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Indicators to measure governance performance in integrated coastal management

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Abstract

This paper discusses the potential contribution of indicators to assess the performance of the governance processes involved in integrated coastal management, focusing on the evaluation phase and the need to complement process-oriented indicators with outcome-oriented indicators to improve adaptive management and accountability. The example of integrated management of marine protected areas is used to propose a menu of indicators of global applicability.

1. Governance and the policy cycle of integrated coastal management

Governance is the process through which diverse elements in a society wield power and authority and, thereby, influence and enact policies and decision concerning public life and economic and social development. Governance is carried out by the state, as well as the private sector and civil society. With relation to integrated coastal management (ICM), governance refers to the structures and processes used to govern behavior, both public and private, in the coastal area and the resources and activities it contains. ICM refers to the process through which the use of specific resources or portions of the coastal area are managed to achieve desired objectives. While the coastal area governance system can apply to the conduct of a single activity (e.g., control of coastal erosion), what distinguishes "integrated coastal management" from "coastal management" or "coastal resource management" is the ability to create a governance system capable

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to manage multiple uses in an integrated way through the cooperation and coordination of government agencies at different level of authority and of different economic sectors.

2. Evaluating the performance of integrated coastal management: the role of indicators

Given the complex nature of the governance processes involved, ICM is confronted with the challenge to establish measurement systems able to adequately track the progress of efforts. Greater emphasis on performance can help make ICM more oriented toward outcome-based results rather than on input-based accounting. Too often, the performance of ICM initiatives has been based on the level of investments, the number of permits issued for coastal development, or the number of laws and regulations adopted. These "input" measures may or may not be indicative of success. Actual success in both environmental and socioeconomic terms can only be judged "on the ground", as a matter of outcomes and impacts. Outcomes should be measured in terms of improved water quality, increased public access to beaches, decreased habitat loss, reduced coastal hazards, or increased employment in coastal-related activities.

Within the ICM policy cycle (Fig. 1), evaluation answers two major needs: accountability and adaptive management. In practice, evaluation results are usually used in more than one way. Information used by managers to improve the performance of their management strategies (adaptive management) can also be used for reporting (accountability) or lessons learned by others to improve future planning.

In order to measure performance, ICM initiatives should be characterized by clear goals accompanied by quantifiable objectives. Examples of coastal goals, drawn from the US Coastal Zone Management Act 1972 are:

- Protect, restore and enhance coastal habitats.
- Maintain and improve coastal water quality.
- Reduce the threat to and loss of life and property from coastal hazards.
- Provide public access to the coast.

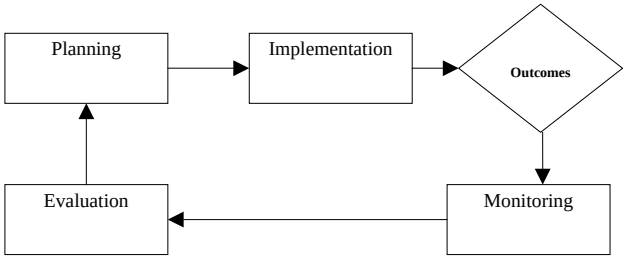

Fig. 1. The ICM policy cycle.

- Sustain, develop and restore the economic vitality of coastal communities.
- Provide and maintain appropriate sites for coastal dependent uses.

General goals, however, should be operationalized into quantifiable objectives, for a meaningful analysis and assessment to be carried out. Given the multiple-use character of ICM some objectives will inevitably conflict and it might not be possible to achieve all of them at the same time. Also, perceptions of problems and views about their relative importance usually differ among stakeholders. Perceptions about the importance of objectives may also change as more information is obtained.

A successful example of measurable objectives can be taken from the Chesapeake Bay Agreement 2000:

- Restore 25,000 acres of tidal and non-tidal wetlands by 2010.
- Reduce the rate of urban "sprawl" by 30% by 2012.
- Preserve 20% of the watershed as permanently protected open space by 2010.

As anticipated above, information based on indicator for ICM should satisfy some basic conditions: being simple, quantifiable and communicable. To this end, indicators for ICM should have a number of attributes that make them suitable, such as:

- Being relevant to management objectives and scientifically valid.
- Being developed with all those involved in management (unlikely to work if imposed from above).
- Being credible, easy to understand, and unambiguous.
- Being part of the management process and not an end to themselves.
- Focusing on the use of information, not on gaining it.
- Having a clear link to the environmental outcome being monitored.
- Being continuously reviewed and refined when necessary, as part of adaptive management.
- Providing early warning of emerging issues or problems.
- Being capable of being monitored easily to show trends over time.
- Using accepted and clearly documented methods and units.
- Being as simple and cheap as possible (while achieving the desired results).
- Being adaptable for use at a range of scales, wherever possible.

Indicators to measure governance performance in ICM can be divided into four main types. *Input indicators* refer to the resources used in the ICM cycle. *Process indicators* express the dynamics of the policy cycle. *Output indicators* indicate the products and services that were delivered from the ICM initiative. *Outcome indicators* indicate the on-the-ground results achieved.

Examples of process indicators—inputs and outputs—can include:

- Legislative authority for management.
- Resources allocated (staff, budget, facilities).
- Institutional arrangement for planning and implementation.

- Existence of management plan.
- Stakeholder participation in management.
- Level of satisfaction of participation in management.
- Public understanding of the management plan.
- Training provided to stakeholders and local communities.
- Active community participation in management.
- Clearly defined enforcement procedures.
- Compliance with the management plan.
- Stakeholder involvement in surveillance, monitoring and enforcement.
- Process to revise management plan.

For a detailed list of governance performance indicators based on the discussion held at the Ottawa workshop, see the appendix.

To advance the development of indicators, partnerships between governments, communities, the private sector, NGOs, and research institutions can be organized to set up and run the process. This will require the provision of adequate resources (time, expertise, funds) and a commitment to collect new data if required. Important contributions can also come from continuing research and development to provide the most appropriate indicators and to understand cause and effect relationships, as well as to raise awareness of the links to wider social and economic considerations.

However, there are pitfalls to avoid in the development of indicators, such as collecting data outside the relevant management context, a lack of commitment from leaders, absence of or limited development of capacity, a focus on punishment instead of improvement, not enough feedback from stakeholders, limited link between performance measures and resource allocation, and excess of bureaucratic inertia.

When considering future directions for governance indicators, as the understanding of coastal systems improves, it will be possible to select better, more cost-effective indicators, improved instrumentation will allow more sensitive detection and monitoring, real-time measures and more powerful modeling will capture and analyze data more quickly, visualization techniques will allow more ready use by managers, and indicator use will feed to better reporting and communication.

3. Integrated management of marine protected areas

Marine protected areas (MPAs) provide an example of integrated approach to the management of coastal and marine areas. All MPAs are affected by human activities that lie outside their boundaries, ranging from marine transportation and fishing to land-based sources of marine pollution, e.g., agriculture, urban runoff, and sewage. In many, if not most, cases, these exogenous sources have far greater effects on resources of the MPA than activities within the protected area.

The management of MPAs takes place within the context of a larger ocean governance system, but often with little or no integration. Coastal and ocean governance systems are often designed without consideration of MPAs. MPAs are often designed and implemented without recognition of the larger system within which they are located.

Despite the fact that many programs and regulations affect coastal and marine resources, areas, and activities, there are no basic principles or general processes for establishing authority and accountability in the management of marine resources and uses of ocean space, including MPAs. In other words, there is no coherent governance system. Most countries continue to manage their ocean resources and space on a sector-by-sector regulatory basis. One law, one agency, and one set of regulations may be applicable to a single-purpose regime (e.g., oil and gas development, fisheries, water quality, navigation, or protecting endangered species), and a single ocean area may be subject to a plethora of regulatory management regimes.

Sometimes, this fragmentation means that important issues, rather than receiving too much attention, fall through the cracks of various jurisdictions. For example, although a number of agencies purport to exercise partial responsibility for the management of marine habitats, the question of habitat protection as a whole may simply not be addressed. Fragmentation also means that real or potential conflicts either among governmental requirements or among proposed users are often not anticipated, and when they emerge, they cannot be resolved effectively. In the absence of a coherent, coordinated system, opportunities are lost and resources are squandered.

The fragmentation of governmental agencies is both horizontal and vertical. At the present time, management of the marine environment is carried out at local, state, regional and national (and, in some cases, marine transportation, for example, international) levels of government. At any given level, various functions are carried out by a wide array of separate agencies and organizations, with limited or sporadic coordination. As a result, fragmentation is the general rule and many situations are poorly or inefficiently managed. Conflicts among users and uses are solved with great difficulty, if at all.

Many MPA governance strategies include mixed configurations of power sharing by national, state or local governments with stakeholders. These approaches range from complete management control by governments and/or nongovernmental organizations (NGOs) to delegated management to designated organizations, private corporations, communities, or indigenous people. The quest for an effective power-sharing model to reduce inherent fragmentation in these approaches, however, has eluded most MPA theorists and practitioners [1].

4. Indicators for MPAs

Some efforts have been made to approach the governance aspects affecting MPAs, especially those that may interact with the MPA goals and objectives, and may also help in assessing the effectiveness of specific MPA sites or a national system of MPAs.

Table 1
Governance goals, objectives, and indicators for evaluating MPA management effectiveness

Governance indicators	
MPA goal	Management objectives
1. To ensure effectiveness of resource management structures and strategies	1A. Effective and implemented management planning 1B. Socially acceptable and clearly defined rules for resource access and use 1C. Presence of effective and accountable decision-making and management bodies 1D. Sufficient human and financial resources used efficiently and effectively 1E. Recognition and incorporation of traditional/local/informal governance in management planning 1F. Periodic effective monitoring, evaluation and adaptation of the management plan ensured
2. To ensure the effectiveness of legal structures and strategies for management	2A. Ensure existence of adequate legislation 2B. Ensure compatibility between formal legal arrangements and traditional local arrangement 2C. Ensure that national/local legislation incorporates rights and obligations set out in international legal instruments 2D. Ensure compatibility of international, national, state and local rights and obligations 2E. Ensure enforceability
3. To ensure effective and equitable representation and participation of coastal resources stakeholders in management.	3A. Representative and effective systems of co-management 3B. Building resource users capacity to participate in co-management 3C. Strengthen and enhance community organizing
4. To enhance compliance by resources users with management plans	4A. Improved surveillance and monitoring of coastal areas 4B. Improve the willingness and acceptance of people to behave in ways that allow for sustainable coastal resources management 4C. Build the local ability (capacity) to use resources sustainably 4D. Increase user participation in surveillance, monitoring and enforcement 4E. Adequate applications of law and regulations 4F. Ensure transparency and simplicity of, and access to management plan to foster compliance
5. To manage coastal resource use conflicts	5A. Reduce conflicts in four levels: (1) within each user group; (2) between user groups; (3) between user groups and community; (4) between community and people outside the community

Table 1 (*continued*)

Governance indicators	
MPA goal	Management objectives
Management objectives	*Indicator*
1A	Existence of a management plan and adoption of plan
1B	Understanding of MPA rules and regulations by the community
1C	Existence of an MPA decision-making and management body with a mandate to make management decisions
2A	Existence and compatibility of legislation with needs of the MPA management plan
3A	Degree of stakeholder participation in management of the MPA
3A	Level of satisfaction of stakeholders with participation
3B	The amount and quality of training provided to resource users to participate in MPA management
3C	The amount and quality of training provided to community organization to participate in MPA management
3C	Community organization formed and active
4A	Available human resources and equipment for surveillance and monitoring
4A	Clearly defined enforcement procedures
4A	Number of patrols per time period
4B	Effective education program on compliance for stakeholders
4B	Regular meeting of MPA staff with stakeholders
4C	Number of people trained in sustainable resource use
4D	Number of stakeholders involved in surveillance, monitoring and enforcement

Source: WCPA-Marine/WWF MPA management effectiveness initiative.

For instance, a recent effort is the International MPA Management Effectiveness Initiative, a joint effort of the World Commission for Protected Areas-Marine (WCPA-Marine) and the World Wide Fund for Nature (WWF). One of the objectives of this initiative is to develop specific indicators and guidelines for MPA managers to evaluate the effectiveness of their sites. Launched in 2000, the initiative has organized two workshops with MPA scientists and managers (Chichiriviche, Venezuela, October 2001; and Honolulu, Hawaii, September 2002) and developed a guidebook [2] with biophysical, socio-economic, and governance indicators for evaluating MPA management effectiveness. An initial set of MPA goals, objectives, and indicators were reviewed, evaluated, and prioritized during the Venezuela workshop. A final review and selection for field-testing the indicators was made for 18 selected MPA sites at the Hawaii workshop.[1] The initiative is currently in the

[1] For further information on the indicators and the guidebook contact Lani Watson, NOAA, at lani.watson@noaa.gov.

Table 2
List of governance performance indicators

Phase or stage	Feature of governance	Indicator of output or outcome
Initiation	Authority	Enabling legislation enacted Executive mandate issued Authority for national and sub-national bodies identified clearly Roles and responsibilities for ICM among levels of government clearly identified Soft and hard legal instruments identified Overlaps and gaps among institutional mandates clearly identified
	Leadership	Political support obtained and maintained Agency leadership identified and developed Leaders of constituency groups identified and developed
	Visioning	Consensus built for common vision or philosophy Linkage of ICM with national development, economic development and environmental goals
	Institutional capacity	Interagency steering/coordination group established Scientific/user advisory groups established Initial partnerships formed Training courses for public officials held Authority and roles for different levels of government and stakeholders identified Rights and responsibilities (rules of the game) are clearly defined Consistency among actions at various levels of government (national, regional, local) ensured Inter-agency process and authority defined clearly Coordination among ICM projects and investment ensured
	Human resource development	Development of human resources to plan, implement, monitor, and evaluate ICM Identification of necessary leadership skills and broadcast of these expectations
	Empowerment	Local stakeholders have influence and control over ICM regime that has legal basis
	Financial resources management	Scaling of financial resources is appropriate to institutional capacity Financial contributions to ICM are effectively coordinated

Table 2 (*continued*)

Phase or stage	Feature of governance	Indicator of output or outcome
Planning	Planning capacity	Adequate resources for planning allocated Appropriate staff hired, trained, and maintained Baseline studies completed Problems identified, analyzed and ranked Management boundaries defined Clear and realistic goals/targets identified and ranked Measurable management objectives specified Alternative management strategies identified and analyzed Costs/benefits of alternative management strategies analyzed Selection criteria for management strategies specified Ability to be adaptive and react to unpredicted change (e.g., climate change) established Ability to be predictive, anticipatory established Collaborative, participatory and transparent planning processes adopted Stakeholders actively participate in regular ICM planning meetings Access to public coastal resources assured
	Information management capacity	Adaptive information management system established Performance indicators established Information is effectively and appropriately organized, managed, and disseminated Public access to information is assured Verifiable information is used to determine management issues
	Public participation	Public awareness program initiated Increased awareness of coastal issues Effective stakeholder participation in all phases of ICM Stakeholders satisfied with degree of participation Stakeholders have access to information related to ICM Assurance that "unheard voices" are taken into consideration
Adoption	Formalization and support	Legitimate authority(s) agree to adopt plan of action ICM program integrated into national environmental management & sustainable development programs Plan of action endorsed by constituencies and users

Table 2 (*continued*)

Phase or stage	Feature of governance	Indicator of output or outcome
		Stakeholders actively seek resources to implement plan of action Long-term financial support for all elements of ICM (e.g., monitoring) ensured
Implementation	Implementation capacity	Clear authority provided to write/enforce regulations to change behavior Clear authority to provide economic and economic incentives to change behavior Appropriate funding available for implementation activities Socially beneficial changes in user and institutional behavior as a result of management actions Diverse activities among institutions and projects are effectively coordinated
	Enforcement capacity	Appropriate compliance monitoring program in place Appropriate penalties assessed and collected for non-compliance
	Conflict resolution	Mechanisms for resolution of conflicts among agencies identified and implemented Conflicts among users resolved/mitigated Future of uses and conflicts anticipated
	Decision making	Definitive decisions taken Decision makers held accountable for results
Environmental and socioeconomic outcomes	Coastal and marine environmental quality	Improvements in water quality over a range of physical, biological and chemical parameters Increases in percentage of coastline suitable for bathing and recreation Reduction of human diseases associated with water quality Socioeconomic benefits from increased tourism and recreation
	Coastal hazards	Relocation of people and structures from high-risk areas Reduction of human, environmental, and socioeconomic losses due to coastal hazards
	Coastal development	Reduction of conflicts over coastal use Socioeconomic benefits (jobs, income, revenues) from increased coastal activities
	Biodiversity/Habitat	Reduction in percentage of endangered and threatened species

Table 2 (*continued*)

Phase or stage	Feature of governance	Indicator of output or outcome
		Improvements in structure and function of coastal and marine ecosystems Socioeconomic benefits from coastal and marine protected areas
	Fisheries	Reduction of damaging practices (by-catch) and equipment Recovery of fish stocks Increase in fish productivity Socioeconomic benefits from sustainable fisheries
Monitoring and evaluation	Monitoring capacity	Appropriate management performance monitoring is operational Appropriate users and communities involved in monitoring Monitoring and evaluation of social, economic and bio-physical context is operational Advanced monitoring tools employed when appropriate, available, and fiscally possible
Adaptation and reformulation	Evaluation capacity	Outcome indicators used to evaluate performance Evaluation of success/failure of management action fed back to planning Evaluation results used to reallocate resources Evaluation results used to change goals, objectives, management strategies, and desired outcomes

field-testing stage (November 2002), and the selected governance indicators and their goals and objectives are summarized in Table 1.

Appendix

The list of governance performance indicators is shown in Table 2.

References

[1] Salm R, Clark J, Siirila E. Marine and Coastal Protected Areas: A Guide for Planners and Managers. Washington, DC: IUCN, 2002.
[2] Pomeroy R, Parks J, Watson L. "How is Your MPA Doing?" Draft. Guidebook for Evaluating Effectiveness of Marine Protected Areas. Washington, DC: WCPA-Marine & WWF, 2002.