

Co-learning and stakeholders' participation in marine protected area management

Siddique, M.A.L^{a*}, S. Myers^a, T. Smith^a, and R.W. Carter^a

^aSustainability Research Centre, University of the Sunshine Coast, Queensland, Australia
* Upazila Fisheries Officer, Department of Fisheries, Bangladesh and Corresponding author.

Abstract

Marine protected area (MPA) management is the management of ecosystems not only for conserving marine resources but also for human purposes. While there is often detailed knowledge of specific research subjects and sites, and knowledge of broad scale processes, there are significant challenges in integrating current knowledge across the range of scales needed for effective management of MPA. Most agencies dealing with MPAs are beginning to learn how to design and conduct an effective participatory process for MPAs, to gain understanding of the implications of increased stakeholder involvement to improve the process. While there is growing awareness of the need for involvement, there is a lack of understanding of the implications of co-learning as an essential element in the process of stakeholder involvement. As policy-making continues to evolve, it is critical to understand the role of stakeholder involvement and, in particular, how participatory decision-making processes can be improved through mutual learning improvement. Significant stakeholder participation occurs in MPA when they see that their contributions to the process have helped shape a meaningful decision. Such participation can be fostered by enhancing stakeholders' participation in the generation and application of knowledge, providing opportunities to exchange their learning, and strengthening their ability to deal with changes throughout the process. This study aims to understand the influences of planning and management instruments fostering or hindering the co-learning systems using Moreton Bay Marine Park as a case study.

Introduction

Many learning theories and concepts have been proposed to explain what motivates human behaviour for shared or mutual learning. These include:

- the importance and process of social learning,
- organisational learning to create a supportive learning environment,
- the necessity of policy learning and planning for regular reviewing, and
- anticipated learning for achieving resilience against sudden shock.

In the case of sustainable MPA management, co-management promotes access to, and exchange of, material and non-material resources, such as money, technology, scientific knowledge, knowledge from local experience, as well as increased management legitimacy (Sandstrom & Rova 2010). Thus, co-learning can foster the process of sharing information by offering a premise of knowledge exchange among networks of actors in the management. Considering the importance of information and knowledge sharing for NRM and MPA management, this paper describes how co-learning and stakeholder participation can form part of MPA management strategy.

Background

Community participation in MPAs

Natural resource management (NRM) is not only concerned with ecosystems but also with ecoplexes – the management of ecosystems for human purposes (NRM 1999). In Australia, the management of natural resources has been documented as having the three long-term goals of achieving:

- healthy ecosystems and catchments,
- innovative, competitive and self-sustaining industries, and
- proactive communities that are committed to the ecologically sustainable management of natural resources (NNRMT 1999:9).

Significant stakeholder participation occurs in MPAs when they see that their contributions to the process have helped shape a meaningful decision in planning and management. It also provides opportunities to exchange learning and strengthening of stakeholder ability to meet concerns and deal with changes and uncertainty. Exchange of information can empower stakeholders to become involved in and make an impact on the planning process in MPAs.. Capacity building is also an inherent part of co-management, where management effectiveness can be increased through shared learning and acting together in a collective manner.

Knowledge utilization and diffusion as part of learning process in MPA management

Learning is an integral part of knowledge management in the MPA management system. MPA management organisations can adopt internal systems to increase internal communications, promote cross-functional teams, and create a learning community if they are to become successful learning organisations. Knowledge utilization in the MPA management system is poor, mainly because of lack of evidence-based information and the lack of multidirectional knowledge flow between managers and stakeholders (Hockings et al. 2000; Pullin et al. 2004). For example, "around 60% of conservation management decisions rely on experience-based information, and many practitioners report having insufficient evidence to assess their management decisions (Cook et al. 2010: 181)".

The availability of appropriate and readily usable information or knowledge for managers and stakeholders can improve the management plans. Although little attention is being given to the utilization of evaluation information to improve conservation management outcomes (Jacobson et al. 2011), information is always required as part of learning process. Information utilization in protected area management has focused on existing knowledge (see Fazey et al. 2005), which is usually gathered from expert information providers (Jacobson et al. 2011) rather than stakeholders' knowledge and experience.

Methodology

The extent to which co-learning evidence is currently used in decision-making processes was investigated by examining the way in which an organisation formulates implements and Sources of information used by management and their decision-making framework and information arising from their decisions were investigated through desktop analysis of literature and management plans. This paper aims to address the evidence for social learning among stakeholders and managers and management outcomes in MPAs. It attempts to identify the factors that foster or hinder social learning among and between stakeholders and managers. Moreover, it aims to develop an effective co-learning framework in the context of management. Stakeholders' experiences of the dynamics of resources and associated needs, sustainable use of, and accessing information and knowledge to aid in their understanding and collective involvement in social learning processes are the core components of the study.

Results and discussion

Stakeholders participation in Moreton Bay Marine Park

Active participation requires a supportive learning environment for continuous sharing between managers and stakeholders. In the draft Moreton Bay Strategic Plan (1991), it was

proposed to establish a marine park over Moreton Bay to allow a holistic approach to decision making on all uses of the Bay and give that approach legislative backing to ensure that activities undertaken in the Bay conform to the Moreton Bay Strategic Plan (Robson 1993:3). Over 8000 submissions were received in response to the draft zoning plan, where approximately 6000 submissions supported the draft zoning plan to develop the final zoning plan – the *Marine Parks (Moreton Bay) Zoning Plan 2008* (EPA 2008).

Co-learning mechanism in NRM and MPA literature

This paper uses the notion of co-learning to refer to a process of social learning with adaptive learning at its heart where managers and stakeholders simultaneously acknowledge and adapt to the other’s learning, knowledge and behaviour so as to produce desirable management outcomes. Co-learning can facilitate a re-framing of beliefs, assumptions and expectations regarding a problem (i.e. more congruent technological frames), which allows the parties involved to arrive at an increasingly shared understanding of the problem (Thorburn et al. 2011). Similarly, learning experience can initiate an internalized process of incorporating new information within existing knowledge (Jacobson et al. 2011) sharing of this knowledge is rarely evident in the literature of MPA management systems. However, stakeholder participation in shared or co-learning activities is linked to capacity to change in three broadly defined ways (Kilpatrick 2003):

- by delivering new knowledge and skills, (e.g., refining existing knowledge as adaptive learning),
- by providing interaction with ‘experts’ (e.g., managers as facilitators), and
- by providing opportunities for interaction with peers (e.g., social learning).

Adaptive and social learning

The rationale for adaptive learning in management systems rests on three key elements: 1) rapid knowledge acquisition, 2) effective information flow, and 3) processes for creating shared understandings (McLain & Lee 1996). Change and implementation of integrated, adaptive, and sustainable resources management systems cannot be brought about by top-down implementation; rather, they require a process and change (Pahl-Wostl 2007) through the practice of social learning. Social learning is co-learning of individuals and or groups in society through observation, interaction, engaging, sharing, experiencing and self-reflection to develop relational capacities resulting in a common framework of understanding for collective or joint action that goes beyond individuals (Figure 4.1). Flow of accessible updated information serves as fuel to promote social learning and assumes a missing link in the social learning process in MPA management.

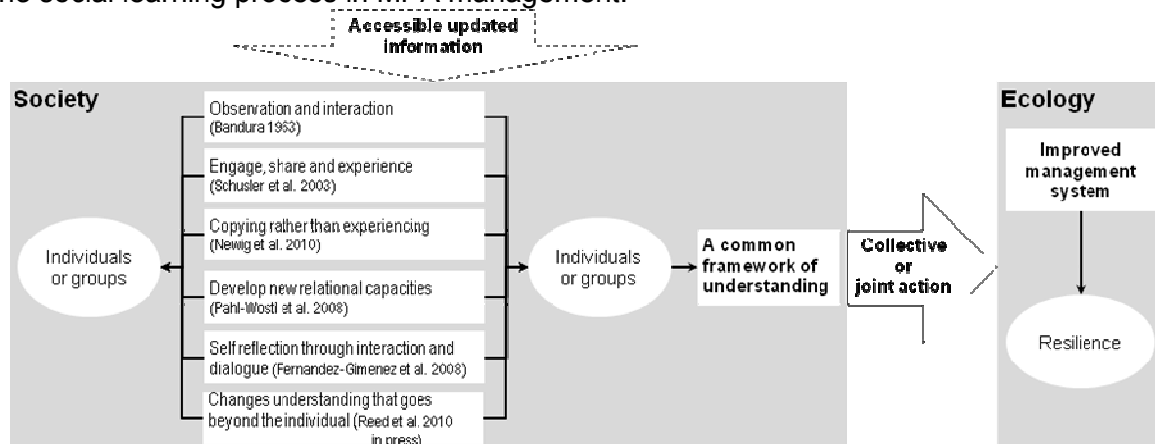


Figure 4.1 Social learning process in social-ecological system of natural resources management (dashed arrow head indicates the missing link).

The processes also involve shared problem perception in a group of actors, trust as the base for a critical self-reflection, recognition of mutual dependencies and interactions in the actor network, assumptions about the dynamics and cause-effect relationships in the system, subjective valuation schemes, and collective decision (Pahl-Wostl 2002). In the decision-making processes, social learning among all stakeholders offers the potential for significantly increasing the sustainability of management (McFadden et al. 2009). Current thinking does not discount the importance and processes of adaptive and social learning for sustainable NRM, but adds organisational learning along with this as a premise of supportive environment.

Organisational learning

The more a 'management organisation' transforms to a 'learning organisation', the better it can create a supportive environment to promote exchange of learning as:

“a learning organisation is an organisation skilled at creating, acquiring, and transferring knowledge, and at modifying its behaviour to reflect new knowledge and insights (Garvin 1993: 80)”.

Learning organisations engage everyone in the exploration, exploitation, and transfer of knowledge, increasing the collective learning throughout the organisation to make it adaptive and transformational (James 2003). Social learning among individuals, groups and organisations is a key factor in the creation of such organisational knowledge (Tyre & von Hippel 1997). However, the core learning elements for building an organisation that can truly “learn” are based on five converging component technologies such as system thinking, personal mastery, mental models, building shared vision and team learning (Senge 2006:1). All these attributes, with their focus on social and collaborative learning in the organisation demonstrate that appropriate strategies and policies are also essential component of attaining and practising organisational learning.

Policy learning/reviewing

Decision makers now recognize that policy instruments must create organisational environment for stakeholders participation that requires reviewing and fine tuning (Hans et al. 2000). This reviewing is not only for assessing the degree to which existing policies contribute to achieve objectives, but also on the degree to which they stimulate or facilitate a learning processes (Hans et al. 2000). Alternately, such substantial changes may not occur, which Gabler (2010) referred to as simple learning within a community and conflictual learning across communities. In complex and reciprocal learning, actors seek a reasoned consensus and are open to preference change. However, simple learning may lead to weak policy integration. Complex learning has deeper socialization and weak to medium policy integration while reciprocal learning leads to strong policy integration (Gabler 2010).

Participatory planning and implementation

Incorporating local knowledge in the early stages of the planning process for MPAs may well be an effective way to foster participation, and empower stakeholders in the governance of marine resources (Scholz et al. 2004). Co-management research proved that fishermen and fishing communities are often equipped with a high level of knowledge regarding fish populations and marine ecology, and so using Local Ecological Knowledge (LEK) into policy processes can help achieving numerous goals (Scholz et al. 2004). However, positive social conditions, constructive personal behaviour, and social learning can be the essential elements that contribute to positive participant interactions for sharing their knowledge in the

policy process (Dalton 2005). Active involvement by participants ensures that the interests and knowledge of stakeholders are integrated into planning decisions. Anticipatory learning may have positive influence on sustainable decision-making process in the case of uncertainty by reducing conflicts.

Anticipated action learning

A crucial factor is seeing futures not only as forecasting but also as creating confidence in individuals and the system's ability to adapt to new challenges of sustainability (Inayatullah 2006). Anticipatory action learning/research is collaborative, and works within the epistemological framework of participation, which differs from futures research by expert forecasts, more attuned to participatory learning processes, particularly questioning and knowing categories of participants (Inayatullah 2006). Similarly, in the process of foresight, the outcomes are negotiated by those who participate, resulting in futures that are constantly revisited through envisioning, experimenting, and reflection (Tschakert & Dietrich 2010:11). At the same time, the successive series of collective decision making and action in these cases indicate how the manner in which problems have been framed in one instance shape the space for future learning (Maarleveld & Dangb'egnon 1999).

Co-learning framework as a way of stakeholders' participation

Co-learning framework is a combination of building blocks of formal and informal learning finetuned through managers-stakeholders' experiencing, sharing, updating and updated information sharing processes (Figure 4.2). Similarly, stakeholders learning is essential as science alone cannot provide all the answers, and has to be combined with a structured process of shared learning (Allena et al. 2001). Co-learning framework is also useful for defining the ecosystem services in NRM and managing existing maintenance of what stakeholders should value in the systems (Cork et al. 2001; Hagmann et al. 2002).

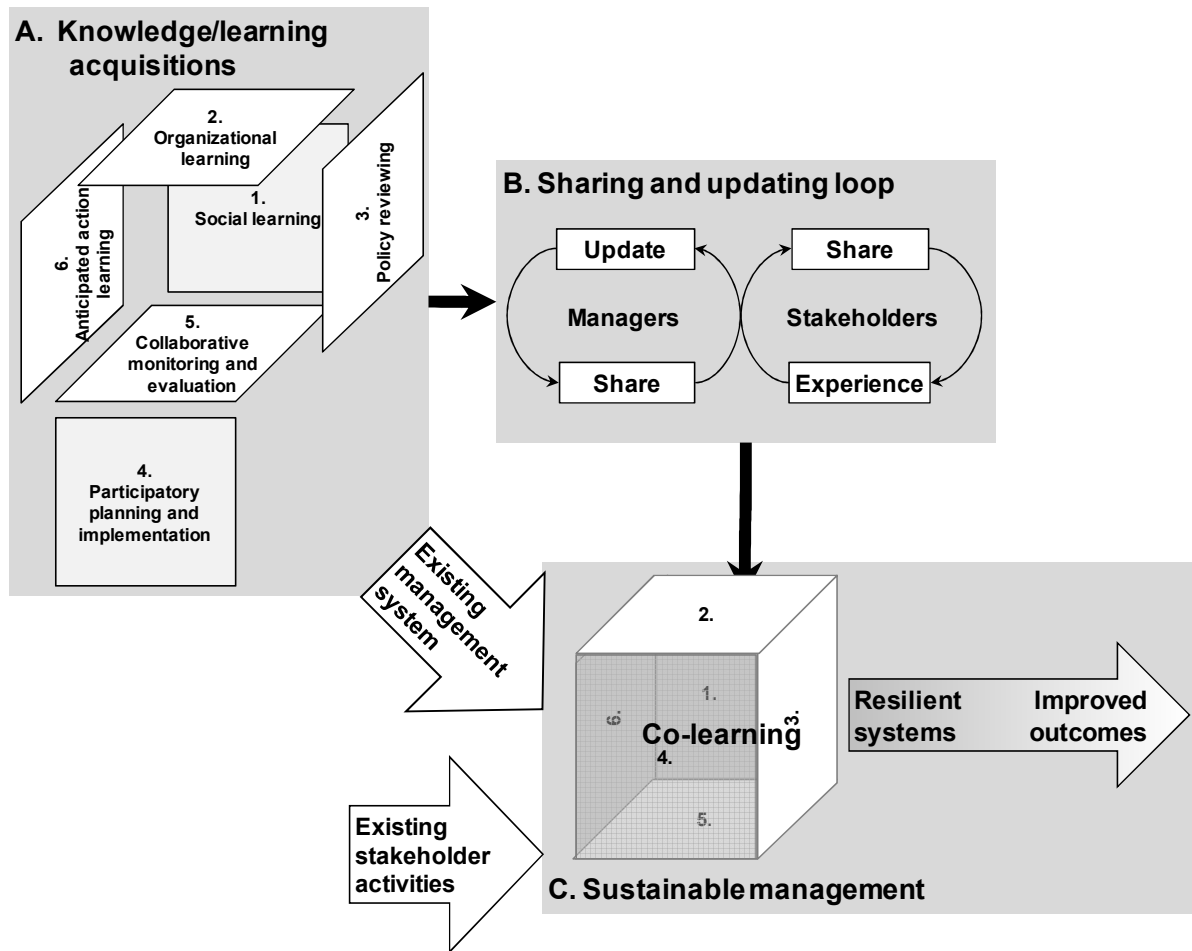


Figure 4.2 Co-learning framework for MPA management improvement.

Reflection from experience and the literature also ascertain that NRM systems, such as MPAs, already have different forms of information and learning that are diffuse and disconnected ('A' in Figure 4.2). The system requires an integrated continuous process of sharing-updating/experiencing-sharing ('B' in Figure 4.2) through which disconnected learning would exist as a formal integrated and interconnected process ('C' in Figure 4.2). The hypothetical assumption is that the existing routine management activities along with the stakeholders responses may able to create a resilient systems by going through the process of integrated and structured learning systems. Because existing information and knowledge sharing among stakeholders supports shared understanding, which ultimately leads to improved participation (Alem & McLean 2005). This structured form of learning is denoted as co-learning frame, which can help improve management outcomes through improving compliance with satisfaction based on trustful relationship.

Conclusion

Managers and policymakers always need updated information regarding management to attain the maximum potential by multiple stakeholders. Integrating knowledge (scientific or otherwise) into management is a complex process. The processes for accessing stakeholder knowledge, sharing and integrating knowledge towards co-learning and co-management remains problematic. However, outcomes for natural resource management can be achieved if agencies coordinate their policies and actions and implement a single broad set of policies with stakeholder participation in each step from planning to evaluation.

References

- Alem, L., and A. McLean. 2005. Supporting learning and information sharing in natural resource management with technologies for electronic documents. *International Journal on E-learning* 4:7-32.
- Allena, W., O. Boxha, M. Kilvington, D. Harleyb, and I. Brown. 2001. Monitoring and adaptive management: resolving social and organisational issues to improve information sharing in natural resource management. *Natural Resources Forum* 25:225-233.
- Cook, C. N., M. Hockings, and R. W. Carter. 2010. Conservation in the dark? The information used to support management decisions. *Frontiers in Ecology and the Environment* 8:181-186.
- Cork, S., D. Shelton, C. Binning, and R. Parry. 2001. A framework for applying the concept of ecosystem services to natural resource management in Australia. Pages 157-162 in I. Rutherford, F. Sheldon, G. Brierley, and C. Kenyon, editors. *Third Australian Stream Management Conference, Brisbane, Australia.*
- Dalton, T. 2005. Beyond Biogeography: a Framework for Involving the Public in Planning of U.S. Marine Protected Areas. *Conservation Biology* 19:1392-1401.
- EPA, Q. G. 2008. Final Public Benefit Test report for the *Marine Parks (Moreton Bay) Zoning Plan 2008*, Environmental Protection Agency (EPA), Queensland Government, Australia. .
- Gabler, M. 2010. Norms, Institutions and Social Learning An Explanation for Weak Policy Integration in the WTO's Committee on Trade and Environment. *Global Environmental Politics* 10:80-117.
- Garvin, D. A. 1993. Building a learning organisation. *Harvard Business Review* 71:78-91.
- Hagmann, J. R., E. Chuma, K. Murwira, M. Connolly, and P. Ficarelli. 2002. Success factors in integrated natural resource management R&D: lessons from practice. *Conservation Ecology* 5:29.
- Hans, T., A. Bressers, and A. R. Walter. 2000. Innovation, Learning, and Environmental Policy: Overcoming "A Plague of Uncertainties". *Policy Studies Journal* 28:523-539.
- Hockings, M., S. Stolton, and N. Dudley. 2000. *Evaluating Effectiveness: A Framework for Assessing the Management of Protected Areas.* IUCN, Gland, Switzerland and Cambridge, UK. x + 121pp.
- Jacobson, C., R. W. Carter, M. Hockings, and J. Kelman. 2011. Maximizing conservation evaluation utilization. *Evaluation* 17:53-71.
- James, C. R. 2003. Designing Learning Organizations. *Organizational Dynamics* 32:46-61.
- Maarleveld, M., and C. Dangb'egnon. 1999. Managing natural resources: A social learning perspective. *Agriculture and Human Values* 16:267-280.
- McFadden, L., E. Penning-Rowsell, and S. Tapsell. 2009. Strategic coastal flood-risk management in practice: Actors' perspectives on the integration of flood risk management in London and the Thames Estuary. *Ocean & Coastal Management* 52:636-645.
- McLain, R. J., and R. G. Lee. 1996. Adaptive management: promises and pitfalls. *Environmental Management* 20:437-448.
- NNRMT. 1999. *Managing Natural Resources in Australia for a Sustainable Future*, National Natural Resource Management Taskforce (NNRMT), Agriculture, Fisheries and Forestry Australia, Canberra.
- Pahl-Wostl, C. 2007. Transitions towards adaptive management of water facing climate and global change.
- Pullin, A. S., T. M. Knight, D. A. Stone, and K. Charman. 2004. Do conservation managers use scientific evidence to support their decision-making? *Biological Conservation* 119:245-252.
- Scholz, A., K. Bonzon, R. Fujita, N. Benjamin, N. Woodling, P. Black, and C. Steinback. 2004. Participatory socioeconomic analysis: drawing on fishermen's knowledge for marine protected area planning in California. *Marine Policy* 28:335-349.

- Senge, P. M. 2006. *The Fifth Discipline: The Art & Practice of The Learning Organisation*. Random House Business Books, London.
- Thorburn, P. J., E. Jakku, A. J. Webster, and Y. L. Everingham. 2011. Agricultural decision support systems facilitating co-learning: a case study on environmental impacts of sugarcane production. *International Journal of Agricultural Sustainability* 9:322-333.
- Tyre, M. J., and E. von Hippel. 1997. The Situated Nature of Adaptive Learning in Organizations. *Organization Science* 8:71-83.