

# THE PROCESS AND FRAMEWORK OF INTEGRATED COASTAL MANAGEMENT

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## INTRODUCTION

The easy accessibility, unique ecosystems and exploitable resources make coastal areas popular for human settlements. More than 60% of the world's population are settled in coastal areas and there is a diverse range of economic activities dependent on coastal resources. Sectoral management has contributed to serious conflicts and complicated problems, which result in short-term gain but long-term loss.

There is clearly a need for an integrated interdisciplinary and multisectoral approach in the management of coastal areas. Conflicts have to be minimized to ensure that coastal resources can contribute effectively to sustainable development. Numerous cases of coastal environment degradation have repeatedly demonstrated that economic sense justifies a preventive approach over a curative one. Funds needed to restore degraded coastal areas in order to maintain a reduced level of economic activity far exceed those generated earlier from environmentally unsound practices.

## DEFINITION OF ICM

Integrated coastal management (ICM) has been defined as "a natural resource and environmental management system that employs an integrative, holistic approach and an interactive planning process in addressing the complex management issues in the coastal areas". The integrated or holistic approach is aimed at reducing conflicts that are often associated with sectoral approaches. All issues should be addressed together rather than in isolation. This facilitates appreciation of potential conflicts and formulation of optimal solutions acceptable to most users.

The coastal environment is the boundary where land and sea meet. The terrestrial environment is from the marine environment. Each is governed by fundamentally different processes. Management must recognize, appreciate and accept these differences.

There is interaction at the coastal interface between these two environments and special management that considers the different environmental dimensions and their interaction is required.

Management is the process of exercising control or influence. A reflection on what is to be managed is useful. Should it be management of processes that influence the environment (i.e. the land, the sea, and the coastal ecosystems) or of human activity that affect these natural processes?

## THE ICM FRAMEWORK AND PROCESS

ICM is a system or framework designed to attain the goals and objectives of sustainable development of the coastal environment. Single sector management of coastal issues e.g. pollution, cannot be considered as an ICM program can easily be applied to and include these different issues. Of immediate importance is a proper understanding of the concept of ICM. Time and effort will be more productive in applying the ICM process as possible so that sustainable development can be achieved.

There is common tendency to consider any single, isolated action of coastal conservation or protection as integrated coastal management program. Community-based management projects on mangrove protection for example, have been described as an integrated coastal management program. Integrated coastal management goes beyond separate actions of managing resources. It is a management framework that not only addresses multiple issues of conflict between coastal users, but also identifies the institutional and financial mechanisms that must be established. These facilitate the efficient adoption of appropriate policy, institutional and technological interventions necessary in responding to the cumulative impact of economic development on the coastal environment.

The ICM framework provides practical tools to assist policy-makers, planners and resource managers to meet the challenges of sustainable devel-

opment in coastal areas. The coastal zone contains rich and diverse ecosystems and resources that are strategically important to the economic and social well-being and development of all coastal nations. When applied in timely and comprehensive manner, ICM facilitates sound investment and sustainable use of the coastal zone and its natural resources.

Management of the coastal area has traditionally been developed to address sectorized issues e.g. over fishing, habitat loss, and pollution. This resulted in conflicts between users over resource allocation and impacts of individual activities on one another and the environment. Integrated coastal management takes a holistic approach aimed at reducing conflicts between users and at minimizing environmental degradation. It requires a high level of integration and coordination over an extended time frame.

Ideally, an ICM program should operate within a closely integrated, coherent management framework within a defined geographical limit. The coastal zone is viewed in its entirety as a special geographical area where its productive and natural defense functions are intimately linked with the physical and socio-economic condition far beyond its physical boundary. Hence, any policy and management action designed to address coastal development conflicts must be founded on a sound understanding of the productive capacity of the natural systems, the assimilative capacity of the environment, the political, socio-cultural and economic conditions, present and future demands as well as social costs involved.

ICM not only attempts to provide co-ordination between institutions, but also entire programs that have an impact on the biophysical and socio-economic processes. Government policies, strategies and action for coastal management are formulated and implemented systematically through a series of and implementation processes; collectively forming the coastal management system. ICM should be viewed as a system with three mutually supporting dimensions: a) management processes, b) identified management issues, and c) management actions.

In this management system, all three dimensions are closely connected and should be considered in their entirety. The system becomes ineffective or collapses when any one dimension is ignored. ICM provides for a planning and their sustainable development.

Each identified management issue is taken through three phases of management processes (comprising planning, implementation, and monitoring & evaluation) and three categories of management action (institutional and organizational arrangements, incentives/regulations).

#### **a. Management processes**

The three essential components of management processes comprising planning, implementation, and monitoring & evaluation are sequential but in reality often overlap. These processes are iterative and generally useless if any one of them is not followed through, e.g. planning is waste of time if not followed by implementation, and implementation is ineffective without proper monitoring and evaluation. These processes are meant to identify and analyze management issues, and to develop the necessary policy and management options. The planning component constitutes the basic layer of the cube.

#### **b. Management issues**

The management issues relate to conflicts arising from resource allocation, exploitation and utilization as well as other adverse effects of sectoral development. Management issues could be categorized primarily into those related to resource use, environmental quality, institutional concerns, and natural hazards. Management plans can then in the first instance, be directed more on categories considered of higher priority for the area.

#### **c. Management Actions**

These comprise various action formulated to address specific parts of the management issues. Action are aimed at a functional integration of institutions and organizations, and not just periodic meetings of various parties so that effective integrated policies can developed and implemented. Action is also needed on public involvement and investment such as education and awareness programs, infrastructure development, and capacity building. Intervention directions at modifying human behavior include policy instruments such as regulations and market-based incentives.

Management actions are thus categorized into:

1. Institutional and organizational arrangements
2. Public intervention to influence private behavior
3. Direct public investment

### **Institutional and organizational arrangements**

Management strategies concerning resource utilization, conservation and protection can only be effective if they are implemented within the existing legal framework. Government involvement is therefore essential for ICM and planning. ICM plans made without the concurrence of the government are difficult to implement. Even with the concept of co-management or community-based management, the government must first transfer management authority to the appropriate communities, and second provide the necessary supervision, technical assistance and financial support.

As a government program, ICM has the necessary legitimacy in implementation. Policy considerations are important management actions for an ICM program. Government policies and legislation need to be formulated or clarified with respect to the promotion of sustainable development in inland, coastal and marine areas, and the protection of territorial use rights, biodiversity, coastal habitats and environmental quality. The enactment of coastal laws is an important step towards providing the necessary legal framework. Management actions are also required to address organizational deficiency, particularly with respect to law enforcement and clarification of duties and responsibilities. The most common management actions here include:

1. Clarifying and defining legal right and obligations
2. Determining organizational jurisdiction and responsibilities
3. Strengthening enforcement capability
4. Undertaking monitoring and evaluation

### **Public intervention to influence private behavior**

Popularly referred to as "command and control", management measures here include incentives and regulations necessary for effecting human behavioral changes in line with ICM goals. Incentives such as tax exemption or reduction, government subsidy and technical assistance, or disincentives such as heavy or new taxes, license fees, closed season, limiting access to specific resources, are some of the measures to promote environmental protection or discourage polluting or destructive practices. The most common management actions pertaining to command and control to mitigate adverse environmental effects could be grouped under the following types:

1. Imposing new regulatory measures
2. Strengthening existing regulatory measures
3. Establishing and implementing standard e.g. water quality, emission / discharge
4. Providing incentives

### **Public involvement/investment**

This category of management intervention involves a direct investment by the government to improve capacity at local levels. This can apply to infrastructure development, raising of public awareness, information dissemination, research and development, and training and technical assistance. Capacity building gives local governments and local communities a greater sense of ownership of ICM programs through greater involvement and participation. It also garners stronger support for the program from local stakeholders.

All three dimension are of equal importance and mutually dependent. Unlike sectoral development which is represented by one sector of the cube (e.g. overfishing), the spillover effects of one from of development will be addressed under the present from of integrated management system.

The management system is analogous to a Rubick's cube. It is in a perfect form when each segment of all three dimensions are closely coordinated and orderly in place such that coastal management issues are adequately addressed, and economic development could be sustained without compromising the coastal or the marine environment. This ideal situation is seldom, if ever achievable as it is never easy to get the same color on each side of the cube. However, success can be measured by getting as many of the squares on each side of cube to be of same color. The ICM system sets the direction towards achieving this objective. It is therefore logical to assume that sustainable development is not easily attainable, but there is a way of getting there, partially if not completely.

Coastal planning and management is a continuous process improving with time and experience and the ICM system has to be supported over long time frames. The process is iterative and needs to be constantly reviewed and evaluated. It is unrealistic to expect a management plan to remain fixed and rigid over extended periods where inevitable changes in circumstances and scenarios do occur. The system has to have in-built flexibility to change. Under

an integrated coastal management framework, institutional and financial mechanisms can be established to effectively respond to the cumulative impacts of economic development on the environment through adopting appropriate policy, institutional and technological interventions.

The ICM framework can be applied to sectoral issues such as fisheries and aquaculture. The management process consisting of planning, implementation, and monitoring and evaluating can be applied in a systematic manner to reduce conflicts

of aquaculture or fisheries development with other users. Various types of management actions categorized under institutional and organizational arrangements, incentives/regulations to change behavior, and direct public involvement and investment can be considered in achieving the goal of harmonizing aquaculture and fisheries with other coastal activities within the of sustainable development. While the ICM system is useful when applied to sectoral issues, it can expediently consider different issues as a whole.