target participants

- age
- educational level
- ethnicity/race
- language
- world views
- marital status
- socio-economic status
- religion
- work experience
- sex
- residency (urban/rural)
- length of local residence
Designing the FGD guidelines  
(refer to semi-structured interviews)

1. Guidelines are open-ended questions used by the facilitator to initiate discussion of a particular topic. The objective is to encourage FGD participants to discuss target concepts and express their opinions, experiences and memories. Open-ended questions are those that require information other than a simple "yes" or "no" for an answer. Avoid these types of questions because they do not lead to new ideas.

2. Phrase questions in a way that seeks to discover prevailing attitudes and practices, not just those of group participants, e.g., use "In general..." as a starting phrase.

3. Guidelines should be brief.

4. Guidelines should provide only the opening questions for key topics and a reminder to probe certain aspects.

Example of guidelines for a session in introducing a marine sanctuary:

1. Coral reef  — What are they? How are they used? Why are they used in that manner?
2. Fishery laws  — What laws are you familiar with? How are they implemented? How are they useful to the community?
3. Marine sanctuary  — What is it? Is it useful/important?

6. Train the facilitators and the note taker.

During the session

Guide for the facilitator

1. After the introductions, start with a warm-up topic (non-controversial but related).

2. Request permission to record the discussion.
3. Go through prepared guidelines. Feel free to jump back and forth, be flexible.

4. Keep track of every topic by putting check mark next to each topic as it is discussed.

5. At the end of the discussion, give a brief summary of the topics that have been discussed by the group.

Guide for the note taker

1. Write down key words in the statement or question. If possible, enough should be written to get the essential meaning.

2. Furnish participants a copy of the highlights of the discussion after the FGD.

Outputs

★ Information that can be used for planning, strategizing or completing the profile of a community or resource.

★ Consensus or agreement on controversial issues.

★ General perception of community members on important matters, e.g., projects, plans and activities.

Strengths

• Allows discussion of sensitive issues in the community, leading to further clarification of such issues.

• Generates desired information if facilitated effectively.
Limitations

- Because of the limited number of participants, responses cannot be taken as representing the views of the whole community.

- Not all sensitive issues that arise can be processed and resolved through FGD. There might be other more appropriate venues to resolve these. It is therefore important for the facilitator to keep the discussion focused on the agreed topic and simply note down other critical issues raised.

Prepared by Perry Paleracio
Brainstorming

Definition

Brainstorming is a group activity where selected members of a community take turns in sharing their ideas relating to a certain topic or question. A facilitator encourages participants to react to the topic or question and the responses of other participants.

Brainstorming differs from listing because it encourages participants to think critically and creatively rather than to simply generate a list of options, answers or interests.

Purpose

- To generate new information, perspectives and ideas or gather different opinions from several people on a certain topic in a short time.
• To generate useful information on some issues in the community to produce a quick overview of a specific subject. It is most useful in discovering the “what” of a certain issue but can also be used to explore the “why”, “how”, “who”, “when” and “where”.

The information produced is often sketchy but can be followed up by other participatory tools or methods (refer also to topics on ranking, venn diagram and focus group discussion).

Requirements

Human resources
✓ facilitator
✓ recorder or note taker

Materials
✓ chalkboard and chalk
✓ bondpaper
✓ paper and pencil
✓ writing cards
✓ pentel pens
✓ masking tape

Suggested approach

Pre-activity
1. Set the objective of the activity.
2. Based on the objective, determine the individual or groups that should be involved in this particular activity (e.g., fisher, farmer, women, youth, etc.)
3. Inform and discuss with the community leader details of the activity and the criteria to be used in the selection of the participants. If the topic relates to coastal activities then fishers will be the target group.

4. Let the community leader identify the possible participants (refer also to topic on selection of key informants).

5. Set the date, time and place of the meeting with the community leader.

**On the day of the activity**

1. Explain and discuss the objective and mechanics of the session so that everyone understands the process.

2. Introduce the topic.

3. Ask each participant to give or share their ideas relating to the topic.
   
   Do not sanitize ideas. Do not discuss in length.

4. Write down all ideas on the chalkboard as they arise.
5. With the participants, sort, classify and synthesize ideas written on the board.

6. Discuss and analyze with the participants the results or use them as an input to the succeeding exercise.

The richness of the brainstorming session largely depends on how evocative the facilitator is in drawing out ideas from the participants.

Output

* A set of new ideas or new ways of looking at a topic or question. The ideas may be classified, segregated or synthesized. They can also serve as the starting point of a new brainstorming session.

Result of a brainstorming activity done in Barangay Mugdo, Western Samar, Philippines

<table>
<thead>
<tr>
<th>Reasons why fishers choose to engage in illegal fishing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy to do</td>
</tr>
<tr>
<td>Technology accessible</td>
</tr>
<tr>
<td>Lack of alternative livelihood</td>
</tr>
<tr>
<td>Dynamite fishing commonly used</td>
</tr>
<tr>
<td>Quick return of investment</td>
</tr>
<tr>
<td>Competition with other fishers</td>
</tr>
<tr>
<td>Poverty</td>
</tr>
<tr>
<td>Easy money</td>
</tr>
</tbody>
</table>
Strengths

- Provides information in a short time; usually takes 15 minutes
- Simple
- Highly participatory

Limitation

- Some participants might dominate the sharing. Using idea cards or forming sub-groups can eliminate this problem.

Variations

Using idea cards

In some cases, participants are hesitant to voice out their ideas. Using metacards or idea cards can help address this problem.

1. Distribute cards (made of cartolina or bond paper with a dimension of 10 x 30 cm) to each participant.
2. Let the participants write their ideas using a pentel pen and let them post the cards on the chalkboard.

Using cards saves the facilitator time and effort in gathering working ideas on the board. The cards can also be easily moved around the board when sorting, classifying and discussing the results. The use of symbols or drawings is also encouraged. Sometimes, ideas are better expressed in visual creative forms rather than as words.

Example

Instead of writing the word fish corral, a drawing showing that particular gear can be drawn. Symbols can be drawn either on a chalkboard or on writing cards.
Formation of sub-groups

Depending on the objective, group participants according to age, sex, class and ethnicity. The information gathered can either be compared, segregated or synthesized according to the categorization of the participants.

In India, a mixed-aged group of women participants can be dominated by the mother-in-laws. One solution is to split the group into sub-groups.

Reference


Compiled by Charlotte Mayette Zamayla-Paredes
Surveys and interviews
Identification of key informants

Definition

Key informants are purposely selected community members who are able to provide information on a particular research topic based on their knowledge, skills or experience with that subject. Because it is not possible to speak with everyone in a community, individuals with experience on the research topic are sought.

The identification of key informants is a basic and critical step in doing participatory research.
Tip

Different types of people have different types of knowledge. If you ask the same question to a child, a woman, a less educated person and an older man, you may get four different answers. The type of knowledge people have is related to their age, sex, labor division within the community or family, enterprise, occupation, socio-economic status, experience, environment and history.

Purpose

The principle behind using key informants is the belief that the community members can provide the most accurate, relevant and detailed information about their own community. For example, the chairperson and members of a fishers’ organization can give detailed information about issues confronting fishers in the locality (e.g., marketing, illegal fishing) using their experience as basis.

The identification of key informants is usually the first step in semi-structured interview, seasonal calendars, historical lines, transects and others.

Requirements

Human resources

✓ community members
✓ facilitators

Materials

✓ notebook
✓ pen
Knowledge can be grouped into three general categories

1. Common knowledge – held by most people in the community, e.g., how to cook rice.

2. Shared knowledge – held by many but not common to all, e.g., fishers know how to catch fish; so will other members of their household.

3. Specialized knowledge – held by only a few people who have special training, e.g., makers of bancas or boats, blacksmiths or teachers.

Possible approach

1. Identify the type of information that you need. For example, local names of fish species caught in the area, trends in fish catch, household incomes and fisher population.
2. Identify the village leader and arrange for a meeting to explain what you would like to do.

3. Ask the village leader to identify individuals in the community that hold key positions or are widely respected. These include religious leaders, heads of fishers or other community groups, health workers and teachers. This should include all major sectors of the community. Try to ensure that women, youth and elderly community members are represented.

4. Choose who among these people can provide relevant information based on your objectives. Find out where they live or how you can contact them so you can arrange for a meeting or an activity.

5. Leave a directory or list of key informants and their areas of special knowledge with the village leader for future reference.
Strengths

- Can be done for any topic or sub-topic.
- Ensures that the information gathered is from the most relevant sources, i.e., the community itself.
- Fosters a high level of participation.
- Can quickly and easily generate a list of individuals with shared or specialized knowledge.

Limitations

- Can give misleading or biased information according to the informant’s interests. Cross-check information by asking a number of informants the same questions.
- One informant may dominate, or be present in too many activities which might cause bias.
- Works better in smaller villages where people know each other. In larger areas, a more systematic variation can be used.

Tips

1. Outsiders might give more objective information or explanation of village issues. People from neighboring communities can give another perspective on issues raised.
2. Find the right people to ask and seek them out. For example, women who collect or glean mollusks may know more about them than their fisher husbands.
Variations

Snowball or rolling sampling method

- After identifying primary key informants, ask them who else could be of help in giving information about a particular topic. Other informants may be fishers with specialized local or ecological knowledge.

Others

- Another technique is to ask people who they disagree with on certain topics to get a range of opinions. Asking who people go to if they have a problem will also help identify people respected in the village.
• In larger communities, key informants can be identified by asking a broad sample of people to name others in the village who know most about a certain topic. Prioritize and visit the people whose names appear most often. Ask these people for further names. From these two steps the names that appear most often will give an indication of who the community thinks can provide the most information, or is an ‘indigenous specialist’.

References


Compiled by Karen Hampson
Survey of commercial fish landings

Definition

Surveys of commercial fish landings are direct methods used for collecting information on fishery resources exploited on a large-scale from the local region. Community-based survey methods enable the members of a community to gather information on the resources from the fishers with the help of a facilitator.

Data on resource changes and past history can be collected from experienced fishers.
Purpose

- To collect indicative data on trends in resource changes and exploitation in the case of large-scale fisheries.
- To generate basic information on the quantity and size of fish caught, fishing gears, fishing grounds, etc.

Output of this survey can be used by the community for making its own decisions for local management of the resources. The information will also be useful to non-government organization (NGOs), resource managers, local administration and other fisheries interest groups.

- To obtain feedback from the community.

Requirements

**Human resources**

- facilitator with basic skills in fishery survey methods and in participatory rural appraisal (PRA)
- team members from the community (able to identify local fish species using local names)

**Materials**

- field notebook
- checklist of local names vs. scientific names or common names
- spring balance
- drawings/photographs of local species not common
- paper
- pencil
- pocket calculator
Prerequisite: site selection

- Planning is essential for a fish landing survey. Visit the area before selecting the study site.
- The proposed site must be representative in terms of fish species, craft, gear, scale of operation and accessibility for data collection. Suitable sites can be selected using PRA methods (e.g., participatory mapping).
- Ideally, the site should not undergo major changes in fishing operations during the year.
- Avoid sites where migrant fishers and vessels from other areas are landing their catch and where there may be conflicts among fisher groups (e.g., traditional vs. mechanized sectors).
- Choose sites where the community is supportive of project intervention.

Possible approach

Assessment of present resource status

1. Arrange for the team to go to the fish landing site and record information on fish species, weight and size using direct observation. You may need to convert local units (e.g., baskets) to kilograms. Use the attached form A.

2. Record other information:
   - total number of boats operating on the day
   - seasonality of fish abundance (e.g., peak season for Tuna)
   - seasonality of gears
   - seasonality of juveniles
3. Use this information to compare sites and look at trends.

4. Present the information to community (use maps, charts and diagrams).

5. Discuss the implications of your findings with the community. It will be useful to involve in the discussion a fisheries specialist who is familiar with the village.

6. Assess the need for further monitoring.

**Variation**

**Assessment of changes in the resource status, with time**

1. Using interviews, collect information on major species caught, fishing craft and gear used, changes in the sizes of fish landed, changes in the average catch per boat or gear, changes in the number of fishers operating in the area, changes in the fishing grounds, etc. (e.g., 10 years ago, 5 years ago and present). Use the attached Form B.
2. Present this information to community for discussion.

3. Look at the changes over time and discuss the reasons.

Caution
Check the information on present yields, craft, gear, etc. by direct observations.

4. Rank the reasons for changes in the resources.

Outputs

★ A set of basic data on the fish species caught and landed in the area (type, number/kg).

<table>
<thead>
<tr>
<th>Fish catch/Fisher</th>
<th>1950</th>
<th>1970</th>
<th>1991</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td><img src="image1" alt="Fish" /></td>
<td><img src="image2" alt="Fish" /></td>
<td><img src="image3" alt="Fish" /></td>
</tr>
<tr>
<td>Volume</td>
<td><img src="image4" alt="Fish" /></td>
<td><img src="image5" alt="Fish" /></td>
<td><img src="image6" alt="Fish" /></td>
</tr>
<tr>
<td>No. of fishers</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

★ Decisions concerning intervention measures.
★ An analysis of trends in fish catch and landings.
Intervention decision!

- If the mesh size of the net is increased, initial decline in catch can result. The fishers should not misunderstand this and go back to the old mesh size. It will take some time for the catch to improve and this must be clearly understood.
- If use of a gear catching low priced fish is discontinued, absence of cheap fish may marginalize the small scale fish processors who depend on cheap fish.

Strengths

- Provides a broader understanding of the resource.
- Useful in evaluating changes that have occurred and understanding the reasons for such changes.

Limitations

- Monitoring of impact requires more effort and can be time consuming.
- Some data from 5-10 years ago is based on perception and experience rather than actual records; information may not be accurate.
- This method is not suited for monitoring artisanal fisheries.

Prepared by Mohan Joseph Modayil
Form A:

Fish landing sheet (fill up for each craft/boat)

<table>
<thead>
<tr>
<th>Recorder:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of craft:</td>
<td>Horse power:</td>
</tr>
<tr>
<td>No. of crew:</td>
<td></td>
</tr>
<tr>
<td>Type of gear(s):</td>
<td>Mesh size/</td>
</tr>
<tr>
<td></td>
<td>No. of hooks:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Area of operation:</th>
<th>Duration of operation:</th>
<th>No. of fishing days per month:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Fish Species</th>
<th>Quantity (kg)</th>
<th>Average size (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow fin tuna</td>
<td>250</td>
<td>800</td>
</tr>
<tr>
<td>Yellow Jaw</td>
<td>100</td>
<td>300</td>
</tr>
</tbody>
</table>

Number of boats operated on the day: __________________________

Number of fishing days during the month: _______________________

Seasons/month when juveniles are caught for each species: ________

Type and mesh size of gear used during that time: ______________

Species of juveniles caught and when: _________________________

Seasonality of fish abundance: ________________________________

Seasonality of gears used: _________________________________
Form B:

<table>
<thead>
<tr>
<th>Averages in Resource Status</th>
<th>Location: ______</th>
<th>Date: ______</th>
<th>Recorder: ______</th>
<th>Interviewee: ______</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>10 years ago</td>
<td>5 years ago</td>
<td>Present</td>
</tr>
<tr>
<td>Major species caught</td>
<td>Major species</td>
<td>Approximate size</td>
<td>Major species</td>
<td>Approximate size</td>
</tr>
<tr>
<td></td>
<td>caught</td>
<td></td>
<td>caught</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common craft(s) used</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common gear(s) used</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of boats</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common fishing grounds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approx. catch/boat</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Semi-structured interview

Definition

A semi-structured interview is a conversation with a purpose. As such, it differs from a structured interview which has a specific set of questions in a specific sequence often with multiple choice options for responses.

A semi-structured interview usually involves a set of guide questions or discussion points. The interviewer combines these guide questions with the new questions that arise during the interview (as a result of responses from the respondents). Therefore, the information generated is not limited to a set of predetermined questions but evolves with new information provided by the respondents.
Purpose

Semi-structured interviews are often part of a broader program of research, for example, to complement participant observation or life histories (refer also to topics on focus group discussion and general guidelines for using participatory tools).

A semi-structured interview is a way of generating data or information by providing opportunity for the interviewer to do the following.

- To probe answers.
- To open up new dimensions of a problem.
- To secure vivid, accurate and inclusive accounts based on personal experiences.

Requirements

Materials

☑ notebook
☑ pen or pencil (ask permission from the interviewee to write)
☑ tape recorder (optional)

Preparation for the interview

1. Gather and review available information about the village.
2. For a more meaningful conversation, observe people, be familiar with the local technical terms they use and understand the cultural meanings of gestures and other symbols.

Remember that your sex, background, age and personality will affect the interview. For example, rural women may feel uncomfortable talking to a man even if no personal questions are asked.

3. Use participatory techniques in identifying key informants (refer to topic on identification of key informants).

4. Prepare an agenda and list of topics.

5. Phrase questions that require participants to tell a story and not those that are only answerable by YES or NO.

   Example of a good question (open-ended)
   *How often do you go to the market?*

   Example of a bad question (leading)
   *Do you go to market twice a week?*

6. Arrange for a place for the interview wherein the informant will feel at ease.
Types of questions to ask

1. Descriptive questions – These prompt informants to describe their activities.

   *Example: Could you describe what happened after the tourist resort was constructed?*

2. Structural questions – These attempt to find out how informants understand their situations and organize their knowledge.

   *Example: Has the dynamite explosion affected your fish catch? If so, how?*

3. Contrast questions – These encourage informants to discuss the meanings of situations and provide an opportunity for comparisons to take place between situations and events in the informant's world.

   *Example: How would you compare the fish catch of now with that of 20 years ago?*

4. Probing questions - These allow informants to analyze and reflect on the deeper causes of a particular situation. Probing questions usually start with "Why?" and "How?"
Suggested approach

1. Introduce yourself and the purpose of the interview.

2. Present the general topics or themes to be covered in the interview.

3. Start with simple questions that require description. Then move on to more complex structural and contrast questions. Be particularly sensitive when asking probing questions.

Tips

- Start with general questions and then get more specific.
- Make links between the comments by posing further questions in the informant's own words so as to encourage him/her to provide a portrait in his/her own terms rather than in the interviewer's terms.
- Ask questions in different ways to probe so that informants will provide further information.
- Make links between observations and information given during the interviews.

4. Write-up the interview as soon as possible when it is still “fresh in your mind.”

5. When possible, share with the informant how you have used the information from the interview.

Be aware that people might respond differently depending on who might be listening in the background. It would be ideal to conduct interview alone with the informant.
Strengths

- Semi-structured interviews can generate perceptions and emotions in detail.
- Interviews can lead to the truth.
- If done well and cross-checked with other information, semi-structured interviews can provide an excellent situationer for the area. The interviews can particularly be effective for revealing personal dynamics and how these affect the topics under discussion.

Limitations

- It is time consuming.
- Different interviewers may get different results. It is recommended that an experienced interviewer conduct the interviews.
- Some responses may be influenced by personal biases, e.g., people may use the interview to talk about personal grievances, etc.
- People may give answers which they think you expect to hear.

Variation

Group interviews

Group interviews are advantageous because the group has more control over the discussion as well as the questions posed. They also provide an opportunity for a dialogue among the participants in the group.
A multi-disciplinary team composed of a sociologist, anthropologist, biologist and practitioners from other disciplines may also conduct interviews although caution should be taken that the participants do not get overwhelmed by the presence of these people.

Local people can be trained to conduct interviews themselves with the members of the community. The informants might be more comfortable talking to them rather than to "outsiders".

Prepared by Corazon Lamug
Family food analysis

Definition

A process of assessing the nutritional adequacy of the foods and beverages consumed by individual members of the family. The process provides an opportunity to gather information on food diversity, food sources, food allocation and food security.

Family food analysis also includes the recording of the schedule and the number of meals taken each day, the practice of taking snacks and the sharing of food with relatives and acquaintances.

Individual food preferences, taboos and beliefs are also documented during the process. There are several tools used in family food analysis but food recording and weighing will be the focus of this paper.
Purpose

- To describe a family diet in a coastal area.
- To classify participants into well-fed, over-fed and under-fed categories based on percent diet adequacy.
- To identify, characterize and locate (through maps) groups or households that are nutritionally at risk.

Requirements

Human resource
✓ nutritionist or trained facilitator

Materials
✓ ball pens
✓ ruler
✓ food record form (sample attached)
✓ weighing scales (dietary and bathroom)
✓ calculator
✓ tape measure
✓ measuring cups (solid and liquid)
✓ measuring spoon
✓ food composition table
✓ Recommended Dietary Allowance (RDA) table (optional)
✓ weight for height table
✓ food materials for demonstration and dry run
✓ camera (optional)
Prerequisites

The family food analysis is best conducted when:

1. Arrangements with local officials, community and organization leaders have been completed.
2. The facilitator has visited all parts of the community, has interacted with the residents and has some idea of their work schedules.
3. The facilitator has reviewed secondary data on the community.
4. The facilitator has coordinated with fieldworkers of other organizations.
5. Sample households have been invited to participate.
6. All materials needed are ready.

Possible approach

Collaboration with fieldworkers of various organizations in the area should be sought and strongly encouraged to avoid duplication of data collection activities and to facilitate other development initiatives.

Food has multi-faceted meanings to different individuals and households. Cultural and psychological values contribute to the meanings attached to food. This could affect the quality of people's participation in the family food analysis. Allow enough time to get to know the target participants before the activity.
1. Subdivide the community into sections that appear to have similar levels of food consumption.

2. Select sample households at random from each section (30% of the households/area).

3. Conduct food weighing demonstration for the participants and explain how they should use the food record form.

**Caution**

Not all food is consumed at a group meal at fixed times. Thus, the eating habits of the participating families must be determined and the recording method adjusted accordingly.
4. Provide a session for a household practice or test run.

5. Let the participant households know the days that the nutritionist will visit (optional).

---

**Food record form**

Name: ___________________ Date: _______ Day: _______

Recorded by: ___________________

<table>
<thead>
<tr>
<th>Meal (please indicate time and place)</th>
<th>Food/description (type/part, brand names, sizes, number of pieces, cooking method)</th>
<th>Amount served (g)</th>
<th>Leftovers</th>
<th>Amount consumed (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Edible portion</td>
<td>Non-edible portion</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
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<td></td>
</tr>
</tbody>
</table>

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**Family food analysis** 87
6. Measure height and weight of individual household members.
7. Distribute forms and explain to individual family members how to record their daily food intake. They should do this on one ordinary day, one market day and a Saturday or a Sunday.
8. Ask the nutritionist or local fieldworkers to go around several participating households during weighing time to check if they are doing it correctly (optional).
9. Collect the completed forms after several meals and review and discuss the data.
10. Let the nutritionist or health workers calculate the nutrients (optional).
11. Ask the nutritionist to assess the nutritional adequacy of the diets documented.
12. Use the data to document households that are nutritionally at risk.

Outputs

★ Indigenous weekly menu.
★ Compilation of recipes with food beliefs and taboos explained and a list of suggestions on nutritional improvement.
★ Poster of nutritional/health status of the population.
Recommendations regarding health and nutrition programs and food production.

★ Spot map of nutritionally at risk households.

Example

Legend:

🌟 Nutritionally at risk household

Strength

• Provides detailed household level information.

Limitations

• Recording and weighing require practice for accuracy and precision.

• Time consuming. Participants must be highly motivated to sustain participation.
Variation 1: Food consumption

The method of recording food consumption can be modified or simplified to address the time and capacity of both the participating families and the facilitator. One variation to the process described above is as follows.

1. As described in the approach stated earlier.
2. As described in the approach stated earlier.
3. Determine the best ways to record food consumption. This will be determined by source of food, who prepares it, when and how it is cooked or prepared. Convenient measures are the most practical.

For example: “cups” of rice, pieces of fish, numbers of carrots. However, this will have to be tried in each sample household to be sure there is some way to relate the units to more precise, quantitative figures.

4. Get rough estimates from a number of families than a detailed information from a few families who might be able to and conscientious about recording information.

In some ways, the comparison of consumption by different members of the same family is more important than standardization of measurements for comparison between families.

5. Use semi-structured interviews (refer to this topic in this sourcebook) to explore these options.

6. During the interviews, obtain information on food preferences, taboos, sources of food (fishing, garden, market, relatives, etc.) changes in food availability over the years (what did you eat as a child) and seasonal changes in diets.
Variation 2: Food path

This method was developed by the International Institute of Rural Reconstruction (IIRR, 1987) and had been used in the Children's Program of the Institute in SADOPECO, Sto. Domingo, Albay, Philippines.

1. Ask for volunteers to post the steps that food items will take from production to consumption. Post the pictures on the board.

   ![Sequence of pictures: Planting, Transporting, Marketing, Cooking, Family distribution]

   Sequence used by the children's program

2. Have the other participants comment on the sequence.

3. Ask the participants to identify for each step the following points. Write the responses below each picture.
   a. Conditions/Problems
   b. Solutions
   c. Person/Agency Responsible:
      -- Family member: Father/Mother
      -- Agency: Department of Agriculture and Food, Department of Health, etc.

4. Discuss the results. Reinforce correct comments and modify wrong ones.

5. Proceed to the next topic or health program planning.
Sample output: Analysis of food path

<table>
<thead>
<tr>
<th>Problems</th>
<th>Cooking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planting</td>
<td>1. Lack of knowledge in cooking.</td>
</tr>
<tr>
<td>1. No land</td>
<td>2. Lack of knowledge on quality of food.</td>
</tr>
<tr>
<td>2. No capital</td>
<td></td>
</tr>
<tr>
<td>3. Calamity</td>
<td>3. Unsanitary utensils used in preparing</td>
</tr>
<tr>
<td>4. Lack of knowledge in planting</td>
<td>food preparation</td>
</tr>
<tr>
<td>5. Expensive fertilizer</td>
<td></td>
</tr>
<tr>
<td>6. Land not fertile</td>
<td>4. Lack of knowledge in food preparation</td>
</tr>
<tr>
<td>Transporting</td>
<td></td>
</tr>
<tr>
<td>1. Rough roads</td>
<td></td>
</tr>
<tr>
<td>2. Lack of public transport</td>
<td></td>
</tr>
<tr>
<td>3. No permanent public transportation</td>
<td></td>
</tr>
<tr>
<td>4. Expensive fare</td>
<td></td>
</tr>
<tr>
<td>Marketing</td>
<td></td>
</tr>
<tr>
<td>1. Lack of produce</td>
<td></td>
</tr>
<tr>
<td>2. Expensive goods</td>
<td></td>
</tr>
<tr>
<td>3. Fruits and vegetables not fresh</td>
<td></td>
</tr>
<tr>
<td>4. Vegetables too heavy on chemical inputs</td>
<td></td>
</tr>
<tr>
<td>5. Inaccurate weighing scale</td>
<td></td>
</tr>
<tr>
<td>6. Lack of knowledge in selecting nutritious food</td>
<td></td>
</tr>
<tr>
<td>Family distribution</td>
<td></td>
</tr>
<tr>
<td>1. Many family members but not enough food</td>
<td></td>
</tr>
<tr>
<td>2. Meals are not served on time</td>
<td></td>
</tr>
<tr>
<td>3. Feeding of children not given enough attention</td>
<td></td>
</tr>
</tbody>
</table>

92. Participatory Methods in Community-based Coastal Resource Management
Sample output: Analysis of food path (continued)

Recommendations
1. Seek help from the Barangay Council and people who have vacant lots
2. Plant in cans or pots
3. Make backyard gardens
4. Seek help from the Department of Agriculture and other agencies or people who have planting materials
5. Continue planting even after calamities
6. Learn Bio-Intensive Gardening (BIG)
7. Educate parents on:
   a. nutrition;
   b. family planning;
   c. health care; and
   d. cooking.

References


*Prepared by Angelita M. del Mundo*
Assessment of income from fishery resources

Definition

This tool focuses on the assessment of the income the community earns from the resources it exploits. These may be fish, shellfish, mollusks, seaweeds or any other living resource which is systematically harvested from the local area.

This method only measures the value of these resources at the point where they are sold for the first time; it does not measure value additions by further sales or transformations into other products.
Purpose

- To analyze the economic viability of the community's fishing practices.
- To consider options for improving fishing practices.
- Information can also be used in demographic analysis and economic planning at the community level.

Caution

The money value of the resource must be estimated at the point of the FIRST SALE. This is the place where the resource is exchanged for money for the first time after capture. Subsequent points of sale MUST NOT be considered for this assessment.
Prerequisites

Adequate planning should go into the assessment process. Pre-assessment site visits must be made to select as many sites as possible to cover all types of resource exploitation activities and scales of operation.

Requirements

Human resources

✓ trained facilitator who takes the lead in the community to carry out the assessment during the early stages

✓ volunteers from the community

Materials

✓ field note book

✓ calculator

✓ site map

Possible approach

Two basic sets of data are needed for the assessment. These are:

- estimates of quantity landed of each resource; and
- average sale price of each resource.

Collect the above sets of information from the sites of first sale using direct observation and semi-structured interviews (refer to these topics in this sourcebook).
Decide on the method of data collection. Two possible approaches are described here. Use the criteria given below to choose the method.

<table>
<thead>
<tr>
<th>Method 1</th>
<th>Method 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit value method</td>
<td>Total value method</td>
</tr>
<tr>
<td><strong>Advantages</strong></td>
<td><strong>Advantages</strong></td>
</tr>
<tr>
<td>• Participatory in approach</td>
<td>• Easy and quick to do</td>
</tr>
<tr>
<td>• Results are very useful to</td>
<td>• Does not require high level of skill</td>
</tr>
<tr>
<td>community</td>
<td></td>
</tr>
<tr>
<td>• Gives detailed price structure on varieties and units</td>
<td></td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td><strong>Disadvantages</strong></td>
</tr>
<tr>
<td>• A lengthy process</td>
<td>• Less participatory</td>
</tr>
<tr>
<td>• Skill/ training needed</td>
<td>• Results may be too generalized</td>
</tr>
<tr>
<td></td>
<td>• Gives only gross values</td>
</tr>
</tbody>
</table>

Caution

Care must be taken to make correct estimates of sale price. Use direct observations and secondary sources to validate the sale prices and to estimate the quantities landed.

Caution

The selling price of a resource changes or varies depending on supply, demand, local situations, perceptions, quality deterioration and value added. Remember that results are only estimates of the true/actual value of the resource.
Method 1: Unit value method

1. Use a site map to make a list of all the sites where resources are landed after capture from the whole locality. Find out what types and how many gear units are operating in the area. If there are sites with a very high catch, select a smaller number of gear units from the site for data collection. Make sure that these include all varieties and scales of operation.

2. Visit the sites where the resources are sold for the first time. This could be a landing site on the beach, a local market, a village outlet, a trader's collection point or a retail outlet. Find out the total number of gear-wise fishing units landing in the whole area.

3. Find out the local units of measure for sale of the catch (e.g., baskets, bins, bags, heaps, numbers)
4. Find out the prevailing price for each variety of landed resource by making inquiries from fishers, auctioneers, traders, vendors, commission agents or agents of wholesale merchants who are present at the landing site.

The survey team should validate the field data by direct observations.

5. Find out the total number of units (e.g., baskets) of each species caught in the area. Do this by direct observations at all the landing sites and in the area through one-on-one interviews with the fishers. Use the data sheet for tabulation and assessment. If there are many gear units in a site:

- select representative numbers; and
- gather data from those fishers to find average catch for each species per gear/craft. Multiply this by the number of gears/crafts in the site to get an estimate of the total number of units of each species caught on that site.

6. Estimate the total value of each variety landed for the day by multiplying the average price per local unit by the total number of units caught in all the sites in the area.
Add up the values for all the species to obtain the total value for the entire site for the day.

Because landing quantities and prices may be different at different times of the day (or night), assessments should be done at several times - during early hours, during the peak and during the last hours of the landing. The results from these three assessments can then be added together and divided by three to reach a more accurate estimate of the total number and total value of the resources caught on that day.

7. Repeat this exercise several times during the same season to obtain average daily value for the season.

Note

- Estimates for the season or year can be obtained by multiplying this value by the number of fishing days during the season or year as the case may be.

Example

The average catch of mackerels estimated from five assessments in March at Kakinada Bay, India (two landing centers) was 68 boxes per day (range was 20 to 90).

The average price was Rs. 720 per box (range was Rs. 520 to Rs. 1200) at the first sale point.

There were 36 fishing days during the mackerel season.

Therefore, the average daily money value was Rs. 720 x 68 = Rs. 48,960 while for the entire season, the landed resource of mackerels was worth Rs. 48,960 x 36 = Rs. 1,762,560.

The mackerel season for the area was restricted to this 36 days and therefore, this was the amount for the entire year also.

There are 460 mechanized boats, 250 catamarans, 280 beach landing crafts and 16 shore seines operating in this area.

- If estimates of cost of fishing operations (fuel + labor + overheads) are available, this can be deducted from the gross value to yield the net income for the whole area. This will be a better index of the money value of the harvested resource.

- It may not always be possible to collect species-wise information because low value species may not be sorted out and sold separately. In such cases, only estimates of grouped species are possible.
Method 2: Total value method

1. Choose a convenient place to interview the fishers.

2. Find out the total value of the fish sold during the day from the fishers through group interviews. This may be validated from auctioneers/fish vendors-middlepersons/traders.

3. Repeat this exercise several times throughout the fishing season.

4. Estimate the total number of fishing days in a month/season/year.

5. Multiply the average value obtained from the several interviews by the total fishing days of the month, season or year to give the gross value for the corresponding period.
Variations

- The value of the catch caught by each fisher can be calculated. By deducting his/her operating cost, the fisher would be able to calculate the net income he/she receives from fishing.

- The value of the catch for different types of gear can be assessed separately (e.g., handlines, beach seines, cast nets, traps, gill nets, etc.) so that incomes from these activities can be compared and information used to improve the profitability of fishing.

- The value of fishing resources can be calculated by weight rather than by local unit of measurement. The information can be on total weight for each species caught; and price per kilogram of each species. Multiply these together to find total gross value.
Output

* Data on the value of the resources caught in an area with respect to total value, per species, per type of gear, per individual fisher.

<table>
<thead>
<tr>
<th>Field data sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locality ________</td>
</tr>
<tr>
<td>Date ____________</td>
</tr>
<tr>
<td>Interview 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
<th>Total weight (a)</th>
<th>Value per kilogram (b)</th>
<th>Total value (c = a \times b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
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<td></td>
<td></td>
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<tr>
<td>3.</td>
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<td></td>
<td></td>
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<tr>
<td>4.</td>
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<td></td>
</tr>
</tbody>
</table>

Strengths

- It is a community-based analysis where the fishers play a supporting role in assessing the profitability of the fishing activity.
- Reduces errors normally associated with indirect methods, e.g., valuing of resources based simply on perception and hearsay.
- It gives a straightforward measure of what the fishers can earn from their activity at the first sale level.
Limitations

- The process is time consuming and tiring.
- Inaccurate data on value or quantity of catch can result in incorrect estimates.
- Resource types may change and therefore updates are needed.
- Prices of fish may change with time or depending on supply, demand, quality and local situations and therefore, estimates made are valid only for short periods.

Caution

Community members may be concerned that income information may be used as a basis for taxes or they may consider their marketing information as confidential. The information you receive may not be complete or accurate.
Visualizing and diagramming relationships
Problem trees and webs

Definition

Problem trees and webs are diagrammatic presentations of a problem, its causes and effects. These are done after a community has identified and prioritized its problems.

Purpose

- To identify core problem, its root cause and effects.
- To help the community members, development agencies, planners and researchers identify the cause and effect of a specific problem, and to agree on points of action.
### Requirements

<table>
<thead>
<tr>
<th>Human resources</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ facilitator</td>
<td>✓ flip chart</td>
</tr>
<tr>
<td>✓ co-facilitator</td>
<td>✓ marker pens</td>
</tr>
<tr>
<td>✓ record keeper</td>
<td>✓ board</td>
</tr>
<tr>
<td></td>
<td>✓ board pins</td>
</tr>
<tr>
<td></td>
<td>✓ blank cards (optional)</td>
</tr>
</tbody>
</table>

### Suggested approach

#### Choosing whether to use a problem tree or problem web

Problem trees are appropriate for participants who are new to using participatory tools, since they are quite simple to do. Problem webs allow participants to draw out more complex, interlinked relationship among effects or among causes. They can be done by more experienced participants.

#### Problem tree

1. Tell the participants that the focus will be one problem, its cause and effects. Give an example to distinguish between "problem", "cause" and "effect".

   **Example**
   
   Problem: mangrove deforestation  
   Cause: high demand for firewood  
   Effect: decline of young fish in the area

2. Draw an outline of a large tree on the board. Do not draw yet the branches or roots. Write the problem on the trunk.
3. Let the participants brainstorm over the causes of the problem by asking the question “why?” Draw a root for each cause, and write the cause on the root.

4. Repeat the question “why?” for each cause identified in step 3, to identify secondary causes. Write these lower down the roots, below the primary causes identified.

Primary causes may have common secondary causes, and even primary causes may be linked. Make the appropriate links in the roots of the tree to represent this.

5. Allow participants to continue until they can identify no more secondary causes.
6. Then ask participants to identify effects or impacts of the problem by asking “what happened?” Draw a branch for each effect, and write the effect on the branch.

7. For each effect identified, repeat the question “what happened?” to reveal secondary effects. Place these higher up the branch above the primary effects.

Example

![Diagram showing the process of identifying effects and their impacts through a tree-like structure.]

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8. Allow the participants to continue until they can identify no more effects of the problem.

The facilitator can help participants produce a more polished version of the problem tree on another paper for future use.

Problem web

1. Tell the participants that the focus will be one problem, its cause and effects. Give an example to distinguish between "problem", "cause" and "effect".

2. Write down the chosen problem at the center of a large piece of paper.

3. Ask the participants to write on a card one cause of the problem by asking “why?” Place the card on any side of the center box.

4. Ask “why?” to this cause and write the answer in a box next to the card. Again, ask “why?” to this and write the answer in yet another box. Continue this process until the root cause is arrived at.

5. Draw an arrow from the last box to the center box connecting all the intermediary boxes. This gives the picture of the problem-cause relationship.

6. Ask the participants to identify another cause and write it on a card. Pin this up and go through steps 4 and 5 for this new cause.

7. If two root causes are the same or are linked, connect them with a two-way arrow on the diagram.
Example

Note
A problem web can also be used to identify the effect of a problem.

Variation

For both problem trees and problem webs, participants can write all the causes and effects they identify on separate cards and pin them on the tree. One advantage of this is participants can easily move the cards around as they see links among the causes and effects.

Output

* A problem tree or a problem web. This can be the focus for developing a plan of action to resolve the chosen problem.
Strengths

- Develops the community members’ skill in identifying complex webs of causes and effects in analyzing their problems.
- Gives a comprehensive view of the causes and effects of a particular problem.
- Helps clarify relationships between causes or between effects.
- Simple to conduct and easily facilitates understanding through clear visual presentation using a tree or a web.

Limitations

- Participants cannot easily confirm an issue, a problem, a cause or an effect. A good facilitator can guide them in deciding.
- Participants might identify some causes that they feel are beyond their power to change. This can lead to frustration. However, communities often have more power than they realize (e.g., they might be able to change government policies through an advocacy campaign).

Prepared by Dipankar Saha
Venn diagram

Definition

The venn diagram is a tool for illustrating relationships and relative influence of institutions, issues or problems related to an area or project. The venn diagram commonly uses circles or cutouts to represent groups. The size of the circle is related to the influence of the group. The position of a circle relative to other circles shows relationships. The position of the circles relative to a boundary distinguishes internal and external groups.

The diagram is conducted by all the participants present or a group of key informants who are familiar with the issues or relationships of institutions and the community.
Purpose

- To identify groups, individuals or institutions, both internal and external, and the nature of relationships between them and the community.
- To identify the interaction and relationship between different institutions vis-a-vis a particular subject (e.g., CRM, illegal fishing, etc.) in the community.

The venn diagram can be used at any time after the initial stages of a CBCRM project (e.g., resource assessment and planning). It can also be done after program implementation to determine changes over time in the relationships and degree of influence related to a particular issue.

Requirements

Materials

✓ cartolina or colored papers cut into varying sizes of circles, 3-5 sizes of circles at least 10 pieces each
✓ craft paper or manila paper
✓ card cut in square 1” x 1” to represent the subject coastal community
✓ markers
✓ masking tape
Possible approach

1. Gather key informants.

2. Explain the objective and use of the venn diagram to the participants.

3. Place the craft paper on the ground or on the table and ask participants to gather around.

4. Agree on the legend (or meaning of circle size or placement) that will be used. Some important considerations include the following.

Size of the circles

- The larger the circle the more influence the group represented by that circle has on the issue.
- Size should be relative to other circles.
Placement of circles

- Circles representing institutions that influence each other can be placed overlapping each other depending on the degree of influence or number of similar membership.

Boundary

- A rectangle represents a boundary such as the community or project area.
- Circles inside the boundary represent internal groups.
- Circles overlapping the boundary are external groups with presence in the community or activities.
- External institutions but with some degree of influence in the community will be placed outside of the square; its relative distance from the square will depend on the link or effect of the institution identified.

Remember

This is a sample legend. If your venn diagram requires the illustration of other relationships, be creative. Remember, always indicate the agreed meaning of circle sizes and positions somewhere on the group output.
Color of circles

- Colors can be used to differentiate between types of groups (e.g., red – community based; blue – government; black – academe).

5. Draw or paste a rectangle on the craft paper to represent the subject coastal community.

6. Ask the participants to identify groups (institutions or individuals) providing support or intervention in their community, both internal and external to them.

7. Symbolize each institution with a circle of the proper size.

8. Using masking tape, position the circles according to relationships between them and relative to the boundary. Allow the participants sufficient time to discuss positioning of symbols.
9. Let the participants review their outputs and make changes when necessary.

10. Write the legend used at the lower part of the craft paper.

11. Validate with a larger group if only key informants are involved in preparing the diagram.

12. Encourage the larger group to analyze the output. If necessary, prompt by asking open-ended questions or questions that will lead to discussion.

13. Make a copy for yourself and leave the original diagram with the community.

Output

★ A visual representation of the relative influence of groups on a community or issue and their relationship to each other. The participants that prepared and validated the venn diagram will have a better understanding of the key groups affecting a given issue.
Sample output of a venn diagram

Institutions involved in CRM
Sitio Luzaran, Lapaz, Nueva Valencia, Philippines

BDC - Barangay Development Council
UPV - University of the Philippines in the Visayas
DENR - Department of Environment and Natural Resources
* - Fish retailer and wholesaler
Strengths

- Summarizes complex information in a visual manner.
- Identifies informal groups and institutions not recorded in secondary data.
- Highlights local perceptions on the relationships and level of influence of groups.

Weakness

- If the legend is omitted or lost, the information may be misinterpreted.

Variation

The type of relationship between group, i.e., positive, negative, neutral, can also be shown using venn diagram. Draw lines between groups that have some form of relationship. If the relationship is considered positive (i.e., the groups work well together) then the line is marked with a plus sign. If the relationship is antagonistic, the line is marked with a negative sign.
Sample output of a venn diagram showing type of relationship

Institutions involved in CRM
Sitio Luzaran, Lapaz, Nueva Valencia, Philippines

Legend
- More important institution
- Less important institution
- Indicates the community (in this case, Sitio Luzaran)
- Institution within the community
- Outside institution/service organization providing assistance to the community

UPV - University of the Philippines in the Visayas
DENR - Department of Environment and Natural Resources
References


Compiled by Melodie Buendia
Commodity flow diagram

Definition

Commodity flow diagram is a method that helps community members trace the movement or flow of their products from one area to another. It answers the following questions: Where does a particular product go when it leaves the production area? Who sells the product? Who buys the product? For how much? At what volume? What happens to those that are not sold?

Purpose

- To introduce basic marketing concepts.
To generate information on the local market structure, e.g., prices, presence or absence of middlepersons brokers, presence or absence of cooperatives, infrastructure support, credit facilities, mark-ups/profits, taxes, etc.

To identify and analyze marketing issues that need intervention.

To broaden the community's awareness of the local market structure and economy.

To develop marketing strategies for the products of the community.

Requirements

<table>
<thead>
<tr>
<th>Human resources</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ extension staff</td>
<td>✓ craft paper</td>
</tr>
<tr>
<td>✓ facilitator</td>
<td>✓ markers</td>
</tr>
<tr>
<td>✓ marketing specialist (optional)</td>
<td>✓ masking tape</td>
</tr>
</tbody>
</table>

Possible approach

1. Ask participants to identify key commodities they produce and sell.

2. Divide the participants into groups composed of 5-8 members. Ensure that all groups work on the same commodity or commodities to ensure wider sharing of experiences.

Commodity flow diagram
3. Explain the four important symbols used in the tool.

a. The illustration of the commodity. This represents the commodity being analyzed and is a reference point of the community.

b. The size of the circle. This refers to the volume of product each market outlet absorbs.

c. The length of the line. This pertains to the relative distance of the market outlet from the community.

d. The arrow. The direction indicates the mode of transporting the commodities to the market. Commodities are either delivered (arrow points to the buyer) or picked up (arrow points to the seller) at certain areas.

Sometimes, distance is not the only key factor. Other variables, e.g., time to market, accessibility, etc., should be considered.

4. Ask the participants to illustrate the flow (from producer to consumer including middlepersons) of each of these commodities.

5. Give the groups at least 15 minutes to work on the exercise. Then, ask each group to present their workshop results.
6. Synthesize the result by pointing out the common or similar features of each small group workshop output. Try to resolve conflicting perceptions until the bigger group reaches a consensus.

7. Analyze results and draw out significant observations, learnings and recommendations into a commodity flow diagram that summarizes the group consensus.

**Outputs**

★ A diagram illustrating the flow of community products.

Example: Community flow diagram

![Commodity flow diagram](image)

A modified commodity flow diagram originally drawn by the community members of Sitio Abuyo, Brgy. Espinosa, Jordan, Guimaras, Philippines during the community resource appraisal and planning workshop conducted by SMISLE Programme in October 1996.
An analysis of market-related problems/issues affecting the community products.

Information on the local economy and market structure.

Example

In 1995, at Brgy. Sto. Rosario, Pitogo, Bohol, Philippines, local fishers sold their wild grouper to the local market at a very low price. With the introduction of livelihood project coupled with this tool in early 1996, they started selling their cultured grouper to restaurants/hotels in Cebu, Philippines, commanding higher prices.

Community to one trader pathway

Community to other marketing options
In the future, buying stations will be established for commodities produced through the alternative livelihood projects. This will cater to collective marketing needs like what has been done for agricultural products in Guimaras, Philippines. Three buying stations for both mango and calamansi were built to address the marketing needs of backyard growers. These cooperative-managed buying stations offered farmers competitive prices and provided input assistance for their farm.

Variations

- This can be used as a project-specific planning exercise focusing only on one commodity, e.g., grouper, lobster, siganid, etc.
- Targeting specific groups during the exercise can be done among women, young people, fishers and other homogeneous groupings (ethnicity, gender, age, etc.). There might be differences in the price and market structures and availability of credit facilities for the products of men and those produced by women.
Strengths

- Requires very minimal cost.
- Opens discussion on trader-producer relationships particularly on financing.
- Can be a very good introduction to a savings and credit component of a project.

Limitations

- Price of the product is not usually provided accurately. People tend to keep the information secret to protect their interests.
- Mean price of commodity fluctuates. This means that the data will only be relevant to a certain period of time. The use of a seasonal calendar to plot fluctuation can help project trends on commodity prices.
- Fishers find it difficult to change market system even if results of analysis point to this direction because they are indebted to local traders.

Compiled by William Jatulan
Family portrait

Definition

A family portrait is a description or a detailed profile of a selected family in a coastal community. It presents a detailed account of the interactions of the family with the biophysical, socio-cultural, economic and political environment. It documents how different family types make decisions that affect the coastal community via their resource use system and how they are consequently affected by changes in the coastal environment.

A family portrait is generated through the use of semi-structured interviews. It also makes use of other participatory methods such as daily activity or time lines at the family level.
Purpose

- To determine the characteristics of certain types of families and how these affect or influence their attitude and behavior towards the coastal environment. Resource use patterns are results of the decisions made not only at the community level but also at the family or household level.

- To provide insights into the dynamics of family life in coastal communities.

The results can be used by the community in designing a CBCRM program that would meet the varied needs of different types of families in coastal communities.

Requirements

Materials

☑ barangay/village profile
☑ other relevant documents, e.g., results of semi-structured interviews with key informants
☑ markers or pentel pens, preferably of different colors
☑ notebook
☑ pen
☑ brown paper

Suggested approach

1. Set the objectives of the activity.

   Examples

   - To determine factors that families consider in deciding how to use the coastal resources.
- To determine the reasons for participation or non-participation in coastal resource management community projects.

2. Select families representing a cross-section of the community that you will make a portrait of.

*Example*

- Families that are full-time fishers, families that are part-time fishers and part-time farmers, or families that are part-time fishers and with part-time involvement in a small business enterprise (e.g., selling firewood).
Secondary data and semi-structured interviews with key informants provide a good basis for the selection of sample families for the portrait exercise.

3. Get an estimate of the percentages of each family type in the village from key informants or any other available data. Get at least three suggestions from the key informants on the possible families within each type to do a portrait.

4. Prepare a set of guide questions to generate the information needed based on the objectives.

Guide questions

- What is the structure of the family?
- What are the sources of income? If the family is multiple earner, what is the primary source of income?
- How are the activities divided among members of the family? Construct a seasonal calendar for the family’s various economic activities.
- What is the family’s fishing history? How have the family’s fishing practices changed over time? What are the reasons for changes?
- What facilitates or constrains the family from participating in community projects for coastal management?

5. Ask the whole family to participate in the making of their own portrait. Use the family tree as a starting activity.

6. Using the family tree, generate other details: age, civil status of children, occupation, income, contribution to family income, food supply and other household resources by each family member.
7. Continue using the semi-structured interview to generate the portrait of the family. Use other graphical methods such as daily activity, historical lines (at the family level) to make the process more participatory and creative (e.g., if done along the beach, use available materials to illustrate or draw the portrait).

8. Compile notes and write the narratives after the interview. Give a copy to the families interviewed.

**Caution**

- In writing the report, be cautious about distinction between confidential information and information for public consumption.

- Be sensitive about personal family and ethical issues. Example, the way the family members interact that suggests power relationships within the family.
Output

★ Family profiles or portraits that are representative of the main types of families in a given coastal area.

Contributions of each family member to the household resources

Strengths

- Provides information which may not otherwise be collected in community meetings and that necessitate probing from other information sources.
- Involves the whole family as the unit of analysis.
Limitations

- Facilitator has to have the trust and confidence of the families to generate accurate portraits.
- Can be time-consuming depending on the number of family portraits that have to be generated.

Prepared by Victoria Ortega-Espaldon
Presenting numeric data in diagrams or charts

Definition

This is the representation of comparative information (temporal, spatial) or numeric data using simple diagrams, graphs or charts in a manner wherein data can readily be shared with and understood by others.

Fishing gears used one year before and one year after marine protected area (MPA) establishment

<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illegal</td>
<td>Illegal</td>
</tr>
<tr>
<td>Spear</td>
<td>Spear</td>
</tr>
<tr>
<td>Gillnet</td>
<td>Gillnet</td>
</tr>
<tr>
<td>Hook and line</td>
<td>Hook and line</td>
</tr>
</tbody>
</table>
Purpose

- To explain and visualize comparative or numeric data, which are often difficult to understand and hard to appreciate.
- To translate and summarize collected information in a format that is simple, attractive and easy to understand at a glance.

Requirements

Materials

✓ numeric or comparative data from finished appraisals
✓ colored chalk or crayons
✓ black board or manila paper

Possible approach

Do this immediately after the data gathering.

Some possible sources of data for charting

- daily activity
- logbook
- fish catch landing assessment
- transect/quadrat
- resource assessment
- seasonal calendars

1. Organize a short meeting with the team that collected the data and other interested members of the community to decide how to present the collected data.
2. From the data set, list all the types of information or comparisons that can be presented. Write/post the list on the board.

3. Ask the participants to identify which items are hard to understand or will be understood better if presented differently through charting.

4. Ask the participants to brainstorm on creative ways to represent the data. Be prepared to have a list of options to stimulate ideas, if necessary, for them to choose from.

Try to work with at least two different types of charts for each topic and see which type better illustrates the data.

5. Make the diagrams and charts according to the participants' ideas. This process could take more than one day.

Reminders in making diagrams/charts

1. Chart only information really needed (as determined during the meeting or focus group discussion).

2. Do not try to put too much information on one diagram.

3. Make sure that symbols used are clear and appropriate.

4. Put a heading for each chart or title.

5. Test the ideas/style of the output by presenting it to the other members of the community and see if these are clear and easily understood.
Output

* Diagrams, graphs and charts representing collected data which can be used by the community for planning, awareness raising, information dissemination, etc.

Example of outputs

Comparison of men and women membership in fisher organization in different coastal barangays of Western Samar, Philippines

<table>
<thead>
<tr>
<th>Cabugawan (45:15)</th>
<th>Bulu-an (15:35)</th>
<th>Villa Hermosa (30:5)</th>
<th>Lahong (35:10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

♀ = 5 individuals
♂ = 5 individuals

Presenting numeric data in diagrams or charts
Quarterly average of fish catch by a municipal fisher in Brgy. Cabugawan showing the average no. of fishing days per month and the relative no. of species caught per operation.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Color: Red - (1-5)</td>
<td>Yellow - (6-10)</td>
<td>Blue - (11-15)</td>
<td>Green - (&gt;15)</td>
</tr>
</tbody>
</table>

- Red - 1 kilogram
- Yellow - 6-10 species
- Blue - 11-15 species
- Green - >15 species

Fishing time and fish catch: changes 1975-1990

Fishing time for every 24 hour period

Average daily fish catch in kilograms

Compiled by Vence Adajar
Temporal methods
Seasonal calendar

Definition

A seasonal calendar is a tool for documenting regular cyclical periods (i.e., seasonal) and significant events that occur during a year and influence the life of a community.

The seasonal calendar provides a general picture of important environmental, cultural and socio-economic periods throughout the year.

The seasonal calendar activity can be conducted at the early stages of participatory assessment. It should be after the preparation of the resource map, as the features on the map may serve as a guide for the calendar.

Sample seasonal calendar matrix

<table>
<thead>
<tr>
<th>JAN</th>
<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
<th>JUL</th>
<th>AUG</th>
<th>SEP</th>
<th>OCT</th>
<th>NOV</th>
<th>DEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEATHER</td>
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<td>SOCIAL ACTIVITIES</td>
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<td>![Image of social activities]</td>
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<tr>
<td>ECONOMIC ACTIVITIES</td>
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<td>![Image of economic activities]</td>
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<tr>
<td>COMMON ILLNESSES</td>
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<td>![Image of common illnesses]</td>
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</tbody>
</table>

The calendar emphasizes qualitative information focusing more on periods (usually lasting a few days or more) than events (that usually last a day or less). The periods are based on experiences from previous years.
Purpose

- To inform practitioners of community-based coastal resource management (CBCRM) of important and regular periods during the course of a year that influence the activities and socio-economic conditions of coastal communities.

  Be aware of and make use of local calendars.

- To identify appropriate periods for conducting various CBCRM activities.

- To generate information that highlights potential biases in information collected only during certain periods of the year.

Requirements

Human resources

✓ facilitator (preferably experienced in coastal/fishery issues)

✓ co-facilitator (may be necessary if the group size is large)

✓ participants
Participants involved in preparing the seasonal calendar must come from the coastal community of that area. Encourage the more marginalized sectors, i.e., municipal fishers, indigenous groups and women to be involved as these groups are often an overlooked source of important traditional ecological knowledge.

Materials

✓ craft paper
✓ tape or push pins
✓ pentel pens
✓ different colored pens, crayons
✓ notebook

Possible approach

1. Prepare for the activity by having participants draw an outline of the local annual calendar on craft paper.

Example

<table>
<thead>
<tr>
<th>Activity</th>
<th>MONTHS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>JFMA</td>
</tr>
<tr>
<td></td>
<td>MJJAS</td>
</tr>
<tr>
<td></td>
<td>OND</td>
</tr>
</tbody>
</table>

Seasonal calendar
2. Ask the participants to identify important environmental, cultural, or socio-economic periods in a year that influence their activities or condition. Give examples such as rainy season(s), cultural festivals, periods of high incidence of disease or food insecurity. (Refer to box for other suggestions).

The activities/events which could be used are:

- environmental conditions (e.g., weather, currents)
- fishing (e.g., fish catch levels and spawning times of the top five important fishery species)
- economic aspects (e.g., household expenditure, market values)
- illegal activities (e.g., dynamite fishing, pollution)
- social aspects (e.g., health, education)
- other livelihood activities (e.g., agricultural crops, tourism, handicrafts)
- socio-cultural activities (e.g., religious events, holidays)

3. Use symbols or drawings to add interest to the activity. Let the group decide what symbols they want to use.

For example, ☔️ could be a symbol for rainy season. It should be placed in the matrix at the appropriate time periods (e.g., months) that it occurs.

4. Repeat the process for other periods.

5. After the activity, transfer the output from craft paper to a long bond paper. Leave the original with the community.
Analysis

When analyzing the calendar, make links within the calendar and with the overall problems and issues of the community.

For example, is expenditure high at the same time as destructive fishing occurs? When is expenditure high and why? Are school fees due? When are the commercial fishing vessels encroaching? Is it at the same time as the fish catch is low? Is fish catch high due to fish stocks being high or because of increased fishing effort due to high demand by the markets?

Encourage the community to probe into issues and make the links. Note down what trends need more study and data gathering.

Tips

If there are data gaps, then a strategy to fill these should be put in place. One such method is to keep a logbook to record significant events, e.g., destructive fishing, endangered species. Some activities/events may need further discussion, this may be best facilitated by inviting key community members to participate in a focus group discussion (example: illegal fishing). (Refer also to topics on logbooks and focus group discussion).

Outputs

★ Seasonal calendar

★ Analysis of trends
An example of a seasonal calendar

<table>
<thead>
<tr>
<th>ACTIVITY/EVENT</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
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<tbody>
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<td>Weather</td>
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<td>- encroachment of commercial fishing vessels</td>
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<td>Handicrafts</td>
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<td>Tourism</td>
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</tr>
</tbody>
</table>

Legend

- Summer Vacation
- School Start
- Fiesta
- Christmas

- 🌞: Low (L), Medium (M), High (H)
- ☀️: Important Dates
- 🌞: Expenditure/income
- 🌞: Illegal activities
- 🌞: Handicrafts and Tourism

Note: The symbols indicate the level of catch, indicating the amount of fish caught. The fish indicates the spawning times. Expenditure/income: Low (L), Medium (M), High (H). Illegal activities: Dynamite fishing, Cyanide fishing, Encroachment of commercial fishing vessels. Handicrafts and Tourism: More symbols indicate more of these activities occurring.

Date Completed: 29 July 1997

Participants involved: Juan, Enrico, Yvonne, Wilson, Susan, Peter, Ben, Floy, Lore, Karen Cathy

Place: Barangay Ogan, Fantasia, Philippines
Strengths

- Involves all sectors of the community.
- Comprehensive: includes social, economic, political and environmental issues.
- Quick and easy to do (requires few inputs).

Limitation

- Relies on people’s memories.

Prepared by Karen P. Vidler
Historical lines

Definition

This activity generates historical information on significant changes in the community's environment, demography and other events that affect the community.

This tool documents significant events and changing conditions in the community in written format, symbols or both. Ideal participants should include elders, long-time residents and younger groups.

This tool can be used during the initial phases of program identification with focus on marine environment and socio-economic conditions. Succeeding activities may focus on specific events.
Purpose

- To better understand the local, national or international events the community considers important in its history, how it has dealt with problems and issues, e.g., natural resources and environmental, economic and political issues, in the past.
- To gain insights on present practices and attitude of the community.
- To provide an overview of the community's history. The details of historical lines can be done through other temporal tools such as historical transect, trend lines and historical narratives.
- For the younger generation to appreciate previous experiences of earlier community members. The older generation would be able to share their insights and thoughts to the younger generation.

Requirements

Materials

- pentel pens
- craft paper
- masking tape
- crayons
- bond paper
- scissors
- paste or glue
- available historical documents or write-ups
Possible approach

1. Organize the participants composed of elders, males, females and young adults (maximum 20). Have each group (of five or six people) construct time lines. Participants may also choose not to group themselves.

2. Rather than defining what is important for them, ask the participants to identify the events that shaped and influenced individual and community activities.

Date when the fish kill first occurred can be a starting point of discussion on CBCRM.

3. Let the groups use large sheets of paper and permanent markers to write in large letters, preferably in the local dialect.

4. Ask each participant to list one event for each sheet of paper. Ensure that these are written large enough to be seen at some distance. After doing so, let the participants group the events in their respective years. After which, present the results to other participants for validation.
5. If interested, allow the participants to divide the information into useful categories such as environmental or natural changes (e.g., occurrence of natural calamities) or human-made events (e.g., political, economic or cultural).

6. When the time line is established and agreed upon, determine whether one or another type of event (drought, for instance) is increasing in intensity and frequency.

Discuss the trends and how the community has adjusted to these changes. Ask participants for their opinion about recent efforts by the government, church, or other groups to address the community's problems.

Tips

- If the group is having difficulty in establishing dates for particular events, try to relate them to other well-known events like war, e.g., World War I and II, drought, typhoons, earthquakes, etc. Refer to available historical documents or write-ups.

- Ensure that everyone has materials to use and work on and encourage participation.

- Activity should not exceed an hour but if the participants are enthusiastic then allow them more time.

- Avoid situations wherein a single participant (e.g., elder) dominates the activity.

- Make sure that participants concur on identified reference points.

Output

★ A chronology of significant historical events in a particular community.
### Historical line of Taytay Poblacion, Palawan, Philippines

<table>
<thead>
<tr>
<th>Year</th>
<th>Poblacion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1600</td>
<td>Raids by Moro pirates</td>
</tr>
<tr>
<td>1700</td>
<td>Taytay is the capital of Paragua, Palawan</td>
</tr>
<tr>
<td>1930</td>
<td>Establishment of Pujalte Estate Lumber, Co.</td>
</tr>
<tr>
<td>1940</td>
<td>Entry of &quot;Pescador&quot; fishing vessels - 1960</td>
</tr>
<tr>
<td>1950</td>
<td>Assassination of A. Sarabia</td>
</tr>
<tr>
<td>1950</td>
<td>San Diego Concession started</td>
</tr>
<tr>
<td>1957</td>
<td>Decline in fish catch felt</td>
</tr>
<tr>
<td>1960</td>
<td>Term of Mayor Ordonez started</td>
</tr>
<tr>
<td>1961</td>
<td>Private high school founded</td>
</tr>
<tr>
<td>1972</td>
<td>Municipal hospital constructed</td>
</tr>
<tr>
<td>1978</td>
<td>People become shareholders of PHS</td>
</tr>
<tr>
<td>1982</td>
<td>Puerto Princesa-Taytay highway completed</td>
</tr>
<tr>
<td>1985</td>
<td>New market site completed</td>
</tr>
<tr>
<td>1989</td>
<td>Assassination of Vice Mayor Gabiana</td>
</tr>
<tr>
<td>1990</td>
<td>Cyanide fishing becomes widespread</td>
</tr>
<tr>
<td>1993</td>
<td>Illegal logging exposed</td>
</tr>
<tr>
<td>1994</td>
<td>Drug smuggling exposed</td>
</tr>
</tbody>
</table>
**Variation**

Historical lines can also be presented using a matrix that identifies certain CBCRM parameters such as fish catch, income, etc., and comparing past and present status.

1. Identify parameters relevant to CBCRM and write them in the first column.

2. On the second column, let the participants describe the status in the past (e.g., 10 years ago).

3. On the third column, ask the participants to describe present conditions.

4. In the last column, give the explanations for the change.

5. Present and discuss the matrix for group validation.
Sample output

Barangay Silang, Cavite, Philippines

<table>
<thead>
<tr>
<th></th>
<th>Situation 10 years ago</th>
<th>Situation today</th>
<th>Explanation for change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Rainfall</td>
<td>Same as today</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Fish</td>
<td>More Big 100 kg/day</td>
<td>Less No change 20 kg/day</td>
<td>Illegal fishing (No explanation) Overfishing</td>
</tr>
<tr>
<td>- variety</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- sizes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- catch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Income</td>
<td>More</td>
<td>Less</td>
<td>Low catch</td>
</tr>
<tr>
<td>4. Education</td>
<td>Less</td>
<td>More</td>
<td>Overseas workers</td>
</tr>
<tr>
<td>5. Use of illegal fishing methods</td>
<td>Less</td>
<td>More</td>
<td>No alternative livelihood</td>
</tr>
<tr>
<td>6. Population</td>
<td>More</td>
<td>Less</td>
<td>Migration</td>
</tr>
<tr>
<td>7. Mangroves</td>
<td>Trees more saplings less</td>
<td>Trees less saplings more</td>
<td>Fish ponds</td>
</tr>
<tr>
<td>8. Coral reefs</td>
<td>More</td>
<td>Less</td>
<td>Blast fishing</td>
</tr>
<tr>
<td>9. Fishing ground</td>
<td>Near</td>
<td>Farther</td>
<td>Low catch</td>
</tr>
</tbody>
</table>

Strengths

- Provides detailed historical information that could complement the results of other temporal tools.
- Reveals differences or similarities between men and women. For example, men may show interest for national events that affect their lives while women may show concern for dwindling resources that affect their immediate daily lives.
- Enhances historical documentation thereby providing useful information for future use.

Compiled by Ephraim Batungbacal

Participatory Methods in Community-based Coastal Resource Management
Daily activity

Definition

A tool that provides information on the various activities performed daily in the reproductive and productive sphere, as well as in community leadership and management. This tool can complement other tools that look at time such as historical timeline and seasonal calendars.

Purpose

- To identify the activities performed by the various sectors in the community in a day. This tool is also used to differentiate daily activities of various segments of a community, particularly according to gender.

- To help CBCRM practitioners better understand the constraints that local people have regarding their time thus helping them design more appropriate community organizing strategies and CBCRM activities with the community.
For CBCRM planning, implementation and monitoring, the tool can help identify primary interest groups that have the time, skills and experience on management activities and/or alternative economic development.

Requirements

Materials

- crayons
- pencil
- pentel pen
- manila paper
- bond paper
- masking tape
- (assorted colors)

Any materials that can be used to represent/help visualize the participants’ responses.

Prerequisite

Daily activities should be conducted after the initial participatory assessment activities have been introduced such as timeline, resource mapping, transect and seasonal calendar. At this stage, the participants are already familiar with the participatory nature of the tools/activities.

Possible approach

Prior to the meeting

1. Invite participants (10 to 20 members) from the community with a balanced representation of men and women from the major sectors of the community (e.g., fishers, farmers, youth, etc.).
2. Explain to the participants the nature and purpose of the activity. Clarify with them the schedule and venue.

3. Prepare a blank 24-hour chart on a sheet of poster paper for each group (e.g., men, women and children).

During the meeting

1. Explain the activity, purpose, use of the information, general flow and expected output.

2. Provide each participant with bond paper and pencil and ask them to write/list down the activities they do in a typical day, from the moment they wake until they retire.

3. Divide into sub-groups (e.g., according to gender, sector, age, etc.) depending on the objective of the activity. Ask each individual in the respective sub-groups to share his or her typical daily activities.

4. Ask each sub-group to prepare a daily activity chart representing the typical activities of that sub-group. If possible, draw or symbolize each activity.
5. Ask each sub-group to choose among themselves a group leader/facilitator and a rapporteur. Ask the different groups to share/present their work to the rest of the participants.

6. Ask the participants to share their personal insights/feelings about the information that came out of the whole process or activity.

Tips

- Be prepared to conduct daily activity at night specially when this is the only time available for the participants.
- Sub-grouped results must have the consensus of all the participants.
- Encourage the participants to present the data/group work.
Output

- A visual presentation of typical activities undertaken by various segments of the community.
- Information on how various segments of the community allocate and manage their time.

Sample output

Variations

The participants could be asked to do daily activity charts during different seasons or phases of production. For example, daily activity during peak and lean months for fishers (refer to topic on seasonal calendar for specific periods).
Male participants could be asked to do the daily chart of the female and vice versa. This could provide insight on the perceptions of each group on the other.

Regular use of the tool can help monitor the impact of participation in the implementation of the development plans on the workload of women and men. (Changes in workload; sharing of domestic work between men and women).

**Strengths**

- Activities done by women which are usually neglected or not given importance are reflected in this tool.
- An effective tool to start self/gender awareness in the community or initiate gender planning to address the issues faced by the women in the community.
- Facilitates data segregation between male and female in the production and reproduction sphere, and community participation.

**Limitation**

- Important activities not considered part of a typical day maybe overlooked. For example, weekly or monthly events such as religious and community activities may not be reflected in the chart.

*Prepared by Jovelyn Cleofe*
Historical transect

Definition

A historical transect is a pictorial representation of an area through time. It is used to show trends in both bio-physical and socio-cultural conditions using variables such as land use, vegetation, marine diversity (fish, mangrove and seagrass species), coral reef variety, health or condition, catch trends, fishing gear (legal and illegal), income, health, education and population.

A historical transect can be used during the initial phases of program identification. Succeeding activities may focus on specific events.

This tool can be done along with other temporal tools: historical lines, historical narratives, trend lines and seasonal
calendar. It is also recommended to perform historical lines before the historical transects.

Ideal participants for this tool are long-time residents and younger groups.

**Purpose**

- To help establish correlations between various parameters over time, e.g., the relationship between fish catch decline and the incidence of poor health.

**Requirements**

**Materials**

- pentel pens
- colored paper
- paste/glue
- bond paper
- craft paper
- scissors
- masking tape

**Possible approach**

1. Ask the group to brainstorm on possible variables to include in the historical transect (refer also to topic on brainstorming). Select the most significant ones (e.g., limit the variables to 5).

2. Divide participants into groups of six. If possible, male and female participants should have separate groups. It is advisable to have a maximum of 20 participants.
3. Ask each group to divide the manila paper into rows and columns. Write the time or season along the top row. Write the resources or other variables along the first column.

4. Using symbols, drawings or anything available (e.g., magazine, pictures, leaves, shells) ask the participants to give the trends of the variables focusing on the quantity of the variable.

5. Clarify the use of pictorial representations (e.g., does size of tree represent the quantity of trees or relative size of the trees?) Ask them to include the legend beside the transect chart or table.

6. Ask the groups to identify possible reasons for the trends. They may write them down in the last row.

Caution: This tool helps to establish correlations. However, interpretation of the results should be verified by the community.
7. Discuss with the group the trends and how the community has adjusted to them. Ask participants for opinions about recent efforts by government, church, or other groups to address the community's problems and seize opportunities.

Tips

- Limit number of variables to be used.
- Trying to get too much information at one time is **not advised**.
- Decide on a reasonable interval between the years to be observed in order to establish a trend. It does not have to be a ten-year interval.
- The activity does not usually exceed an hour. But if the participants are enthusiastic, be flexible and allow them more time.
- Include one important event from the historical line to the time periods to help participants think about the conditions at that time.

Output

- Visual representation of the changes in specific variables over time.
Sample output

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Income</th>
<th>Fish catch</th>
<th>Mangrove</th>
<th>Coral reef</th>
</tr>
</thead>
<tbody>
<tr>
<td>1940</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>1950</td>
<td></td>
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<tr>
<td>1960</td>
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<tr>
<td>1970</td>
<td></td>
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<td></td>
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<tr>
<td>1980</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Trends or correlations observed (per variable)

Indicators

Reasons

Correlations observed between variables:

<table>
<thead>
<tr>
<th></th>
<th>Population</th>
<th>Income</th>
<th>Fish catch</th>
<th>Mangrove</th>
<th>Coral reef</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

Historical transect 171
Strengths

- Shows how a community perceives local conditions in relation to changes over time.
- May provide initial evidence of correlations between variables. This should suggest additional analysis using other research methods that can examine the subject in greater detail and with greater precision.

Limitation

- This tool only gives a relative picture of trends.

References

Mascarenhas, J. 1992. PRA and PALM: Recent experience from MYRADA and So. India.


Historical narratives

Definition

Historical narratives are personal testimonies of past events and conditions usually presented and documented in chronological order. These narratives document the first-hand knowledge of individuals who are participants or witnesses to the events. These also document the oral history of the community.

The oral history is a form of a semi-structured interview that emphasizes the chronology of events and their impact.

Although the key informants in this activity are the elders in the village, the presence of the younger generation, including the children, is encouraged for the transfer of information.
Purpose

- To examine the impact of major historical events on the life of local individuals.
- To allow for the transfer of history, stories, folklore information and lessons of specific events from generation to generation.
- To document in detail single perspective chronologies of a given area.

Requirements

Materials

- ✓ tape recorder
- ✓ blank tapes
- ✓ notepad

Possible approach

1. Select respondents (refer also to topic on key informants). This activity targets older men and women but could also include younger members of the community.
2. Schedule a suitable time and place for the interviews.

3. State clearly the focus of the interview and the questions that you want to address to avoid wandering off into different topics. Prepare questions that will guide the discussion. (Refer also to topic on semi-structured interview.)

4. Start with personal questions (e.g., When were you born? What was the first important event that you can remember in your community?)

**Sample question guides**

- How have the practices that determine people's access and control over resources changed over time?
- Identify the dominant economic occupations in the past.
- Describe the status of the resource system at different years.
- How has the community perception of resource depletion and environmental degradation changed over time?
- Were there perceived negative changes in the environment? How did these changes affect you?
- What activities have they done in response to these conditions?
- How has the local population changed over time and how has this affected coastal resources?
- What lessons related to coastal resources management have been generated in the past and how could they be relevant today?
- What mistakes (related to coastal resource rights) have been made in the past and how could we learn from them today?
5. An hour of interview is long enough. If the respondent is tired, cut short the discussion. If enthusiastic, be patient and listen. Note down the key points raised.

Hint
You can use a tape recorder but ask permission first.

6. Write down notes and other observations immediately after the interview. Allow the interviewee to listen to the tapes and read the narratives to ensure that the interpretation is appropriate.

Strengths

- Significant events in the past are documented. Historical information adds an interesting dimension.
- Specific events can be studied in detail.
- A very specific and personal case study is developed that adds a human dimension to data.

Limitation

- Information is solely based on respondent’s experiences. To validate, cross-check information with other respondents.

Prepared by Ephraim Batungbacal

176 Participatory Methods in Community-based Coastal Resource Management
Trend line

Definition

Trend line graphically illustrates the community’s perception of certain events and changes. Perceived changes in land productivity, fish catch, income and other aspects of resource availability and use can be highlighted. Ideal participants should include both long-time residents and younger groups.

Purpose

- To document changes in resource status and infer a particular pattern or trend over time.
- To verify trends shown in the historical transect if the period being analyzed is the same.
Trend analysis helps in understanding how a community views changes in various sectors. Integrating key changes into a village profile simplifies problem identification and makes identification of opportunities easier.

Trend lines can be used for the following topics:

- Fish catch (total production, species-specific)
- Income
- Land productivity (total production, crop-specific)
- Population
- Migration (residents leaving community or new residents)
- Education (increase or decrease in the number of students)
- Government budget for certain sectors, e.g., agriculture
- Illegal fishing activities (incidents/violations recorded) within a year

Topics can also be used for historical transects.

Requirements

Materials

✓ pentel pens
✓ paste/glue
✓ craft paper
✓ scissors
✓ colored paper
✓ masking tape
✓ stones, seashells, other material
✓ bond paper

Participatory Methods in Community-based Coastal Resource Management
Possible approach

1. Organize one to three groups with three to six members.

2. Use a sample graph to explain the concept of trends and trend lines.

3. Ask the group to draw the trends of some of the most important changes in the community. You may make suggestions on how they can do it but encourage them to come up with their own style.

4. Use stones, seashells, art paper or other available materials to show trends.

5. Let each group present their graph to the rest of the group.

6. Probe for explanations of the changes. This helps identify underlying problems. Find out what solutions have been tried, its advantages and disadvantages and reasons for success or failure.

Recommendation

Perform historical lines before trend lines. Also refer the results of this activity with other temporal tools, e.g., historical lines, historical transect, historical narratives and seasonal calendar.

![Graph showing fish catch (kg) from 1960 to 1990](image)

Using manila paper has its advantages as it can easily be stored after use. However, taking pictures of the results of this activity can be an effective documentation tool.
7. Formulate preliminary recommendations to address the problem.

**Variation**

Let participants draw trends on small sheets of paper using one variable per sheet. After which, ask the participants to group similar variables together.

Let them present the trends and do the analysis and revisions until the participants are satisfied with the results.

**Output**

* The output could either be a bar graph, line graph or pie graph with its variation.

**Example**

In order to consider trends in fish catch, participants might look at three different species separately (e.g., grouper, tuna and sardines). The output of this would be three trend lines.

These data could be grouped together using a bar chart to give a clearer view of changes in fish catch.

![Graph showing fish catch trends for grouper, tuna, and sardines from 1960 to 1990.]
Strength

- Provides clear and simple visual presentation of changes through time.

Limitations

- Trends are based on individual experiences. Thus, results may be subjective.

- Relationship between variables cannot be established, although it can be inferred.
  Example: declining fish catch and increasing fisher population.

Compiled by Ephraim Batungbacal
Flow charts

Definition

A flow chart is a diagrammatic representation of a series of events, activities or procedures, which can show a sequential process, cycle or flow from beginning to end. (Refer also to topic on commodity flow diagram).

Purpose

- To condense information into an easy to understand format and highlight sequences of activities to give an overview of a process.

- To highlight critical steps in a sequential process where interventions have a good chance of having impact (e.g., a critical link in a commodity flow diagram or a problematic step in a conflict resolution process).
Requirements

Human resources
✓ facilitator
✓ group of participants

Materials
✓ different sizes of paper
✓ pens or pencils

Possible approach

1. Identify the process (a flow or a cycle) for discussion, using information previously gathered.

2. Assemble a group of participants (refer to topic on identification of key informants).

3. Brainstorm on the processes involved in the chosen topic. Ask questions like "What do you do first?", "What happens next?"

4. Note the steps as outlined until all steps in the flow or process have been covered. Once they have all been noted, ask some participants to choose one of the steps and try to draw it on smaller card or paper.

5. Facilitate the participants in putting their drawings/descriptions on to a larger piece of paper in the proper sequence. Use arrows to connect the flows. Other symbols can be used to differentiate between activities done by men, women or children.
6. Analyze the flowchart. Examine each step to identify weaknesses. For example, a flowchart of soil erosion in a coastal watershed may help identify where erosion could be reduced (i.e., at the farm) or how it could be mitigated (i.e., vegetative buffer strips along creeks and rivers).

Flowcharts can also be used to examine weaknesses in social or institutional processes. For example, analysis of the process of getting a local ordinance passed to establish a municipal marine sanctuary may point to the step requiring scientific assessment of the site as the most problematic step.

7. Present and discuss the outcome for clarification and validation.

8. Leave the original with the community and make a copy.

Output

★ A diagrammatic representation of a flow, process or cycle.

Example of a flow diagram

The process of smoking fish

- Catching the fish
- Salting the fish
- Drying the fish
- Smoking the fish
- Selling the finished product
Variation

Flow charts can be done with different sectors to highlight different aspects of the same process.

Bio-resource or natural resource flow diagrams can be very useful tools (e.g., nutrient flows). The sequence will often not be just one way, but is more likely to be cyclical, going back and forth between the components.

Strengths

- Help outsiders get a better understanding of the 'what' and 'how' of local practices.
- Help identify key areas (i.e., steps or stages) in complex procedures where reforms or efforts to increase efficiency can be directed.
- Raise awareness among local people of the extent and usefulness of their knowledge.
- Information can be easily simplified and presented.

Limitation

- Too much detail can make flow charts too complicated.
References


Prepared by Karen Hampson
Spatial methods
Manta tow technique

Definition

Manta tow is a survey tool used to look at general trends on the distribution of corals (such as live, soft and dead corals), seagrass, diversity of some indicator reef organisms and/or presence of pollution. However, it may also be used to survey other habitat and marine resources. The survey involves the local members of the community.

This tool provides an overview of the general morphology of the sea bottom. It may also be used to compare fishers' perception about resource status with a more scientific approach. This tool may be used during the baseline data collection phase of specific interventions, e.g., marine reserve establishment. The results from the manta tow can be used to select sites that are representative of large reef areas for more comprehensive and in-depth studies such as underwater visual census.
Purpose

- To determine the extent of the damage caused by large-scale disturbances, such as destructive fishing practices (e.g., dynamite and poison fishing).
- To assess other reef organisms of particular interest (e.g., outbreaks of Crown-of-Thorns Starfish).
- To validate the results of participatory resource mapping.
- To highlight difference in perceptions of fishers and researchers, i.e., scientists.
- To explore fishers' understanding of the marine resources

Requirements

Human resources

✓ boat driver
✓ observers (at least 2 persons), preferably one researcher
✓ snorkelers (at least 2 persons), preferably a researcher-snorkeler with a technical background and a local fisher-snorkeler
✓ person using the manta board (must have previous experience with the technique or access to an individual who does)

Local fishers are usually excellent for this job as they know the area very well.
Materials and equipment

Pre-survey

✓ a small motorized boat with an outrigger
✓ 1-2 manta boards made of local materials with associated slate and data sheet.
✓ extra slate and data sheets
✓ a map of the reef drawn on the underwater slate or topographic map
✓ water-resistant watch to time the tows
✓ mask and snorkel
✓ anchor
✓ extra amount of fuel
✓ spare pencils and underwater slates
✓ pencil sharpener or knife
✓ drinking water
✓ first aid kit
✓ compass or global positioning system (GPS) (optional)
Post-survey
✓ brown paper
✓ colored pencils or crayons

Possible approach

Pre-survey
1. Meet with the community to discuss planned activities and explain the importance of the survey.
2. Describe the whole process of the manta tow technique and explain the different categories of coral cover to the community.
3. Carry out a participatory mapping of the coastal marine resources (i.e., seagrass/seaweed beds, coral reefs, etc.). Refer also to topic on resource mapping.
   Ask the fishers to use this map to rank the coral areas into five different categories (1-poor, 2-fair, 3-OK, 4-good, 5-excellent). Keep this copy for the post-survey phase.
4. Transfer this map onto the underwater slate.
5. Review the use of snorkel, fins and mask, and proper handling of manta board underwater.
6. Review the hand signal signs for snorkeler-observer communication system or make a different system that is more applicable to the fishers.

![Hand signals]

7. Discuss with the fishers what information they would like to survey: various types of corals, fish species, food species, etc. Use local names and the other symbols that would clearly illustrate the variables chosen.

8. Identify the route (e.g., north-south, east-west along a fringing reef, ziz-zag or criss-cross route on shoal) and mark the local names of the area.
Actual survey

1. If possible, begin the tow from an easily identifiable reference point. Make sure that the motor is kept in neutral or in idle until the snorkelers are well away from the boat and the rope is laid out.

2. Ask the snorkelers to mark the tow “No. 1” on the sheet attached on the board and give the “o.k.” signal to the observers.

   Fisher variation: Fisher-snorkeler can use: a) separate manta board; b) the same manta board as the other snorkeler; or c) hold onto the outrigger with an underwater slate.

3. Ask the observers to mark the position of the tow on the map and the bearings of the tow on the observer sheet.

   Fisher variation: Fisher-observer notes down the position of the tow using local names referring to the area (i.e., triangulation for the start and the end point or local names of landmarks).
4. Let the boat driver navigate the boat for two minutes at a slow speed of 1-1.5 knots, i.e., speed of brisk walking.

5. Ask the snorkelers to make observations from the surface of the water. Each or both can dive below the surface if the substrate is no longer visible (i.e., less than 6m) or if closer inspection is required.

6. At the end of two minutes, remind the driver to stop the boat and let the observers signal the snorkelers to start recording the data by giving two distinct tugs at the rope.
Data to be gathered

- Estimation of percentage cover

<table>
<thead>
<tr>
<th>Category</th>
<th>Researcher's perception</th>
<th>Fisher perception</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1</td>
<td>0-10%</td>
<td>Coral color</td>
</tr>
<tr>
<td></td>
<td></td>
<td>White corals (dead)</td>
</tr>
<tr>
<td>Category 2</td>
<td>11-30%</td>
<td>Few colored corals</td>
</tr>
<tr>
<td>Category 3</td>
<td>31-50%</td>
<td>Colored corals</td>
</tr>
<tr>
<td>Category 4</td>
<td>51-75%</td>
<td>Many colored corals</td>
</tr>
<tr>
<td>Category 5</td>
<td>76-100%</td>
<td>Too many colored corals</td>
</tr>
</tbody>
</table>

Percentage cover is the total area covered by the tows occupied by either types of coral (i.e., live, soft and dead corals) and substrate (i.e., sand/rubble).

- Visibility (Vis)

Visibility is recorded every 15 tows, or whenever there is a change in the clarity of the water. It is estimated using the marks tied along the tow rope.

<table>
<thead>
<tr>
<th>Code</th>
<th>interval (m)</th>
<th>Visibility</th>
<th>Fisher’s perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0-6</td>
<td>poor</td>
<td>Cannot see far</td>
</tr>
<tr>
<td>2</td>
<td>6-12</td>
<td>good</td>
<td>Can see quite far</td>
</tr>
<tr>
<td>3</td>
<td>12-18</td>
<td>excellent</td>
<td>Can see a long way</td>
</tr>
</tbody>
</table>

- Other observations/fishers’ observations on the area

For example, presence of hard corals and their local names (e.g., branching corals, massive corals, etc.), dead corals (e.g., those caused by the effects of dynamites and poison fishing), different types of fishes, visible pollution (e.g., plastics), etc.
7. Simultaneously, ensure that both the snorkelers and observers enter the necessary data under “Tow No. 1” and each gives the “o.k.” signal to the other when ready to proceed with the next tow.

8. Rotate the roles of the snorkelers and observers after 15 consecutive tows or when a snorkeler is already tired. Prior to change-over, the team should have a debriefing about their observations (i.e., general reef feature, presence of common or dominant lifeforms, presence of associated and indicator species, characteristics of the area and possible pollution encountered).

9. End the survey when the entire predetermined location has been inspected.

10. If it is not possible to complete a survey in a single set of consecutive tows, put marker or buoys to denote where the next set of tows will begin.

Example of using fisher knowledge

In the Central part of Visayas, Philippines, local fishers have conducted manta tow surveys. During the data collection the fishers identified areas known locally as Aws. These are similar to a lagoon and are known as fish-breeding grounds. Aws are very good sites for fish sanctuaries or reserves. The use of manta tow enables the identification of these areas.
Post survey

1. At the end of the survey, check the data collected by the snorkelers and observers. Transfer the data collected into the manta tow data sheet. (Refer also to topic on logbook.)

Sample manta tow data sheet

<table>
<thead>
<tr>
<th>Date:</th>
<th>Time started:</th>
<th>Time ended:</th>
<th>Tidal level (high, low):</th>
<th>Observer:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Map of the reef:

2. Prepare the map drawn before the survey. Then, ask the snorkeler-fisher to present his/her data results alongside the map drawn by the fisher-observer.
3. Ask the researcher to present his/her own results.

4. Analyze and discuss the two presentations. Look at trends and compare the differences in data.

Sample data results

Using manta tow technique, two reef communities were surveyed in Antique, Panay Island, Philippines (i.e., the Sebaste shoal and the Pandan fringing reef) for the purpose of community awareness. The fishers were involved in the whole process.

Strengths

- Large areas can be surveyed in a fairly short time.
- Relatively simple to perform after some training.
- Can be performed in remote locations with minimal support.
- Allows comparison of perspectives between the snorkelers. The snorkelers then come up with a mutually agreed upon version of the data results.
- Allows different perspectives of the areas to be discussed (e.g., scientific and indigenous knowledge).
- Enables the fishers to do the manta tow the scientific way and the researcher to do the manta tow the fisher way. This enables learning for both the fishers and researchers.
- If combined with environmental education, it can provide very good results in awareness-building.
Limitations

- The method has a large margin of error, e.g., small animals can be overlooked, the snorkelers may miss other biological data, particularly when the boat is not completely stopped between tows.
- The snorkelers may have too much information to remember, particularly if many variables are being recorded.
- The method can only be conducted during good weather conditions.
- Will take time to develop the participatory method. Unless women are actively encouraged, they do not tend to participate (i.e., as snorkelers).

References


Prepared by Ingrid P. Consing
Using transects to build a coastal profile

Definition

A transect is a series of observations performed while walking or swimming across an area (village, marketplace, forest, farm plot, beach, reef).

A coastal profile is a cross-section of the coastal community, showing the connection between land and sea. Information in the profile is built up from one or more transects.
Purpose

The coastal profile

- Reveals the interrelationship between various ecosystems in the coastal zone especially from the inland watershed to the marine ecosystems.
- Helps people gain an understanding about the coastal area (extent of habitats, severity of problems, resource use).
- Contributes to the coastal management planning process.
- Is a quick, initial assessment tool that may reveal a need for more detailed or quantitative assessment.
- Provides a venue for the community to share information among themselves and view their area in a different perspective.

The transect method

- Allows direct observation, as a cross check, for information previously collected through interviews.
- Helps develop friendly relations with community members through informal, relaxed interaction.
- Introduces the team members to farmers and fishers who may not be available for interviews in the village.
- Provides specific information needed for mapping and analysis, including sensitive issues that may not be brought up in more formal settings.
Types of information that can be gathered using transects

Biophysical
- Topography, hydrology, soil type, geology
- Type, extent and distribution of habitats (forest, agricultural, mangrove, reef, mudflat, etc.)
- Extent of environmental problems such as erosion, coastal abrasion, blast fishing
- Status of rare or endangered species (i.e., bird counts, reptile counts, turtle counts, visual survey of sea grass beds to check for dugong feeding tracks, etc.)

Resource use
- Systems of agriculture, land use and ownership, types and intensity of marine resource exploitation
- Types of plants present that are used by the community, i.e., medicinal, food, animal fodder

Socio-economic
- Number and types of housing, boats, shops and other economic indicators
- Economic activities (food processing, boat building, livestock pens)
- Types of foods being grown or gathered or available in the market
- Sanitary facilities, water sources
Sample application of a beach transect

In many coastal communities, people eat seaweed, a valuable source of trace minerals. Often, because only a few of the useful seaweeds are being used in any given village, this resource is underutilized. One quick and enjoyable way of documenting the variety of available seaweeds is to walk a transect along the drift line of the beach together with the children. The children will quickly find all the different types of seaweeds, as they have a keen eye for detail and are used to playing on the shore. Older ones will also be able to tell you which seaweeds are commonly eaten and what they are called in the local language. If you cannot immediately identify the seaweeds, the collection can be photographed or a sample of each type can be sun-dried and taken to a resource person for identification. Compile a list showing the diversity of resources and their potential uses (for fertilizer, animal fodder, human food, handicrafts). This list can then be the basis for discussion about seaweed as a village resource.

When do you do a transect?

Walking a transect usually occurs after the team has worked through the basic stages of getting to know a community. In some cases, this includes a participatory mapping activity (see variation below). The transect exercise is then used to validate and enhance the mapped information.
In other cases, a transect may be used to gather detailed information that will be built into a more sophisticated resource map for management purposes. In this case, the mapping exercise would follow the walking of the transect or transects. If very detailed resource information is to be mapped, quantitative sampling tools such as quadrats can be combined with the transect method.

**Who does a transect?**

A team, together with villagers, who are involved in resource use and can act as key informants and guides can do a transect. For a land transect, farmers, foresters and people active in harvesting forest products should be involved. For a marine transect, fishers and shellfish gatherers should be involved.

**Requirements**

**Materials**

- ✓ comfortable walking shoes or snorkeling equipment, as appropriate
- ✓ length of rope to mark off distance
- ✓ yardstick or tape measure
- ✓ pen and notebook
- ✓ video or still camera, if appropriate
- ✓ compass (optional)
Suggested approach

1. Select team members, clearly identify the information needs and prepare a work plan. Consult with community members in choosing the best area direction and length of the transect.

2. Choose the path and assemble equipment. Choose either to go through the village and into the surrounding countryside, following a footpath or river, or walk down to the shore and out to the edge of the reef. More specific transects can be performed along the reef crest, along the high tide mark of the beach or through farm plots depending on the information needed.

3. Choose the time. Early morning is not only more comfortable but is also the time when community economic activities may be most likely to be done.
4. If covering a large area, use a 50 or 100 m long rope to mark off the distance covered. For a transect over a short area (reef, field, forest garden) where you want detailed information, observe at closer intervals.

5. Take notes of observations made to the left and right sides every 50 m (or whatever the rope length). Explore the leftward and rightward areas from the reference/transect line but always return to the transect and resume the original path.

6. Record distance and elevation or water depth whenever a significant ecological change is encountered. Ask whether local people have their own names for different elevations or habitat types. Discuss observations with the villagers who accompany the team and with those met along the way.
7. Note any additional questions that arise that need to be answered regarding local condition and activities.

8. At the end of the transect, return to the village to consolidate and cross check the information.

9. Use the information to draw a coastal profile together with local participants. Feed other information into other activities (resource mapping, historical documentation, socio-economic analysis, etc., as appropriate).

Example

While doing a transect, the group saw a woman carrying a large load of coconuts. She was making her way from the forest above the village down to the beach. The team learned from her about an important village economic activity, coconut processing. They found out that coconuts come from forest gardens in the hills and brought to the beach for processing. Here, women worked together in groups to extract milk and oil from the coconuts.

The team learned about systems of land ownership and use, a cooperative that owns the equipment rented for processing, methods and seasonal patterns of harvesting, processing and marketing. They also discussed the roles of older women and children, who control the income from the activity, how the commodity is taken to the market and what social and environmental conditions affect the enterprise.
Transect tips

Using a compass keeps you on a straight line in the case of a swimming transect.

It is very important to be conscious observers. Discuss what you see with village participants. Talk to others you meet along the way. Ask very basic questions about everything, even if you think it makes you look stupid! You may have walked many transects through similar terrain in the past. Pretend that this is your first one. Keep your mind open to new information.

If you have permission and people are comfortable with it, bring along a still or video camera to document conditions and provide photos that can be used in discussions later on.

Output

★ Representation of a coastal profile

Example of a coastal profile
Variation

This variation uses a different style/approach in the preparation of the coastal profile. The main difference is that the coastal community members prepare a coastal profile (using other local materials) using their memory and experiences. Afterwards, the profile is validated by walking/swimming through the area with the interested community members.

Requirements

Materials

✓ paper and pencils
✓ completed resource map
✓ note books and pens for each work group

Prerequisite

Complete the resource map before this activity.

Suggested approach

1. Give an introduction and define a coastal profile.
2. Ask the community what cross section of the resource map touches the highest variety of habitats and community activities. The numbers of coastal profiles they will prepare depends on the diversity of the area.

3. Divide the participants into groups of 4-8. Working from memory, let each group prepare a profile. Allow at least one hour for this.

Another way of doing this is to assign two to prepare a profile for the same location. Let them work on their profiles separately. After they have finished, convene again and ask each group to present their profile. Encourage discussions and debate until the group comes to a consensus. Draw up a list of information needs or locations where they are not certain.

4. Using the transect method, let the participants go to the location of their coastal profiles and check their information. Discuss with them the differences.

Example

The group has drawn a mangrove forest on their profile. However, during the field validation, there is actually only a small fringe of mangrove forest and the area behind it is cleared. Has this just occurred? Is it a sensitive issue? What do they think about it?

5. Revise and update profiles, have further discussion and make a list of particular issues or problems highlighted. Are there opportunities for the community to manage things differently? What affirmative action can be put in place to address the issues or problems? Use this information to assist in planning.

Prepared by Irene Novaczeck
Underwater fish visual census

Definition

This is a method that can be used by coastal communities to estimate the variety, numbers and sizes of common, easily-seen and easily-identified fish in areas of good visibility.

The method complements small-scale fish catch monitoring. Underwater visual census is readily adaptable to a variety of organisms. However, this method focuses on reef fish.
Purpose

• To monitor the variety and abundance of fish in a given area, particularly in fish sanctuaries.

Requirements

Human resources

✓ volunteers (around 4 to 8) who are able to identify various fish types
✓ facilitator experienced with the technique

Materials

✓ resource map with information on fishing grounds, depth, habitat type, management zones, fish distribution (if available) and other impacts relevant to the resource
✓ goggles or mask and snorkel
✓ two 50-m lines each marked every 5 m
✓ underwater slate with attached pencil
✓ calculator

Options

✓ laminated butterflyfish identification guide (for use underwater if butterflyfish indicator species are to be observed and counted)
✓ boat (depending on the distance of the survey site from shore)
✓ numbered model fish of various lengths (if sizes are to be estimated)
✓ underwater camera for documentation (optional)

Possible approach

1. Clarify objectives with the community and make sure that this is the appropriate method to use.

2. Choose a book that showcases the group of organisms to be surveyed. Make sure that the book is appropriate to the bio-geographic area (e.g., Indo-Pacific, Caribbean, etc.) and habitat (e.g., reef fishes, seagrass fishes, etc.) to be censused.

You may also compile and use a picture album of the fishes in your area.
3. Gather a volunteer census team. Spearfishers and aquarium-fish gatherers are usually good at identifying reef fish and estimating size. Encourage women to participate as men and women often differ in the species they can identify.

4. Together with the team, choose the fish types to be counted and observed based on the following:
   - the objectives of the census;
   - the importance of the particular fish types to the community; and
   - the level of experience of the census takers.

5. Ask the census team to list the local names and relative abundance (uncommon or common) for each fish types selected for assessment. Copy the list of local names on the community logbook and on the underwater slates. This list should guide the observers to be consistent in the use of names during the assessment.

Local names

One local name may sometimes refer to many different species. Make sure that the local names are distinct for each of the fish types.
Examples of fish types

Favored by fishers (for food or for the market):

- Parrotfish
- Grouper
- Surgeonfish/unicornfish
- Rabbitfish
- Snapper
- Jack
- Butterflyfish
- Moorish idol

Indicator species:

- Angelfish

Common species:

- Wrasse
- Sweetlip/grunt
- Squirrelfish/soldierfish
- Emperor
- Fusilier
- Goafish
- Triggerfish
- Filefish/leatherjacket

6. Decide on the location, depth, number and length of transects to be observed. Also, decide on how often observation will be done.

Consider:

- the objectives of the census;
- movement ranges, abundance and distribution of the fishes to be assessed;
- the team’s mobility; and
- the team’s available time.
7. Lay the two transect lines parallel to each other and 10 m apart. Make sure that the area enclosed is of a constant depth (or depth range—if on a slope). Record the depth. Wait 10-15 minutes for the disturbed fishes to return.

8. Float directly above one end of the line. Record the name and count each fish type seen between the two lines up until the next 5-m mark. List faster-moving and roving fishes first; record slower-moving and resident fishes later.

9. Swim to and stop every 5-m along the lines to record until the transect is completed (Table 1). A 50-m transect takes approximately one hour in the water.

10. Similarly, record the other transects until all the target transects have been observed.

Do not scare the fish

Clarify each team member’s role beforehand so as not to have too many people in the water. Also, caution team members not to be splashing around because this may scare away the fish and bias the results. Do not census before 8:30 a.m. or after 4:30 p.m. so that it will not yet be too dark and so that the numbers of day-active and night-active fishes are not changing. Practice newly-trained census takers a couple of times before doing the actual census.
11. Categorize the various fish types, transect and areas into groups so the data will be more manageable and easier to understand. Fishes may be grouped by economic value and/or ecological function (e.g., herbivores) while transects may be grouped into areas and/or management zones.

12. Sub-total the counts of each type of fish for each transect. Label each sub-total with the unit “per transect”.

Example: 5 parrotfish per transect

Table 1. Sample raw data

<table>
<thead>
<tr>
<th>Distance along transect (m)</th>
<th>Type of fish</th>
<th>Number of fish</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Parrotfish</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Surgeonfish</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Checkered wrasse</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Damselish</td>
<td>20</td>
</tr>
<tr>
<td>10</td>
<td>Line-tail grouper</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Coral fish</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Damselish</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Hummerhead wrasse</td>
<td>7</td>
</tr>
<tr>
<td>15</td>
<td>Snapper</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Damselish</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Butterflyfish</td>
<td>10</td>
</tr>
<tr>
<td>20</td>
<td>Wrasse</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Damselish</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Fusiliers</td>
<td>30</td>
</tr>
</tbody>
</table>

Table I. Sample raw data

Date: April 15, 1997
Reef: Minombonan Fish Sanctuary
Village: Camanga
Municipality: Salcedo
Province: Eastern Samar
Observer: Cone Macatimpag
13. Sum these sub-totals for each fish group for each area and/or management zone. Similarly, label with the total number of observed transects.

*Example: 19 surgeonfish per 3 transects*

14. Tabulate and graph the sums of counts.

15. In comparing the sums with measurements from other places and times, multiply the numbers with the appropriate factor (number of transects to be compared divided by the number of transects actually observed) so that similar volumes of sample are being compared.

16. Ask the census team to present their findings to the community for verification and comments. Suggest that the community discuss the possible implications of the comparisons keeping in mind differences in observer, place, time and management.

**Outputs**

★ Variety, count estimates and size distribution of surveyed reef fish.

★ Translations of the local names of fishes.

★ A comparison of two or more sites to help decide where to establish a marine sanctuary.

★ A billboard with data on fish variety and numbers.

**Billboard**

*Eye-catching graphs of the results may be rendered on a billboard at a prominent location near the census site (e.g., fish populations of a marine protected area through time).*
Sample output

<table>
<thead>
<tr>
<th>Food fishes</th>
<th>Cabacongan marine reserve established 1997</th>
<th>Camanga fish sanctuary (no buffer zone) established 1995</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inside sanctuary</td>
<td>In buffer zone</td>
</tr>
<tr>
<td>Groupers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgeon fishes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fusiliers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snappers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butterfly fishes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trigger fishes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Damsel fishes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fairy basslets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wrasses</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legend:

- 1-5
- 6-25
- 26-100
- 101-600
- 601 or more

Strengths

- Useful for the conduct of simultaneous census of many reef fish species.
- Highlights the special skills of some organization members.
- Strengthens monitoring capability of fishers’ organization.
Limitations

- The method is limited to areas 3-7 m deep.
- Fishes may be frightened by or attracted to the census takers thus, biasing observations.
- Not suitable for censusing sparse or highly mobile fishes.
- Can be tiring.

References


Compiled by Andre Uychiaoco
Resource mapping

Definition

A method for collating and plotting information on the occurrence, distribution, access and use of resources within the economic and cultural domain of a specific community. Variations are introduced in selecting particular participant groups (e.g., gender) or in adding a further stage to generate a topographic map – related information through a two-stage resource mapping process.
Resource mapping is ideally preceded by a resource historical transect, which provides for a preliminary checklist of resource-related issues relevant to the community. The resource map provides useful information to help orient the transect walk, which generally follows. Information generated during the conduct of the latter further complements the outputs of the resource mapping exercise.

Resource maps

- may be used by the community itself (with or without facilitators) for internal discussions or to relate to outsiders;
- are essential inputs both for insiders and outsiders for planning and monitoring purposes; and
- support researchers in the conduct of in-depth assessments of particular resources.

**Purpose**

- To allow community members identify, locate and classify past and present resource occurrence, distribution, use, tenure and access, and to reveal the significance the participants attach to them. Critical locations such as areas known for illegal fishing, pollution, siltation, etc. can be identified and mapped.
- To allow the establishment of relations between information sets and their spatial location (e.g., establishing visual relations between resources and/or issues).
Important

Resource mapping is best associated with other tools and in particular with the inland and coastal transects, which contribute to a more critical analysis of the individual resource. Resource mapping should be conducted at the onset of a CBCRM activity, but only after rapport has been established with the community.

Knowledge of the social structure of the target community is a prerequisite for the facilitator. This is because resource distribution, use and access may be considered as sensitive issues by the community. At given intervals, similar exercises can be repeated for monitoring and evaluation purposes. Follow-up in-depth resource mapping (i.e., of a particular coral reef, fishing ground or mangrove area) can be done at any time of the project cycle, possibly generating qualitative and quantitative information.

Resource mapping can apply to all ecosystems known to the community and the scale of the maps can be set/adjusted depending on the required level of detail.

Requirements

Human resources
✓ facilitator (preferably skilled in CBCRM or related disciplines)
✓ co-facilitator
✓ documentor

Materials
✓ craft or manila paper (at least 1 x 2 m)
✓ pencils and chalk assorted colors
✓ fixative spray (e.g., hair spray)
✓ markers
✓ masking tape
Optional
✓ compass and ruler
✓ topographic map and or nautical chart (original, colored)
✓ topographic map blow-up (1:25,000), 2 to 3 copies
✓ camera

Any surface can be used. The map can be drawn with chalk on a concrete floor, or on the ground with a stick. Resources and features may be pictured by the use of local materials like stones, leaves, sticks, shells or other. But these kind of maps need to be transferred to a more durable and mobile base (paper) to preserve the generated information over time.

Suggested approach

1. Identify the participant group.
2. Describe purpose and scope of the mapping exercise.
3. Invite the group to select key informants knowledgeable about the resources to be described (i.e., fishers should predominate in coastal, while farmers or forest dwellers in terrestrial resource mapping). Should access and use of resources be culturally or socially related, and should this be critical for CBCRM, then participants may further be stratified according to ethnicity, gender or age.
4. Collate checklist of resources or features to be mapped. Consider that only a limited number of topics can be mapped.

5. Position the paper in a place which has a good view of the area to be mapped.

6. Facilitate the preparation of a base map on craft paper. Make sure that participants have a common understanding of the orientation. The size of the map (1 m x 2 m) should allow several people to contribute at the same time. Ask the participants to draw landmarks, reference points or reference lines.

   The sequencing is important. Start with coastline, followed by watercourses, islets, mountain peaks, paths, roads, human settlements, etc. Agree on the local name for each feature.

7. Ask participants to locate on the map the listed resources and features. Allow for additions the participants (and you) think are important in relation to the resources'

   Examples of topics that can be mapped
   - habitats, e.g., mangroves, mudflats, seagrass beds, coral reefs, nipa swamps, etc.
   - breeding grounds
   - migration routes
   - fishing grounds
   - specific species' areas
   - gendered resource and uses
   - usage
   - access limitations
   - rights and tenure
   - areas of conflict

Make sure that the process is properly recorded by the documentor and that issues debated among participants are noted down.
occurrence, distribution, use or access. Use symbols and colors to represent various sets of information and generate a corresponding legend.

8. Allow for validation of the information by a wider forum.

9. Once the output is agreed upon, fix chalk and pencil by use of the fixative spray.

10. Draw copies of the maps. Leave the original with the community and, if necessary, copies with other concerned parties.

Output

★ A map and a written report of the process. However, this could differ according to the specific purpose of the exercise and the characteristics of the participants.

★ The composition of the map reflects the perception and vision of the participants about the resources and features they have been portraying and provides an insight into the intimate relation between the participating group and the resources.

For example, issues on resources important to the participants might appear exaggerated in size or color versus minor issues which might be pictured small.

The most important resources or features will appear first in the map. Documenting this process is an essential part of the output.
Example of a resource map

Resource map modified from the originals drawn by the fishers of Barangay Bucana, El Nido, Palawan, Philippines

Legend
- Turtle nesting areas
- Destroyed fish breeding areas
- Octopus breeding areas
- Fish breeding areas
- Squid breeding areas
- Swiftlets nesting areas
- Restricted fishing area
- Ferry boat route

- Dugong sitting areas
- Nesting area (Tabon birds)
- Seagrass areas
- Coral reef areas
- Mangrove areas

Participatory Methods in Community-based Coastal Resource Management
Strengths

- Provides visual representation of resources and their uses.
- Represents a good starting point for participatory problem analysis and planning.
- Is easily understood and implemented.

Limitations

- Difficult to use as supporting documentation in formal or legal contexts.
- May contain a limited number of information sets (less than 10).

Variations

Variation 1: Stratified resource mapping

Stratified resource mapping involves dividing participants into groups according to gender, age, ethnic origin or other categories. This is extremely useful in identifying relationships of social groups and resources. This knowledge is essential for planning purposes, specially when selected strata of the community have exclusive or limited access to given resources.

This approach generates stratified information of valuable use in identifying customary rights in resource use, access and tenure and in the allocation of resource management responsibilities.
The steps in conducting stratified resource mapping are similar to the steps described before. But the facilitator needs to conduct a preliminary assessment of the community to get a deeper insight into its social structure, to identify appropriate venue and timing for gathering the selected group of participants.

Output

- Stratified resource maps based on gender, ethnicity or age-related resource maps. The outline of the resources strongly reflects the domains of interest of the participating groups.

Variation 2: Gendered mapping

This is the variation that highlights men's and women's access to, control over and perceptions regarding the importance of certain resources. There are women's and men's spaces in the coastal zone, as well as fishery resources and practices that are associated with men and women.

For example, mangroves and inshore flats are usually associated with the shell- and seaweed-gathering activities of women whereas fishing on coral reefs and deeper waters are usually the domain of men. Gendered mapping is usually conducted among separate groups of men and women. Remarkably, different outputs might be achieved if the filter is applied.

The following are additional steps to be considered by the facilitator:

1. Ask the participants to identify symbols to represent men and women. For example, ♂ for men and ♀ for women.
2. For each of the resources or features in the sketch map, ask the group to determine whether it is predominantly associated with men, women or both and apply symbols accordingly. If time permits, further clarify who has access and who has control over the resources.
Uses

Gendered maps may be used for:

- raising and discussing issues and concerns;
- identifying existing and potential resource use conflicts and forming the basis for appropriate action; and
- identifying livelihood opportunities for men and women.

Variation 3: Two-stage resource mapping

This variation involves transposing the information from the sketch map to a conventional topographic map. Two-stage resource mapping may be used by the community in dealing with formal institutions on particular issues related to tenure, usage rights, right of way, etc.

The outputs obtained from this variation can be transferred with minimal distortion to more sophisticated information storage systems (i.e., Geographic Information System) and be used for planning and monitoring purposes on broader geographical areas. To maintain momentum among participants, the process of data transfer occurs before the completion of the sketch map.

The following are some additional steps to be considered by the facilitator:

1. Expose the topographic map (in a suitable scale) close to the developing sketch map, aligning the two maps according to the compass points. Allow for some time for the participants to familiarize themselves with the topographical map, eventually assist them in interpreting illustrations, like contour lines.
2. Ask some participants to start transposing the information spotted on the sketch map on to the topographic map. Use symbols and colors uniformly in representing individual sets of information. Should one topographic map be crowded a second one can be used. Name landmarks, islets, rivers, mountain peaks and settlements. Make sure that a legend appears on each map.

3. Make sure that both maps are being completed then ask participants to list their names at the bottom of the maps.

4. Allow for validation of the generated information sets by a wider forum.

5. Fix chalk and pencil by use of a fixative spray.

6. Draw copies of the maps. Leave originals with the community.
Outputs

Two-stage resource mapping generates two outputs: the resource sketch map (stage 1) and the elaborated topographic map (stage 2). The first is richer in people's perceptions. The second adds precision in the location of the information, allowing for a larger number of information sets to be mapped because of spontaneous drawing closer to scale by the participants.

Strengths

Facilitates the communication between insiders and outsiders, because the media is understood and valued by both sides.

Translating information from a resource sketch map onto a topo-map allows:

- information to be defined in terms of occurrence and most significant in terms of extent;
- the collection of local names not necessarily available from centralized information sources;
- the generation of an output readily linkable to secondary information;
- the use of the map within an evaluation process, because the topographic base map remains the same over time; and
- the transfer of the information into a computerized format, providing a valuable contribution in addressing forthcoming scientific research or comprehensive resource management planning.
Limitations

Limitations apply to the second stage of the process in cases where topographical maps are not available or inaccurate, or when the physiography of the area is constantly changing like in estuarine areas.

General considerations and recommendations to mapping:

- The process explored in the first half of the paper may be applied to generate other types of maps like social maps, economic maps, health maps, etc., or providing useful information on resource tenure and rights.

- The conduct of mapping may take one day. An additional half day may be necessary to produce copies of the outputs and to consolidate the notes taken by the documentor. The validation may occur on the same day and generally takes about one hour.

- The cost of conducting mapping includes the acquisition of supplies, travel expenses and food allowances for the facilitating team and participants.

- Unlike inland communities, the economic domain of coastal communities may stretch over several kilometers of coastline and coastal waters. Prepare your supplies accordingly. In the case of topographical maps, make sure that they contain a reference scale in the form of a line of a given length and that the coastline is clearly identified.

- Consider the opportunity of complementing or cross-checking the generated information.

Prepared by Giacomo Rambaldi, M. Luisa Fernan and Susana V. Siar
Participatory coastal zoning

Definition

This is a method of addressing conflicting interests among resource-users through the delineation of areas or zones for specific uses. The areas or zones are based on the features and importance of the ecosystems as well as the concerns and recommendations of different sectors affected by the zoning plan.

This approach is based on the experiences of a coastal community in Bolinao, Philippines, who, for the past two years, have been working towards zoning their municipal waters. As of this writing, they are currently negotiating with the municipal government and other resource-users for a common zoning plan.
Purpose

Coastal zoning allows different sectors who use the coastal area to reach a consensus on coastal use. It is a chance for dialogue and cooperation among fishing communities, business interests, non-government organizations (NGOs) and local government.

Requirements

A prerequisite for zoning is to have several well-organized contiguous coastal communities sharing a common resource (e.g., a bay or gulf) that are willing to work with each other in a lengthy process that requires patience and flexibility.

This exercise would be more effective if community-based organizations (CBOs) have working knowledge and skills in the following areas:

✓ basic marine ecology – to understand the local ecology and the impact that different resource uses have on it

✓ conflict management and resolution

✓ knowledge of local and national laws – to be aware of how zoning can be enforced

✓ leadership, negotiation and planning skills – to be able to work with various interest groups in reaching a zoning plan

✓ advocacy skills – to raise awareness about the zoning plan in the coastal community
management, monitoring and evaluation skills – to implement the proposed zoning plan

Possible approach

1. Let each CBO identify resources, how they are used and what conflicts there are among resource users for the coastal zone that they use. Resource mapping and transects are useful tools for this process.

2. Ask each CBO involved to produce a map showing the current use of resources in their area and locate where the conflicts are.

Example of a map highlighting resource-use conflicts
3. Ask each CBO to produce a second map that in their view resolves these conflicts through zoning.

Example of a map of how the area could be zoned

4. Gather together the CBOs in the municipality that are committed to the zoning project to discuss their respective zoning plans. Let them produce a joint map suggesting how the area could be zoned.

Example of a map jointly produced by the CBOs
5. Ask the CBOs to carry out an information campaign about the proposed plan to community members of their neighboring coastal areas within the municipality to gain the support of unorganized coastal communities.

6. Encourage the CBOs to work with local government in setting up a multi-sectoral forum on coastal zoning. Invite all stakeholders so that they can give their input on how the area could be zoned. Likely sectors are:
   - CBOs
   - small-scale fishers, fry gatherers, gleaners
   - commercial fishers (deep-sea fishers, fish pen/pond owners)
   - business community (tourist resort owners, boat transportation group)
   - NGOs and religious organizations, etc.
   - local officials
   - the police
   - media
   - national government agencies (if appropriate)

Encourage all coastal villages to attend.

7. Ask the CBOs to present their proposed zonation plan at the multi-sectoral forum and hear the views of other sectors. Do not expect to arrive at a consensus at this early stage of the consultation process.

8. Form a multi-sectoral committee for coastal zoning from among the sectoral representatives. Ask the committee to meet regularly to decide the finer details in producing a zoning plan that takes into account all the views of the forum.
The committee regularly reports back to the whole forum. All the sectors should be represented in the committee. It is essential to have a strong CBO presence in the forum, and particularly the committee, because the local government may tend to be influenced by more powerful sectors, e.g., business and commercial allies.

The output of the committee is the final zoning map and an implementation plan.

The final version of the coastal zoning map
9. Submit the plan to the appropriate legislative body for legislation and discussions on how the zoning laws can be enforced (refer also to topics on legal and institutional analysis).

10. Implement the coastal zoning plan.

This will involve:

- working with different sectors in transferring activities to designated zones;
- setting up environmental projects, such as mangrove reforestation; and
- tapping funding from local government, business sponsors and donor agencies.

Output

★ Comprehensive coastal zonation plan

Sample output: Zoning map in Bolinao, Philippines
Partnerships formed among stakeholders (refer to topic on building partnerships)

Strengths

- Highly participatory, coastal communities are involved from conceptualization to implementation stage.
- Numerous community consultations involved serve as a venue to expand CBCRM advocacy.
- CBOs are empowered to initiate coastal zoning plan and forge collaboration with various resource-users to implement CBCRM.

Limitations

- Arriving at a consensus or compromise resolutions might take a long time because of the different interests involved.
- Collaboration between CBOs and local government units (LGUs) may be difficult to achieve especially if the latter is influenced by other interests (e.g., commercial).

Prepared by Severino Salmo III
Quadrat transect methods

Definition

Quadrats are used to improve the precision of the transect method. Thus, quantitative data about spatial extent and condition of a variety of habitats and resources are gathered in a systematic way.
Purpose

This method is useful for gathering many types of quantitative data, including:

- coastal habitat inventory that provides information on quantity and condition of resources (mangroves, seagrass, seaweed, shellfish, coral, etc.);
- resource mapping in the intertidal area or in deeper water (using snorkeling or diving equipment). These detailed maps can be used as tools for various management tasks, such as zoning and resource monitoring;
- mapping soil types (samples in this case would be soil samples) in farm or forest plots; and
- mapping extent and condition of areas exploited by the community (e.g., shellfish gathering areas).

When to use this method

This activity would normally follow a participatory mapping exercise that resulted in a sketch map. The transect/quadrat method is then used to field check information and provide more precise spatial, resource and habitat information so that a detailed resource map can be either drawn from scratch or overlaid on an existing marine chart.
Requirements

Human resources
✓ community members (4-6)
✓ facilitators

Materials
✓ 100 m transect rope marked off at regular intervals
✓ base map, chart or sketch map of the community territory
✓ compass
✓ waterproof data slates
✓ suitable quadrat(s)
✓ ruler or tape measure to measure water depth
✓ shoes appropriate for walking on wet/submerged intertidal rocks
✓ snorkeling gear
✓ boat and paddles
Suggested approach

1. Do a quick site inspection to see what range of habitats you will be working in (manta tow or transect method would be useful).

2. Select sampling interval and quadrat size.

3. Decide which animals and plants will be recorded. Be selective.

4. Prepare equipment and explain the method and sampling tool to each work group.

5. Lay out the transect rope over the site, following a systematic pattern, i.e., parallel or perpendicular to high tide mark or reef crest. Record the starting point in terms of distance and angle relative to clear landmarks (use compass), and find the position on your map.

6. Use the rope to find sampling points at regular intervals.

7. At each sampling point, lay down a quadrat (on top of the transect rope) and record the type of bottom, and percentage of bottom covered by various attached animals and plants inside the quadrat. Record the number of mobile animals (shellfish, sea cucumbers, etc., according to information needs) in each quadrat.

Hint

Sampling in intertidal habitats should be carried out during low tide and in a month when there are very low tides during the daytime.
When very high numbers of animals (e.g., shellfish) are encountered, do not try to count every one inside the transect. Subsample!

Too many snails! Count the number of snails in five out of the 16 quadrat squares. Average these and multiply by 16/5 to give you an estimate of the total number of snails in the quadrat.

8. Use simple categories for bottom type (e.g., sand, mud, gravel, rock, coral) and living things (e.g., seagrass, corals, snails, bivalves, edible and other seaweeds, etc.). Use local names and categories if possible. Describe corals further in terms of their form and condition, i.e., alive or dead; broken or standing; branched, massive, encrusting, etc.

9. Record water depth (if at sea) at each sampling point.
10. Between sampling points, take note of where any changes in slope, vegetation and bottom type occur as you walk along the transect. Also note occurrences of rare or endangered species and plants or animals that are or could be used by the community. For more detailed mapping, measure and record distance features and boundaries to left and right of the transect line.

11. Continue to record observations until the boundary of the area being assessed/mapped is reached.

Caution
For safety, swimmers should always be accompanied by a boat.

12. Perform additional transects at suitable intervals within the area. Map the different habitats and calculate the extent and average coverage of various bottom types and life forms.
The number and frequency of transects will vary according to: a) the size of area being mapped; b) whether or not a good base map exists that could show the size and shape of the reef; and c) the level of detail needed in the data. If an accurate map is already available indicating the size and shape of intertidal area, detailed measurement of the width of the reef is no longer needed. However, if the map is being built up without benefit of such a base map, more measurement and transects must be made.

13. Gather data from each transect and check for completeness.

14. Use data to draw a transect profile and/or resource map. Transect profiles can be prepared by community participants. More sophisticated resource maps are usually prepared by non-government organizations (NGO) or other outside resource persons and then returned to the community to be checked before final revision.

**Output**

★ Accurate and detailed quantitative data/information on the spatial extent and contribution of a variety of habitat and resources.

★ More detailed resource map or transect profile to complement other resource maps and transects.
Resource map of intertidal reef drawn using 14 sets of transect/quadrat data

Legend
- Density average
- Density low
- Seaweeds abundant
- Mangrove
- Coral (middle)
- Coral (good)
- Dead coral
- Sand with gravel
- Sand
- Mud
- Sea cucumber
- Gravel
- Sea grass

Intertidal reef flat surveys often use 100 m transect ropes with sampling intervals of 10 m and quadrat size of 1 sq m (divided into 16 squares)

Strengths

- Provides quantitative and spatial information.
- This method is useful in a wide range of habitats.
- Can be used to collect a mixture of biological and socio-economic information.
Limitations

- The number of samples collected per habitat will not always be enough to fully characterize a particular resource.
- Random quadrat sampling within a habitat in different seasons provides more detailed information on resource condition.

Example

When applied to an intertidal habitat, this method provides information about intertidal marine resources that are present during a particular month, remain during low tide, and can be found in daytime. To obtain information on deep water fisheries, or on intertidal resources that are found at different seasons of the year or other times of day or night, a range of other methods must be used (manta tow survey or swimming transect at high tide, seasonal calendars, daily activity charts, fish catch records, etc.).

Variation

Gather socio-economic information while performing this method, just as the qualitative transect is done. Ask village participants for information about the various things being recorded. Which shellfish is collected? By whom? How many? What are the local names? Write down local names for each plant and animal as well as for the different habitats or levels of the shore.
Example

In Biak, Indonesia, the intertidal gathering of shellfish is a very important source of family food and has been largely ignored by fisheries researchers, so no data is available. However, interviews with gleaners show that shellfish stocks are perceived to be declining. There are areas which used to be harvested and now have been abandoned because of resource depletion. In this case, the quadrat-transect method would be valuable for mapping and characterizing past and present shellfish gathering areas. Using detailed random quadrat sampling of controlled gleaning (catch per unit effort assessment and measurement of size and diversity of shellfish) within each area would be valuable for understanding the impact of gleaning on shellfish populations. This would provide valuable information for designing a community management strategy and zoning plan.
Random quadrat sampling method

Definition

This method measures the percentage of sea floor covered by particular organisms. Data collection is done by a trained team of community members.

The tool used to collect data from a number of sampling points inside a sampling site is called a quadrat. (Refer to topic on quadrat transect methods.)

The sampling points are randomly scattered over a sampling site and selected using a sampling rope.
Purpose

- To monitor the status of coral reefs or to document change in any plant, animal or community attached to or lying on the bottom in other habitats (seaweed beds, seagrass beds, shellfish beds, rocky bottom).
- To monitor impacts over time from human activity such as use of destructive fishing gears (bombs, poison), pollution, etc.
- To compare current habitat health in different sites (i.e., polluted versus non-polluted, bombed versus not bombed).
- To perform a quantitative resource or habitat inventory.
- In combination with the transect method, to collect quantitative data for resource mapping.

Prerequisite

Random quadrat sampling is a technical method that requires a high level of motivation and commitment on the part of the community. The community should always discuss whether this is in fact the most suitable option. A monitoring method based on traditional knowledge that already exists in the village can be easily integrated into daily village activities.

Requirements

Human resources

✓ facilitator to help with planning, method development, training, site selection, supervision and data analysis.
field team(s) composed of three persons: one boat tender, two persons equipped with snorkel gear to place the sampling rope and quadrat and record data.

**Materials (See annex )**

- 25 m long sampling rope
- 1 m square quadrat made from thin iron rods welded together
- snorkeling equipment (2 sets per team)
- 3 or more data slates
- boat with paddles
- data book
Suggested approach

Preparing the monitoring plan

1. Select sample sites.

2. Define the information needs very clearly; determine how many samples are needed.

3. Train a team of community members.

4. Develop the data recording and analysis plan and assemble required equipment.

5. Hold a workshop where community members can review and revise the method and work schedule, and share their knowledge.
Using quadrats to measure coral reef health

1. Check tide to determine the right time to go out on the reef. The tide should be about 2 m above the sampling site.

2. Assemble equipment.

3. Paddle or swim out to the sampling site.

4. Record date, time, water depth, weather, visibility.

5. Let the two observers lay the 25 m sampling rope along the bottom so that sampling points are selected without bias. The rope should perch lightly on top of the corals.

Remember
Do not try to lay the rope straight. It is a sampling guide, not a transect.

6. Ask one person to carefully place the quadrat over each sample point marker in turn.

Caution
Corals are fragile and grow back slowly. Do not damage them with your sampling rope or quadrat. If entanglement or breakage is a problem, try using an "imaginary quadrat" or half quadrat.
7. Let the second person record percentage cover data. Observers must estimate the percentage cover of corals inside the quadrat while floating on the surface of the sea above the sampling point.

8. Record data underwater on a data slate. Continue this process until the predetermined sample size is reached.

In general, it is easier to estimate percentage cover when it is close to 100% than if it is below 70%. Therefore, observers should be encouraged to take their time and consult one another when trying to estimate cover on patchy bottom.

Random quadrat sampling method
9. Take additional notes you need (presence of rare species, fish, etc.) in the surrounding area.

<table>
<thead>
<tr>
<th>Site: Amafur reef</th>
<th>Weather: Sunny clear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date: Feb./97</td>
<td>Tide: High</td>
</tr>
<tr>
<td>Time: 10 A.M. to 12nn</td>
<td>Sea state: Calm</td>
</tr>
<tr>
<td>Water depth: 3m</td>
<td>Visibility: 15m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample</th>
<th>% Live</th>
<th>% Dead</th>
<th>Type of Dead coral</th>
<th>% Soft coral</th>
<th>% Sea weed</th>
<th>% Other animal</th>
<th>% Sand</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>40</td>
<td>new</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>white skeleton coral</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
<td>0</td>
<td>old</td>
<td>20</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>60</td>
<td>old</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>bombed rubble</td>
</tr>
<tr>
<td>4</td>
<td>75</td>
<td>10</td>
<td>old</td>
<td>0</td>
<td>10</td>
<td>5</td>
<td>0</td>
<td>old dead coral</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
<td>0</td>
<td></td>
<td>5</td>
<td>10</td>
<td>10</td>
<td>5</td>
<td>-</td>
</tr>
</tbody>
</table>

Notes: Saw I green turtle
Fish abundant

10. Transfer all data and notes to a data book immediately after the sampling is finished (refer to topic on logbooks).

11. Together with end users of the data (fishers, local management institutions, tourism operators), plot and analyze the data. The values for percentage cover of each indicator should be recorded in a data table. Then, average the values for each category.
12. Plot the averages on a graph to show how different sites vary from one another and over time.

![Graph showing average coral cover over time for two sites.]

Site 1: No blast fishing, now a protected area.
Site 2: Blast fishing stopped in 1994

13. After drawing conclusions from the data about the health of the reef, decide whether further actions need to be planned or the sampling strategy has to be modified.

14. Package and make available information which needs to be shared with other stakeholders.

**Possible outputs**

A key indicator of coral reef health is the percentage cover of living coral. Depending on the purpose of the monitoring exercise, the outputs will include measurements of one or more of the following indicators.
<table>
<thead>
<tr>
<th>Data</th>
<th>Why collect it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>• % cover by living hard and soft corals</td>
<td>• key indicator of reef health; observers may want to limit themselves to this one category</td>
</tr>
<tr>
<td>• % cover of dead corals</td>
<td>• to monitor impact of destructive fishing gears, pollution, etc.</td>
</tr>
<tr>
<td></td>
<td>Recently killed coral is bright white and coral dead a long time is overgrown by green or reddish fuzz, small pink crusts or other small lifeforms.</td>
</tr>
<tr>
<td>• % cover of newly broken but still living coral</td>
<td>• to monitor impact of careless anchoring, tourists</td>
</tr>
<tr>
<td>• % cover or number of other animals (anemones, crinoids, giant clams)</td>
<td>• to monitor biodiversity</td>
</tr>
<tr>
<td>• % cover by seaweed</td>
<td>• indicator of nutrient pollution.</td>
</tr>
<tr>
<td></td>
<td>Too much fertilizer will encourage seaweed to grow over the top of corals, causing corals to die.</td>
</tr>
<tr>
<td>• % cover of non-living bottom, i.e., sand, mud, pebbles, bare rock</td>
<td>• monitors movement of sand by storms and currents, increase in mud due to sedimentation from land-based activities</td>
</tr>
<tr>
<td>• water depth, weather conditions</td>
<td>• may affect accuracy of observations</td>
</tr>
<tr>
<td>Data</td>
<td>Why collect it?</td>
</tr>
<tr>
<td>------</td>
<td>----------------</td>
</tr>
<tr>
<td>• water clarity (how far can you see through the water - is it clean or dirty?)/turbidity</td>
<td>• may affect accuracy of observations. Indicator of pollution or plankton blooms. To stay healthy, corals need lot of light, i.e., light can only pass through if water is clear</td>
</tr>
<tr>
<td>• sedimentation (if you wave your hand over the coral, does a cloud of dirt rise up?)</td>
<td>• corals may die if smothered by sediment</td>
</tr>
<tr>
<td>• fresh surface water layer that may touch the coral heads</td>
<td>• corals can be killed by exposure to fresh or brackish water</td>
</tr>
<tr>
<td>• garbage</td>
<td>• plastic rubbish can smother and kill corals</td>
</tr>
<tr>
<td>• number of rubble filled craters on the sample site</td>
<td>• indicator of blast fishing</td>
</tr>
<tr>
<td>• intact bleached coral skeletons</td>
<td>• indicator of use of cyanide for fishing or local rise in water temperature</td>
</tr>
<tr>
<td>• presence of crown of thorns starfish</td>
<td>• a serious coral predator</td>
</tr>
<tr>
<td>• rare or endangered species on the sample site (giant clams, turtles, etc.)</td>
<td>• monitoring status of endangered species</td>
</tr>
<tr>
<td>• relative or actual fish abundance on the sample site</td>
<td>• indicators of biodiversity and fisheries potential</td>
</tr>
<tr>
<td>• different forms of coral present (encrusting, branched, foliose, massive, submassive)</td>
<td>• indicator of biodiversity and tourism potential</td>
</tr>
</tbody>
</table>
Strengths

- Provides quantitative data. Allows communities to compare the condition of their reef with that of other communities. May help foster a sense of pride or motivation to restore/conserve a reef.
- Increases environmental awareness for village participants as well as sharing of local ecological knowledge.
- Use of a "scientific" method builds pride and confidence in local managers (but recognition and institutionalization of a local, indigenous method may do this as well).
- Involves direct observation of a reef in a systematic way. Many types of information can be collected at the same time and changes in reef health reported to managers to stimulate an appropriate and timely response to any emerging problem.
- An enjoyable communal activity by village participants.
- Method can be applied to a wide range of habitats.

Caution
Random quadrat sampling sites should be homogeneous, i.e., one habitat type and with consistent depth.

Limitations

- Is based on a standard scientific method which is probably foreign to the community.
- Requires a period of training and practice.
• Requires investment in equipment not normally available in villages (snorkeling gear, quadrat).

• Requires support from a local management institution. In the absence of a village-based facilitator or management institution, the effort required for this method may be difficult or impossible to sustain.

• Suitable only for shallow water habitats. For deeper water monitoring, scuba equipment is needed.

Caution

Avoid monitoring reefs at low tide when water is less than 2m deep. Observers will be tempted to stand on the living coral instead of floating above it. Optimal water depth for this method is 2-3 m.

Variation

Random swimming transect without sampling tools

In this case, the principle is similar but the method is quicker, simpler and the resulting data is less precise.

1. Swim across the sampling site, following the contour of the reef so that sampling is consistently in one water depth. Record water depth.

2. Stop after every 50 fin kicks. In this way, sampling points are selected by counting fin kicks.
The observers must be very conscious of possible bias, so that they stop and use the spot directly below them regardless of its condition. They may be tempted to move a bit left or right to a place where the coral is better or measurement is easier.

3. Record the percentage cover of different categories found in an "imaginary quadrat" (1 m square area).

As a general guide, 10 sampling points provide a reasonable estimate of coral reef health. However, if the reef is very variable, more sampling points may be needed.

Prepared by Irene Novaczeck
This glossary is designed to provide both general definition of terms used in the sourcebook as well as special forms of usage that have been adopted for this particular publication.

A

ancestral waters marine areas claimed by indigenous peoples as having been part of their territory since time immemorial

approach a systematic strategy or methodology for addressing a development or conservation concern

For example, community based coastal resource management is an approach to addressing integrated conservation and development in coastal areas.

artesinal fisheries usually small-scale, local, subsistence fisheries conducted by individuals or small groups

assessment a review or informal evaluation of a selected condition

associated species living things (e.g., plants, animals) that are commonly found or interact with a given organism, habitat or ecosystem

B

baseline information usually the first measurement of an indicator taken at the beginning of a project and used to compare with subsequent measures taken after some intervention has been implemented
biases a prejudiced outlook of an individual or group of individuals based on a perspective or pre-conceived notion that does not fairly represent the larger population.

biodiversity the variety of living things found in a given area

This includes the variety of genes (i.e., genetic diversity), the variety of species (species diversity) or the variety of ecosystems (ecosystem diversity). In addition, the variety of functions (e.g., producers, consumers and decomposers) and the variety of cultures or cultural diversity (e.g., distinct ethnolinguistic groups) are also considered part of biodiversity.

buffer strips lengths of land or water that serve to provide protection to an area in need of protection from some external threat

For example, a five-meter wide strip of land running alongside a river may serve as a buffer strip to prevent surface erosion from entering the river.

buffer zone an area of land or water that serves to provide protection to a conservation area (usually surrounding it) designated for protection from some external threat

For example, an area one hundred meters wide surrounding a marine sanctuary that may have some regulations regarding productive activities.
**Case study** a short description of a particular project, situation or condition that serves to communicate key messages to the reader. Case studies are commonly used to document experiences and share them more widely through training or workshops.

**Community** an association of people living in a given area or sharing some general commonality in addition to geographic proximity. An ecological community refers to an association of plants and animals living in a given ecosystem.

**Comparative information** data that relies on other data as a point of reference (i.e., relative measures) and that can not provide a precise measure of accuracy in and of itself. For example, trend analysis may indicate that fish yields are decreasing every year, but will not necessarily provide the absolute figures for yield for each year. Similarly, local preferences may rank choices by comparison and not necessarily by some independent quantitative measure. This information may be all that is necessary to initiate some action, in other cases, more absolute information may be required.

**Consensus** agreement by a large majority of a population or group. It is considered ideal when the entire population or group is in agreement.

**Conservation** the maintenance of careful regulation of a resource or area through sustainable use.
The term conservation has been commonly and mistakenly been used as a synonym for preservation which refers to strict protection of a resource or area.

**coping mechanisms** ways in which individuals, households or groups adjust to or deal with difficult or changing conditions

For example, during periods of peak labor requirement, children may be taken out of school to provide additional labor. For projects, coping mechanisms may refer to ways in which project staff address problems that may impede the implementation of planned activities.

**customary laws** rights, regulations and norms that have been established over time and are generally accepted by a group as a framework for governing social behavior

Contrast with State law, which refers to an official legal system of a nation.

**cross-check** a way of ensuring accuracy of data collection by comparing information on a given subject from one source or method with information on the same subject from another source or method

**cyclical periods** specific lengths of time that are established by naturally occurring cycles or rhythms

For example, the length of time required for the earth to make one complete revolution (orbit) around the sun is referred to as an annual or solar cycle. Depending on latitude and regional climate, this will result in regular seasonal patterns. Similarly, the length of time required for the moon to revolve (orbit) the earth is referred to as a lunar cycle. This cycle influences tides and associated phenomena.
E

emphasize the ability to understand the feelings of another person or group by trying to put oneself in the position of the other person and feel the emotions from this perspective

enhancement the improvement of some condition based on a human perspective of what constitutes improvement

F

fish fry recently-hatched fishes

G

gender "the socially constructed roles and responsibilities of women and men, in a given culture or location" (CEDPA/Gender and Development Training Manual, 1996)

gender analysis "an organized approach for considering gender issues in the entire process of program development" (CEDPA/Gender and Development Training Manual, 1996)

gender and development an approach which seeks to empower women and transform unequal relations between women and men" (CEDPA/Gender and Development Training Manual, 1996)

genera plural form of genus which is a category or level used to classify living things according to biological and structural similarities and differences

gleaners individuals or groups that collect or harvest resources from the wild without cultivation or propagation
indicative data  data that implies, demonstrates or suggests a certain condition
For example, the existence of coral rubble in a circular pattern is indicative data suggesting the occurrence of dynamite fishing.

indicator species  a specific organism that implies, demonstrates or suggests a certain condition
For example, the occurrence of large numbers of crown of thorns starfish.

indigenous knowledge  information, practices, technologies, beliefs, tools, materials, experimentation, skills, pedagogy, communication systems and other social systems or institutions that people in a given group, community or area have tested, adapted and continue to adapt over time

indigenous taxonomies  systems and categories of organizing or associating living and non-living resources
For example, local groups will classify or categorize soil, fish and other resources into locally-recognized groupings.

informal community organizations  organizations that are not officially registered or recognized by national or local governments

informant  a person who provides information

intertidal zone  the area between above the lowest low tide mark up to the point where tidal influence continues (commonly the highest high tide mark) or slightly beyond
juveniles fish or aquatic organisms usually characterized by the incomplete development of reproductive organs

legend a description of symbols or abbreviations used on a map

letter-petition a formal and organized request for change or action by preparing a letter of request and having it signed by a large number of people who support the specific contents of the letter

local ecological knowledge refer to indigenous knowledge

logbook a notebook used to record in chronological order the events considered important based on local needs and preferences

manta tow a shallow water survey method that employs towing a swimmer behind a boat by a length of rope with a wooden board at the swimmers' end that is used for stability, maneuverability and recording observations

marine reserve an area of ocean protected from specified or all uses for any number of reasons including unique biodiversity, its support as habitat for local fisheries, educational purposes, rehabilitation and resoration

marketing the entire process of identifying, creating addressing and supplying the demand for any given product

This may involve market research, product development, pricing, advertising and determining methods of sales.
media any or all of three forms of information dissemination: 1. print (e.g., newspapers), 2. audio (e.g., radio) and audio-visual (e.g., television)

media campaign a systematic effort to use the media to gain support for a particular position or objective

medium a channel of communication or information dissemination (refer to media)

methodology a general approach or framework that employs a related collection or body of methods consistent with the overall approach

For example, CBCRM can be seen as a methodology.

methods a systematic procedure employed to achieve a certain objective

For example, participatory methods are procedures that follow certain guidelines to maximize participation, minimize bias, ensure validity and balance precision with time and effort. The methods described in this sourcebook make use of more specific tools such as matrices or diagrams and are part of a larger methodology.

monitoring the process of measuring changes in specific indicators at regular intervals over time

morphology relating to the shape (i.e., form or structure) of an organism

numeric data information presented in quantitative form or using numbers
O

**organization**  a group or association of people bound by a common interest

P

**paralegal**  a person with training in the law but not licensed to practice the law officially

**permanent belt**  a permanent transect distinguished by two parallel lines

**point of first sale**  the site at which a product (e.g., marine resource) is first transferred from the person who caught or produced the product to a person who pays for the product

**preservation**  the strict protection (i.e., no use) of all resources (living and non-living) in a defined area

**process**  a predetermined and systematic series of steps, actions or operations used by an individual or group to achieve specific objectives and move toward a general goal

**productive roles**  the activities, responsibilities and expectations of an man or woman related to providing the basic economic needs of a household (e.g., food production, wage employment, etc.)

**property rights**  the official or legal interest of an individual or group to access or control a certain area of land or water or resource

**protected area**  the generic term used to describe an area of land or sea that is governed by some form of protection from use or degradation

This may be in the form of conservation or strict preservation.
quadrats  a rectangular plot or frame used to assist in the measurement and study of ecological conditions

rehabilitation  the process of improving the conditions of an area of land or sea so that they are more favorable to conditions suitable to humans

reproductive roles  the activities, responsibilities and expectations of a man or woman related to the care and maintenance of the household (reproduction, child care, education, health, home maintenance, security, etc.)

respondent  a person who provides information to another person often through completing a survey questionnaires but also through participating in group discussions or participatory methods of analysis

restoration  the process of returning a given area of land or sea as closely as possible to the specific conditions (i.e., specific species, relative abundance, etc.) that existed in an earlier time

sanctuary  an area of land or sea that is often governed by strict protection (i.e., no activities or resource use allowed) often placed within a larger marine reserve

spatial  related to geographic area

For example, spatial tools look at where things occur in a given area or in relation to each other. Compare with temporal tools which means having to do with or related to time.
**spawn**  the production or deposition of eggs or young of aquatic organisms

**species**  a category of formal scientific biological classification that describes organisms that are biologically and morphologically similar and capable of interbreeding

**stakeholder**  usually groups of individuals – within a larger population (e.g., community) - that share a common interest, perspective, worldview or background

**temporal**  related to time

For example, a time line is a temporal tool that looks at the significant events in the history of community.

**tenure**  the right to access or control over a resource or area of land or sea

**terrestrial**  related to land as opposed to sea

**tools**  specific analytical techniques (matricies, diagrams, transects) that assist in the collection and analysis of data

For example, a matrix is a tool that can be used for participatory livelihood analysis which is a participatory method and is part of an overall methodology that is community-based coastal resource management.

**triangulation (validation)**  the process of confirming, validating, or improving the precision of data by seeking separate and independent confirmation of the data

Triangulation can be done by using different methods to collect the same data or seeking different respondents or both.
triangulation (geographic)  the process of determining or locating a specific point on a plane using landmarks to determine the intersection of two lines

transect  a length of land or sea – usually a straight line – that is used as the basis for sampling plants, animals or other indicators of interest using various sampling techniques

V

village assembly  a meeting open to all residents of a village for the purpose of sharing views and disseminating public information

W

watchdog groups  informal groups or formal organizations that serve to monitor activities related to a particular issue

For example, a small group of residents may form a group to monitor the occurrence of illegal fishing operations in sanctuary.

watershed  an area of land that shares a common point where water drains – usually to the ocean

Watersheds are commonly divided into functional (although arbitrary) sections such as upland, lowland and coastal ecosystems. Another functional grouping looks at catchment areas, service areas and drainage areas.
Z

zoning  the process of determining and assigning specific purposes, uses or regulations to specific portions of land or sea in order to optimize land-use

For example, a zoning plan for a bay may be developed to ensure the optimal and equitable allocation of space for often competing uses such as aquaculture, recreation, transportation, conservation or preservation, etc.
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VOLUME 3
Tools and methods

1998

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Publications such as the "Participatory Methods in Community-based Coastal Resource Management" are products based on knowledge acquired from direct field experience of individuals and institutions operating at the community level. IIRR relied heavily on the experience of partners and peers engaged in the field of community-based natural resource management. These supporters include a large number of people who have contributed in various capacities over time.

First on the scene were Ken Mackay, International Development and Research Centre of Canada (IDRC); Julian Gonsalves, International Institute of Rural Reconstruction (IIRR); and Gary Newkirk, Dalhousie University's Coastal Resources Research Network (IDRC/CoRR). Together they recognized the need for a publication that documents participatory methods used specifically for coastal settings. At that time, it was felt that IIRR's experience with participatory methods for rural development would play an important role in the overall project. Similarly, it was felt that the wealth and depth of experience in community-based coastal resource management in the Philippines warranted its selection as the venue for the participatory workshop.

An organizing committee was initiated including (in addition to those above) Gregory Ira and Joy Rivaca-Caminade (IIRR); Bob Pomeroy, International Center for Living Aquatic Resource Management (ICLARM); Francisco
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The documentation of the experiences of these committed individuals and each of the contributing authors into the final sourcebook could not have taken place without the financial support of donors. We are grateful to the following organizations and their representatives for recognizing the value of the sourcebook and having confidence in our capacity to produce it. Initial financial support came from Ken Mackay of IDRC. Additional financial support came from Mr. Paul Huddleston and Zenaida Cuenca-Forbes of the Canadian International Development Agency (Environment Development Fund), Ambassador Eric T.J.T. Kwint of the Royal Netherlands Embassy (Small Embassy Projects Programme), Herman Ongkiko of SMISLE and David J. Moles of the Western Samar Agricultural Development Programme (WESAMAR).
IIRR also remains appreciative of the support it has received (over the years) from the United States Agency for International Development (USAID) and the Ford Foundation (FF). Such institutional support allows IIRR to leverage resources and foster partnerships with other institutions.

The entire list of participants is provided in this sourcebook. Their contributions go well beyond their respective papers. Each participant added value to the work of their colleagues.

There are, however, certain individuals that deserve special mention for the special effort they provided. First, we would like to thank the VSO volunteers who provided editorial support during the workshop: Arlene Brooks, Cathy Rosario, Sarah Jane Curran, Maeve Nightingale, Stuart James Green and John Purvis. Arlene Brooks and Cathy Rosario extended their stay with us to help integrate third round revisions into the papers. Their voluntary support was characteristic of the commitment of VSO to assist local organizations in the pursuit of CBCRM.

Marie Grace Madamba-Nunez provided IIRR staff with critical technical support in the post-workshop editing of the papers. Dr. Gary Newkirk provided extremely valuable comments to the various drafts.

The International Institute of Rural Reconstruction would like to thank these individuals and each of the authors and support staff for contributing their time and experience toward the successful completion of this publication.

Mabuhay!
Introduction

The need for a sourcebook on participatory methods for community-based coastal resource management (CBCRM) arose from the absence of practical field-tested reference materials that merge the participatory nature of CBCRM with the unique conditions of the coastal zone. Field workers from government, non-government, community-based and even research organizations are increasingly applying participatory and community-based approaches (developed primarily in terrestrial settings) to work in the coastal zone.

While the general principles of participatory methods for conservation and development apply equally well to coastal conditions, the specific tools and their applications will differ. Practitioners of CBCRM have been developing and adapting participatory tools to their unique environments for many years now.
There is no one way to do community-based coastal resource management. Its concepts and processes continue to evolve as field practitioners relentlessly explore, innovate and generate new ideas and techniques in managing the coastal environment. This sourcebook is an attempt to document the various tools and methods developed in the course of doing CBCRM as actually and effectively employed by field practitioners in countries like the Philippines, Indonesia, India and other Asian countries.

The sourcebook is heavily biased towards participatory methods because the authors believe that such processes not only intend to empower, but *do* empower. Participatory approaches also generate relevant information from local and indigenous knowledge that is crucial to community-based coastal resource management.

The sourcebook is designed for use by people working directly with coastal communities to help strengthen their capability to manage, protect and develop their local resources. These include community organizers, community leaders, researchers, other field workers who may come from NGOs, GOs or research and training institutions. The tools are meant to guide users and not to be taken as rigid formulas. The tools can generally be applied or adapted to all types of coastal settings with a little resourcefulness and creativity.
The first booklet

The first section of the sourcebook zooms in on the coastal zone, the principles and components of community-based coastal resource management, community organizing as an underlying and integrating component to CBCRM and an overview of participation. This section differs from the rest of the sourcebook because it is more of a “reader” with basic background information; a foundation for the rest of the sourcebook.

The paper on the coastal zone emphasizes the challenges of the terrestrial and marine interface including the following characteristics: the prevalence of open access conditions; predominance of common pool resources; the mobile nature of many of the resources; the unique influence of temporal (e.g., lunar) cycles; the frequently strong gender differentiation in productive roles; and the dual (i.e., terrestrial and marine) nature of coastal livelihoods.

The paper on community-based natural resource management presents the evolution, principles, stages and strategies of CBCRM. CBCRM is presented as a framework for coastal conservation and development in partnership with community based organizations, local governments, non-governmental organizations and others.

Community organizing (CO) is covered in the introduction because of its central role in integrating CBCRM activities. Participants recognized the diversity in CO approaches and the political and administrative obstacles in some countries. Nevertheless, the depth of experience and central role of CO in the Philippines (a recognized leader in CBCRM) supported its inclusion in the introduction.
Finally, the issue of participation itself is presented. The rationale for participation, the forms of participation, the obstacles to participation and the relationship between participatory approaches and non-participatory approaches are discussed. General guidelines for using participatory methods are also included.

The types of participatory methods presented in the sourcebook and the degree to which they promote participation varied greatly. The methods range from survey type questionnaires (less participatory) to locally designed wealth ranking tools (more participatory). A common sentiment was that the only “correct” level of participation is that which is acceptable to the local community members.

The second booklet

The main section of the sourcebook is the step by step description of various participatory methods field-tested by the authors and their organizations. A simple outline was devised for most of the topics in this section and include the following headings: definition, purpose, materials, suggested approach, outputs, strengths, weaknesses and variations. Examples were commonly used to illustrate key points. In most cases, the examples were based on actual experiences. Cautions highlight areas where potential problems are likely to occur. Icons were also used for these special considerations.
The methods can be categorized in a number of ways: 1) the type of tool employed (e.g., matrix, diagram, timeline); 2) the purpose of the tool (e.g., temporal analysis, spatial analysis, comparison); and 3) the stage in the project cycle when it is applied (e.g., analysis, planning, implementation). Eventually, the final groupings adopted for the sourcebook emphasize the type of tool and its purpose. The judicious use of cross-referencing was used to address any weakness in the categorization of the topics.

The third booklet

While the primary focus of the book is on methods for analysis, planning, monitoring and evaluation, the authors felt strongly that a description of a few critical "implementation interventions" was warranted. Hence, the topics on mangrove reforestation and establishment of marine protected areas. The sourcebook also recognizes the importance of gender and indigenous knowledge as cross cutting themes, thus their inclusion.

In addition, appendices including a list of relevant equipment and a matrix of livelihood options for CBCRM are included.

A distillation of practical field experiences

The sourcebook – like most of IIRR publications – is a distillation of practical field experiences of a committed group of conservation and development practitioners. There
is no cutting edge science or even new knowledge. The strength of the sourcebook is its ability to simplify and communicate ideas clearly to a particular audience.

There is, however, an inherent contradiction in such undertakings. It is often difficult to balance the site-specific nature of field-tested experiences with the need to provide useful information to a wider audience. Authors were encouraged to be specific in describing the tools and methods they used. At the same time, they were reminded to avoid or explain local terms, norms or institutions. In general, the steps or the suggested approaches are written in generic terms and selected examples are used to illustrate the specific experiences from which the method was derived. Ultimately, it is the reader that will determine the local relevance of the methods.

The success of the publication will be measured by the creases on the binding and the amount of salt spray that forms on its cover as practitioners regularly turn to it in the field.

The creativity and ingenuity of the users will determine the life-span of the sourcebook. Improvements and adaptations are welcome and expected. Indeed, we look forward to working again with the original contributors as well as future users of the sourcebook to continually provide relevant and practical materials in support of CBCRM.
How this sourcebook was produced

This sourcebook is the final output of the workshop conducted at the International Institute of Rural Reconstruction (IIRR) in Silang, Cavite, Philippines on 28 July - 08 August 1997. The workshop, organized by IIRR, brought together about 35 community-based coastal resource management (CBCRM) practitioners in Asia. They worked closely with a production team of editors, artists and desktop publishing staff.

It is during the workshop that these participatory tools in CBCRM were compiled and participatorily edited. This publication is aimed at community workers, researchers, community leaders, extension agents and field teams of various government, non-government and community-based organizations.
Workshop objectives

Process, participation and product were the 3Ps stressed in the workshop which recognized the following objectives:

1. To compile participatory field methodologies, tools and approaches used in coastal communities into a sourcebook for use, testing and adaptation by other practitioners and organizations involved in CBCRM.

2. To produce a sourcebook based on successful practices.

Workshop process

Planning and preparation for the production of the sourcebook started long before the workshop. With the members of the steering committee (representing various organizations in Asia), the focus of the publication was decided on. The steering committee also assisted IIRR in the identification of topics and resource persons for the workshop.

The workshop used a process developed and pioneered by IIRR. This process had been used to produce information kits on a range of topics related to agriculture and natural resources management, including agroforestry technologies in the Philippines, integrated agriculture-aquaculture in Asia, ethnoveterinary medicine in Asia and environmental concepts and actions.
During the workshop, each participant presented his or her draft paper, using overhead transparencies of each page. Copies of each draft were also provided to all other participants who critiqued the draft and suggested revisions.

After the first presentation, an editor-artist team helped the author revise and edit the draft and draw illustrations to accompany the text. The edited draft and artwork were then desktop published to produce a second draft.

Each participant then presented his or her revised draft to the group for the second time, also using transparencies. Again, the audience critiqued it and suggested revisions. After the presentation, the editors, artists and desktop publishing staff again helped the author revise it and develop the third draft. Toward the end of the workshop, the third draft was made available to the participants for final comments and revisions.

The workshop allowed inputs from all participants to be incorporated, taking advantage of the diverse experience and expertise of all present. The concentration of resource persons, editors, artists and desktop publishing staff at one time and place enabled materials to be produced more quickly than is typical for similar publications. And the sharing of experiences among participants allowed the development of networks that would continue to be fruitful long into the future and would lead to concrete follow-up activities.
Assessment and monitoring tools
Planning for assessment and monitoring at the community level

Definition

Assessment is measuring certain aspects of the environmental or socio-economic conditions in a community.

Monitoring is repeated assessments at regular intervals to detect changes over time.

Key to both monitoring and assessment is the selection of success indicators based on the objectives/targets of the project to be monitored and assessed.
Purpose

- To assist the community in coming up with an assessment and monitoring design and system for community level programs or projects.
- The data collected during the actual implementation of the assessment and monitoring plan can be used by the community in making important resource management decisions.

Requirements

Human resources

✓ facilitator
✓ volunteers from the community or community-based organizations

Prerequisite

Training of community members/volunteers

Community members who will carry out data collection have to be trained. Persons whose livelihoods or lives are directly connected to the health of the resource or who are knowledgeable concerning the socio-economic condition being measured should be encouraged to participate as observers. These people are more likely to perform consistently over time. Trainees who will collect data from marine environments should be at ease with snorkeling equipment and familiar with various types of habitats before beginning technical training.
A community workshop in which community members can share their ecological and local knowledge is an important step in the training process. This is an opportunity to discuss issues such as safety at sea. Local fishers can provide warnings about dangerous animals, currents, etc.

During the training, observers should be encouraged to collect information in their local language and classify organisms being monitored using local names. The meaning of local names and classification systems must be clear, documented and validated by the larger community before being used.

Suggested approach

1. Identify program/project or resource to be assessed and monitored.

2. Set or review objectives of program/project or resource to be assessed and monitored.

3. Based on the objectives, identify and select the indicators (should be measurable) to be assessed and monitored. Decide unit of measurement for each indicator selected.
Example

The community council wants to build a marina beside the local reef. Because of concerns over the potential damage to the reef from siltation during construction, the council decides to strike a work group to design a monitoring plan. The group decides to measure reef health by monitoring total fish catches over the reef during the construction period. However, when an elder is consulted, he points out that the method chosen is guaranteed to tell the developers that their activity is enhancing the fishery! This is because the construction period will be during that time when pelagic fish migrate into the bay and total fish catches go up. Measuring total fish catch, therefore, is not appropriate. The community needs a frequent and direct measurement, like a record of water color and clarity and regular checks to see if dirt is settling on the coral. With timely feedback of information from monitoring, construction practices can be adjusted before long-term damage is done.

4. Identify and/or develop the methods for collecting information on the indicators selected. This includes selecting the most appropriate site for collecting information whether for assessment or monitoring.
Choosing a sampling site

- The sampling site is a physical location where you collect information.
- The choice of a biological sampling site is based on judgement and knowledge of the environment.
- If you are monitoring the condition of a resource, ask local resource users (fishers, farmers, forest workers) to help you find the best sampling site. Do not try to sample all possible places where the resource exists. Select one or two sample sites that are easy to reach.
- If you are measuring the impact of a project or activity, choose one sampling site which is where you expect the most impact to occur. Choose another site where you expect no impact at all. These sampling sites should be as similar as possible (i.e., marine sites should be alike in terms of water depth, bottom type, slope and wave exposure).

The number of samples needed will depend on:

- the change you want to measure.
  To detect small changes in the average condition of your indicator, you need a lot of data and a very accurate estimate of average. To detect large changes, you need fewer samples and a rougher estimate of the average.
- the amount of variation you naturally find in your indicator.
  If your indicator has a large range of possible values, take many samples to arrive at a good estimate of "average". If, however, the indicator being measured hardly varies within your sampling sites, collect fewer samples.

Example

If you are monitoring changes in substrate, you will need more samples in an area with high variation in substrate vs. an area with low variation.

![High variation (take many samples)](image1)

![Low variation (take fewer samples)](image2)
5. Regularly evaluate and test the method that you have chosen.

**Testing**

Testing can be done through repeated use in one place on the same day to see if the result is repeatable. There are always differences even when you count or measure accurately.

If the results change a lot every time, either the method is not good enough or the observers need better training. If the method turns out to be too difficult, time-consuming for community members or provides data that you do not understand or cannot analyze, find a different approach.

6. Develop a workplan for assessment; and subsequently, for monitoring.

**Tips**

- Photography can also be used as a tool to document changes in your indicator. Pictures do not need statistical analysis. They tell a convincing story to people of all ages and education levels. Test and evaluate the method.

- Community people are more likely to apply a method consistently if it is familiar and fits in with their normal daily activities.

- When monitoring, all data must be taken using a consistent method and always from the same sampling site or stakeholder group.
Output

★ Workplan for the conduct of monitoring and assessment.

The actual assessment should be able to generate baseline data using the selected indicators. Actual monitoring, on the other hand, should be able to record the changes in the indicators selected. These changes should be discussed and analyzed.

Limitations

• Some community information needs cannot be met through simple methods performed by non-specialists. In some cases, the community will need to collaborate with a non-government organization (NGO) or academic or government institution to gather and analyze information related to resources.

• The monitoring methods, timing and reporting have to be reviewed regularly to see whether improvements or adjustments are needed.
Mangrove assessment and monitoring (using the transect plot technique)

Definition

The transect plot technique is a modification of the transect technique described in this source book and in English, et al. (1994). It is a systematic and participatory approach in quantitatively describing the condition and structure of the mangrove forest (e.g., species composition and density). Although the method is standard for technical persons, the steps are simple and could very well be carried out by local communities. The transect plot technique is most practical when used to assess and monitor large and naturally occurring mangrove forest.
Purpose

- To generate a quantitative technical description of the mangrove forest (e.g., diversity, density, dominance, regenerative potential). Technical descriptions are useful in establishing or justifying the legal instrument (e.g., ordinance) for the establishment of mangrove reserves.
- To provide baseline information to validate technical information generated by "outsiders" (e.g., Environmental Impact Assessment) and for validating claims for the success or failure of any management initiative.
- To substantiate mangrove-related advocacy work.
- To supplement requirements by some funding agencies that require a detailed technical description of the resource being proposed for management.
- To give an opportunity for the community worker to explain some of the ecological processes occurring in mangrove areas.

Requirements

Human resources

✓ community worker (facilitator, recorder, analyst; helps identify some of the species that are not named by the villagers)
✓ 2-3 selected community members (lay the transect and establish plots; measure circumference of the trees; count the saplings and seedlings; and identify species using local names)

The roles can eventually be assumed by the participants after training.
Materials

✓ measuring tape (with centimeter scale)
✓ transect (rope, approximately 100 meters in length)
✓ map of the general area (topographic map, resource map, aerial maps)
✓ prepared data sheets
✓ pencils
✓ compass
✓ Mangrove Identification Guide (e.g., Calumpong and Menéz, 1996)

Suggested approach

1. Conduct a brief orientation on the method and other related processes (e.g., common identification of species). Discuss purpose of the assessment.

2. Select site for the transect.
   - Discuss and decide where to establish the transect lines using a resource map or other available maps. Sites should be able to represent the different conditions in the forest (e.g., with or without communities, open or protected, near or far from rivers).
   - Verify the transect position on site and make the necessary changes if the sites chosen are not representative of the general area.
- Location of the sites should be properly recorded based on landmarks and must be reflected on the map.

3. Gather data needed.

- Establish transect lines for each site by laying down the rope from the seaward edge of the forest at right angle to the edge of the mangrove forest. For large forests, the compass will come handy in ensuring the laying of a straight transect.

![Diagram showing transect lines and plots](image)

Note: transect lines should not overlap

- For each forest type (species zonation) encountered along the transect, randomly establish three plots. Plots could be established randomly along the transect line, if the zone is wide, or at the sides of the transect line, if the zone is narrow. The size of the plot should not be less than 10 m x 10 m (using ropes or marking only the corners to establish the plot).

- For each species in the plot do the following:
  
  a. Count and record the total number of mature trees.
b. Measure and record the circumference of all mature trees (at breast height, approximately 1.3m from the ground).

There will be occasions wherein the growth of mangroves will be irregular. The following are the standard procedure in measuring the circumference at breast height (CBH) and should be followed all throughout the sampling.
c. Count and record number of saplings (use a 5m x 5m subplot if the density is high).

d. Count and record the number of seedlings (use a 1m x 1m subplot if the density is high)

• For each plot take note of the following.
  a. Substrate type (e.g., rocky, sandy, muddy).
  b. Any impact (natural or human) in the area (e.g., shell collecting, cutting of trees for mangroves, storm effects, uprooting) and assess human impact on a scale of 0 to 5 (0 for no impact and 5 for severe impact, e.g., clearing for fishpond).
  c. Other organisms (e.g., birds, invertebrates, fish) encountered should also be recorded or enumerated when possible.

4. Organize data gathered according to diversity, density and basal area based on the following definition and formula.

  a. Diversity - the number of species encountered per transect.
  b. Density

  Stem density - the number of trees per plot

  \[
  \text{Stand density per hectare} = \frac{\text{No. of stems in plot} \times 10,000}{\text{Area of plot}}
  \]
c. Density of mature trees - the number of CBH measured for a particular species per plot

Density could be presented as density of mature trees, saplings, seedlings of a particular species, the sum of the density of the different categories of a particular species or the total density of all the species.

d. Basal Area (BA)

\[
BA = \frac{\pi (\text{Diameter at breast height})^2}{4} \quad \text{unit} = \text{cm}^2 \quad \pi = 3.1416
\]

Species BA = Sum of all the BA of a particular species per plot

Because the formula calls for Diameter at Breast Height (DBH), there is a need to convert the CBH to DBH.

\[
DBH = \frac{\text{CBH}}{\pi}
\]

\[
\text{Stand BA} = \frac{\text{Sum of BA for all species}}{\text{Area of plot}} \quad \text{unit} = \text{m}^2 \text{ per hectare}
\]

Stand BA for each species is calculated by the same method but calculating only for trees of the same species.

Because three plots are established, average the values for the three plots.
Example

### Mangrove assessment data

**Location:** Bais Bay, Negros Oriental, Philippines  
**Site:** No. 1 (Near Channel)  
**Date:** August 1, 1997  
**Team Members:**  
Roy Olsen D. de Leon  
Celia Acedo  
Wendy Regis  
Dalmacio Calumpong

<table>
<thead>
<tr>
<th>Transect No.</th>
<th>Plot No.</th>
<th>Substrate Type (rocky, sand, muddy)</th>
<th>Impact (0-5)</th>
<th>Mature Tree (&gt;4 cm)</th>
<th>Sapling (&lt;4 cm diameter height &gt; 1m)</th>
<th>Seedling (&lt;1 m height)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>sand</td>
<td>1</td>
<td>Ra 15</td>
<td>Ra 10</td>
<td>Ra 18</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ra 25</td>
<td>Rm 15</td>
<td>Rm 15</td>
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<td>Rm 14</td>
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<td>Ra 19</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>sand</td>
<td>2</td>
<td>Rm 14</td>
<td>Rm 16</td>
<td>Rm 2</td>
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<td>Rm 16</td>
<td>Ra 13</td>
<td>Ra 5</td>
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<td>Ra 12</td>
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<td>Rm 15</td>
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<td>Ra 18</td>
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<td>Ra 21</td>
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<td></td>
<td></td>
<td></td>
<td>Rm 13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ra = *Rhizophora apiculata* ("bakhauan-lalaki")  
Rm = *Rhizophora mucronata* ("bakhauan-babae")

**Other observations:**  
Impact includes "miracle hole" (artificial tidal pool, 1 m depth, 3 m diameter) dug by villagers to trap fish during low tide.
5. Present the results to the community.

Summarize and present the results of the assessment as a mangrove profile. This could be presented along with results from other participatory coastal resource assessment methods.

6. Discuss and analyze observations.

7. Monitor the impact of mangrove management initiative. To monitor, establish permanent plots at well-marked locations. Mark trees in a plot either by nailing to the tree metal plates with information such as transect, plot and tree numbers.
Mark corners of plots using 1.5 m bars driven in the substrate (approximately 1 m should be above ground to make it conspicuous). Use wooden poles for short term and iron bars for long term.

Monitoring should also gather the same information taken during the assessment. Results of the monitoring should be compared with the (baseline) data resulting from the assessment. Monitoring should be done every three months.

**Outputs**

* Information

Following is the type of information that will be generated using the transect plot technique

<table>
<thead>
<tr>
<th>Data</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of species encountered</td>
<td>• Diversity of mangroves is one of the criteria in selecting sites for mangrove reserve/sanctuary.</td>
</tr>
<tr>
<td>(Diversity)</td>
<td>• One of the functions of mangrove reserve/sanctuary is to provide possible sources of seeds/propagules for mangrove enhancement.</td>
</tr>
<tr>
<td>Stem density and basal area (mature trees)</td>
<td>Low Diversity: 1-3 species</td>
</tr>
<tr>
<td></td>
<td>High Diversity: 10+ species</td>
</tr>
<tr>
<td></td>
<td>The most diverse single stand mangrove forest reserve in the Philippines is in Pagbilao, Quezon with 29 species.</td>
</tr>
<tr>
<td></td>
<td>• Index on the condition of the forest. Condition of the forest is usually equated with the number of trees found in a given area. Coupled with data on the basal area, the condition of the forest is better described.</td>
</tr>
<tr>
<td>Data</td>
<td>Use</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>• Density alone may be deceiving at times. Forest may have a small density but the trees are huge (occupy a greater portion of the area) and therefore should be protected because this indicates an “old” forest.</td>
</tr>
<tr>
<td></td>
<td>• The stem density and basal area can also be used to determine the direct impact of development on the mangrove ecosystem. The number of trees that will be lost in favor of development could be calculated given baseline information.</td>
</tr>
<tr>
<td></td>
<td>• Basal area can be a good index of dominance. Dominant species are usually the more appropriate species for forest enhancement or reforestation.</td>
</tr>
<tr>
<td>Saplings and seedlings</td>
<td>In the Talabong Mangrove Forest Reserve, Bais Bay, Negros Occidental, Philippines, the density of matured <em>Avicennia marina</em> (mostly &gt; 60 cm DBH) average 900 stems occupying 27 sq m per hectare. In another forest zone in the same area, density of mature <em>Rhizophora apiculata</em> (5.1 to 10 cm DBH) average 5705 stems but only occupies 15 sq m per hectare.</td>
</tr>
<tr>
<td>density</td>
<td>• Density is an indicator of the regenerative capacity of the forest.</td>
</tr>
<tr>
<td></td>
<td>• If the saplings and seedlings are more than 50% of mature trees, the probability of the forest to sustain its existence is high. If the density is low, it can indicate high impact on the area (e.g., uprooting of seedlings and saplings due to shellfish gathering). This will help the villagers determine the need to enhance or rehabilitate the condition of the forest.</td>
</tr>
<tr>
<td></td>
<td>• Density can also help pinpoint the location of possible sources of transplanting materials. Some species (e.g., <em>Avicennia</em> and <em>Sonneratia</em> spp.) are difficult to grow if planted from seeds and will better survive if transplanted.</td>
</tr>
</tbody>
</table>
### Strengths

- Increases awareness of community about ecological processes.
- Generates detailed information on the mangrove forest.
- Generates quantitative data that could be used in scientific studies.
- Uses minimum equipment.

### Limitations

- Time consuming
- Walking through mangroves can be difficult and uncomfortable.

---

<table>
<thead>
<tr>
<th>Data</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate type</td>
<td>Seedlings and saplings for <em>Avicennia marina</em> in Lag-it Bais Bay, Negros Oriental, Philippine average 22,187 per hectare. Highly distributed forest density for seedlings and saplings can range from 0 to 100 stems per hectare.</td>
</tr>
<tr>
<td></td>
<td>• Is a necessary input in any reforestation effort. Species survival is more often dependent on the soil substrate. For example, <em>Rhizophora sp.</em> “Bakhau” is more suited in muddy-sandy substrate.</td>
</tr>
</tbody>
</table>
Literature cited


Compiled by Roy Olsen D. de Leon
Monitoring the effectiveness of marine sanctuaries

Definition

Monitoring the effectiveness of marine sanctuaries is a tool using a set of identified indicators to assess the immediate effects and impact of marine sanctuaries on the productivity of coastal fisheries and quality of life of fishing communities.
Value

This method builds on the different monitoring methods/tools such as underwater fish visual census, fish catch monitoring and seasonal calendar. Done in a participatory manner by community members, this will help to develop lasting community support and cooperation for the protection of the marine sanctuary as they experience, understand and appreciate its importance to their livelihood and well being. The data gathered may be used as basis for local policy advocacy.

Requirements

Human resources

✓ marine sanctuary monitoring team (composed of trained volunteers from the community: refer to the topic on establishing and managing marine sanctuaries)

Materials

✓ seasonal calendar
✓ gridded map
✓ colored pens
✓ craft paper
✓ notebook
✓ 5 x 20 m improvised permanent belt transect (see annex)

✓ underwater slates
✓ snorkels and masks
✓ fins (optional)
✓ markers/bouys
✓ boat
Suggested approach

The effectiveness of a marine sanctuary may be determined given a particular function it serves such as: breeding, nursery, feeding, refuge area and as a source of recruits to the fisheries. Indicators are identified to establish the basis for judging a marine sanctuary's effectiveness.

The approach outlined is based on its application on a coral reef sanctuary. Indicators of its effectivity include an increase in biodiversity and increase in fish catch. One indicator of impact on the quality of life would be an increase in the income of the fisher.

The indicators can be slightly modified to apply to mangrove and seagrass sanctuaries.

A general approach in monitoring these various functions may be as follows:

1. Prepare a seasonal calendar that includes, among others, the spawning season of the different species of fish and shellfish, the peak season for the different species of fish and the average size of the commercial species caught. Involve as many members of the community as possible to get more accurate information. The calendar will serve as the baseline information where succeeding calendars will be compared (refer to topic on seasonal calendar).

2. Depending on the area covered by the marine sanctuary, identify five to ten representative points in the sanctuary as sampling stations. The same stations will be used throughout the monitoring program. It is important that these stations are properly marked.
3. Do regular monitoring on a monthly, bi-monthly, quarterly, seasonal or annual basis depending on the parameter being monitored, availability of logistics and availability of the monitoring team. During each sampling activity, record the date, weather condition, phase of the moon, tide, depth, station number and name of recorder. Generate a monitoring report for each monitoring period.

4. Present monitoring report to the community. Discuss and analyze findings or variations from the original calendar and explore possible causes and implications.

5. At the end of each year, prepare a seasonal calendar using data from the monitoring activities. This could be useful in establishing trends.
Monitoring for specific functions

As breeding/nursery area

This could be done on a "general observation" basis, recording few, some or many species for each site but even this needs a trained eye.

The presence of spawn, fish fry, spats and juveniles in large numbers in the marine sanctuary is an indication that the area is being utilized as breeding or nursery ground by various marine organisms. It is also an indication of the "healthy" condition of a particular sanctuary.

1. Swim through the permanent belt transect in each sampling station and count the number of fish fry, spats and juveniles observed. Identify to genera or species level whenever possible. Record the number and species of spawning adults whenever this is observed. Repeat outside the sanctuary.
Eggs/spawn are deposited on suitable support (e.g., corals, seaweeds, hard substrates).

Spats settle on suitable surfaces (e.g., rocks, seagrass blades, mangrove roots).

2. Transfer recorded observations to a notebook.

As feeding or refuge area

1. Prepare a table on the underwater slate to facilitate recording of observation.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>Ave. size</th>
<th>Feeds on</th>
<th>Remarks</th>
</tr>
</thead>
</table>

2. Swim through the permanent belt transect in each sampling station and record observations of feeding fish and other organisms on the slate.
3. Transfer recorded observations to a notebook.

**As source of recruits to fisheries**

1. Identify the same number (5-10) of sampling stations outside the sanctuary (unprotected area). Set the improvised permanent belt transect and mark the sites.

2. Do a fish visual census of the sampling stations inside and outside the marine sanctuary. Record size estimates of commercially-important species (refer to topic on underwater fish visual census).

3. Monitor fish catch of the local fishers (refer to topic on fish catch and effort monitoring).

4. Transfer observations to a notebook.

5. Compare data on species composition, number and size from the sanctuary with the fish catch data from the local fishers.

   If composition, number and size of fish caught by the local fishers outside the sanctuary are similar to that of those in the sanctuary, then you can conclude that indeed the sanctuary is effectively becoming a source of recruits for the fisheries of that particular area.

**Output**

* Monitoring report using a particular set of indicators that measure the effectivity of the marine sanctuary.

* Trend analysis of selected indicators
Strengths

- Integrates various tools to measure effects/impact of a particular coastal resources management intervention.
- Generates detailed information on the characteristics of the habitats and fisheries found in the sanctuary.

Limitations

- Availability of the monitoring team to do regular monitoring of the marine sanctuary over a long period of time.
- Broadcasted eggs are not visible.
- Frys are not very visible unless in big quantity.
- Long monitoring period before significant changes/impact can be observed.
- Benefit for the community cannot be felt immediately.

Compiled by Margarita dela Cruz and Andrei Uychiaco
Fish catch monitoring (for small-scale fisheries)

Definition

A method that can be used by fishers to monitor and assess trends in their local fisheries. This involves the standardized collection of information about their daily fish catch, fishing gear, hours and fishing grounds.

Purpose

- The method is readily adaptable to a variety of organisms (e.g., crabs, shells etc.). Fish catch monitoring can be conducted in areas where there is a strong fisher association.
The data can be used to support advocacy initiatives of the fisher organization (e.g., stricter enforcement of laws in municipal fishing grounds and livelihood assistance). Data collected and analyzed in a systematic manner and formally presented to government and other sectors can be impressive and influential.

- Fish catch monitoring is a useful method for monitoring both positive (e.g., marine reserve) and negative impacts (e.g., mining) of activities affecting the coastal area.
- The information can be useful for project management and development.

The data or information generated from the fish catch monitoring might not be acceptable as legal evidence, or useful for detailed statistical analysis.

Requirements

Human resources

✓ 4 - 8 volunteers (fishers)
✓ facilitator (especially during the early stages for training and data analysis)

Materials

✓ craft paper and pens
✓ resource map (the original and copies)
✓ fish identification materials (picture book)
✓ data sheets and pencils
✓ logbook
✓ weighing scales (whatever is locally available)
✓ calculator

Optional
✓ ruler/locally designed fish measurement board
✓ binoculars and boat (depending on distance of fishing grounds from shore)

Suggested approach

Preparation
1. Clarify objectives and the value of fish catch monitoring with the community and make sure that this is the appropriate method to use.

2. Generate lists and reach a consensus about the location of the fishing grounds, different types of fishing gear, fish species and fisher groups. Discuss each item in the list to make sure that everybody is referring to the same things (refer also to the topics on brainstorming, focus group discussions and resource mapping).

3. Group and rank the items in the lists (e.g., fish species according to local importance). This should be recorded in the logbook and used as the standard list for data entry and analysis.
4. Show and explain the sections of the data sheet. Include suggestions for improvements. It is important to be accurate and to record zero values (e.g., if a fisher goes fishing but catches nothing).

Example of a fish catch data sheet for the Philippines (in English and Filipino)

<table>
<thead>
<tr>
<th>Date (Petsa):</th>
<th>Recorded by (Itinala ni):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (Oras):</td>
<td>Weighed by (Tinimbang ni):</td>
</tr>
<tr>
<td>Location (Lugar):</td>
<td>Comments (Puna):</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Moon phase (Punanon)</th>
<th>New</th>
<th>1st quarter</th>
<th>Full</th>
<th>Last quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weather (Panahon)</td>
<td>Stormy</td>
<td>Raining</td>
<td>Overcast</td>
<td>Fine</td>
</tr>
<tr>
<td>(Masama)</td>
<td>(Maulan)</td>
<td>(Maulap)</td>
<td>(Maganda)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sea state</th>
<th>Calm</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Walang alon)</td>
<td>Rough</td>
<td>(Malaki ang alon)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fishing gears (Kase ng pangangada at pagsasarap ng tangisang)</th>
<th>Fish species (Kase ng isda)</th>
<th>Weight (Timbang)</th>
<th>Location (Saon galing)</th>
<th>Number of fishers (Kong Manginooy)</th>
<th>Hours (Kong oras)</th>
<th>Motorized banca (Meron motor o walang motor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male (Lakal)</td>
<td>Female (Balbey)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

34 Participatory Methods in Community-based Coastal Resource Management
Many different fish species / fishing grounds / fishing gears may be referred to by the same local name. Make sure that the local names are distinct for each of the different types.

5. Ask the team to decide on the location (e.g., store, fish buyers’ waiting shed) and the time (a set time of day and a set day of the week). Aim to have a frequency of at least once a week (e.g., every Monday morning). Encourage the team to set-up a schedule.

Things to consider when deciding on the fish catch monitoring schedule:

- The morning, afternoon and night fisheries are very different (the time when the fishers return to the land will vary)
- Focus on the dominant fishery or the one where you are expecting to see changes
- Regular daily and weekly schedules of the volunteers

6. Explain fish catch per hour and the data analysis process (refer to the analysis section).

7. Elect a leader for the volunteer team. The team leader will be responsible for keeping the data sheets/logbook, standard lists, labelled map and calculator.
Monitoring proper

1. Ask the volunteers assigned for that day and hour to facilitate the records of fishing details for as many fishers as possible for that day. Later, as more of the fishers in the area appreciate the importance of catch monitoring, the individual fishers may record their own data and simply give it to the volunteers to collate. Other relevant information may be recorded in the logbook.

2. After 1-2 months of data collection, help/assist the volunteer team in analyzing the data.

3. Ask the volunteer team to present their findings regularly (e.g., fisher association meetings) to the community for verification or comments. Discuss with the community possible implications of the data and plan for appropriate action.
4. Display graphs of the results on a billboard at the same place as the monitoring station. This should be updated regularly.

5. After the village level monitoring is established, coordinate fish catch monitoring efforts with adjacent villages if villages share common fishing grounds, and/or common issues.

Analysis

1. To calculate catch per fisher hour, the number of kilograms of fish caught per unit effort (hours and number of fishers), use the following formula

\[
\text{Catch per fisher hour} = \frac{\text{Fish catch (weight)}}{\text{No. of fishers} \times \text{Fishing hours}}
\]

*Note: Always specify the gear used as catch per fisher hour times of the day or time of the year.*

Example: Catch/fisher hour of grouper by hook and line

\[
\frac{10 \text{ kg}}{2 \text{ fishers} \times 2 \text{ hours}} = 2.5 \text{ kg/fisher hour}
\]
This method can be used to calculate catch per fisher hour for different gear, species, fishing grounds, or any combination of these.

Example

You are planning to implement a mangrove reforestation project and you hope that this will encourage mangrove-associated species to increase in that area. To do this, conduct a baseline survey and then monitor changes in species caught for that fishing ground over time (months).

2. Compare your results with other communities conducting fish catch monitoring.

3. Plot the relevant data in simple bar, line and pie charts (refer also to topic on presenting numeric data in diagrams or charts).

4. Invite the community to discuss the possible implications of the differences observed keeping in mind variations in weather, habitat and management. Raise issues of what can be done (i.e., use the information to plan future action).

Outputs

★ Information on the fishery activity of the village in a standard, comparable and simple way.

★ An objective assessment of the effectiveness of current coastal management projects or activities.
Strengths

- Suitable for regular monitoring; not highly technical.
- Builds capability of the community to work together on their own.
- Builds confidence of the community to advocate for fishery-related issues.
- Encourages the community to see for themselves the state of their fisheries and increases their awareness on fishery issues.
- Provides an opportunity for cooperation between fisher organizations and other agencies (e.g., government, fishery institutions).
- Women, men and the youth sector can be involved.

Limitations

- Fishers may not want to cooperate with the monitoring thus biasing observations.
- Misconceptions about the need for the data can cause problems, e.g., “is this just for those scientists?”
- In some areas, it is difficult to mark fishing grounds on maps due to distance from shore and lack of reference maps.
Variations

Fish length monitoring

When conducting fish catch monitoring in a community marine reserve, it is highly beneficial to gather and analyze data about the average length of different species. This can be added to the fish catch monitoring data collection.

It is not necessary to measure every fish, a sub-sample will do. This may be conducted once a month for all species caught, on a particular day (e.g., the second Tuesday of every month). Randomly select (not just select the big ones, take five fish from different catches) from 10 - 20 fish per species and measure their length. Use the standard drawing of the fish and demonstrate to the volunteers how to measure the fish in a standard way.

Another option is to select some indicator species and have these measured every monitoring day using a sample of 5 - 10 fish per species per day. Add the average length of the different fish species then add to the monitoring board and plot over time.
Good species to monitor for marine reserves which have coral reefs are groupers (*Plectropomus* spp., *Cephalopholis* spp.), parrotfish (*Scarus* spp.), rabbitfish (*Siganus* spp.) and snappers (*Lutjanus* spp.). It is worthwhile to record the actual species not just the genera, as different species have different length ranges.

**Example**

Grouper species are often combined together as one local name but *Plectropomus* spp. has a maximum length of more than 70 cm whereas *Cephalopholis* spp. has a maximum length of approximately 35 cm.

**Effort mapping**

This is useful to determine the levels of fishing in nearshore fishing grounds (e.g., those near a marine reserve). Ask for the number of boats and number of fishers in the village using each fishing gear. Ask also about the (a) typical months, times and fishing grounds where these gear are used; and (b) typical landing grounds for these types of gear, when and why they are used.

Determine the peak fishing hour for the village of interest and have the team set-up a rotation for the mapping of fishing boats to be done twice a month. During the peak hour, let the designated team member (perhaps with the binoculars) observe the village waters (either from shore or from a boat). Mark the fishing gear (one mark for each fisher) on a copy of the coastal map (on bond paper). Submit this map to the team leader. A map of the total fishing effort in the area may be derived from this information.
This method cannot be used to map gear used at night.

Another option is to use a map wherein the area of interest is gridded into some 10 to 25 approximately equal (in size) sub-areas and label each of these sub-areas with a letter or local names.

Individual fisher self-monitoring

Ask each fisher to record the days when he or she goes fishing.
Sample: Fish catch monitoring form  
Prieto Diaz, Sorsogon, Philippines

<table>
<thead>
<tr>
<th>Name:</th>
<th>Brgy.:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of crew</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fishing hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gears</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gears specification</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fishing ground</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Species caught</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Income)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight sold</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight unsold</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Written in native dialect</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cross every day you go fishing

<table>
<thead>
<tr>
<th>S M T W Th F S</th>
</tr>
</thead>
<tbody>
<tr>
<td>X X X X X X</td>
</tr>
<tr>
<td>X X 9 10 11 12 13</td>
</tr>
<tr>
<td>14 15</td>
</tr>
</tbody>
</table>

Record all fishing days

Prepared by Karen Vidler, Andre Uychiaoco and Margarita de la Cruz
Mangrove reforestation monitoring

Definition

A method to monitor the progress or growth of mangroves after reforestation activities by coastal communities (refer also to topic on mangrove reforestation). The information gathered allows for improvements or adjustments to be made to the mangrove reforestation project which can lead to increased survival rates of the mangroves planted.

Purpose

- To determine the survival rate and growth of mangroves planted.
- The information generated can be useful in deciding where to expand efforts for mangrove rehabilitation, e.g., sites that have better survival and/or growth rates.
Requirements

Human resources
At least three people, preferably community members who were involved in the reforestation activities. Depending on the size of the area you may have more than one team.

✓ 1 data recorder
✓ 2 observers

Materials
✓ measuring stick (for height measurements)
✓ tape measure (dressmaker type)
✓ notebook
✓ pencil
✓ data sheets
✓ resource map
✓ compass (optional)
✓ calculator (optional)
✓ camera (optional)

Prerequisite
Map the mangrove reforestation area directly after planting is complete. On the map, record:
• numbers of each species;
• average space between seedlings;
• area of site;
• substrate;
- tidal range; and
- existing mangroves and other features.

This will be your baseline information.

Record any significant events which occur in the area in the logbook (e.g., typhoon, illegal cutting, repairs to the fence, cleaning of barnacles, rubbish, etc.) as these may significantly affect the reforested area.

Suggested approach

1. Conduct monitoring activities six months after planting to enable you to plan for replanting activities; and 6-12 months thereafter, until the mangroves are established and/or three years old.
2. Conduct the survey with the recorder standing in a central place while the two observers walk or wade in a predetermined pattern around the reforestation plot. Let the two observers systematically call out information on every seedling to the recorder:
   • alive, unsure or dead; and
   • name of species of alive or unsure.

3. Fill out the following table for every mangrove present to assess mangrove abundance, composition and survival.

Sample output

Mangrove abundance, composition and survival data sheet

<table>
<thead>
<tr>
<th>Location:</th>
<th>Site:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date: / /</td>
<td>Recorder/Observer:</td>
</tr>
<tr>
<td>Mangrove health status</td>
<td>Count</td>
</tr>
<tr>
<td>Alive</td>
<td>NU-NU-NU-1</td>
</tr>
<tr>
<td>Unsure</td>
<td>NU</td>
</tr>
<tr>
<td>Dead</td>
<td>NU-III</td>
</tr>
<tr>
<td>Species 1</td>
<td>NU-NU</td>
</tr>
<tr>
<td>Species 2</td>
<td>NU-NU</td>
</tr>
</tbody>
</table>

4. At the same time, conduct a growth survey by using a subsample of 10% of the mangroves (i.e., conduct it for every tenth mangrove plant counted, if that mangrove
propagule is dead or unsure, go to the next one, until you have a live mangrove plant). Then, record the following information:

- seedling height – measured from the lowest point, i.e., the base of the plant or where it enters the substrate to the highest point, i.e., the top of the growing shoot;
- number of leaves: if more than 20, just place >20;
- diameter at base: 5 cm above the substrate, 5 cm above the roots (if present);
- presence of prop roots or other root structures; and
- presence of fauna, e.g., barnacles, crabs, etc.

Mangrove growth data form

<table>
<thead>
<tr>
<th>Mangrove growth</th>
<th>Sample size: 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location:</td>
<td>Site:</td>
</tr>
<tr>
<td>Date:</td>
<td>/ /</td>
</tr>
<tr>
<td>Recorder/Observer:</td>
<td></td>
</tr>
<tr>
<td>Mangrove height (cm)</td>
<td>Number of leaves</td>
</tr>
<tr>
<td>Diameter at base (cm)</td>
<td>Prop roots Yes/No</td>
</tr>
<tr>
<td>Fauna present</td>
<td>Comments</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Take several photographs of the area for documentation purposes. Put the date on each photograph.

6. Compile the data sheets and log the information into the logbook. Present these during the next meeting to discuss the progress of the mangrove reforestation.
Analysis

Combine all the data sheets for the site and add up the totals (see mangrove abundance, composition and survival data sheet). To calculate the survival rate, follow the following example.

Example

10,000 mangrove seedlings were planted in a hectare plot (7,000 *Rhizophora* spp. and 3,000 *Bruguiera* spp.) Six months later, there were 8,974 alive, 207 unsure and 678 dead (6,403 *Rhizophora* spp. and 2,918 *Bruguiera* spp.).

Overall survival rate

\[
\frac{100 \times (\text{alive} + \text{unsure})}{\text{total planted}} = \frac{100 \times 9,181}{10,000} = 91.81\%
\]

Species survival rate

\[
\begin{align*}
*Rhizophora* \text{ spp.} & = \frac{100 \times 6,403}{7,000} = 91.47\% \\
*Bruguiera* \text{ spp.} & = \frac{100 \times 2,918}{3,000} = 97.26\%
\end{align*}
\]

Survival rate guide

- Above 80% survival rate — excellent
- Above 60% survival rate — good
- Below 60% survival rate — poor

Some species may have lower survival rates, e.g., *Avicennia*, *Ceriops*. This may not mean you should stop planting them, as a more diverse mangrove forest has a higher ecological value.

Mangrove reforestation monitoring
Calculations may seem daunting... but can be fun when conducted in a group.

The unsure category is useful when comparing information from different sampling times, e.g., at the first monitoring you had 90% survival rate and this decreased to 40% after six months. If the total for the “unsure” was high, this may mean a gradual die off; if the total was low there may have been a major impact to cause such a drastic change (e.g., typhoon, pollution).

Output

★ A detailed map of the mangrove reforestation area to complement the resource map

★ A description of the site and methods used (this may be part of a logbook).

★ Recommendations for future mangrove reforestation activities in the area.

50 Participatory Methods in Community-based Coastal Resource Management
Strengths

- Allows the community to monitor their own mangrove reforestation efforts.
- Allows comparison between different sites or with other communities.
- An opportunity to involve the youth to conduct the monitoring as their own.

Limitation

- Time consuming

Variation

Depending on the area, sub-divide the mangrove reforestation plot, e.g., if there is variation in the type of substrate or level or amount of tidal inundation within the plot in order to get more accurate results.

Prepared by Karen Vidler
Resource enhancement strategies
Conservation and rehabilitation strategies

Definitions

Conservation is the protection of natural ecosystems and resources through sustainable use. This differs from preservation which implies strict protection with no use. Enhancement and rehabilitation are activities whereby people aid or speed up the process of environmental recovery or regeneration. Restoration differs somewhat from rehabilitation in that it promotes regeneration that replicates a previous natural/original condition. These activities are a major component of CBCRM.

These strategies can be introduced early on but can only be implemented when the community calls for them. Supplementary coastal livelihoods which diversify or reduce dependence on coastal resources are frequently complementary strategies.
Purpose

- To prevent destruction or depletion of coastal resources.
- To directly rehabilitate coastal habitats or resources.

Prerequisites

- Community organizing and environmental education (refer to these topics in this sourcebook).
- Participatory assessments of the habitats or resources (e.g., mangroves, fishes, etc.) and resource users (e.g., fishers, women, etc.) that will be affected by these strategies.
- Participatory problem analysis (e.g., problem trees) including prioritization (ranking) to decide if conservation and rehabilitation strategies are necessary and then select the specific method to be used.
- Consensus-building to ensure that a large portion of the community agrees and supports the conservation and rehabilitation strategies.

Conservation and rehabilitation strategies

The following table is a presentation of conservation and rehabilitation strategies/methods.

<table>
<thead>
<tr>
<th>Indigenous methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Be sure to understand the local/traditional methods of protection and enhancement (e.g., spirits in the mangrove trees). Try to strengthen or build on these practices or beliefs if they are useful.</td>
</tr>
</tbody>
</table>
# Strategy: Regulation and enforcement

<table>
<thead>
<tr>
<th>Strategy/Method</th>
<th>Action</th>
<th>Purpose when to use</th>
<th>Considerations</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marine protected area/zoning</td>
<td>Closing an area to some uses and assigning areas for other uses.</td>
<td>To protect and allow recovery of an area and its resources.</td>
<td>Must be widely accepted.</td>
<td>Promotes consensus and networking. Easier to enforce than most other regulations.</td>
<td>Legislation difficult to get. May highlight conflicts. Benefits may take a few years before becoming evident.</td>
</tr>
<tr>
<td>Seasonal closure.</td>
<td>Not allowing fishing or diving during certain times of the year.</td>
<td>To allow resources or habitats to recover.</td>
<td>May need alternatives for those affected. Information regulation campaign needed.</td>
<td>Allows use of the area at the other times.</td>
<td>Loss of fishing opportunity. Usually difficult to enforce.</td>
</tr>
<tr>
<td>Species restriction.</td>
<td>Not allowing the catching of certain species.</td>
<td>To protect endangered species or breeding of overexploited species.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patrolling and enforcement.</td>
<td>Helping the authorities ensure compliance with the law.</td>
<td>Essential to realize the objectives of the above regulatory methods.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Strategy: Impact reduction

<table>
<thead>
<tr>
<th>Strategy/Method</th>
<th>Action</th>
<th>Purpose when to Use</th>
<th>Considerations</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recycling.</td>
<td>Reusing materials for the same or for another use (e.g., composting).</td>
<td>To reduce waste production and extraction of materials.</td>
<td>External facilities needed to re-use certain materials (e.g., metals).</td>
<td>Also reduces cost and even generates income.</td>
<td>Concentrates impact to one place.</td>
</tr>
<tr>
<td>Waste collection/ clean-ups.</td>
<td>Moving scattered garbage from coastal habitats to a landfill.</td>
<td>To contain waste to a place where it will do less damage.</td>
<td>May encourage contests.</td>
<td>Sanitation also improves health.</td>
<td></td>
</tr>
<tr>
<td>Watershed revegetation.</td>
<td>Replanting erosion-prone areas.</td>
<td>To reduce erosion and sedimentation.</td>
<td>Will also depend on farming and upland communities.</td>
<td>Also helps soil fertility.</td>
<td></td>
</tr>
<tr>
<td>Anchor buoys.</td>
<td>Providing a safe place for boats to moor without causing habitat damage.</td>
<td>To reduce anchor damage to corals.</td>
<td>Care needed in putting down buoy's weight.</td>
<td>Can also be used to delineate marine protection area boundaries.</td>
<td></td>
</tr>
<tr>
<td>Livelihoods.</td>
<td>(Refer to topic on livelihoods).</td>
<td>To reduce dependence on and extraction of coastal areas; to improve coastal livelihoods by reducing waste or through sustainable intensification.</td>
<td>Should be environment-friendly.</td>
<td>Sustained and increased income.</td>
<td></td>
</tr>
</tbody>
</table>
### Strategy: Transportation and reseeding

<table>
<thead>
<tr>
<th>Strategy/Method</th>
<th>Action</th>
<th>Purpose when to Use</th>
<th>Considerations</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mangrove reforestation.</td>
<td>Transferring young mangrove (propagules or saplings).</td>
<td>To start-up mangrove growth and reproduction. To restore abundance of mangrove forest.</td>
<td>Do not introduce foreign species or mangroves where there was none, multi-species forests are more natural. Availability of seedlings.</td>
<td>Stabilizes coast and reduces sedimentation.</td>
<td>May take a long time for benefits to be felt so must ensure control of area for 10-25 years.</td>
</tr>
<tr>
<td>Reseeding.</td>
<td>Transferring young or breeding adults of species to a depleted area (e.g., sea cucumber, urchins, giant clams).</td>
<td>To speed up restocking of a depleted area and to allow growth of these species.</td>
<td>Young or breeding adults must be protected. Watch out that other species are not harmed. Requires input of young or breeding adults.</td>
<td>Spawn also reseeds the areas beyond. Usually economically-valuable species are reseeded.</td>
<td>Young may die young.</td>
</tr>
<tr>
<td>Artificial reefs.</td>
<td>Putting in a soft bottom area.</td>
<td>To serve as a shelter for fish to aggregate.</td>
<td>Currently controversial. Carefully consider site and materials.</td>
<td>Might also serve as a substrate for corals to settle and grow.</td>
<td>Would speed-up resource depletion if it is fished.</td>
</tr>
</tbody>
</table>
 Outputs

★ Assisted natural regeneration of the habitat or resources.

- Restoration
  - Reforestation using indigenous species and matching abundance
  - i.e., 3 varieties

- Rehabilitation
  - Reforestation using single fast-growing species
  - i.e., 1 variety

★ Tested organizational capacity and commitment to the management of natural resources.

Limitations

- Some community members may be opposed to the enhancements to be carried out, thus, dividing the community or organization. Consensus should be ensured here.
• Very few areas can be set aside for conservation without negatively affecting some resource users.

• Usually expensive, time-consuming and physically tiring.

References


Prepared by Andrei J. Uychiaoco, Margarita T. dela Cruz and Severino Salmo
Establishing and managing marine sanctuaries

Definition

A marine sanctuary is a zone in a protected area where fishing activities of any kind and gathering of any marine organisms are strictly prohibited and where historical and cultural features are preserved either by law or by traditional practice. Research and other educational activities are regulated in accordance with existing policies and guidelines formulated by the government or by the community.

A marine reserve may also be established in which case a buffer zone is designated to enclose the sanctuary. Traditional fishing activity like hook and line may be allowed in the buffer zone.

Marine protected area
Purpose

Establishing a marine sanctuary is a coastal resource management strategy aimed at:

- increasing fish yields, food and income;
- biodiversity conservation;
- resource regeneration;
- habitat rehabilitation; and
- historical/cultural value preservation.

Established and accepted by the community, this can serve as a rallying point for community cooperation, heighten their awareness and appreciation of the environment and the different ecosystems.

Requirements

Materials

- secondary data like manta tow survey data (if available)
- resource use map
- manila paper
- pentel pen
- masking tapes
- improvised transect quadrat
- logbook/notebook
- underwater slates
- fins (optional)
- snorkels and masks
- bouys, billboards and markers
- compass
- boat
Suggested approach

A. Marine sanctuary establishment

An officer of a community-based organization (CBO), a non-government organization (NGO) development worker or a government extension worker can facilitate the process.

1. Conduct a multi-sectoral consultation (refer also to topics on focused group discussion, historical transect, problem tree, resource use mapping) to:
   - identify problems and issues affecting the community and the coastal environment;
   - explore possible solutions; and
   - introduce the concept of a marine sanctuary as a possible strategy in addressing some of the problems such as resource depletion.

The process being discussed may apply to any of the following conditions in the community.

- A community-based organization has already formulated a coastal resources management plan which includes, among others, the establishment of a marine sanctuary.
- The local government or a government agency decides that a marine sanctuary should be established in the area.
- An NGO thinks that a marine sanctuary is a good strategy to address low income levels among fishers due to declining catch and make this an entry point to the community.

In any case, the greater majority of the community must associate ownership of the idea to ensure community support for the program when implemented.
2. Ask the participants to validate the resource map, preferably with the assistance of a technical person.

3. Let the participants identify potential sites for the marine sanctuary based on the following criteria:
   - impact on the community (who and how many will be adversely affected)
   - manageability (location, area covered)
   - historical/cultural value
   - critical site (on the brink of irreversible damage)

- diversity of life forms (high live coral cover)

- diversity of ecosystems (mangrove, seagrass, coral reefs)

- functional diversity (spawning, nursery, feeding)

- critical area for endangered species (dugong, sea turtle, etc.)
4. Ask the participants to present the potential sites in a public consultation and come up with an agreement about which site to declare as a marine sanctuary.

5. Get volunteers from the participants to prepare the needed documents and lobby for local legislation.

6. Delineate boundaries of the marine sanctuary using compass and install bouys and markers in the process.

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B. Marine sanctuary management

1. Organize a multi-sectoral marine sanctuary management council. The size and composition of the team will depend on the number of volunteers and the sectors present in the community.

2. Strengthen the team, particularly on coastal resource management planning.

3. Formulate the marine sanctuary management plan taking into consideration local issues/concerns and sustainability (refer to Table 1). Refer also to topic on fish visual census, random quadrat sampling method, fish catch monitoring, monitoring effectiveness of marine sanctuaries).
### Table 1. Sample of a marine sanctuary management plan

**Camanga (Philippines) Marine Sanctuary Management Plan**  
**January - December 1997**

<table>
<thead>
<tr>
<th>Issues /Concerns</th>
<th>Objectives</th>
<th>Activity</th>
<th>Time frame</th>
<th>Logistics needed</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illegal activities, violations</td>
<td>• maintain integrity of the sanctuary</td>
<td>• organize and train enforcement team (paralegal training)</td>
<td>1 month</td>
<td>• volunteers</td>
<td>• coordination with local government units; police and coast guard and environmental lawyers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• deputize team as coastal zone wardens</td>
<td>1 month</td>
<td>• patrol boat</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• prepare patrolling plan</td>
<td>1 week</td>
<td>• enforcement officer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• conduct patrolling operations</td>
<td>ongoing</td>
<td>• fuel, oil, logbook legislation</td>
<td></td>
</tr>
<tr>
<td>1. Illegal activities, violations</td>
<td>• develop expanded support for the sanctuary</td>
<td>• conduct ecological awareness seminars and information drive</td>
<td></td>
<td>• information materials</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• install billboards in strategic places</td>
<td></td>
<td>• billboards</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• resource people</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>• link with NGOs and appropriate government agencies</td>
<td></td>
</tr>
<tr>
<td>Issues/Concerns</td>
<td>Objectives</td>
<td>Activity</td>
<td>Time frame</td>
<td>Logistics needed</td>
<td>Remarks</td>
</tr>
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<td>---------</td>
</tr>
<tr>
<td>2. &quot;Health&quot; of the marine sanctuary</td>
<td>• assess state (improvements) of the marine sanctuary</td>
<td>• organize a regular monitoring team</td>
<td>1 month</td>
<td>• volunteers</td>
<td>• link with NGO and academe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• train team on simple monitoring methods</td>
<td>3 months</td>
<td>• resource people</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• do regular monitoring of fish, coral cover, benthos, etc.</td>
<td>quarterly</td>
<td>• snorkels, masks and fins</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• interpret data together with other members of the community</td>
<td>quarterly</td>
<td>• boat</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• transect quadrat</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>• underwater slate</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• underwater camera (optional)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• gasoline</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• notebook</td>
<td></td>
</tr>
<tr>
<td>3. Sustainability</td>
<td>• ensure sustained community effort in managing the marine sanctuary</td>
<td>• identify and develop programs that will ensure continuity of marine sanctuary management activities such as support for livelihood projects, cross visits, community incentives, etc.</td>
<td>3 months</td>
<td>• facilitator</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• resource use map</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>• case studies/success stories</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• lobby for support from government such as budget for fuel and oil, equipment, etc.</td>
<td>regular or as needed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• proposal</td>
<td></td>
</tr>
</tbody>
</table>
4. Conduct a public consultation to validate the marine sanctuary management plan and to gather volunteers for the activities to be conducted.

5. Finalize the plan.

6. Negotiate for needed support from different agencies.

7. Implement the plan.

8. Regularly monitor the implementation of the plan.

9. Evaluate implementation and, if necessary, revise the plan.

Outputs

★ Increased environmental awareness among members of the community.

★ An area where fish and other marine organisms can breed, feed and grow undisturbed to replenish their numbers.

★ A local zoning legislation delineating the sanctuary area and stipulating rules and regulations governing the site.
Strengths

- Enhances community cooperation and unity.
- Deepens environmental awareness and commitment, especially when positive results are achieved.

Limitations

- Highly dependent on community participation
- If government organization or NGO leads, there may be less support from the community than if it is community-based organization (CBO) -initiated.

Caution

The spirit of volunteerism and community cooperation is alive in coastal communities and should be strengthened. Paying or giving honorarium to a few people who will do the patrolling or regular monitoring of the marine sanctuary may erode this value. Other forms of incentives that will not only boost the morale of the monitoring and enforcement teams but also enhance community participation should be identified and developed, e.g., livelihood support projects, providing basic services, community awards, etc.

Compiled by Margarita dela Cruz
Mangrove reforestation

Definition

Mangrove reforestation is a resource management option used to rehabilitate or restore mangrove forest cover. It involves the planting of seedlings or transplanting of young mangrove species.

Mangroves are a unique life-support system of coastal ecosystems that provide many services to coastal communities.

Purpose

- To improve the mangrove forest in areas previously cleared for other purposes (e.g., fishpond, abandoned development, etc.).
To enhance habitat of ecologically and socio-economically important marine organisms (e.g., crabs, shrimps, etc.) that are biologically dependent on the mangrove ecosystem.

- To ensure sustainable harvest of mangrove trees.
- In the long term, to provide supplemental income from marine products for coastal communities.
- To ensure tenurial rights, access and management control of the community over the mangrove resource.

**Prerequisite**

Prior to reforestation activities, ensure the following:

- basic working knowledge on mangrove ecosystem dynamics for the members of the community;
- an understanding of local tenure/utilization issues related to mangroves;
- an understanding of different techniques of mangrove reforestation; and
- mangrove management system (e.g., monitoring).

These can be acquired through the conduct of study tours and/or basic ecology seminars.

**Suggested approach**

**Site selection**

1. Identify and assess potential mangrove reforestation site(s) based on the following criteria:
• previously a mangrove area (e.g., abandoned fishpond that is not titled as private property);

• suitable environmental conditions (e.g., substrate, exposure to waves and salinity);

• public or state-owned domain or property; and

• not intended for any other uses in the near future.

2. Gather data on the tenurial status, possible claims or leases of the potential sites. Visit the government agency in-charge and/or conduct an informal investigation of possible claimants of the potential sites.

3. Conduct a public hearing on the proposed project. Consult the community regarding the proposed site. Perhaps, the area is used by the community as a gleaning area or marina for local boats. Make sure that all users attend the hearing.

4. After the public hearing, finalize the site(s).
5. Secure the necessary tenurial instrument or permit from concerned government agencies. This is necessary to ensure legal access to the resource and maintain management control.

**Example**

In the Philippines, a "mangrove stewardship agreement" (MSA) may be awarded by government agencies to a family, group or community.

**Fund sourcing**

Source funds for reforestation activities that will involve land surveying, propagules and planting materials, plastic bags for potting, etc.

**Site preparation**

1. Survey the area to establish boundary and parcels to be assigned to the community members. Use wooden stakes as boundary markers. Establish structures, e.g. nets to suppress high waves and to prevent people from entering the area while the mangroves are still small.

*Size of the plots will depend on the total available area for reforestation and the number of cooperators. Usually, in the Philippines, 1/4 ha is given to a family.*
2. Select appropriate mangrove species using the following criteria:
   - dominant species in the area;
   - appropriate to the substrate;
   - appropriate to the tidal range; and
   - appropriate to salinity range.

![Diagram of mangrove zones]

3. Collect propagules and/or seedlings of selected species from identified sources. For species that will require seedlings to be transplanted from the wild (e.g., *Avicennia spp.*) or those requiring potting prior to planting, establish a nursery.

4. Determine the appropriate season for planting.

   The best time to plant is usually during the off-typhoon season. Determine also the season when adult trees produce propagules or natural seeds.
5. When the site and planting materials are ready, schedule the date(s) for actual planting.

During actual planting, determine spacing. Propagules that are planted farther apart (e.g., 0.5 m, 1 m spacing) grow slowly but require less thinning.

Implementation time may vary depending on the availability of propagules, biological nature of chosen species and preparedness of the community.

Maintenance of the reforestation site

1. Clean the site every 2-3 days initially, then every week thereafter (e.g., removal of wastes and garbage materials, plastic, net remnants, barnacles, fouling organisms, etc).

2. Re-plant in areas with low survival.

3. Thin out or trim after 2-3 years or if the plants are growing massively

4. Harvest selectively (resolve utilization agreement among community members).

5. Monitor regularly (refer to topic on mangrove rehabilitation monitoring).
Example

In Banacon Island, Bohol, Philippines, a community reforested an area of over 400 hectares with *Rhizophora* spp. The community members now sustainably harvest from the area. They sustain this livelihood through regular replanting.

**Strengths**

- Community is directly involved in the planning, implementation, monitoring and management of the project.

**Limitations**

- Securing tenurial instrument or legal papers or permits may take a long time depending on the government system.
- Benefits not immediately felt by the community members.
- Possible social conflict may arise with other resource-users, e.g., gleaners.
- Replanting dominant species in the area improves the chances of success but does not give a good "natural" mix of mangrove species.
- Monocropping can cause diseases to easily spread.

*Prepared by Severino Salmo III and Roy Olsen De Leon*
Education and extension
Issue-based environmental education for coastal communities

Definition

Environmental education is a process through which coastal communities understand and appreciate the environment, the earth's resources and the interconnectedness of ecosystems. It introduces various ecological concepts and principles as they relate to environmental issues experienced by the community. It enables them to further explore these issues and take the appropriate action to address them.
Environmental education is a very important component of CBCRM and must be a continuing process throughout the program cycle. To be effective, it must be highly participatory and learning must be enjoyable and experiential.

**Purpose**

- To bring about positive change in the values and behavior of individuals and the community, particularly in their perception and relationship towards the natural environment.
- To move the community to actively participate in conservation/resource management programs.
- To enable the community to assert their right to use and manage their resources and the benefits.

**Requirements**

**Human resources**

- resource persons (with knowledge and experience in environmental work and how to use participatory tools and methods)
- facilitator/documentor
- participants (20-40 participants are manageable)

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**Note on the participants**

Encourage the participation of people of various age, economic status, religion, occupation and sex.
Materials

Prerequisites
✓ references/case studies
✓ outputs from previous activities

Supplies
✓ manila paper
✓ pentel pens
✓ crayons
✓ ballpens
✓ notebooks
✓ meta cards
✓ masking tape

Equipment (optional)
✓ cassette player
✓ camera
✓ slide projector
✓ slides
✓ video player and monitor
✓ video tapes (resource assessment of the area)

Possible approach

1. Identify current environmental issues facing the community. These should be clearly recognizable by the majority of the community. You may wish to use a preference or problem ranking matrix to prioritize these issues.
2. Facilitate a discussion on the perceived causes of the issue. Be open to various perceptions. For each perception, ask why that is a cause. In this way, you develop a hierarchy of causes similar to a problem tree (refer to the topic on problem trees and webs).

Spend some time examining the differences and relationships between immediate or direct causes and underlying or root causes.

3. Facilitate a discussion on the consequences or impacts of the issue. Ask what is currently happening as a result of the issue and what will happen if the issue continues without any intervention. For each consequence or impact identified, ask how this might affect other aspects of community life.

Categorize the consequences into two groups: 1) impact on the environment; and 2) subsequent impacts of environmental degradation on people, especially their health. Emphasize the link between environmental health and human health and welfare.

4. Identify key ecological concepts or principles that arise during the discussion. Very often, these will arise when discussing the linkages between impact on the environment and impact on human health and welfare.
For example, the linkage between the pollution of estuarine water and human poisoning resulting from consumption of shellfish would provide an opportunity to discuss the ecological concept and process of "biological magnification of pollutants." Similarly, the linkage of mangrove degradation and declining capture fisheries would provide an opportunity to discuss "habitat" or "nutrient cycling."

5. When people are aware of the problems, their causes, consequences and the underlying relationships, they are in a better position to address them. At this stage, discuss ideas for action. Very often, these action activities can be an integral part of the CBCRM program.

Five steps in an issue-based approach to environmental education
Individuals can develop and become involved in activities that are most relevant to the maintenance of their own health and welfare.

Example

In Barangay Macabug, Ormoc City, Philippines, fishers noticed the corals were losing their color and silt was accumulating on them. They discussed this with other fishers and they decided to hold a public forum and invited a resource person from a local NGO. Together, they analyzed the situation using PRA tools (e.g., problem tree) and the issues of coastal quarrying/mining surfaced. The NGO representative then explained why this land activity is affecting the corals in the sea.

The community realized their lack of awareness and understanding of the environment. They requested for an informal environmental training program from the NGO. At the same time, they decided to bring the matter to the city government. They prepared posters and fliers and invited the media in their advocacy. This caught the attention of the public and the city government promised to discuss the issue during the next council session.
Outputs

★ Greater appreciation and support for project activities.
★ An analysis of issues and introduction to ecological concepts and principles.
★ People who are aware of issues and with increased knowledge of certain ecological concepts and principles (an indicator of this is their ability to articulate and discuss such issues and concepts with other members of the community).
★ Local policy recommendations/positions based on an informed understanding of an environmental issue.

Strengths

• Gives people a logical basis for action, e.g., motivates them to prevent blast fishing because destroying corals negatively affects supply of fish.
• Allows sharing of information between the community and technical people/resource persons.
• Can lead to immediate action (e.g., clean-up drive, reforestation of mangrove areas, etc.)
• Helps the community organizer identify potential leaders and trainees from the community.

Limitation

• Raising awareness takes time and changing people’s behavior even longer.

Prepared by Margarita dela Cruz, Ingrid Gevers and Stuart Green
Participatory technology development and dissemination

Definition

Participatory technology development and dissemination (PTD&D) is a process which combines the knowledge and research capacities of local communities (i.e., indigenous knowledge) with that of research and development organizations in an interactive learning process. It involves identifying, generating, testing, adapting and promoting improved or new techniques or institutional arrangements to help solve local problems.
The ultimate aim is to improve resource management and strengthen the experimental and technology management capacities of local people and communities, thus fishers and farmers play a key role in the entire process. Many projects currently apply various aspects of PTD&D.

The diagram below illustrates the main components of PTD&D and lists some of the tools or methods that can be used for each component.

**Components of PTD&D**

The main components of PTD&D are described below:

- Examination of relevant and appropriate local or indigenous knowledge, e.g., information, beliefs, technologies and institutional arrangements found in the community.
- Examination of relevant and appropriate external knowledge, i.e., knowledge that comes from outside the community (e.g., from researchers, non-government organizations, government organizations or other communities).
• Joint technology/practice development includes any form of collaboration between insiders and outsiders to improve resource management. The contributions of local and external knowledge will vary.

• Testing and adaptation “on-farm research” is the process of fisher or farmer experimentation and modification of jointly developed technologies or practices.

• Fisher/farmer-led extension and dissemination, i.e., peer to peer exchange of knowledge through cross-visits, study tours or focused group discussions.

PTD&D begins during the assessment and analysis phase of a project when key problems are identified by the community. It moves into the implementation phase as fishers and farmers and outside facilitators begin to develop improvements based on weaknesses of the current practices. Later in the monitoring and evaluation stage, it is the fishers and farmers who adapt the new technologies and analyze the results. Finally, in the scaling-up phase, fishers and farmers serve as trainers, extensionists or resource persons to help disseminate improved technologies or practices in other areas.
Purpose

- To improve existing technologies or develop new ones. It is useful in situations where outside facilitators and community members are willing and able to work together to improve specific technologies or practices.
- To be used in any situation that can benefit from combination of indigenous and external knowledge.
- May be especially useful in settings where indigenous innovation is not very dynamic.

Requirements

Human resource

Outside facilitators who have developed rapport with community, are familiar with the marine and terrestrial eco-systems and who have the technical skills in the sector under study (e.g., fisheries, agriculture, livestock, aquaculture, etc.)

Possible approach

1. Assess indigenous knowledge related to the key problem area in the sector under study (refer to problem identification and ranking tools and indigenous knowledge).
2. Determine the current weaknesses or limitations of local or external practices or technology (refer to problem tree and ranking tools), e.g., the uncontrolled growth of the vegetation sometimes creates a problem for other species in the pond.
3. Identify modifications or alternative practices or technologies to address the limitation, by blending indigenous knowledge and external knowledge, e.g., aquaculturists and researchers developed a system to stratify the pond using a palm leaf (tal).

4. Develop a training module and train selected community members to implement the technology.

This may involve a number of training modules conducted over a period of time. Emphasize principles or reasons behind specific technologies. This will help facilitate adaptations by farmers/fishers in the next stage.

5. Conduct on-site research by observing and documenting significant changes, as fisher or farmer leaders apply and adapt the technology or practice over a period of

Tip
Take note of the impact of the improved practices or technologies. Pay special attention to adaptations made and why.
time. These changes reflect the unique combination of environmental, economic and social constraints faced by each individual fisher or farmer. This is a critical part of PTD&D that recognizes the importance of adaptation and differentiates it from simple transfer of technology.

Technology developed with farmers gardening in sandy and saline coastal soils

6. Conduct cross-visits or study tours to bring other community members to learn from the experience of the selected community members.

7. Help to improve the capacity of farmers to share their innovations with others. This can include assistance in developing communication skills, documenting lessons learned or improving indigenous extension or sharing methods.

Outputs

* Improved technologies (e.g., techniques for oyster culture) or improved practices (e.g., better coordination through the use of communal labor).
The specific output of PTD&D depends on the unique set of circumstances (environmental, cultural, economic, political and demographic) that a resource user or community faces.

★ A secondary output of PTD&D is improved capacity of local resource users to test, adapt and share new ideas more systematically.

Strengths

- Process is not technically complex. It requires, however, technical specialists or researchers to work directly with community members and recognize their role in change.

- Builds on existing technologies of men, women, children and elderly and promotes jointly developed improvements, thereby avoiding the introduction of new technologies that may be inappropriate for men and women of various ages.

- The testing and adaptation phase allows resource users to modify improved technologies or institutional arrangements to suit individual needs. To some extent, this can also address the specific conditions of various segments of the community (i.e., men, women, children and the elderly).

- Places heavy emphasis on the use of indigenous knowledge (e.g., technologies, beliefs, practices or information) throughout the PTD&D process.
Limitations

- It requires the direct involvement of selected community members over a long period of time (as both research partners and indigenous extensionists).

- Time consuming, often requiring at least one year (or more) for jointly developed improvements and adaptations to be evaluated. The dissemination component can only take place after this period of time and also requires some capacity building. While the duration is long, the level of involvement from the outsider gradually decreases over time.

- It is relatively expensive as a result of the high input of staff time. However, the dissemination component of the approach is supposed to reduce this cost as local community members take on an increasingly larger role in technology development and dissemination.
Study tours

Definition

A study tour or cross-visit of community-based coastal resource management (CBCRM) sites is an experiential learning process where participants get to see a number of coastal areas where CBCRM principles and technologies are practiced. The study tour highlights the results of such practices visually (e.g., by a tour of reefs and mangrove forests). It also shows the processes involved in achieving these results, through direct interaction with community.

For the communities visited, on the other hand, the tour is an affirmation of the value and effort they invested in CBCRM. The tour is also an opportunity for fishing communities to meet other fishing communities, thus enriching the experiences of both.
Purpose

As an effective tool for deepening the participant’s appreciation of CBCRM, a study tour is normally done at the early stages of a project where participants are already quite familiar with the concept but have not seen its expression in actual practice.

It can also be used to look at specific interventions (e.g., fish sanctuary, mangrove reforestation) sites and experiences.

The general purpose of the study tour can be broken down as follows.

- To understand and experience the values/principles and practices of CBCRM through direct interaction with coastal communities in selected sites.
- To facilitate assessment and redesigning of existing coastal resource management programs through sharing, reflection and planning.
- To promote and advocate CBCRM values, principles and practices to a broader sector of the community especially local policymakers, government agencies, NGOs and other fishing communities.
- To initiate linkages and networking among different fishing communities.
Requirements

- tour kit – The tour kit is a compilation of reference and reading materials that are relevant to the theme or topics to be taken up during the tour. It should include copies of the tour objectives and design, schedules and itineraries, profiles of sites to be visited, a directory of participants, facilitators and resource persons.
- flashlights
- snorkeling gear
- swimming gear
- life jackets
- looking glass (for those who do not know how to swim or snorkel)
- seminar/workshop materials

Suggested approach

Planning

1. Review the needs of prospective participants. What knowledge/skills/orientation do you intend the participants to acquire during the tour?

2. Define the theme and objectives of the tour. There can be one or several themes involved in a single tour. A tour can focus on resource enhancement technologies (sanctuary management, marine reserves, mangrove reforestation), community organizing processes and/or coastal livelihood projects using appropriate technologies.
List of possible study tour themes and topics

- community organizing processes
- resource tenure issues and possible interventions
- community participation in environmental protection and law enforcement
- role of women
- coastal livelihood initiatives
- building fisher cooperatives
- marine sanctuary management
- mangrove management
- building local partnerships
- advocacy for local policy reform in the fisheries sector

Site selection

1. Draw up a list of potential sites. Identify your criteria according to the theme and objectives of the tour.

2. Gather information about the sites and write a brief profile for each site.

3. Visit the potential sites. It is important for the tour coordinator to see the sites before the actual tour to be able to determine:

   - the appropriateness of the sites
   - the availability of logistical needs, e.g., a meeting place, ample accommodation, available means of transportation
   - the itinerary for the tour and the time needed to move around the areas to be visited
to consult and inform the community to be visited about the proposed activity. It is important to get the support of the community to be visited because they will act as host and "tour facilitators" or "guides."

Tour design, itinerary and logistics

1. After visiting all potential sites, finalize the tour design and itinerary.

2. Incorporate mini-lectures on related topics in the tour design. For example, an overview of the history and concepts in CBCRM can be given at the beginning of the tour as part of the orientation.

Basic ingredients to a tour

Give the participants:
- time for study
- reflection and interaction
- rest and recreation
- evaluation and planning
3. Aside from the community members in the sites to be visited, invite also resource speakers from non-government organizations (NGOs), government and the academe based in the area to give inputs related to the theme (if necessary).

4. Finalize logistical needs. Key to the success of any study tour is that logistics are handled efficiently. Since participants will be mobile most of the time, time must be managed very strictly. Delay in one area can affect the whole tour. Accommodations should be comfortable enough and provide basic facilities, e.g., toilet, water, etc.

**Selection and invitation of participants**

1. Always choose the participants carefully. Determine criteria based on the objectives of the activity.

   **Example**

   If it is to build the capability of the fisher leaders and members, then majority of the participants should come from this group. If the tour is also intended to convince local officials for policy reform, then representatives of target agencies or officials should be invited to participate.
2. Prepare a letter of invitation. Stipulate what the participants should expect in terms of accommodation and travel arrangements.

3. Include a checklist of things to bring. Relay information about the place, the weather, clothes to wear, etc. (e.g., if there will be a lot of island hopping, advise participants to wear shorts and slippers).

   The ideal touring group should not be more than twenty people, including tour staff. The number of participants will be determined by available resources and manageability.

4. Consider gender/ethnicity and age when selecting participants.

5. Provide an overview of cultural dos and don’ts for the participants if they are from a different cultural background.

**Tour proper**

1. **Staff complement**

   A study tour, "crew" or staff complement should be able to take on the following roles. The crew could be composed of two or three people:

   - a tour coordinator who also serves as over-all facilitator/"tour guide";
   - a logistics person in charge of transportation, food, accommodations and budget; and
   - a documentor who will document in written form photos and, if possible, video the whole activity.

   Additional staff (facilitators and guides) should come from the local organizations in the sites to be visited.
2. Cost and budget

The basic items in the budget include:

- transportation
- board and lodging
- communication
- materials for the tour kit
- honoraria for facilitators and documentors
- rent for function/meeting rooms and presentation equipment
- documentation materials (e.g., film, video camera rental, tapes)
- first aid and contingency fund
- if resources allow, a short-term accident insurance

An honoraria or donation (in cash or in kind) should be given to the community as token of gratitude for their time and effort.

Post-study tour activities

Conduct any of the following as possible post study tour activities:

- echo seminars – hold a seminar and get participants to share their experiences to community members who were not part of the tour.
- on-site training activities – train the community in a skill learned on the cross visit
- proposal-making and fund sourcing for possible projects/technologies seen on the visit
- cross-visit of the “visited” community to the sites of the participants

The extent to which the tour coordinator(s)/sponsor(s) will become involved in the post-study tour activities depends on its relationship with the tour participants.
Three stages of the study tour

1. Orientation sessions
   - Introductions
   - Expectations
   - Overview of tour design
   - General overview of CBCRM

2. Tour proper
   - Site briefings
   - Tour
   - Interaction/sharing
   - Processing of experience or inputs or formal study sessions with resource persons to be done for every site visited.

3. Evaluation and planning
   - Planning for individual or participating organization
   - Overall evaluation of the tour

Tool box

In presenting their experiences, the community visited can make use of their historical lines, resource maps, seasonal calendars or fish catch monitoring charts. The visitors, on the other hand, can use semi-structured interviews, walk a transect line of the area and note down observations. The facilitator can also convene a focus group where key informants from the visited community can be invited.
Output

★ A compilation of enriched/revised CBCRM plans drafted by participating organizations.
★ Written documentation of proceedings.
★ Photo and video documentation.
★ Network of CBCRM practitioners.

Strengths

• Coming into contact with fellow fishers who are reaping the gains of their efforts is usually an inspiring and motivating experience.
• Travelling and seeing other places broaden the perspective of participants.
• The interaction between communities provides a venue for contact-building and networking.

Limitations

• The tour takes the people away from their livelihood for a considerable period of time. Arrangements can be made with families who will be affected by this activity.
• Although the tour usually raises the expectations and enthusiasm of the participants, the technologies seen in the tour sites may not necessarily be applicable in their respective areas. The participants should be able to critically assess the sites and the technologies applied.
• A study tour is costly and resources are always limited.

Note

These are, of course, the tangible outputs. The most important output is the experience the tour can give both to the participants and host communities.
Hints and tips

- Documentation. Document the tour through write-ups, photos and video. Documentation serves as reference material for sharing the learnings and experiences and for replicating the activity in the future.

- Duration. A study tour can go for as long as 10 days, depending on how extensive or intensive the topics are intended to be. The length of time community members are willing to be away from work should be considered.

- Sensitivity to culture. Participants should also be reminded to be sensitive to the culture of the communities to be visited. Information about this should be relayed as part of the orientation of the participants. If there are problems in the language spoken, make arrangements for an interpreter.

- Timing. Scheduling the tour is also an important aspect of planning. The best time to conduct a tour would be:
  - during summer (weather is fine, people have less work in communities in the Philippines); and
  - before the community participants enter the CBCRM planning stage.

- Flexibility. Anything can happen in a mobile tour; not all factors can be controlled. Participants must be prepared to be flexible and open to unexpected situations.
Advocacy
Legal analysis

Definition
Due to the imperfection of the law there is a need for legal analysis. Legal analysis is a process whereby fishers can address legal issues affecting their community and marine resources. It can be used at any stage of the CBCRM process, but will be more effective if preceded by community organizing, participatory rural appraisal (PRA) and environmental awareness seminars.

Purpose
- To gain critical understanding of the law and the legal system, especially appreciating the legal framework governing the management of marine resources and coastal zones.
• To gain knowledge of the remedies available and legal procedures related to the implementation of laws and policies affecting marine resources.

• To develop a good grasp of the legal issues affecting these resources and the community’s role in shaping local policies for protecting and managing the same.

• To identify legal needs and at same time plan out concrete actions.

Requirements

Human resources
✓ lawyer – must have experience in community work and be familiar with environment law

✓ paralegal/facilitator – A paralegal is a person who has knowledge of the law and legal procedures. This is normally through informal training/workshops and actual experience, but he/she has no license to practice law. He/she assists the lawyer in gathering evidence, facilitation of paralegal training, legal consultations and documentation. This person may be a fisher, community organizer or any volunteer.

✓ documentor

Key participants
✓ community/village leaders and members (consider gender, ethnicity, age)

✓ local officials, either in the village or town level
Pre-legal analysis stage

1. Community is confronted by a legal issue (e.g., dynamite fishing close to the village). Discuss and analyze issues using any of the following tools: focus group discussion, semi-structured interview, problem trees, brainstorming.

2. Community seeks the assistance of an institution (e.g., non-government organization), lawyer or local official. But if the community does not actively seek assistance, paralegals, lawyers and local officials may come across community issues through community visitations and the media.

3. The community conducts preliminary research on the issue or event by gathering relevant information and/or compiling pertinent legal documents such as copies of local ordinances allegedly violated.

Materials
✓ manila paper ✓ blackboard
✓ pens ✓ masking tape

Processes involved
4. The community schedules a meeting/consultation with the NGO/government official/lawyer/paralegal.

Example

In January 1996, fishers of Sitio Honda Bay, Barangay Sta. Lourdes Palawan, Philippines, participated in a consultation on CBCRM. During this forum, they presented a problem concerning the entry into the Puerto Princesa bay area of “hulbot-hulbot” (conical shaped, fine-meshed net with scaring device), a destructive type of commercial fishing operation. They claimed that since the “hulbot-hulbot” fishing operations started, their fish catch had significantly dropped. They needed help to stop the commercial fishing operation but were not aware of pertinent laws on the matter as well as remedies available to them. After a long campaign, they were able to stop the operation of the “hulbot-hulbot.”

Legal analysis proper

Community attends assembly, meeting or consultation to discuss and analyze the issue and develop an action plan. In this consultation, the lawyer discusses the legal strategies or other remedies that the community can use.

Actions

The community may decide to adopt one, some or all the following actions depending on the nature of the legal issue.
Immediate actions

★ Send a letter-petition to local officials and government agencies bringing the issue to their attention and requesting for immediate action/resolution.

★ Request a village assembly to discuss the issue and propose possible remedies.

★ Request the appropriate government agency to institute the needed legal action (judicial or administrative).

Example: request the enforcing agency to arrest illegal fishers.
Considerations

If problems persist

- Bring the matter to the media to generate public interest and support to the community’s cause (refer also to topic on media advocacy).
- Institute the legal action with the assistance of a lawyer.
- Hold a rally or dialogue (whichever is deemed appropriate by the community) with concerned government officials to press for immediate action.

Long-term actions

- Join committees or “watchdog groups” to ensure the enforcement of the law and apprehension of violators.
• Propose local legislation to address the issue.

• Train community members as paralegals.

**Example**

In one case in Honda Bay, Palawan, Philippines, fishers of Barangay Lucbuan requested more in-depth knowledge on the law, legal system and expressed interest in having some members become paralegals. Thus, a seminar or paralegal training was conducted. Potential community paralegals were identified during the training. Twenty people attended the training and five of these volunteered as paralegals. These paralegals have been involved in monitoring the existing community issues, new issues and action plans. They have assisted lawyers in documenting illegal fishing, gathering evidence and following up legal actions.

• Request technical/scientific investigation when necessary to enhance factual basis in any proposed measure or local legislation.

**Tips**

• Photocopy all documents submitted. Letter-petitions should be stamped "RECEIVED" as proof of formal submission.

• Provide community members with copies of relevant laws, regulations or ordinances.

• If laws are in foreign language, translate these into local language or prepare a primer.

• Involve the community in the whole process from initiation through evaluation.
Remember these tips when analyzing the law

- The law is real. Management of marine resources is enabled through legal systems that define rights and remedies, and create supervisory and regulatory agencies.
- Laws are generally made by those who are in power, and thus tend to reflect the interest and bias of the maker. An analysis should be made as to who makes the law as well as their guiding interest.
- Laws change.
- The substance of the law and its implementation are two different issues.
- Fishers must be empowered to take an active role in the legal process. Relying on the present legal system is not enough.

Strengths

- Empowers local communities to participate in shaping and implementing laws and policies related to the marine resources.
- Indigenous communities are given the opportunity to assert customary laws and practices over ancestral waters (e.g., Tagbanua community in Coron Island, Palawan are seeking the recognition and delineation of their ancestral waters).
- Facilitates coordination and networking between lawyers, paralegals and fishers.
- Generates active participation of women (e.g., women of Sitio Honda Bay, Philippines were found to take the lead in the campaign to stop commercial fishing in the bay area).
Limitations

- Presence of lawyer or paralegal is generally required.
- Community may rely solely on the lawyer to identify remedies/options.
- Funding may be required for the travel of lawyers for community consultation.
- Indigenous communities may have different legal systems. Example, in the Philippines, there are indigenous people who have a separate law system, e.g., Mangyan people in Mindoro.
- Depends on local politics and the local judicial systems.

Philippine experience: Local government ordinance on the use of municipal waters

With the advent of the Local Government Code, local government units (LGUs) are responsible for the enforcement of laws and regulating fishery activities within municipal waters. The extent of municipal waters was expanded from seven to fifteen kilometers from the shoreline under the new law. The LGUs, therefore, have the power to issue ordinances to govern municipal waters.

In 1996, when the city of Puerto Princesa prepared a draft ordinance on establishing its municipal waters and regulating fishery activities within its city waters. The fishers of Honda Bay participated in the public hearings and submitted proposals for changes. They succeeded in asserting the following:

- strict prohibition/ban on commercial fishing within municipal waters
- banning of baby trawl
- substantial reduction in permit fees
- formation of resource management councils
- explicit grant of preferential fishery privileges to marginalized fishers in the locality.

Prepared by Grizelda Mayo-Anda
Institutional analysis

Definition

Institutional analysis is the identification of various resource users, stakeholders and organizations involved in community-based coastal resource management (CBCRM). It also involves an examination of the institutional arrangements, the set of rights and rules for CBCRM in a community.

An institutional analysis is usually conducted early in the CBCRM process during the planning phase. The level of detail can range from a simple description of the existing coastal resource management system to a very detailed analysis of the management system in terms of equity, efficiency and sustainability.
Purpose

- To identify existing legislation, policies and regulations for coastal resource management at different levels of government (village, municipal, district, province, regional, national, international) and community (customary, traditional).

- To identify existing property rights and tenure arrangements in order to determine who defines rights to exploit the resources, who has access to the resources, and whether any of these rights are transferable, and the identification of the rules that must be followed.

- To evaluate the existing level of involvement of resource user groups in managing resources in order to determine the ways in which user groups can participate in CBCRM.

A CBCRM program may attempt to alter existing power structures to allow wider participation in management of resources. This is a delicate process where it is essential to be aware of the existing structures and what likely effects proposed changes will have.

- To assess the mandate and structure of existing CBCRM organizations.

Requirements

**Human resources**

✓ government officials

✓ facilitator with expertise in political science, sociology, resource management or economics
The facilitator trains the community leaders and government officials on the purpose and methods for institutional analysis and provides guide questions for them to use in collecting information from both primary and secondary sources.

**Materials**

- notebooks and pens
- brown paper and colored markers

**Suggested approach**

1. Collect data from documents, reports and publications about coastal resource management laws, policies, regulations and organizations. Sources for these may be non-government organizations (NGOs) and research and academic institutions. Use the guide questions as a framework.
Guide questions

Stakeholders
- Who are the resource users and stakeholders?

Organizations at the local level
- What village-level organizations exist in the area?
- Which are engaged in CBCRM?
- Which are formal (legally recognized) groups, and which are informal?
- For formal groups, to which category do they belong (1) LGUs; (2) NGOs; (3) community-based organizations; (4) private interest groups and (5) others?
- What are the organization's mandates or objectives and administrative structure?
- How long has the organization been in existence, and what is its historical development?
- Is the membership increasing or decreasing?
- What are the organization's technical, personnel and financial resources?
- How is the organization affiliated with other organizations vertically and horizontally?
- What are the characteristics of the leadership/power structure of the group?
- How are group decisions made (consensus/majority/autocratic)?
- What is the level of representation and participation of resource users and stakeholders in decision-making?

Institutional arrangements at the local level
- What are the property rights in terms of access, management, exclusion and transfer?
- What are the formal and informal (traditional and customary) rules?
Guide questions... continued

- What are the operational rules that pertain to boundary, allocation, authority and equity?
- What are the regulatory mechanisms (e.g., quota, closed season, etc.) and incentives (e.g., taxation, licensing, etc.)?
- What are the management rules, such as adjudication and enforcement?
- How is the rulemaking body formed in terms of leadership, membership and representation?
- What are boundaries (i.e., political, gear type, traditional/customary, organizational, physical), their size/clarity, ownership, geographical coverage and changes over time?
- How are rules enforced and what sanctions are used?
- How legitimate and relevant are the rules to resource users?

Organizations above the local level

- Which organizations exist in the area above the village level?
- Which organizations are engaged in CBCRM?
- For the relevant organizations, what are the formal policies, programs, regulations, laws and legislation related to CBCRM?
Guide questions: continued

- Which are formal (legally recognized) groups, and which are informal?
- For formal groups, to which category do they belong (1) local government or other state-level bodies; (2) NGOs; (3) POs; (4) private interest groups; (5) national government agencies and other regional agencies; (6) bilateral/regional bodies; (7) international agencies and (8) others?
- What are the organization’s mandates or objectives and administrative structure?
- At what level does the organization operate: (1) international; (2) regional; (3) national/central; (4) regional; (5) province/state; or (6) district/municipal/town?
- How long has the organization been in existence, and what is its historical development?
- What are the organization’s technical, personnel and financial resources?
- How is the organization affiliated with other organizations vertically and horizontally?
- What is the organization’s awareness of the conditions of the fisheries/marine resources?

Institutional arrangements above the local level

- How do national policies, programs, regulations, laws and legislation affect CBCRM at the local level?
- How do the other national policies, programs, regulations, laws and legislation on economic development and general public administration affect CBCRM?


2. Complement and validate the secondary data collection by collecting primary data. A variety of participatory techniques and tools can be used. These include
structured and semi-structured interviews, focus group discussion, resource mapping, historical timelines, flow patterns, case studies and venn diagrams. Again, the guide questions should serve as a framework.

3. Collect and sort the data, focus on the relationships between and among the various institutional arrangements and organizations involved in CBCRM.

4. Identify complementarities, conflicts, overlaps and gaps in the institutional arrangements and organizations which support or hinder effective CBCRM at various levels of government and within the community.

5. Identify what is needed to support CBCRM, such as new regulations, new organizations and enforcement mechanisms.

6. Recommend strategies for implementing patterns of relationships in space, time, flow and decision using various tools such as transects, maps, timelines, venn diagrams and matrix.
Institutional and organizational arrangements can change and should be analyzed over time.

**Example**

<table>
<thead>
<tr>
<th>Administrative level</th>
<th>Government agency</th>
<th>Local government unit</th>
<th>Non-government organization</th>
<th>People's organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>Department of Environment and Natural Resources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provincial</td>
<td>Provincial Environment and Natural Resources Office</td>
<td>Provincial Government (Palawan)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Municipal</td>
<td>Community Environment and Natural Resources Office</td>
<td>Municipal Government (Puerto Princesa City)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Village</td>
<td>Village Council (Mang'ingisda)</td>
<td>- Ligaya ng Buhay - Binunsalan Bay Foundation, Inc.</td>
<td>- Christian Multi-purpose Cooperative - Charity Women's Association - Fisherman's Ministerial Fellowship</td>
<td></td>
</tr>
</tbody>
</table>

7. Analyze rules.

There are three levels of rules which are very closely linked and need to be clearly identified during the analysis.

- *Operational rules* govern and regulate the day-to-day decisions and operations of the resource user concerning when, where and how to harvest the resource.
Management rules are used by resource users and government to formulate and change operational rules, deal with conflicts, enforce decisions, and detect and sanction against rule violation.

Legal and policy rules establish the process for resource management. Legal and policy rules include, for example, the national fisheries policy and legislation which establishes a national fisheries agency. National laws and policies are translated into management rules, which in turn are further translated into operational guidelines. In other words, the rules affecting operation are made within a set of management rules that are themselves made within a set of legal and policy rules.

8. Validate.

It is important for the community members and government officials to participate in validation of the institutional analysis to ensure accuracy and to fill in any data gaps. This can be done through meetings with key leaders, focus group discussions, and/or with the community as a whole.
9. Produce the final report. Following is the suggested outline.

- Background/Rationale for Institutional Analysis
- Objectives of Institutional Analysis
- External Institutional and Organizational Arrangements (national, provincial, district, municipal)
  - policy, legislation, regulation, programs
  - government administrative agencies (mandate, functions, structure, objectives)
  - non-government organizations (mandate, functions, structure, objectives)
  - services
  - nested relationships
- Community Institutional and Organizational Arrangements
  - stakeholders
  - community organizations (mandate, functions, membership, structure, resources)
  - boundaries (political, physical/natural, gear, customary, fishing spot)
  - property rights/tenure arrangements
  - rules: formal/informal; operational, collective choice, constitutional
  - decision making and conflict resolution
  - monitoring and enforcement
  - nested relationships
- Analysis and Diagnosis
  - Institutional analysis of the coastal resource
  - Management systems
  - Pattern analysis (Space, time, flow, decision)
- Summary and Recommendations
Output

A report containing descriptions, maps and figures that analyzes the formal and informal coastal resource management systems that operate in the community. The outputs are of use to resource users, stakeholders and government for dialogue and debate about coastal resource management and CBCRM.

Venn diagram showing nested arrangements for different levels of fishing rules in the Philippines

Legal and policy rules
National fisheries
PD 704 Code of 1975

Management rules
Municipal marine reserve and sanctuary

Operational rules (formal)
Only handlines maybe used in the reserve

Operational rules (informal)
Community level
No fishing in reserve during fishbreeding season of January to March

No fishing activities allowed in sanctuary

Local government code of 1991
**Strengths**

- Depending upon the level of detail generated, the institutional analysis provides information which may not otherwise be available or commonly understood by the community and government.
- Can be conducted in a relatively short time period (one or two weeks) and at a low cost.
- Provides an opportunity for resource users to share their knowledge and understanding about resource management and use.
- Allows for the synthesis of bio-physical, socio-economic and institutional information about coastal resource use and management.

**Limitations**

- Institutional analysis can be relatively complex. Due to this complexity, it requires a trained facilitator to undertake the analysis.
- The analysis requires an understanding of informal rights and rules at the community level. The team members must be able to probe deeply to get this type of information in an accurate manner.
Example

In San Miguel Bay, Philippines, an institutional analysis identified coastal resource use patterns and both formal and informal management systems. Weaknesses were identified in the formal management system of the government because the various municipalities surrounding the Bay were implementing fisheries management regulations in different ways and there was no coordination of management. This resulted in use conflicts and overexploitation of the fishery. Recommendations were made to develop a Bay-wide management council to coordinate management systems and improve overall enforcement. The San Miguel Bay Management Council was established. Fisher organizations were directly involved in the management council providing for a participatory and "bottom-up" management system.

References


Building partnerships in CBCRM

Definition

Building partnerships in community-based coastal resource management (CBCRM) is a process that seeks to mobilize the resources and energies of various players towards achieving the strategic goal of CBCRM, i.e., to empower coastal communities in managing and developing their resources. The process is integrative because it seeks to bring together various groups with diverse roles to work for a common goal.
A partnership can be forged between two or more parties which could include people's organizations, government organizations and non-government organizations. Depending on the partnership's basis of unity, it could extend membership to other interest groups.

**Purpose**

- To create a development environment that is supportive of the principles and processes of CBCRM. The partnership can be a venue to scale-up programs and push for local policy reform.
- To foster dialogue and understanding among various sectors of the community and bring them to a consensus on certain principles, issues and resolutions relating to a particular resource or the coastal environment in general.
- To build on the unique strengths of various organizations toward the achievement of a common goal.

**Possible approach**

Partnerships can be built around a single activity or issue or around strategic concerns like managing and developing a whole coastal zone. It could be short-term, or it could be developed and nurtured for a long period of time, for as long as the principles and/or programs that unite the partners hold true. The nature of the partnership can also evolve and change through time.

In the Philippines, partnership building is usually initiated by a non-government organization or a community-based organization.
The approaches to building partnerships in CBCRM can be as diverse as the characteristics of the development environment are in a particular area. It can also be very flexible depending on the creativity and sensitivity of the people initiating the partnership.

Following are the basic steps in initiating the partnership. However, the life that the partnership will take on after the initial steps will largely depend on the partners themselves.

1. Identify key development players or stakeholders in the community.

These are persons or institutions whose interests and actions significantly affect a particular resource. These development players could include members of the fishing community, the local government unit, the local government agencies, the business community, the academe, religious organizations and other non-government institutions present in the area.
2. Gather background information on identified potential partners.

Identify their interests/agenda, strategies, key persons, strengths and weaknesses, and their relationship to other players. Identify ways to relate with these persons or groups. This can be done by using the venn diagram, stakeholder analysis or institutional analysis methods. A cultural analysis can also be conducted to get an insight into the dynamics and relationships of these groups.

3. Conduct a dialogue with each of the potential partners.

Explain the vision, goals strategies and processes of the organization you are involved with. Discuss with potential partners the prospect of getting together with other institutions and involving them in the program. This will give an idea on how receptive these potential partners are to the proposed program.

4. Convene key development players for an initial consultation-workshop.
The initial meeting could be an introduction of each of the organizations and their programs and projects in the community. Develop a matrix of programs and efforts to show who does what in the area. This can help partners identify common programs or projects. Solicit feedback from the participants about their interest in joining the partnership.

5. Conduct a strategic planning workshop.

The strategic planning could start with an environmental scanning or local situationer of the coastal environment. Let the participants identify issues and problems and analyze them. It is important that participants agree on a common framework or set of principles with which to analyze common issues and then eventually agree on the solutions. Strategies could be identified to address these issues. Ask them to formulate a detailed plan of action afterwards. Each partner should identify their roles and possible contributions to the plan.
6. Set up a coordination mechanism.

A coordination or partnership mechanism could then be set up. The partners should agree on how they should organize themselves.

One possible set-up is to form a council where representatives from each partner organization is represented. The council serves as the policy and decision-making body of the partnership. The council should elect a convener and could be rotated among the partners. The partners should also formulate and agree on a set of operational systems or policies like regular meetings, funds management, process of decision-making (e.g., by consensus), supervision of the secretariat, roles of partners, etc. These could be stipulated in a formal document or memorandum of agreement (MOA) which will be signed by all partners. The MOA can also contain the partners' basis of unity, strategies and plan of action.

A secretariat that will help in convening and monitoring the operations of the partnership can also be formed.

7. Conduct a ritual of commitment sharing.

The consultation workshop could close with a ritual of commitment sharing and signing of memorandum of agreement or terms of reference defining the partnership's basis of unity, roles and commitment of each partner.
The ritual could be done in the context of a celebration or launching of a program highlighted by the signing; or in a gathering of all the partners and their constituents in a simple ceremony.

**Strengths**

- Serves as a venue to scale-up programs and push for local policy reform.
- Fosters dialogue and understanding among various stakeholders in the community.
- Mobilizes the resources and energies of various stakeholders towards achieving a strategic goal.

**Limitations**

- Sometimes, in an effort to involve all sectors, the composition of the partnership becomes too big to manage.
- Because partners are considered on equal footing, decision-making takes longer.
Because partners come from diverse orientations and have their own interests and agenda, facilitation and management of the group can be difficult.

**Tips**

- A partnership must always be anchored on agreed principles, if not a common vision.

- A principled partnership is built on mutual respect and trust. This has to be very clear at the onset of establishing the partnership.

- The community-based organization (CBO) as the initiator of the partnership must achieve a certain degree of organization and readiness when getting into a partnership with government and other institutions. One of the purposes of entering into partnership is to influence the local policy environment so that the interests and the CBCRM agenda of fishing communities are promoted and their gains protected.

  The CBO leaders must have a CBCRM/development agenda and must possess skills in communication and negotiation. They must also be ready to assume responsibilities.

- Key in keeping the partnership operational is the secretariat. It is important that the NGO/CBO representatives in the partnership take part in secretariat work, if not lead it.

- The partnership must sustain itself. Partners, however, may be asked to contribute or help raise resources at the start for meetings and common activities.

- The PO and NGO partners must always involve the government partners in their activities to facilitate regular information exchange, orientation and education and community building among the partners.

- It is preferred that decisions are made by consensus to ensure the support of every partner.

Compiled by Marie Grace Madamba-Nuñez
Media advocacy for coastal communities

Definition

Media advocacy is a way of raising environmental issues and concerns affecting coastal communities using the trimedia: print, television and broadcast.

Purpose

- To get the attention and support of government, non-government organizations (NGOs) and other concerned and interested agencies, e.g., for fisheries policy reform.
• To obtain financial support (for rehabilitation or conservation).
• To raise public awareness.

The media

At present, there are three popular sources of public information: the print media (local, national and international newspapers; newsletters; pamphlets; leaflets), broadcast media (both local and national radio stations), and television (both national and international networks).

Requirements

<table>
<thead>
<tr>
<th>Human resources</th>
<th>Materials needed</th>
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</thead>
<tbody>
<tr>
<td>✓ community leaders</td>
<td>✓ manila paper and pentel pen</td>
</tr>
<tr>
<td>✓ development worker</td>
<td>✓ camera</td>
</tr>
<tr>
<td>✓ writer/artist</td>
<td>✓ typewriter or computer</td>
</tr>
<tr>
<td>✓ photographer</td>
<td>✓ ballpen and notebook</td>
</tr>
<tr>
<td>✓ media contacts</td>
<td>✓ tape or video recorder, if available</td>
</tr>
</tbody>
</table>

Suggested approach

1. Identify issues that need mass media projection. These issues usually need immediate and/or strategic action (e.g., poaching of foreign vessels, occurrence of events
such as fish kill and advocacy for a new fisheries code). Refer to topic on problem ranking.

2. Agree on the media campaign objectives and level-off expectations. Identify desired tangible outputs and the desired impact or effect.

3. Identify the target audience for the campaign or advocacy.

Mang Jose saw the degradation of the marine ecosystem due to blast fishing and wanted the government to enact local legislation strengthening the local enforcement agency and increasing the penalty for such illegal acts.
4. Identify the best media form to use: print, broadcast or television or combination of the various forms. The choice should depend on the target audience for advocacy and the popularity (with higher audience reach) in the community.

5. After selection of the appropriate media, the following strategies can be done.

<table>
<thead>
<tr>
<th>Print</th>
<th>Broadcast</th>
<th>Television</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ press releases</td>
<td>✓ submit taped interviews</td>
<td>✓ prepare/submit video documentary</td>
</tr>
<tr>
<td>✓ expose</td>
<td>✓ conduct radio hopping with a trained spokesperson</td>
<td></td>
</tr>
<tr>
<td>✓ news stories</td>
<td></td>
<td>✓ guest in talk shows</td>
</tr>
<tr>
<td>✓ feature articles</td>
<td></td>
<td>✓ air views in public affairs shows</td>
</tr>
<tr>
<td>✓ letters to editors</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Strategies applicable to all media forms
✓ press conferences
✓ networking with media personalities or media groups
✓ preparation and distribution of press kits (data gathering, writing, photo/video documentation)
✓ media liaison work

6. Discuss the campaign strategy with the community.

7. Gather data to substantiate the campaign or media advocacy. To validate information, consult with other agencies such as government bureaus and non-government organizations. Obtain facts and figures from

Caution
There must a be a consensus from the community what information it wants to release to the media. Also, be cautious about naming names.
them. Get some ideas and examples from reading materials: literature, books, newspapers. Gather as much information as possible and compile them properly. Be discreet in handling confidential information.

8. Prepare campaign materials to be sent out to the media offices. Whoever should write the story for press release must be skilled on how to do it. If there are some issues and concerns which need more scientific explanation, contact an expert on the subject matter.

The community decided to expose their plight by writing press releases. Some were assigned to write while others did the lay-outing and packaging of materials into popular forms (e.g., comics).
9. Submit campaign materials to the media offices. Submit the story to newspapers (local or national) which can advance the community's concern.

Furnish copies to radio stations. For a national publication, include two or more pictures and a letter explaining the content of the press release. Be sure to select the people who should receive the report.

Write to an international publication or ask a television crew to visit the place and ask them to make a special report on the community's plight. Submit articles during special events like Earth Day celebration, Environment Month, Clean-up the World Day, etc.
10. Follow up articles and campaign materials. Be sure to keep the issue “burning”. Should the issues and concerns be solved, make another write-up and share it to media again. In this way, people who are following the story will know the result of the advocacy.

The problem of the community was given prominence when the issue hit the headlines of a national daily.

11. Continuously monitor the issue and the campaign. Make sure people who are following the story know the result of the advocacy. Let them know if the objectives were met and what the gains of the campaign were.

The government responded by sending an official to see the problem. The community shared the problem to the visiting official and together they tried to solve the problem.
12. Inform the people of the follow-up action or strategy

Caution: In countries where media is restricted, the community must be aware of the implications of their statements and must be ready for possible consequences of their actions.

Other options

Call for a press conference.

If the community has friends from the media (newspaper, radio, and/or television), ask them to attend a media briefing you will conduct with the community.

Write to the editors.

Send an original copy of the letter. Photocopies or carbon copies are almost always rejected by the editors. In addition, write to the municipal and provincial officials, congressmen, and other lawmakers about the community’s plight.

Make your own newsletter.

This will serve as historical record and it can be mailed to people who have the same concerns as yours. A leaflet may also be prepared.

Conduct radio visits or call radio stations to air news reports.
Tips in media advocacy

- Provide answers to the what (event, issues, concerns), where (place), when (date), why (the importance), whom (people) and how (procedure).
- Organize a pool of writers and campaign strategists.
- Conduct training/crash course in media work (newswriting, feature writing, photography).
- Organize volunteer writers from the community.

Strengths

- Popularizes an issue, which adds pressure on local decision makers.
- Empowers community members by teaching them to expose issues and defend them publicly.

Limitations

- Needs skills in advocacy/media work.
- Requires a wide network.
- Some forms of media such as video, may be expensive or too technical to be conducted without external assistance.

Prepared by Henrylito D. Tacio
Logbooks

Definition

A logbook is a way of recording information in an informal manner. It involves recording entries by date into a notebook. The information may be general or very specific, depending on the need of the coastal community. These needs may be identified using other methods such as a seasonal calendar.

Purpose

- To provide a way in which the community can keep their own records according to their own criteria of importance. There should be a specific reason for starting the logbook, e.g., a visitors book for marine reserve. Once started, the logbook can then be expanded to cover other issues.
- To provide chronological records that may be useful for establishing trends or documenting events such as violations of local ordinances. It is ideal for recording irregular/unpredictable events like disasters.
- Logbooks can also be used to substantiate advocacy campaigns.

Requirements

Human resources

 Whoever is interested from the coastal community should have access to the logbook. A caretaker may be identified to care for and maintain the logbook. To ensure that everyone is able to have access to the logbook, the caretaker role may be rotated among different people. The logbook may be kept at the house of a local fish vendor or the caretaker.

Materials

✓ logbook (a bound book with lines, preferably with at least 100 pages) with pencil attached
✓ simple format for recording entries

Encouraging the habit of regularly recording different events or activities will increase the capability and confidence of communities about their local knowledge.

Use pencil so that if the book gets wet the text will not blot. A plastic cover can also help.
Possible approach

1. Hold a group discussion to introduce the concept of a logbook. Discuss where the community sees a need to collect information or to monitor different activities.

Examples of information that can be recorded: floods, health, typhoons, siltation from rivers, enforcement schedules and notes, unusually high fish catches, introduction of new fishing gears, mangrove rehabilitation.

2. Discuss how these different events/activities can be best recorded in the logbook. Give guidelines. Record the following information:
   - date and time;
   - type of activity;
   - details of the activity;
   - who made the observation and/or recording (optional).

3. Emphasize that some activities are best recorded using a standard format, e.g., for sightings of endangered species.

<table>
<thead>
<tr>
<th>Date: 19/3/96</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time: Mid morning</td>
</tr>
<tr>
<td>Location: Natanco Island</td>
</tr>
<tr>
<td>Name of animal: Dolphin</td>
</tr>
<tr>
<td>Description: big fin, 1½ m. long, gray with white belly</td>
</tr>
<tr>
<td>Number of animals: 2 adults (adults/young)</td>
</tr>
<tr>
<td>Activity: Feeding</td>
</tr>
<tr>
<td>Recorder: Teddy Lacerna</td>
</tr>
</tbody>
</table>
4. Give examples of information that can be recorded like fish catch, illegal activities, unusual sightings, natural calamities and introduction of new fishing gear.

5. Give an idea on how the book can be divided into sections, for example: bird observations; general comments; visitors’ comments; fish catch monitoring notes and schedules; and mangrove monitoring notes.

<table>
<thead>
<tr>
<th>Illegal fishing activity monitoring data sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barangay:</td>
</tr>
<tr>
<td>Municipality:</td>
</tr>
<tr>
<td>Date</td>
</tr>
<tr>
<td>Petsa</td>
</tr>
</tbody>
</table>

6. Encourage the community to regularly review and discuss the information recorded in the logbook. This can be done at monthly meetings and will help maintain the interest in recordkeeping.

Remember

If groups outside the community need information from the logbook, photocopy it, do not remove the logbook from the community – it is theirs. If you need to borrow the logbook, return it within the day.
Output

★ Chronological record of events and selected information.

Example

A community in Marinduque, Philippines, identified encroachment of commercial fishing vessels as a major problem. They were already conducting municipal fish catch monitoring using a logbook and they expanded the use of this logbook to record illegal fishing activities. The information was used for advocacy initiatives to gain support from the local authorities in stopping illegal activities. The outside project management also used the information to gain additional support for enforcement, e.g., funding for a patrol boat.

Strengths

- It is not highly structured, technical or costly.
- It provides written record for future reference.
- It is ongoing.

Limitations

- Does not record highly detailed or technical data.
- Difficult to sustain continuous recordkeeping.

Compiled by Karen Vidler
Making and using case studies

Definition

A case study is a story line approach to document projects, processes and events.

Purpose

Through making a case study, people are able to analyze their programs and also learn techniques for communicating this to outsiders. Communities with experience in community-based coastal resource management (CBCRM) possess valuable knowledge that should be shared using popular methods where applicable.

Case studies can be used:

- To ensure similar fishing communities who are planning to use CBCRM are aware of the issues they may encounter and those already involved can share experiences with each other.
• To provide insights to trainee fieldworkers about community dynamics and how this affects the success of projects.

• To confront sectors that use the same coastal waters, e.g., commercial fishers, shipping operators and tourist resort owners with the perspective of small-scale fishers. This can be the start of a dialogue on how coastal resources can be shared and protected.

• To raise awareness of development issues with a variety of sectors, e.g., school children.

• As a means of fund-raising or finding other support.

Case study I. In Sandingan, Loon, Bohol, Philippines, a high school student wrote a play script about a case of illegal fishing where the fishers were caught using dynamite and ended up in prison. With very limited funding from a local organization, the drama was presented to over 300 people at the local fiesta (community celebration). Local leaders, fishers and many other people attended the drama and so became aware of the dilemmas involved. Particularly effective was a scene that showed how distressed a fishers family was when he was arrested and imprisoned. The drama was video documented and is now used as a training tool with fishers in the whole of Bohol.
Making a case study

Requirements

Human resources

- facilitator
- a group of willing participants with a story to tell
- if relevant, a resource person who can advise on video film making or recording, comic strip production, scriptwriting for short plays.

Materials

- notebook
- pen
- materials gathered from previous CBCRM methods, e.g., maps, transects
- camera/video camera/tape recorder (optional)

Suggested approach

This takes from a few hours to several days.

1. Select an appropriate area or project site. A case study is best done when the project you want to focus on is nearing completion or completed, or after the event you want to document has just happened.

2. Invite the whole community to be involved in the process to get the widest range of views. If any key informants cannot be present, try to interview them separately.
3. Decide as a group the focus of the case study. Ask the following important questions:

**Important questions to ask are:**

- Are we going to cover our whole program or just part of it?
- What do we want to use the case study for?
- Who will use it? What information will they need?
- What are the main points we want to draw out from our experiences?

4. Put together all the information needed. This can be an occasion to look again at previous research and consider how the program has evolved. Decide if any new research is needed for a more complete picture.

*Caution*

If the case study touches on controversial issues, be aware that you may be placing individuals or whole communities in difficult or even dangerous positions. Make sure the participants understand the implications of putting their views 'on record'. Also, be careful of libel; if you are going to make an accusation in a case study, make sure you can back it up with evidence.
5. Work with the participants in producing an outline of what has happened. This usually leads to heated debate as people usually have very different interpretations of the same events.

Try to draw out the views of all the participants (refer to topic on brainstorming). Reaching a consensus can be a lengthy but enlightening process. You might want to highlight the differences of opinion in your case study but be careful that the main point is not lost.

Caution
Making a case study can open 'a can of worms' since it may lead to the community identifying new problems.

6. Once you have a basic story line, discuss what medium it should be presented in, e.g., written, video, drama, comic strip, photo essay or story (a series of photos with captions and speech bubbles). You might be able to draw on familiar legends and use dance, theatre or mime.
7. Make the case study. Try to ensure it 'flows' and that it has a strong start (refer to topic on using media for advocacy). A possible presentation for the case study is considering the following flow:

- Introduction (remember your likely audience - how much background information will they need?)
- How the project was implemented
- Results
- Conclusions

**Bear this in mind:**

- Do not gloss over what went wrong in the project as this can often provide the most useful insights for those using the case study. Include accounts of problems encountered and how these were overcome.
- A bit of humor will go a long way in making it popular, so try to incorporate amusing anecdotes - and visual humor if making a video or play.

The case study will probably have to go through various drafts so that people can give their comments on it.

8. Leave copies of the case study in the community, credit their involvement and keep them informed of how the case study is being used and what the feedback has been.
Case study 2. An NGO in Baguio City, Philippines, works with community-based organizations on the coast and in the surrounding Cordillera mountains, and wanted to produce case studies that would help their organizations understand how all their livelihoods were interlinked. For example, tailings from mines in the mountains were polluting the coastal fishing areas, forcing fishers to migrate to the mountains in search of work in vegetable gardens.

The first case study was done with a fishing cooperative in La Union. At a community meeting, the history of the coop was discussed, leading to much debate. That night, one of the field workers produced a rough comic strip of the story for feedback from the others. The final comic strip was made by an artist in Baguio, drawing caricatures of the members of the people’s organizations based on photographs. Copies were printed for all the organizations. The fishers were pleased to see their story put into such a professional format. However, on appraisal, it was realized that it would have been better for the artist to have gone to La Union and worked with the community to produce the final comic strip, so that they would have learnt these skills.
Using case studies

Requirements

Materials
✓ papers
✓ pens
✓ if appropriate, props for drama, a video player, materials for CBCRM tools

Suggested approach

Before the session:
1. Choose a case study that is appropriate to your audience and will prompt the kind of discussion you plan to have. You may want to adapt a case study to make it culturally-relevant. Do not be tempted to change too much otherwise all the details that make it real will be lost.
2. Familiarize yourself with the case study. Write discussion questions and try answering them yourself.

Caution
Some case studies can trigger strong emotions. Be aware of how participants might be likely to react to the case study you have chosen.
3. Make sure that any equipment required is working and you know how to use it.

During the session:

1. Present the case study. If it is a written one, it may be best to hand out copies to all the participants but also ask someone to read it out loud.

2. Ask the participants to divide up into small groups of three to six and spend about 30 minutes discussing the case study, using a list of questions as a guide. People will be more confident about speaking in these small groups. Ask them to write all their comments down on a large piece of paper.
### Possible questions

- What is the case study about?
- How were the main difficulties in the project resolved? Would you have resolved them differently?
- How did the personalities of the people involved and their relationships to each other affect the success of the project?
- Were the views of any groups of people left out from the case study?
- What did the case study not tell you, i.e., where were the gaps?
- What do you think will happen next in the program? (you could give participants just part of the case study, ask this question, and then later show them the rest to see how their answers compare to what actually happened.)
- How does the case study relate to experiences in your own work or life?

3. Ask the small groups to report back to the rest of the group. Take one idea from each group at a time for the others to discuss.

4. Ask the participants to further explore the case studies through activities. For example:
   - Rewrite the case study from the perspective of one of the people featured.
   - Have a 'live debate' where participants take on the role of different characters in the case study and discuss the program from their perspective.
   - Perform a drama to explore a particular issue raised, e.g., the role of women in fish marketing.
Produce a 'people sculpture', where participants use their bodies to produce a sculpture that symbolizes the main message of the case study, e.g., the need to work together. This is a useful way of summing-up.

![People sculpture to show cooperation](image)

If the case study has sufficient detail, it could be used in a training session for the fieldworkers to practise using CBCRM tools - e.g., producing a timeline - before going into the communities.

If you are holding a work-related training session over several days, it can be useful for participants to bring their own mini-case studies to the training and present them. They can then share and get advice on their own on-going projects. Make sure they are sent advice on how to make the case study and how long it should be.
Case study 3. In Bien Unido, Bohol, Philippines, a three-year coastal resource management project was just about to phase out. The CBCRM team went to the area for five days to make a case study of the whole process and analyze where to go next. They asked the fishers cooperative to decide how they should document the project. The case study was done as a video, which was shot over three days with the different groups in the cooperative involved in the whole process. Every night, the day's shooting was played back to the community with over 100 people attending. The resulting video is now used as a potent tool with other communities in the area. The project team was also able to analyze the key strengths and weaknesses of the project and to use these lessons in program management and development. It is now used by the local community as an introduction for other visiting groups.

Strengths

- Case studies provide a permanent record of a project.
- The story format is a popular means which people can empathize with more easily compared to program reports.
- They present issues and problems in a social context and so are suitable for exploring those dynamics between people that are important in determining whether a project will succeed or fail.
They can be a useful tool for learning new skills, such as documenting, writing, video-making, drama and comic strip techniques.

They can be the impetus for forming networks between communities. The next stage could be a site visit or study tour (refer to topic on study tours).

They can be used to provide some distance in discussing sensitive issues, e.g., illegal fishing or wife battering. This way the issue can be raised without having to discuss specific cases and people in the community.

Limitations

Case studies only give a small snap shot of reality. They highlight certain issues and ignore others that might have had a strong influence on the project but were 'invisible' to the case study makers, e.g., that they live in a municipality where the local government is supportive of environmental projects.

The presence of an 'outside' facilitator can help give a wider perspective, but there is the risk that they will impose their perspective too much on the narrative.

They are about a specific program and specific site and so the study may not be so relevant to other areas or different projects.

The format does not lend itself to incorporating quantitative data. One solution to this is providing supporting documents containing the 'hard facts'.

Prepared by Stuart Greene and Cathy Rosario
Process documentation research

Definition

Process documentation research (PDR or process documentation) is a learning tool designed to capture project dynamics and experiences that cannot be collected by standard monitoring and evaluation. It focuses on the means or processes used by organizations rather than the outputs or ends (measured against objectives or targets as in typical evaluation) alone. It also attempts to identify the role of external factors that affect project results.
Process documentation relies primarily on direct observation, semi-structured interviews, focus group discussions and community and project validation of written reports. A third party — who is external to the facilitating organization and the local community - conducts the process documentation. The results are validated by the project and community and fed-back into the project to improve it.

PDR, therefore, asks not "what" the project achieved but examines "how" the achievements were reached.

**Purpose**

- To help organizations understand "why" certain approaches (e.g., CBCRM or tripartite partnership) are useful.
- To help organizations systematically examine how certain approaches can be improved.
- To document the effectiveness of “participatory” and “people-centered” processes. Especially, if the processes are likely to be replicated elsewhere.

For example, many organizations in the Philippines are promoting a tripartite partnership (a partnership among community-based organizations, local government units and non-government organizations) approach to CBCRM.

- To examine the value of certain processes (e.g., participatory approaches) independent of overall project success or failure.
## Requirements

<table>
<thead>
<tr>
<th>Human resources</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ project staff of CBCRM initiative (i.e., implementing organizations)</td>
<td>✓ agreements with implementing organizations and project beneficiaries</td>
</tr>
<tr>
<td>✓ project partners/beneficiaries</td>
<td>✓ mutually agreed upon process documentation framework (see Table 1)</td>
</tr>
<tr>
<td>✓ process documentation field staff</td>
<td>✓ notebook</td>
</tr>
</tbody>
</table>

## Suggested approach

1. Select the project and the particular process or approach to be analyzed. This may be identified in advance or requested by a donor or an organization with the financial resources and interest to conduct process documentation.

2. Identify a project team and develop a PDR framework. The PDR team can be single, individual or a small group. Each site requires a minimum of one field researcher. The PDR framework should help focus the attention of the PDR field staff and provide a systematic way of identifying, documenting and analyzing the process under study.
Sample PDR framework

The PDR framework is a guide for the PDR staff and for the implementing organization. It provides general instructions on how the PDR staff will operate and what he or she will focus on. It helps to ensure consistency in the process of direct observations made by the PDR staff.

Below is a sample PDR framework.

1. Describe the planned activity.
2. Describe the expected outputs.
3. Describe the actual activity and how it differed from the plans.
4. Describe the processes used in implementing the activity.
5. Describe the immediate outputs of the activity.
6. When possible (usually at a later date), describe the impacts of the activity.
7. Describe the factors that influence the immediate outputs.
8. Answer the following questions:
   a. How did the tripartite relationship and community organizing process contribute to the immediate outputs?
   b. What was the source of information?
   c. How was the information collected?
3. Conduct an orientation with the implementing organization and project beneficiaries. This orientation is crucial to establish a friendly working relationship with the implementing organization and local community. It should be emphasized that the PDR is not a project evaluation but a process designed to help improve the project for the benefit of both the implementing organization and the community.

4. Integrate the PDR field staff into the activities of the project to allow observation and documentation of project activities. This will include the use of direct observation, focus group discussions and semi-structured interviews.

5. Ask the PDR field staff to analyze the observed activities by considering how the process or approach used benefited or hindered the activity.
This is the most important and difficult step of process documentation research. The PDR field staff must be experienced enough to recognize the differences between the process or approach under study and other common approaches. He or she must be able to distinguish between the effect of the active application of the process under study and the effect of external factors. Finally, the PDR field staff must be able to clearly document and defend his/her observations during subsequent validation meetings.

6. Conduct regular (e.g., monthly) validation meetings with the implementing organization. Even the most meticulous and consistent observers will miss or misinterpret some aspects of project implementation. Regular validation meetings will promote goodwill between the field researcher and the staff of the implementing organization.

7. Conduct quarterly validation meetings with the implementing organization and project beneficiaries. The meetings will highlight the lessons learned over the period and be presented to help improve the project.
Allow the implementing organizations and community representatives to assess the observations and lessons of the PDR field staff. It is preferable to let the implementing organization and community arrive at possible options to improve the project based on their interpretation of the PDR observations. The PDR field staff should help facilitate this process.

**PDR process**

1. Identification of project and "process" to be studied
2. Identification of PDR team and development of the PDR framework
3. Orientation and levelling of expectations with implementing organizations and selected project beneficiaries
4. Implementation of PDR activities
5. Improvement in project processes

- participant observation, informal interviews, (within both individuals and groups), review of project-related documents
- project modifications
- recommendations
- validation meetings
- reports
Outputs

* Written quarterly reports which include insights for consideration by the implementing organizations while the project is still ongoing.

Sample output of quarterly reports submitted to implementing organizations

The following passage from a quarterly report done by the PDR research assistant examines "stakeholders" external to the tripartite relationship under study:

1. A third factor that may make or brake the PO-LGU-NGO partnership is the pressure coming from the players outside the tripartite partnership. These players include the commercial fishing vessel operators, non-PO members and the media.

Example:

"The case of the barangay captain (village leader) owning a commercial fishing vessel is seen as a "conflict of interest." But, would the same barangay captain still a threat to the tripartite partnership if he was to abide by the existing laws and agreements reached in the tripartite (relationship) related to the CBCRM agenda?"

2. The non-PO members are not so much a threat to the tripartite relations but (more of a threat) to the efforts (in the field) of the tripartite (members) in CBCRM (activities).

Example:

"There was one incident of that a (non-PO member) was apprehended by the members. The case filed against him was entry to the area designated as fish sanctuary."

3. The "Bantay Radyo" program is a positive contribution of the media in strengthening partnership relations relative to the CBCRM agenda. But there are also cases where the media may, unconsciously, be a threat "to the partnership".
Example

"The research assistant shared with the group (local people's organization) a new clipping. He read in the local newspaper an article that said the shoreline from Brgy. Cabacungan to Brgy. Candugay in the Philippines is declared a fish sanctuary."

The article led to a discussion among the PO about the accuracy of the article's content and the need to have better linkages with the local media to ensure accuracy in such articles.

Based on the observations and analysis above, the PDR research assistant posed the question to the implementing organization: How should the tripartite partnership address these other stakeholders? Should they become a formal part of the relationship or should special arrangements or channels be made to improve communication and coordination?

★ A final summary report that provides more general insights into the process under study (see examples below)

Sample output of a PDR report examining the "Tripartite Approach" to CBCRM in the Philippines

As stakeholder groups, the government organizations (GOs) continue to be perceived as bureaucratic and politically-motivated; the non-government organization (NGOs) as imposing; and the people's organizations (POs) as passive. As such, projects are often directly between POs and NGOs or POs and GOs and seldom between GOs and NGOs. Project communities, therefore, tend to see GOs and NGOs as largely fund sources or conduits. The GO-NGO cooperation is often indirect, resulting from the implementation of PO-GO or PO-NGO project initiatives or because of protocol, or it being perceived as the ideal thing to do. Nevertheless, the project experiences also show that many of the negative institutional biases may be turned around by finding key individuals to sponsor good initiatives. And before this is misconstrued as the extension of personal favor, some thinking needs to be done to see how a partnership works that is completely built around roles and structures and never personified through individuals in those roles and structures.
Summary report of a PDR project in the Philippines

Strengths

- Provides an outside view of how processes or approaches influence or affect a particular project.
- Helps identify areas for project adjustments in midstream e.g., during the process of project implementation.
- Goes beyond monitoring and evaluation of project ends (results) and examines the role of project means (processes) as well as external forces.
Limitations

- An additional cost to the project.
- If the PDR orientation or implementation is not done carefully, it can lead to animosity between the field researcher and the implementing organization.

Variation

- Another approach is to let the community conduct PDR, or ask a nearby community to do PDR, after proper training on PDR has been conducted.

Prepared by Gregory Ira and Ric Armonia
Cross-cutting themes
Building on indigenous knowledge

Definition

Indigenous knowledge (IK) refers to information, practices, beliefs, tools, skills and institutions that local people have developed over time and continue to develop. It is usually based on experience, tested over long periods of time, adapted to local conditions and continuously evolving.

Indigenous knowledge is not limited to information. It is not confined to tribal or indigenous groups or even rural areas. Other names for indigenous knowledge as described above include “local knowledge,” “indigenous technical knowledge” and “traditional ecological knowledge.”

One way of increasing people's participation in CBCRM is by starting with what they know and building on what they have. This is the basis for recognizing and using indigenous knowledge in development work and natural resource management.

New or alternative livelihood or conservation projects are attractive and often conveniently pre-packaged, but are commonly not appropriate for local conditions nor are they sustained after the life of the project. It is more realistic to assess existing practices and promote those that are found to be effective and, when possible, improve them by introducing external knowledge (refer to topic on participatory technology development and dissemination).

**Forms of indigenous knowledge**

Indigenous knowledge can take many forms. Recognizing and giving value to these forms of indigenous knowledge will increase your understanding of local practices and can increase the participation of local people in development activities. Common forms of indigenous knowledge are described below.

The forms of indigenous knowledge are separated and categorized here to help the reader understand them better. In most cases, however, indigenous knowledge systems are holistic and these distinctions would not necessarily be recognized.
Information

Common indigenous information can range from knowing the habitat, niche and life cycle of various aquatic organisms to understanding the meaning of the underwater sound around the reefs. Indigenous indicators are an example of information that can be put to use in CBCRM activities.

Beliefs

Indigenous beliefs can be described as knowledge that may not be rationally or scientifically explained. In some cases, there are scientific explanations but the indigenous rationale for the belief is different. This includes beliefs associated with religion, world views or other apparently non-rational associations. Beliefs related to coastal resource management range widely from the worship of crocodiles to fear of aquatic omens. Beliefs may play an important role in shaping the behavior of people and should be recognized if CBCRM programs are to be accepted locally.

Tools

Tools in coastal areas can include the various forms of gear and equipment used. Indigenous tools are often made from local resources. Understanding the trends in cost and availability of the resources for local gear and tools are important considerations in CBCRM.
Materials

Indigenous materials include all the resources locally available that are put to use by local people. These may or may not be unique to the area. The use of seaweeds is an example of an indigenous material in coastal areas. In some areas, certain types of seaweeds are eaten, used for feeding fish in ponds or as a component in compost for gardens.

Skills

Indigenous skills include marine navigation, production of tools and equipment, proper preparation of fish and many others. These skills are often learned through years of experience and apprenticeship. In many cases, these skills are undocumented and lost when new technologies replace them.

Communication

Indigenous communication methods include locally recognized symbols and signs. Some communication methods are highly specialized such as communication between boatmen and divers. Communication centers or venues (such as stores, shelters, fish landings, markets, etc.) are often good locations for sharing or gathering new information.
Institutions

Indigenous institutions are social arrangements and norms that include rules and regulations. Examples include arrangements for communal work for pulling in large nets and recognizing individual or group fishing territories.

Practices and technologies

Coastal production systems display a variety of indigenous practices and technologies. These are often complex combinations of information, tools, skills, materials, and institutions. Understanding the strengths and weaknesses of these practices and technologies should be the starting point of development and natural resource management activities.

Relevant indigenous knowledge

There is indigenous knowledge related to every aspect of coastal village life. Problem identification will help focus the assessment of relevant IK. For example, if the problem is the loss of mangrove forest, then relevant knowledge may include information on appropriate species, timing and areas for reforestation.
Purpose

Indigenous knowledge plays a vital role in CBCRM. IK is more valuable when it is used for development or conservation rather than when it is simply documented. The recognition and use of indigenous knowledge can help improve project relevance, acceptability, sustainability and even technical and economic feasibility. The table below shows how IK can help in the four stages of the CBCRM cycle.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Role of IK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment</td>
<td>Situational assessment requires input and analysis from local community members. Their own knowledge (e.g., information on local taxonomies) of the local economic, social and environmental setting is crucial to a clear understanding of local opportunities and challenges.</td>
</tr>
<tr>
<td>Planning</td>
<td>Planning involves timing of activities. This must take into consideration the local seasonal calendar that looks at labor availability, special events and the role of indigenous institutions.</td>
</tr>
<tr>
<td>Implementation</td>
<td>Implementation requires the active participation of community members through field testing and adaptation of improved practices. Their indigenous methods for experimentation will affect how plans get implemented.</td>
</tr>
<tr>
<td>Monitoring and evaluation</td>
<td>Indigenous indicators of impact are often overlooked. Frequently, these involve indirect indicators. While these may be less precise than other indicators, they are often more frequently monitored as part of regular activities of local people.</td>
</tr>
</tbody>
</table>
Who knows what?

The first step in building on IK is to determine who knows what. Many projects have suffered because information regarding key activities has been gathered from the wrong people. Local knowledge can be grouped into three main categories:

- **Common knowledge** is held by most people in a community; e.g., almost everyone knows how to cook rice or how to swim.

  ![Swimming](image1.jpg)

- **Shared knowledge** is held by sub-groups within the community but not by all; e.g., women in the community may know the best methods of collecting certain shellfish at low tide or young men may be most adept at compressor diving.

  ![Diving](image2.jpg)
• Specialized knowledge is held by a few people who might have had special training or an apprenticeship; e.g., only a few villagers may know how to make boats or other specialized equipment.

There are many factors that affect who knows what in a community, including age, sex, education, occupation, length of residence and others. For more information on selecting or identifying resource persons from the community, refer to topic on key informants.

Caution
• Even local people may consider IK as "backward" and may not be forthcoming with information.
• IK changes over time; talk to young as well as older people.
• Migrant populations will have a mixture of IK. Some of the IK they possess may be based on conditions elsewhere, or adaptations.
Determining when to use IK

The decision tree below summarizes the major decisions for evaluating IK.

Ownership of IK

Ownership of indigenous knowledge at the community level is usually different from legal forms of ownership like intellectual property rights. Outsiders should respect the
ownership of indigenous knowledge and consider the following points when using IK:

- Seek permission before documenting and sharing IK.
- Include local people as authors or credit them when recording their practices. Always include names, dates and places in your records and in any document describing IK of specific person or community.
- Help local people document their information, to become authors themselves.
- Record and use IK in the context of applied development projects.
- Leave copies of the outputs of fieldwork (e.g., maps, seasonal calendars) with the community.
- Make the outcome of your study available to the community (e.g., translate reports, make copies of videos, establish village-based databases, etc.)
- Help community members (or communities) copyright documents and patent technologies which are unique and promising.
- Help communities organize to determine for themselves how they wish to respond to inquiries from researchers and commercial companies. They might be able to bargain with such outsiders to ensure that they receive some benefits from sharing their knowledge.
- Know and comply with the local laws on export of artifacts and germplasm.

Prepared by Gregory C. Ira and Dipankar Saha

Participatory Methods in Community-based Coastal Resource Management
Participatory gender analysis and responsive planning

Definition

Gender analysis is a process of understanding the relationship of women and men within a coastal environment. The analysis focuses on the reproductive and productive roles of women and men and how these affect their access to and participation in the management of coastal resources. The results of the analysis can be used for developing coastal resource management plans that would be sensitive to the conditions and needs of men and women in a coastal community.
Purpose

- To facilitate the process of evoking participation of some identified men and women to identify issues and concerns that affect their participation in the use and management of coastal resources.
- To analyze gender roles and relationships in the context of their bio-physical and socio-cultural environment.
- To develop a gender responsive coastal resource management plan.

Requirements

Materials
✓ brown paper
✓ pentel pen
✓ craft paper or manila paper

Prerequisite

The facilitator must:
- have a sound grounding in community organizing and a working knowledge of coastal resource management; and
- be gender-sensitive and have a grasp of the principles/concepts of gender and development.
Suggested approach

Stage 1: Understanding how men and women perceive their environment

1. Group the men and women separately.

2. For each group, discuss the problems and issues about their bio-physical and socio-cultural environment (refer to topics on problem ranking and focus group discussions). Discuss perceived solutions.

3. Write down the results in a matrix.

4. Ask each group to share results. Note commonalities and differences in men and women in the perception of problems and solutions.

5. Synthesize major outputs.
Example

The men's group identified one problem as being the depletion of the mangroves. This was leading to them catching less fish since mangroves are an important habitat for fry. Their solution was to replant mangroves.

The women's group identified the same problem. For them, the main concerns were that without a barrier of mangroves, the beach was getting steadily eroded, so that during typhoons, houses were being badly damaged. Also, it was increasingly hard to find firewood for their daily fuel needs. Their solution was also to replant mangroves.

However, when the two groups joined together, the women were not happy about the large area the men had chosen for reforestation. In the men's view this land was not being used, but as the women pointed out, this was an important gleaning area for them, where they were able to collect shellfish for the family's meals. The women suggested instead a narrower strip of land in a place least rich in shellfish.

The output for the discussion can be used in Stage 3: Gender planning to produce a mangrove reforestation plan that is sensitive to the needs of the whole community.

Stage 2: Gender analysis

In this stage, the community members look into the gender roles played by men and women in the management of their homes (reproductive activities), their sources of income (productive activities), their participation in community activities, and their positions in terms of access and control over their resources.

1. Group the men and women separately.
2. Facilitate the participants' discussion of the various reproductive and productive activities and their respective roles.

3. Write down in matrix form (see sample output) the reproductive activities and productive activities (major activities related to fishing/farming or other sources of livelihood). Subdivide the productive activities into:
   - home-based;
   - coastal based; and
   - community management work.

4. Ask the participants to produce a chart showing how men and women spend their time in a typical day (refer to the topic on daily activity charts).

5. Ask the participants to write down their roles in accessing and controlling resources and how benefits are distributed among men and women.

6. Ask the two groups to come together to compare their matrices.

Sample outputs

A. Reproductive activities and gender division of labor

<table>
<thead>
<tr>
<th>Activity</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food preparation</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Child rearing</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>House cleaning</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Washing of clothes</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Repair of house</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Gathering of firewood</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

The matrix shows that reproductive activities are dominantly done by women with the men sharing in firewood gathering.
Productive activities and gender division of labor

1. Home-based activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish drying</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Care of livestock</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Mending fishnet</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

The matrix shows that women are more active in home-based productive activities than men.

2. Coastal-based activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fishing</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Selling of fish</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mangrove production</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Collection of shells</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

The matrix shows that both men and women are involved in coastal-based activities.
3. Community management work – maintenance of the community through participation in community organizations and activities.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance in meeting</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Community clean-up</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Membership in community organization</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

The matrix shows that both men and women are active in community management work. But discussion indicated that, often, only men join or are considered members of community organizations.

Daily activity chart

<table>
<thead>
<tr>
<th>Time</th>
<th>Men/Activity</th>
<th>Women/Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 a.m.</td>
<td>fishing</td>
<td>wake-up and prepare food for fisher-husband</td>
</tr>
<tr>
<td>5 a.m.</td>
<td></td>
<td>clean house and feed livestock, wash clothes and fetch water</td>
</tr>
<tr>
<td>7 a.m.</td>
<td>sleep</td>
<td>meet fisher husband on the shores, sort fish for vending and sell fish in the market</td>
</tr>
<tr>
<td>11 a.m.</td>
<td></td>
<td>prepare lunch and/or prepare leftover fish for drying</td>
</tr>
<tr>
<td>1 p.m.</td>
<td>mend nets</td>
<td>help mend nets</td>
</tr>
<tr>
<td>3 p.m.</td>
<td></td>
<td>tend to livestock and mangrove farm</td>
</tr>
<tr>
<td>5 p.m.</td>
<td>prepare equipment for fishing</td>
<td>clean house/surrounding, fetch water, prepare dinner and pack food for fisher husband</td>
</tr>
<tr>
<td>9 p.m.</td>
<td>fishing</td>
<td>retire to bed</td>
</tr>
</tbody>
</table>

The composite profile of time allocation of men and women in the community reveals the multiple roles women have in the maintenance and sustenance of their home combined with home-based and coastal-based productive activities.

5. Access and control over resources and benefits – productive resources such as land, house, fishing gear and equipment, tools, etc.

Access and control over resources and benefits

<table>
<thead>
<tr>
<th>Resources</th>
<th>Access</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>House</td>
<td>Men &amp; Women</td>
<td>Men &amp; Women</td>
</tr>
<tr>
<td>Fishing equipment</td>
<td>Men</td>
<td>Men</td>
</tr>
<tr>
<td>Mangrove farms</td>
<td>Women</td>
<td>Women</td>
</tr>
<tr>
<td>Income</td>
<td>Men &amp; Women</td>
<td>Men</td>
</tr>
<tr>
<td>Formal loans</td>
<td>Men &amp; Women</td>
<td>Men</td>
</tr>
</tbody>
</table>

Men and women seemingly have equal access to resources but men have more control over the resources.
Stage 3: Gender responsive planning

Based on the assumption that the participants have critically diagnosed the capacity of their resources and have analyzed gender roles, proceed now to gender-responsive planning.

1. Group the men and women separately.

2. Ask the groups to use the data they have gathered in stages 1 and 2 to identify changes they want to happen in their productive and reproductive activities.

3. Ask each group to formulate a gender-responsive plan of action (i.e., considering division of labor, multiple roles of women, equitable access and control of both men and women.

4. Ask the two groups to come together and reach a consensus on what projects/activities to prioritize (refer to the topic on preference ranking).

5. Identify government and non-government agencies that can possibly assist them in the implementation of the plans (refer also to topics on institutional analysis and stakeholder analysis).
Output

★ Sample plan of action addressing the need of both men and women

Strengths

- Highlights the unique contribution of men and women in the use and management of coastal resources.
- Highlights the often neglected contribution of women in production work.
- Increases awareness of both men and women regarding their perceived roles and relationships in the productive and reproductive spheres.

Limitation

- Discussions can be strongly influenced by cultural (e.g., religion, tradition) biases and might end up in heated discussions or debates.

Compiled by Felixberto Roquia, Jr.

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Annex
Sampling equipment for quantitative methods

Tips for construction or selection, maintenance and use

Snorkeling gear

**Mask**

Better than home-made goggles as it is much easier to see what you are trying to measure.

**Snorkel**

Essential so that observers can keep their faces in the water and their eyes on the sampling area.

**Fins**

Allow a swimmer to propel her/his self out of danger quickly. Also encourage swimmers to keep their feet up away from corals which could be damaged during sampling.
Mask, fins and snorkel must be washed in fresh water after use, allowed to dry and stored in a dry place away from direct sunlight. To preserve rubber parts, sprinkle talcum powder for long-term storage.

**Data recording**

**Underwater data slate**

Made of white plastic or plastic-laminated wood, the slate is roughly the size of a sheet of A4 paper. It has a sharpened, soft lead pencil attached by a string. Carving a groove near the top of the pencil helps the string stay in place. Two more holes may be drilled at the bottom corners of the slate to attach a second string, so that the slate can be hung around the neck of a swimmer.

After use, pencil marks can be rubbed off the slate using toothpaste or an acidic, unripe fruit (mango, nutmeg flesh).

**Manta board**

The manta board can be cut out of any available wood or plywood. Data slates can be attached using screws or clips. The manta board rope is 17 m long polyethylene rope connecting the board to the boat. Attach colored markers to the rope at 6 m intervals to allow the snorkeler to record the visibility.
Finding your direction

Compass
A compass keeps a walker or swimmer moving in a consistent direction and helps you lay out a transect rope in straight line. Pick a compass that is entirely made of plastic and suitable for use underwater.

Measuring weight

Spring balance
Cheap, small, easy to carry spring balances for weighing fish are readily available but rarely very durable. Handle with care and keep as free of salt as possible. Select a balance that is in keeping with the type of fish you want to measure (i.e. a 1 kg or 5 kg balance for small fish, 10 or 25 kg balance for large fish) and also with the degree of accuracy you need. Different balances have different scales of measurement i.e., may be accurate to 100 g, 250 g, 500 g etc.

Weighing scales
Top loading weigh scales are more accurate than spring balances but are heavy and bulky and need to be kept in one place. As with all metal objects, thoroughly clean off salt after each use.
Measuring distance, depth, length and circumference

Fish measuring board
A conveniently sized (e.g., 50 cm), straight wooden board or plastic sheet with a centimeter scale either embedded or drawn with a permanent pen. A short vertical headboard allows fish length to be measured from snout to fork of tail.

Measuring stick
Wooden ruler or straight stick 2 m tall and marked at 1 cm intervals, for measuring water depth or tree height.

Tailor’s measuring tape
The measuring tape is usually 2 m in length. A tape made of plastic material is recommended for working in wet conditions. This can be used to measure the girth (circumference) of trees, depth of shallow water, length of fish or shellfish, etc.
Transect rope as a distance measurement tool

A transect rope, usually 50 or 100 m long (but can be any length that suits the purpose) is used to measure distance during a walking transect. It should be a durable but light rope, made of material that does not get tangled easily. Keep the transect rope wound onto a reel when not in use, to prevent tangling.

Selecting sampling points

Transect rope as a sampling point selection tool

When a transect rope is used to select sampling points, mark it at 1, 5 or 10 m intervals (depending on purpose), using brightly colored tape. Use a different color for each distance marker (red for 1 m, blue every 5 m, etc.). Use a permanent ink pen to write total distance on the 10 m markers (i.e., 10 m, 20 m, 30 m).

If the transect rope is to be used underwater, pick a type of rope that does not float. Otherwise you will have to attach small weights to it at frequent intervals.

Fiberglass tape measure

For some types of work (e.g., line intercept transects requiring data gathering at 1 to 10 cm intervals; detailed mapping) a 50 m fiberglass tape measure makes the best transect rope. These fiberglass tape measures come with a handy reel, are very durable and do not float.
Remember to wash your tape measure in fresh water and allow it to dry before putting it away.

**Aids for selecting random sampling points**

**Sampling rock, stick or rope**

When using a random quadrat sampling method, the idea is to select random sampling points so that all parts of the sampling site have an equal chance of being measured.

However, observer bias is hard to avoid. Some may want to measure only “nice” coral, or decide to put the quadrat over sand so that sampling can be finished more quickly. A colored rock or stick can be tossed over the shoulder to randomly select a sampling point. If the tool is likely to get lost or cause damage, a sampling rope can be used.

A sampling rope is a 25 m long piece of light rope with 3 - 5 brightly coloured markers tied or taped on. The rope is laid over the habitat to be sampled and the markers are used as sampling points.

If being used for underwater sampling, the rope should not float. If it does float, you need to attach enough small weights to it (sinkers, shells, stones) to keep it on the bottom. In this case, the weights can be used as sampling point markers.

A sampling rope is different from a transect rope. Sampling markers on the rope are not at regular intervals. The rope is
placed on the sample site haphazardly and does not have to be in a straight line. The only constraint is that sampling points should be far enough apart that there is no chance for two sampling points (quadrats) to overlap. The rope is laid down repeatedly until the desired number of samples have been collected.

Defining the size of a sampling point

Quadrat

The quadrat is a tool that consistently defines the size of the sampling point. This makes it possible to collect quantitative information of consistent quality. Data collected is in the form of number of individuals or percentage cover per quadrat.

The quadrat is a rigid square which can be made of thin iron rods, or plastic pipes drilled with holes to let water in. It is important that quadrats to be used underwater do not float, but they should also not be too heavy.

People usually find it easier to estimate percentage cover if the quadrat is divided into four, sixteen or twenty five smaller squares using stiff wire or thin metal rods. For instance, when using a 16 square quadrat, observers may wish to record the number of squares covered by each category, and then calculate the percentage cover after returning to land. For instance, if living corals occupy 10 of the 16 squares, this is the same as $10/16 \times 100\% = 62.5\%$ cover.
Quadrats do not have to be 1 m square. The size can be adjusted to suit the size and frequency of the object being measured, e.g., quadrats measuring 0.5 m square and subdivided into 25 squares are often used for seagrass and dense shellfish populations.

If there are problems with entanglement of the quadrat with corals etc., try a two-sided quadrat or even an imaginary quadrat.

If you use several different sizes and styles of quadrat, you must be consistent about which one you use in each type of habitat.

Training tips for quadrats

When training with quadrats, practise estimating percentage cover on land (% cover of grass). Use only one category at first (i.e., % cover of living grass) then work up to being able to estimate 2, 3 and more categories inside one quadrat (i.e., living grass, dead grass, bare dirt and rocks). Work in groups to reach a common perception about percentage cover.

Observers should be encouraged to take their time and consult one another when trying to estimate cover on patchy bottom. Try to visualize picking up each separate clump of the coral, seaweed or whatever, and moving it next to a larger clump, repeating the process until, in your mind's eye, a whole section of the quadrat is filled and the percentage cover is obvious.

Permanent belt transects

An improvised permanent belt transect can be made using polyethylene rope, GI wire, a combination of both or other locally available material (e.g., vine). The rope or wire is permanently attached to the bottom, defining a rectangular
sampling site that is repeatedly monitored over time. The specific length and width of the sampling area may vary according to the need. Distance along each side of the rectangle should be marked to facilitate data gathering. If it is a 5 m x 20 m area, mark every 5 m along the long side.

Permanent belt transects or permanent quadrats (like a belt transect but square) can be set up in a variety of habitats. On solid rock bottom, the rope or wire can be secured using iron rods or large spikes hammered into the bottom. The rope can also be attached to large rocks or corals. It is important that the rope be kept straight and that it is secured at frequent intervals. Then if it breaks loose at one point, it will not whip around and get tangled in corals, etc., possibly causing damage.

![Diagram of permanent transect](image)

Markers for permanent sampling sites

Markers attached to the bottom

Establishing permanent markers in the sea is a challenge because storm waves are very powerful and can remove many types of markers.

Permanent markers in the intertidal area should be brightly colored (orange works well), small and flat and firmly secured by a spike or by underwater cement.

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Sampling equipment for quantitative methods 213
Markers can also be attached to branching coral. In this case, they should be plastic, durable, light, brightly colored and loosely attached to a lower branch.

If placing a buoy to mark a sampling site, keep the following in mind:

- Local fishers must know why it is there so that they do not remove it. Try attaching a flag with a message in the local language.
- If possible, use a small float that remains submerged as opposed to a surface buoy.
- Use a floating rope to attach your buoy and keep it as short as possible. This limits the chances of entanglement of the rope with corals.
- An anchor must be big and strong enough to resist the force of waves but not so big as to be aesthetically offensive. You may have to use underwater cement to keep the anchor in place and/or hammer an attachment into the bottom.

Soft bottom plot markers

Stakes 1.5 m in length for marking survey plots in soft-bottom habitats like mangroves can be made of wood, iron bar or PVC pipes. Wood may be readily available but will not last as long. Iron is cheap and durable. PVC pipes are the most durable but relatively expensive.

Drive the stake 0.5 m into the substrate and leave 1 m sticking up above ground.
Tree markers

Metal plates can be hammered onto trees to mark permanent sampling plots. Information is written on the plate, such as the transect and plot number and tree number.

Collecting physical data

Thermometer

Thermometers for use by community data collectors should be sturdy, preferably plastic with alcohol inside as opposed to glass with mercury inside. If possible, select a model that allows a string to be attached, and keep it inside a case to keep it safe. If the thermometer is attached to a string, it can be dangled more easily over the side of a boat, raft or wharf.

Secchi disc

A secchi disk measures transparency, i.e., the distance light penetrates into the sea. The cleaner the water is, the greater the transparency.

The secchi disk can be made of plywood, wood with a surface plastic lamination, or a paint tin lid. Cut the wood into a circle or select a lid 8 inches in diameter. The circle must be painted with shiny black and white paint in a pie-wedge pattern. Drill a hole through the centre of the disk. Pass a rope through the hole and attach a lead or other weight (about 3 kg) to the lower end of the rope. Above the disk, the rope should be 25 m long and
marked at 1 m intervals with tape or by tying brightly colored string through the strands of the rope.

The disk is used by lowering it through the water over the chosen sampling site. Keep your back to the sun so that the glare on the water does not interfere with your eyesight. Watch the disk as it drops through the water, counting off each meter of rope as it enters the water. When the disk disappears, stop counting and record the number of meters depth. Slowly pull the rope in, counting backwards until the disk becomes visible. Record this depth too. The transparency (depth at which the secchi disk can be seen) is recorded as the average of the two measurements.

Data analysis

Calculator

Pick one that is cheap, durable and simple. Look for a dual energy source model (battery and solar).

Prepared by Irene Novaczek
Livelihoods

People in coastal communities undertake a mixture of occupations, means of food production and other activities in order to provide food, shelter, health, education and spiritual enhancement. For some purposes, natural resources available locally are used through fishing, farming, and forestry. In other cases, products or services must be sold to purchase necessary material goods and services.

The options for productive activities for coastal communities are limited, particularly for poor communities that do not have the means to go far to sea or to access nearby productive farm land. If options were available, inventive people would have pursued these already. Nevertheless, there is a need to explore new opportunities provided by successful community-based coastal resource management (CBCRM) within the context of establishing greater access and control over coastal resources. When this is achieved, it is assumed that this would bring about greater food security and increase in income.
There are two generally recognized categories of interventions that could help raise productivity in coastal communities: one, to improve the natural environment; and two, to develop enterprises.

The former is often considered as conservation, enhancement and rehabilitation while the latter is often referred to as livelihood. However, these activities are closely interlinked: one is either dependent or greatly affected by the other.

For example, an improved mangrove forest through restriction of cutting or through reforestation will lead directly to improved fish catch, resulting in increased income and food security. On the other hand, income and food from an aquaculture enterprise reduces the need for fish from the sea and can lead to environmental rehabilitation.
The word "livelihood" is used often and in many ways: alternative livelihoods, supplemental livelihoods and sustainable livelihoods. In many uses, the term livelihood has primarily an economic focus. It should however look beyond economic activities and include quality of life measures, means of providing sustenance, shelter, health and satisfaction. If the development workers' role is to facilitate the improvement in quality of life, they should always maintain this broader perspective.

Some recognized definitions of livelihood

- Livelihoods can include a level of wealth and of stocks and flows of food and cash which provide for physical and social well-being. This includes security against sickness, against early death and against becoming poorer (Chambers, 1993)

Livelihoods: are the means, activities and entitlements by which people make a living (N. Singh)

- Sustainable livelihoods is a balance between economic efficiency, ecological integrity and human well-being, including equity considerations. Sustainable livelihoods are derived from people's capacity to access options and resources and use them to make a living in such a way as not to foreclose options for others to make a living, either now or in the future. (N. Singh).

- A sustainable livelihood includes reserves which can be used to meet contingencies of sickness, accidents, losses, sudden or major social needs, and so on. (Chambers, 1993).

Rehabilitation and conservation projects affect resource users (e.g., gleaners in intertidal area, fishers) in such way that often these users must withdraw from using a particular resource they depend upon for livelihood, in order to conserve that resource or allow time for regeneration and ultimately greater and more sustainable yields.
Decisions on which conservation or livelihood activities to pursue can be made using some of the tools in this sourcebook. Other information will be needed in some cases, such as market data, and will have to be obtained with other methods.

**Remember**

This book is not intended to provide details of the technical or procedural aspects of such interventions. Advantages and disadvantages of various livelihood projects are discussed. Other information (e.g., site suitability, markets, infrastructure and required skills) to be considered during planning and implementation of livelihood projects are also outlined. This information could be useful when initially reviewing options for a specific area.

Following is a table of livelihood projects that can be considered in exploring options for the development of enterprises for coastal communities.
# Livelihood projects

<table>
<thead>
<tr>
<th>Livelihood</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquaculture</td>
<td>• Income may be expected within 6 months</td>
<td>• Juvenile collection may cause stock depletion</td>
<td>• Appropriate conditions (protected cove) in site selection</td>
</tr>
<tr>
<td></td>
<td>• Capital investment may be low</td>
<td>• Must have calm waters</td>
<td>• Brackish water for some species</td>
</tr>
<tr>
<td></td>
<td>• Technology simple and ecologically-sound</td>
<td>• Labor-intensive</td>
<td>• Tenure/access rights to area</td>
</tr>
<tr>
<td></td>
<td>• Potential for live market</td>
<td>• Risk of losing fish to theft or storms</td>
<td>• Availability of feed</td>
</tr>
<tr>
<td>Fish cage culture</td>
<td></td>
<td></td>
<td>• Knowledge and skills in managing project</td>
</tr>
<tr>
<td>Livelihood</td>
<td>Advantages</td>
<td>Disadvantages</td>
<td>Requirements</td>
</tr>
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</tr>
</tbody>
</table>
| Grouper grow-out in cages | • One of the most commercially-important species  
• High market price especially for live market  
• Capital investment is not large  
• Technology is simple and ecologically-sound | • Gathering stock from natural habitat might cause depletion  
• Often calm water conditions are not available  
• High labor input to clean cages  
• Risk of losing fish to theft  
• Risk of losing fish to a typhoon/storm and large waves | • Seawater  
• Sheltered area (protected against waves)  
• Regular cyanide testing (if possible) to discourage use of poisons |
<table>
<thead>
<tr>
<th>Livelihood</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oyster/mussels culture</td>
<td>• Low investment</td>
<td>• Possibly moderate/low demand</td>
<td>• Site sheltered from waves</td>
</tr>
<tr>
<td></td>
<td>• Low labor input needed</td>
<td>• Perishable</td>
<td>• Site without pollution</td>
</tr>
<tr>
<td></td>
<td>• Simple technology</td>
<td>• Vulnerable to theft</td>
<td>• Local seed source</td>
</tr>
<tr>
<td></td>
<td>• Uses local and cheap materials</td>
<td>• Red tide</td>
<td>• Good water flow</td>
</tr>
<tr>
<td>Seaweed culture</td>
<td>• Short growth cycle</td>
<td>• Grazing by fish may be high</td>
<td>• Good water flow</td>
</tr>
<tr>
<td></td>
<td>• Seed for next cycle can be gathered from harvest</td>
<td>• Market may demand high quality</td>
<td>• Brackish to full seawater</td>
</tr>
<tr>
<td></td>
<td>• Enhances local fish resources</td>
<td>• Some buyers only take large lots</td>
<td>• No history of disease in site</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fluctuating price of some species</td>
<td></td>
</tr>
<tr>
<td>Livelihood</td>
<td>Advantages</td>
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</tr>
<tr>
<td>Mud crab fattening</td>
<td>• High market price</td>
<td>• Collecting stock may deplete supply</td>
<td>• Brackish water site</td>
</tr>
<tr>
<td></td>
<td>• Short cycle</td>
<td>• Availability of feed</td>
<td>• Muddy bottom or cages</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Crabs are carnivores</td>
<td></td>
</tr>
<tr>
<td>Sea urchin culture</td>
<td>• Low cost</td>
<td>• Possible shortage of seed</td>
<td>• Hard bottom, marine site</td>
</tr>
<tr>
<td></td>
<td>• High market price</td>
<td>• Vulnerable to theft</td>
<td>• Seaweed as reed</td>
</tr>
<tr>
<td></td>
<td>• Little or no negative environmental impact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sea cucumber</td>
<td>• Low cost</td>
<td>• Growth may be seasonal</td>
<td>• Soft bottom site</td>
</tr>
<tr>
<td></td>
<td>• No feed added</td>
<td>• Seed may not always be available</td>
<td>• Sheltered site</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Good water flow</td>
</tr>
<tr>
<td>Livelihood</td>
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<td>Disadvantages</td>
<td>Requirements</td>
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<tr>
<td>Sea ranching</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abalone</td>
<td>• Slow moving</td>
<td>• Few successful demonstrations</td>
<td>• Hard bottom marine site</td>
</tr>
<tr>
<td></td>
<td>• High market value</td>
<td>• Seed supply may not always be available</td>
<td>• Availability of feed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Promotes conservation</td>
<td></td>
</tr>
<tr>
<td>Giant clam</td>
<td>• Low maintenance</td>
<td>• Seed supply may not always be available</td>
<td>• Reef area</td>
</tr>
<tr>
<td></td>
<td>• No feeding</td>
<td>• Vulnerable to theft</td>
<td>• Tenure and security</td>
</tr>
<tr>
<td></td>
<td>• Promotes conservation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquaculture sales and service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collection of fish seed to stock ponds (e.g., milkfish and <em>Chanos spp.</em>)</td>
<td>• Part-time</td>
<td>• Demand limited or seasonal</td>
<td>• Near the shore or brackish water area</td>
</tr>
<tr>
<td></td>
<td>• Whole family can participate</td>
<td>• May lead to depletion of stocks</td>
<td>• Appropriate transportation facilities</td>
</tr>
<tr>
<td></td>
<td>• Low investment</td>
<td></td>
<td>• Permit might be needed</td>
</tr>
<tr>
<td></td>
<td>• High profit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Livelihood</td>
<td>Advantages</td>
<td>Disadvantages</td>
<td>Requirements</td>
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<td>-------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Food processing</td>
<td>- Adds value to local resources</td>
<td>- Requires training and ongoing management and quality control</td>
<td>- Resources in excess of local food demand (Caution: Do not turn a women's family food resource into a men's cash crop)</td>
</tr>
<tr>
<td>Drying/salting of fish</td>
<td>- Reduces perishability</td>
<td>- May promote an unsustainable fishery</td>
<td>- Knowledge/skills in drying/salting</td>
</tr>
<tr>
<td></td>
<td>- Good fish processing alternative during peak season of fish catch</td>
<td></td>
<td>- Constant supply of fish</td>
</tr>
<tr>
<td>Advantages</td>
<td>Requirements</td>
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<td>------------</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Increases value of product</td>
<td>Quality and sanitary control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduces perishability</td>
<td>Supply of fish, clams, mussels, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Also good for home consumption</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Livelihood</td>
<td>Advantages</td>
<td>Disadvantages</td>
<td>Requirements</td>
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<tr>
<td>-----------------------------</td>
<td>----------------------------------------------------------------------------</td>
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<td>-------------------------------------------</td>
</tr>
<tr>
<td>Fermented fish processing</td>
<td>• Increases shelf life</td>
<td>• Seasonal</td>
<td>• Quality control</td>
</tr>
<tr>
<td></td>
<td>• Makes use of local materials</td>
<td></td>
<td>• Processing plant or kitchen</td>
</tr>
<tr>
<td></td>
<td>• Value added product</td>
<td></td>
<td>• Storage facility</td>
</tr>
<tr>
<td></td>
<td>• Good for home consumption</td>
<td></td>
<td>• Skilled labor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Requires hygienic environment</td>
</tr>
</tbody>
</table>

**Marketing chain business development**

<p>| Transportation of fresh fish | • Avoids trader/middle person                                               | • High investment | • Skilled labor needed                    |
|                             | • Fish reaches market faster, in better condition                           | • Moderate risk of loss | • Ice-box                                 |</p>
<table>
<thead>
<tr>
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<th>Disadvantages</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basket making</td>
<td>• Home made</td>
<td>• Labor intensive</td>
<td>• Supply of materials</td>
</tr>
<tr>
<td></td>
<td>• Local demand/use</td>
<td>• Limited demand</td>
<td>• Skills</td>
</tr>
<tr>
<td>Live fish capture and sale</td>
<td>• High priced product (aquarium fish, restaurant trade)</td>
<td>• High technical skills needed</td>
<td>• Storage and shipping</td>
</tr>
<tr>
<td></td>
<td>• Can promote conservation</td>
<td>• High risk for fishers</td>
<td>• Infrastructure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Potential use of destructive methods</td>
<td>• Quality control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Potential depletion of stock</td>
<td>• Market</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Skills in proper methods</td>
</tr>
<tr>
<td><strong>Fishery supply and service</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selling of fuel for outboard engines</td>
<td>• Local fuel depot makes supply system more efficient</td>
<td>• High investment</td>
<td>• Storage space</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Potential environmental hazard</td>
<td>• Business skills</td>
</tr>
<tr>
<td>Livelihood</td>
<td>Advantages</td>
<td>Disadvantages</td>
<td>Requirements</td>
</tr>
<tr>
<td>-------------------------</td>
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<td>-------------------------------------------------</td>
</tr>
<tr>
<td>Boat making</td>
<td>• Uses local resources and labor</td>
<td>• Materials used might be gathered illegally</td>
<td>• Special construction skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Might need permit from local government</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(e.g., gathering wood)</td>
</tr>
<tr>
<td>Net making/net mending</td>
<td>• Uses traditional skills</td>
<td>• Limited demand for handmade nets</td>
<td>• Net making/mending skills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Investment needed</td>
<td></td>
</tr>
<tr>
<td>Salt making</td>
<td>• Used for fish processing</td>
<td>• Highly perishable</td>
<td>• Appropriate storage facilities</td>
</tr>
<tr>
<td></td>
<td>• Maximizes use of local skills</td>
<td>• Needs wide space/land for salt drying</td>
<td>• Market/users of iodized salt</td>
</tr>
<tr>
<td></td>
<td>• Low investment</td>
<td></td>
<td>• Land area</td>
</tr>
<tr>
<td>Livelihood</td>
<td>Advantages</td>
<td>Disadvantages</td>
<td>Requirements</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>------------------------------------------------------</td>
<td>----------------------------------------------------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>Selling refreshments to fishers at landing sites</td>
<td>• High demand</td>
<td>• Seasonal activity</td>
<td>• Basic infrastructure (e.g., movable kiosk)</td>
</tr>
<tr>
<td></td>
<td>• High profit</td>
<td>depending on seasonality of fish catch</td>
<td>• Initial investment of income</td>
</tr>
<tr>
<td>Community cooperatives</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small shop/kiosk</td>
<td>• Profits go into revolving funds for small business development</td>
<td>• Have to train managers</td>
<td>• Site</td>
</tr>
<tr>
<td>Fish marketing cooperative</td>
<td>• Cuts out the middle trader</td>
<td>• Need starting capital</td>
<td>• Small building</td>
</tr>
<tr>
<td></td>
<td>• Increased profits to producers</td>
<td>• Needs long time to develop</td>
<td>• Supply of goods for sale</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Storehouse/ice plant</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Good location/strategies</td>
</tr>
</tbody>
</table>

Livelihood Advantages

- Selling refreshments to fishers at landing sites
  - High demand
  - High profit

Disadvantages

- Seasonal activity depending on seasonality of fish catch

Requirements

- Basic infrastructure (e.g., movable kiosk)
- Initial investment of income

Community cooperatives

- Management skills critical

- Have to train managers
- Need starting capital

Requirements

- Site
- Small building
- Supply of goods for sale
- Storehouse/ice plant
- Good location/strategies
<table>
<thead>
<tr>
<th>Livelihood</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community-based ecotourism</td>
<td>• Local control spreads the wealth from tourism</td>
<td>• Tourists bring garbage</td>
<td>• Site</td>
</tr>
<tr>
<td></td>
<td>• Communities become active participants, instead of tourism objects</td>
<td>• Tourists may not be culturally sensitive or have a negative cultural impact</td>
<td>- Natural attraction (reef, forest, wildlife)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Good transportation and accommodation facilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Clean, modern sanitary facilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Clean drinking water</td>
</tr>
<tr>
<td>Rental of tourist cottage</td>
<td>• Cottage can be built from traditional materials (sago, bamboo, wood)</td>
<td>• Needs starting capital</td>
<td>• Has to be near an attraction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Needs secure place to store passports, valuables</td>
<td>• Clean, safe, attractive</td>
</tr>
<tr>
<td>Livelihood</td>
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<td>Disadvantages</td>
<td>Requirements</td>
</tr>
<tr>
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<td>-----------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Tourist homestay/bed and breakfast</td>
<td>• Home renovation benefits family as well as guests</td>
<td>• Capital investment can be high or low</td>
<td>• Clean, safe, comfortable, friendly accommodation</td>
</tr>
<tr>
<td></td>
<td>• Visitors experience local family life</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recreation park</td>
<td>• Can be used by locals as well as visitors</td>
<td>• Requires consistent management and care</td>
<td>• Clean, safe, attractive environment</td>
</tr>
<tr>
<td></td>
<td>• Source of municipal pride</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guided tours (walking, snorkeling)</td>
<td>• Draws on traditional knowledge</td>
<td>• Need to be able to speak tourist’s language, e.g., English</td>
<td>• Well planned trails/routes</td>
</tr>
<tr>
<td></td>
<td>• Promotes interest in local history, culture and ecology</td>
<td></td>
<td>• Well marked trails and routes</td>
</tr>
<tr>
<td>Livelihood</td>
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<td>Disadvantages</td>
<td>Requirements</td>
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<td>---------------------------------------------------</td>
</tr>
<tr>
<td>Fishing trips</td>
<td>• Uses local skills and knowledge and existing infrastructure</td>
<td>• Language skills</td>
<td>• Safe, well maintained boat</td>
</tr>
<tr>
<td></td>
<td>• Fishing boat hulls can be refurbished for ecotourism, reducing investment cost</td>
<td>• Need to be able to speak tourist's language</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Uses local skills, knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boat tours, canoe rides, glass bottom boat rides</td>
<td>• Low investment cost</td>
<td>• Needs good marketing and coordination</td>
<td>• Safe, well planned, convenient place</td>
</tr>
<tr>
<td></td>
<td>• Features local fresh fish, shellfish</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Can be very simple</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>• Can incorporate local songs, story-telling, theatre skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organized fish/lobster feasts on beach</td>
<td>• Clean, attractive beach with cooking area, picnic tables, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Livelihood</td>
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<td>Disadvantages</td>
<td>Requirements</td>
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</tr>
<tr>
<td>Food stall/restaurant</td>
<td>• If it features local traditional foods, can use local skills</td>
<td>• Need to be able to communicate with visitors</td>
<td>• Attractive location close to tourist attraction or accommodations</td>
</tr>
<tr>
<td></td>
<td>• Opportunities for women</td>
<td>• Needs quality control</td>
<td>• Clean place and amenities</td>
</tr>
<tr>
<td></td>
<td>• Can be very simple</td>
<td></td>
<td>• Friendly staff</td>
</tr>
<tr>
<td>Handicraft production</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-marine based</td>
<td>• Can be long lasting</td>
<td>• Needs training, skills and dedication</td>
<td>• Skills for making a craft</td>
</tr>
<tr>
<td>crafts/souvenirs</td>
<td>• Lucrative and rewarding to pride of workmanship</td>
<td>• Needs market</td>
<td>• Good ideas</td>
</tr>
<tr>
<td>(wooden shells, T-shirts,</td>
<td>• Can raise awareness of marine conservation/advocacy for</td>
<td>• Can overexploit certain resources (e.g., wood)</td>
<td>• Capital to buy materials</td>
</tr>
<tr>
<td>mats, carving, artwork,</td>
<td>conservation, protection, sustainable development</td>
<td></td>
<td>• Training</td>
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<tr>
<td>food, etc.)</td>
<td></td>
<td></td>
<td>• Tourist or local market available</td>
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<td></td>
<td></td>
<td></td>
<td>• Quality control</td>
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<tr>
<td>Livelihood</td>
<td>Advantages</td>
<td>Disadvantages</td>
<td>Requirements</td>
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<tr>
<td><strong>Agriculture/land-based</strong></td>
<td></td>
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<tr>
<td>Vegetable production</td>
<td>• Can be grown in small areas</td>
<td>• May demand scarce fresh water</td>
<td>• Garden around the house</td>
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<tr>
<td></td>
<td>• Increases variety of diet</td>
<td></td>
<td>• Access to planting materials</td>
</tr>
<tr>
<td></td>
<td>• Continuous supply of food</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Simple technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bio-intensive backyard gardening</strong></td>
<td>• Simple technology</td>
<td>• Requires land area</td>
<td>• Should be done around the house</td>
</tr>
<tr>
<td></td>
<td>• Increases food security</td>
<td>• Labor intensive</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Hygienic waste disposal</td>
<td></td>
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<tr>
<td></td>
<td>• Whole family can be involved</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Increases variety of diet</td>
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<tr>
<td>Livelihood</td>
<td>Advantages</td>
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</tr>
</tbody>
</table>
| Small livestock (pigs, chicken, ducks and goats) | • Varied diets  
• Can be integrated with crops  
• Local breeds easily adapt to the area and conditions | • Requires feeding  
• Veterinary needs  
• Some animals are very sensitive to climate, disease, etc. | • Kept around house  
• Technology/skills needed (control of diseases, housing, feeding, management) |
Glossary

This glossary is designed to provide both general definition of terms used in the sourcebook as well as special forms of usage that have been adopted for this particular publication.

A

ancestral waters  marine areas claimed by indigenous peoples as having been part of their territory since time immemorial

approach  a systematic strategy or methodology for addressing a development or conservation concern

For example, community based coastal resource management is an approach to addressing integrated conservation and development in coastal areas.

artesinal fisheries  usually small-scale, local, subsistence fisheries conducted by individuals or small groups

assessment  a review or informal evaluation of a selected condition

associated species  living things (e.g., plants, animals) that are commonly found or interact with a given organism, habitat or ecosystem

B

baseline information  usually the first measurement of an indicator taken at the beginning of a project and used to compare with subsequent measures taken after some intervention has been implemented
biases  a prejudiced outlook of an individual or group of individuals based on a perspective or pre-conceived notion that does not fairly represent the larger population.

biodiversity  the variety of living things found in a given area

This includes the variety of genes (i.e., genetic diversity), the variety of species (species diversity) or the variety of ecosystems (ecosystem diversity). In addition, the variety of functions (e.g., producers, consumers and decomposers) and the variety of cultures or cultural diversity (e.g., distinct ethnolinguistic groups) are also considered part of biodiversity.

buffer strips  lengths of land or water that serve to provide protection to an area in need of protection from some external threat

For example, a five-meter wide strip of land running alongside a river may serve as a buffer strip to prevent surface erosion from entering the river.

buffer zone  an area of land or water that serves to provide protection to a conservation area (usually surrounding it) designated for protection from some external threat

For example, an area one hundred meters wide surrounding a marine sanctuary that may have some regulations regarding productive activities.
C

**case study**  a short description of a particular project, situation or condition that serves to communicate key messages to the reader

Case studies are commonly used to document experiences and share them more widely through training or workshops.

**community**  an association of people living in a given area or sharing some general commonality in addition to geographic proximity

An ecological community refers to an association of plants and animals living in a given ecosystem.

**comparative information**  data that relies on other data as a point of reference (i.e., relative measures) and that cannot provide a precise measure of accuracy in and of itself

For example, trend analysis may indicate that fish yields are decreasing every year, but will not necessarily provide the absolute figures for yield for each year. Similarly, local preferences may rank choices by comparison and not necessarily by some independent quantitative measure. This information may be all that is necessary to initiate some action, in other cases, more absolute information may be required.

**consensus**  agreement by a large majority of a population or group

It is considered ideal when the entire population or group is in agreement.

**conservation**  the maintenance of careful regulation of a resource or area through sustainable use
The term conservation has been commonly and mistakenly been used as a synonym for preservation which refers to strict protection of a resource or area.

**coping mechanisms** ways in which individuals, households or groups adjust to or deal with difficult or changing conditions

For example, during periods of peak labor requirement, children may be taken out of school to provide additional labor. For projects, coping mechanisms may refer to ways in which project staff address problems that may impede the implementation of planned activities.

**customary laws** rights, regulations and norms that have been established over time and are generally accepted by a group as a framework for governing social behavior

Contrast with State law, which refers to an official legal system of a nation.

**cross-check** a way of ensuring accuracy of data collection by comparing information on a given subject from one source or method with information on the same subject from another source or method

**cyclical periods** specific lengths of time that are established by naturally occurring cycles or rhythms

For example, the length of time required for the earth to make one complete revolution (orbit) around the sun is referred to as an annual or solar cycle. Depending on latitude and regional climate, this will result in regular seasonal patterns. Similarly, the length of time required for the moon to revolve (orbit) the earth is referred to as a lunar cycle. This cycle influences tides and associated phenomena.
emphasize the ability to understand the feelings of another person or group by trying to put oneself in the position of the other person and feel the emotions from this perspective

enhancement the improvement of some condition based on a human perspective of what constitutes improvement

fish fry recently-hatched fishes

gender “the socially constructed roles and responsibilities of women and men, in a given culture or location” (CEDPA/Gender and Development Training Manual, 1996)

gender analysis “an organized approach for considering gender issues in the entire process of program development” (CEDPA/Gender and Development Training Manual, 1996)

gender and development an approach which seeks to empower women and transform unequal relations between women and men” (CEDPA/Gender and Development Training Manual, 1996)

genera plural form of genus which is a category or level used to classify living things according to biological and structural similarities and differences

gleaners individuals or groups that collect or harvest resources from the wild without cultivation or propagation
indicative data  data that implies, demonstrates or suggests a certain condition

For example, the existence of coral rubble in a circular pattern is indicative data suggesting the occurrence of dynamite fishing.

indicator species  a specific organism that implies, demonstrates or suggests a certain condition

For example, the occurrence of large numbers of crown of thorns starfish.

indigenous knowledge  information, practices, technologies, beliefs, tools, materials, experimentation, skills, pedagogy, communication systems and other social systems or institutions that people in a given group, community or area have tested, adapted and continue to adapt over time

indigenous taxonomies  systems and categories of organizing or associating living and non living resources

For example, local groups will classify or categorize soil, fish and other resources into locally-recognized groupings.

informal community organizations  organizations that are not officially registered or recognized by national or local governments

informant  a person who provides information

intertidal zone  the area between above the lowest low tide mark up to the point where tidal influence continues (commonly the highest high tide mark) or slightly beyond
J

juveniles fish or aquatic organisms usually characterized by the incomplete development of reproductive organs

L

legend a description of symbols or abbreviations used on a map

letter-petition a formal and organized request for change or action by preparing a letter of request and having it signed by a large number of people who support the specific contents of the letter

local ecological knowledge refer to indigenous knowledge

logbook a notebook used to record in chronological order the events considered important based on local needs and preferences

M

manta tow a shallow water survey method that employs towing a swimmer behind a boat by a length of rope with a wooden board at the swimmers' end that is used for stability, maneuverability and recording observations

marine reserve an area of ocean protected from specified or all uses for any number of reasons including unique biodiversity, its support as habitat for local fisheries, educational purposes, rehabilitation and restoration

marketing the entire process of identifying, creating addressing and supplying the demand for any given product

This may involve market research, product development, pricing, advertising and determining methods of sales.
media  any or all of three forms of information dissemination:  1. print (e.g., newspapers), 2. audio (e.g., radio) and audio-visual (e.g., television)

media campaign  a systematic effort to use the media to gain support for a particular position or objective

medium  a channel of communication or information dissemination (refer to media)

methodology  a general approach or framework that employs a related collection or body of methods consistent with the overall approach

For example, CBCRM can be seen as a methodology.

methods  a systematic procedure employed to achieve a certain objective

For example, participatory methods are procedures that follow certain guidelines to maximize participation, minimize bias, ensure validity and balance precision with time and effort. The methods described in this sourcebook make use of more specific tools such as matrices or diagrams and are part of a larger methodology.

monitoring  the process of measuring changes in specific indicators at regular intervals over time

morphology  relating to the shape (i.e., form or structure) of an organism

numeric data  information presented in quantitative form or using numbers
organization  a group or association of people bound by a common interest

paralegal  a person with training in the law but not licensed to practice the law officially

permanent belt  a permanent transect distinguished by two parallel lines

point of first sale  the site at which a product (e.g., marine resource) is first transferred from the person who caught or produced the product to a person who pays for the product

preservation  the strict protection (i.e., no use) of all resources (living and non-living) in a defined area

process  a predetermined and systematic series of steps, actions or operations used by an individual or group to achieve specific objectives and move toward a general goal

productive roles  the activities, responsibilities and expectations of an man or woman related to providing the basic economic needs of a household (e.g., food production, wage employment, etc.)

property rights  the official or legal interest of an individual or group to access or control a certain area of land or water or resource

protected area  the generic term used to describe an area of land or sea that is governed by some form of protection from use or degradation

This may be in the form of conservation or strict preservation.
**Q**

**quadrats** a rectangular plot or frame used to assist in the measurement and study of ecological conditions

**R**

**rehabilitation** the process of improving the conditions of an area of land or sea so that they are more favorable to conditions suitable to humans

**reproductive roles** the activities, responsibilities and expectations of a man or woman related to the care and maintenance of the household (reproduction, child care, education, health, home maintenance, security, etc.)

**respondent** a person who provides information to another person often through completing a survey questionnaires but also through participating in group discussions or participatory methods of analysis

**restoration** the process of returning a given area of land or sea as closely as possible to the specific conditions (i.e., specific species, relative abundance; etc.) that existed in an earlier time

**S**

**sanctuary** an area of land or sea that is often governed by strict protection (i.e., no activities or resource use allowed) often placed within a larger marine reserve

**spatial** related to geographic area

For example, spatial tools look at where things occur in a given area or in relation to each other. Compare with temporal tools which means having to do with or related to time.
spawn  the production or deposition of eggs or young of aquatic organisms

species  a category of formal scientific biological classification that describes organisms that are biologically and morphologically similar and capable of interbreeding

stakeholder  usually groups of individuals – within a larger population (e.g., community) - that share a common interest, perspective, worldview or background

temporal  related to time

For example, a time line is a temporal tool that looks at the significant events in the history of community.

tenure  the right to access or control over a resource or area of land or sea

terrestrial  related to land as opposed to sea

tools  specific analytical techniques (matricies, diagrams, transects) that assist in the collection and analysis of data

For example, a matrix is a tool that can be used for participatory livelihood analysis which is a participatory method and is part of an overall methodology that is community-based coastal resource management.

triangulation (validation)  the process of confirming, validating, or improving the precision of data by seeking separate and independent confirmation of the data

Triangulation can be done by using different methods to collect the same data or seeking different respondents or both.
**Triangulation (geographic)** the process of determining or locating a specific point on a plane using landmarks to determine the intersection of two lines

**Transect** a length of land or sea – usually a straight line – that is used as the basis for sampling plants, animals or other indicators of interest using various sampling techniques

**V**

**Village assembly** a meeting open to all residents of a village for the purpose of sharing views and disseminating public information

**W**

**Watchdog groups** informal groups or formal organizations that serve to monitor activities related to a particular issue

For example, a small group of residents may form a group to monitor the occurrence of illegal fishing operations in sanctuary.

**Watershed** an area of land that shares a common point where water drains – usually to the ocean

Watersheds are commonly divided into functional (although arbitrary) sections such as upland, lowland and coastal ecosystems. Another functional grouping looks at catchment areas, service areas and drainage areas.
zoning  the process of determining and assigning specific purposes, uses or regulations to specific portions of land or sea in order to optimize land-use

For example, a zoning plan for a bay may be developed to ensure the optimal and equitable allocation of space for often competing uses such as aquaculture, recreation, transportation, conservation or preservation, etc.
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