19 Widening Coastal Managers' Perceptions of Stakeholders through Capacity Building

M. Le Tissier and J.M. Hills
Envision Partners LLP, University of Newcastle, Newcastle upon Tyne, United Kingdom, e-mail: m.le-tissier@envision.uk.com

Abstract

Environmental integration and mainstreaming is the process that ensures consideration of environmental sustainability in development projects. The agenda for promoting environmental sustainability has been firmly set at the local, regional and national levels through a variety of conventions and legislation. However, mechanisms for developing the capability and capacity to realize these goals remain elusive. Natural scientists have one sectoral view of coastal resources, embedded in a numeric and reductionist framework, whereas social scientists take the opposite approach. Policymakers and other stakeholders will have their own perspectives. A more holistic view of stakeholders' perceptions of the coast from those charged with determining coastal policy and implementation can permit sources of conflict to be identified by managers and appropriate action to be taken. Capacity building is one tool that can lead to an increase in the perceptions of stakeholders' needs and coastal resource issues in coastal managers. However, much training in integrated coastal management (ICM) focuses on increasing scientific knowledge rather than providing a robust framework for management. Recent work in developing capacity in state-level Indian coastal managers has had a more holistic approach, encompassing not just science, but socio-economic and governance issues also. In addition, this capacity-building approach uses a 'virtual scenario' approach, in which groups of delegates are required to develop a strategic ICM plan for a local 20–40 km stretch of coast. An ICM matrix is used to provide a framework for understanding the coast and the impact of management interventions. This 'virtual scenario' approach, coupled with experience in conflict reduction matrices, has been shown to provide coastal managers with a wider appreciation of stakeholder conflict in the coastal zone.

Introduction

Capacity building is one tool that can lead to an enhanced awareness of the diversity of perceptions of stakeholders and lead to a re-evaluation of the nature of knowledge and understanding required by coastal managers (Chircop, 1998; Harvey *et al*., 2002). However, training in integrated coastal management (ICM) often focuses on capacity building of individuals to increase their scientific knowledge rather than providing a robust framework for management. This leads to negligible impact as science-based solutions are rarely practical, socially acceptable, applicable or sustainable and they lack appropriate cultural context (UNESCO, 1988; Belfiore, 1999; Chircop, 2000). The need for

 Environment and Livelihoods in Tropical Coastal Zones (eds C.T. Hoanh, T.P. Tuong, J.W. Gowing and B. Hardy)

multidisciplinarity is consistently advocated, but this usually occurs within a setting of sophisticated, high-tech specialist approaches rather than within one of a generalist approach (UNESCO, 1988).

A recently completed project working with officers from the federal and individual state government of India found that the greatest barrier to developing ICM capacity was an unwillingness to work with, and a mistrust of, other stakeholders, preventing a multistakeholder consensus approach to the management of the coastal zone. In common with the findings of Poitras *et al*. (2003), this problem largely arose from: (i) the novelty of consensus building as an approach to determining management solutions for the coastal zone; (ii) the lack of incentives within the workplace to seek a compromise; (iii) the apprehension of having to negotiate; and (iv) the uncertainty of the outcome and control of the resulting management process.

This chapter describes the development of a training programme to overcome this barrier that required a re-evaluation of the training requirements for ICM capacity building and training methodologies. It also illustrates a process for developing organizational capacity for ICM that seeks to avoid the barriers of specific sectoral and disciplinary approaches.

Background to Integrated Coastal Management

The coastal zone often becomes a zone of conflict, with multiple users competing for limited space and resources. Although attention is often focused on primary stakeholders who directly use space and resources, conflict also exists between secondary stakeholders who are involved in managing the space and resources (e.g. government departments, NGOs, aid agencies, etc.). Much of this conflict between secondary stakeholders arises from competition for ownership of space and resources, but also because different organizations have different institutional arrangements for implementing their policy.

Coastal zone management was introduced in the 1970s (Nichols, 1999; Olsen, 2000). By the 1990s, coastal zone management (CZM) had evolved into *integrated coastal management* (ICM), conceived as a holistic management tool working across sectoral, disciplinary and institutional boundaries (Burbridge, 1997; Ducrotoy and Pullen, 1999; Nichols, 1999; Turner and Bower, 1999; Olsen, 2000), although maybe it has not lived up to its holistic ambitions (Nichols, 1999; Sudara, 1999). Subsequent projects and policy approaches have tended to reflect the particular interests of the particular proponents of the analysis. This can lead to a narrow problem-solving exercise rather than to a holistic management process (Olsen, 1996, 2000).

Sophisticated scientific understanding of the coastal zone cannot in itself achieve ICM. For example, fisheries modelling and quota setting do not deliver solutions to unsustainable fishing-based livelihoods in areas of high poverty. Perceptions of coastal resources among groups can be varied, diverse and conflicting (Fig. 19.1). Natural scientists seek to predict changes in coastal resources embedded in a numeric and reductionist framework (Olsen, 2000; Vallega, 2000). In contrast, social scientists seek to describe the patterns of interactions of people in networks of social relations, their maintenance and the conflict that arises from competing interests (Knight, 1992; Ostrom *et al*., 1992; Wilson and Jentoft, 1999). ICM should seek to determine a holistic view of stakeholders' perceptions of the coast in order to identify sources of conflict where appropriate knowledge from all disciplines can be employed to better understand the linkages and interdependencies of socio-economic and coastal environmental dynamics and arrive at more robust solutions (Vallega, 2000; Bowen and Riley, 2003).

The Integrated Coastal Zone Management and Training Project

This project explored capacity building for ICM from the perspectives of: (i) skills in training; and (ii) the course requirement for developing capacity in ICM. The project sought to develop capacity in state-level

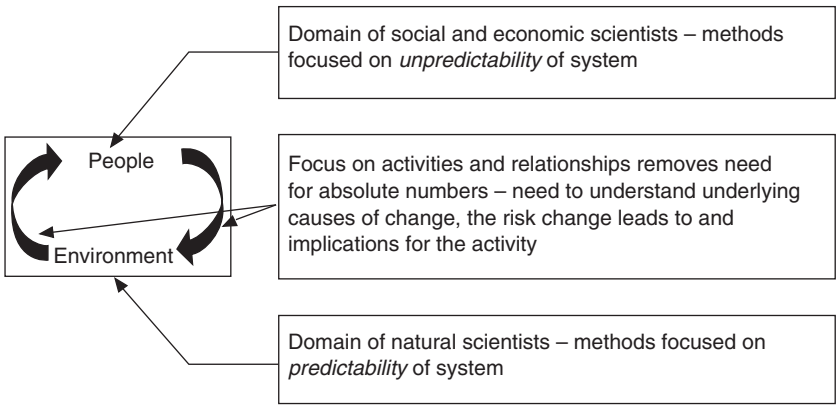

Fig. 19.1. The source of conflict between sectoral groups. Conflict arises because of a focus on either the provider (environment) or the user (people). A focus on the interactions and activities that link the two creates greater understanding of the dynamics of the coastal zone.

Indian government environmental officers for writing and implementing coastal management plans under their 1991 Coastal Zone Notification (<http://www.envfor.nic.in/legis/legis.html>). The project goal was to develop a programme that would promote a holistic approach to environmental management, encompassing socio-economic and governance issues as well as natural sciences, within a tradition of specialist, single-sector management. The training process was designed to lead trainees through a 'virtual scenario' case study approach, in which groups of trainees are required to develop a strategic ICM plan for a local 20–40 km stretch of coast during the duration of the course (Fig. 19.2). Case studies permit role-playing in an environment that simulates the work situation found in an ICM programme. They are safe and do not impose penalties for 'wrong' answers, and they can help improve decision-making skills under conditions of scientific uncertainty and competing interests (Suman, 2001). Central to the project goal was the development of training ability within India so that capacity building could continue beyond the life of the project. Training teams were established at two universities – Anna University at Chennai, Tamil Nadu, and Jadavpur University at Kolkata, West Bengal.

The following section outlines the training of local trainers, the overall training framework, specific training tools and the course design.

Training of trainers

The project required trainers to develop new skills in order to support a sustainable training approach. A major objective of training in ICM must be to remove existing discipline-biased perspectives in favour of approaches that promote an open and inclusive process to contextualize the various, and often conflicting, values and perceptions of the many stakeholders in the coastal zone.

Traditional teaching techniques such as class lecturing and research assignments cannot attain such learning objectives (Grant, 1998; Chircop, 2000; Fletcher, 2001). Furthermore, it is unlikely that a coastal manager can ever be an 'expert' in the many disciplines and sectors that have inputs into ICM. Indeed, one might argue that the role of a coastal manager is as an executive, coordinating and managing knowledge inputs rather than being the source of the knowledge itself. Thus, ICM is a team effort requiring individual inputs from a wide variety of sectors and disciplines.

Our approach was to develop training teams whose composition included expertise in the range of natural, social and economic disciplines and from the range of sectors

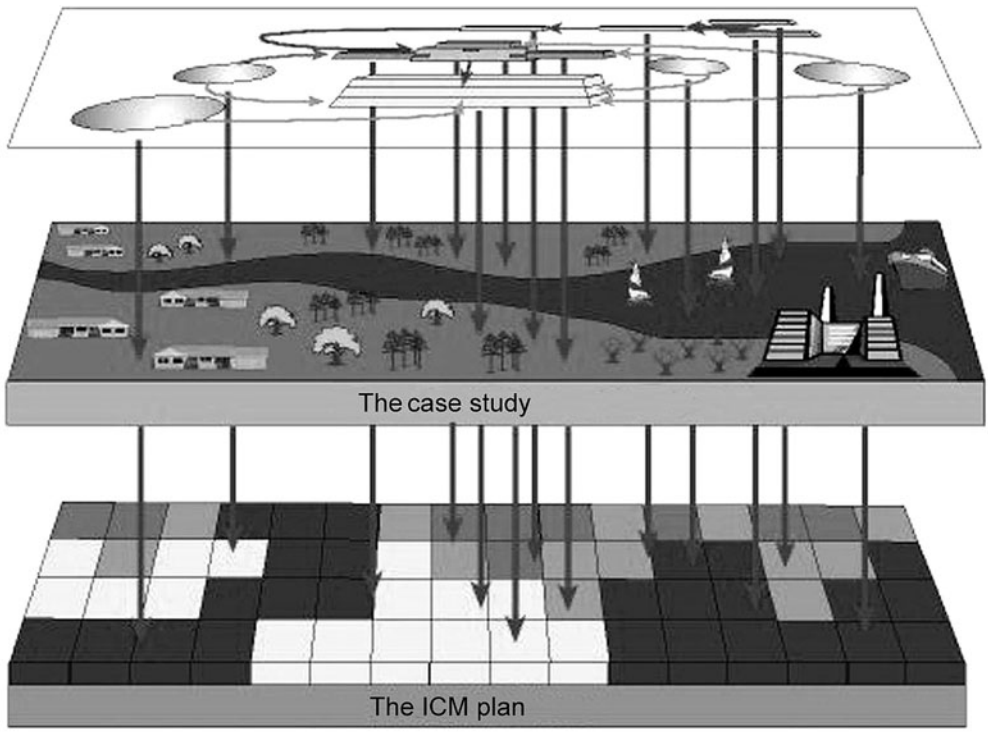

Fig. 19.2. Conceptual outline of the 'virtual scenario' case study approach. The top layer is a conceptual model of how the various dynamics of integrated coastal management commonly interface (see Fig. 19.3). The middle layer represents the various case studies, tasks and exercises that illustrate or codify the various dynamics of the top layer, in real life. The bottom layer represents the outputs of the second layer by populating an ICM plan, as traditionally conceived and implemented (with resources, responsibilities, institutional elements, time scales, etc.). The arrows represent the process of embellishment of each dynamic of the ICM model, with relevant case study information, to form elements of the ICM plan.

having a role in an ICM initiative (e.g. university, NGO, institute and government). The training teams were given a course based on the Certificate of Learning and Teaching in Higher Education given to new lecturers at Newcastle University, which included models of learning; training needs analysis; content, structure, format and materials for training; assessment and evaluation; course organization; and experiential training. This programme provided the necessary skills to conduct case study-based training.

A training framework

To guide trainers and trainees through the process of ICM encompassed within the course structure, a formulaic framework was constructed (Fig. 19.3) that is designed to address four fundamental stages of the ICM process:

- identification of the knowledge, information and inputs required from each discipline and sector to support the ICM process;
- integration of sectoral information on physical, biological and human dimensions of the coastal system;
- identification of significant interactions among processes operating within, and between, the three dimensions; and
- analysis of these interactions to identify the key issues and a range of applicable management options.

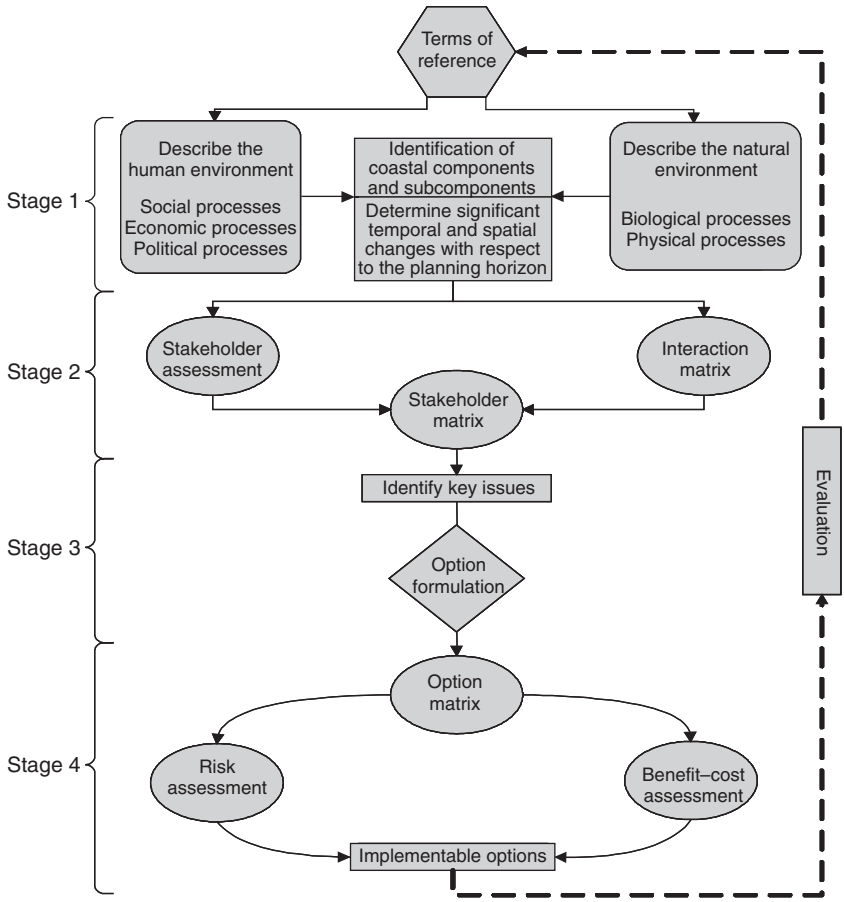

Fig. 19.3. Training framework for ICM. The framework describes four stages that gather information (round-cornered boxes), integrate information (square-cornered boxes), apply analytical tools (ovals) and negotiate priorities and solutions (diamond box). For explanation, see text.

The training framework is designed to be applied using a case study that allows the training process to take place within a virtual scenario of ICM, presenting to the delegates an experience that is as real as possible for the experiences they might expect to encounter in their workplace. The framework provides a structured and sequential guide to the process of ICM that can be used by both trainers and delegates to underpin a training course.

To achieve this process, the framework provides a means to assimilate information that can be interrogated using simplified tools accessible to non-specialists. These tools can synthesize and analyse a diverse array of interactions in order to guide coastal managers towards the determination of applicable options. Each stage in the framework incrementally filters, refines and reviews the outputs from the previous stage. This leads users from an essentially knowledge-led foundation derived from a wide range of sectoral and disciplinary sources, which is then analysed to identify the key issues/problems that are affecting the plan area, through to the formulation of potentially applicable integrated management options. The ICM process described by the training framework incorporates an integrated approach to ICM because it includes the spatial characteristics (physical, chemical, biological, ecological) of land and marine

forms of coastal regions, temporal aspects of dynamic processes occurring within the plan area and the planning horizon of the intended ICM plan, and the interrelationships between the various human uses of coastal areas and resources, as well as associated socio-economic interests and values.

The framework is used throughout a short course in ICM as a means of helping trainers ensure that all training activities contribute to the ICM approach, provide a common structure for delegates to validate their development and progression and provide a common reference between the trainer and delegate.

The framework is 'entered' through a *terms of reference* (ToR) that sets out the goals and objectives of the training exercise in the form of a statement that covers the background to the plan area and the management objectives as well as other information, including the geographic boundaries and timescale of the plan.

The ToR provides a benchmark against which the relevance of information and activity can be evaluated. Progression through the framework then takes place as four discrete stages that develop sequentially.

Stage 1 develops a knowledge base focused on understanding the plan area and the changes that are taking place within it. Stage 2 provides an evaluation of how changes are affecting the plan area and the stakeholders that use the available resources, using stakeholder and matrix-based tools. Stage 3 leads to an identification of the key issues for management focus to fulfil the ToR, and to the design of a range of options for amelioration of identified issues. Both issues and options are attained through negotiation and consensus among the delegates, drawing on their own experiences and expertise supplemented by 'outside' expertise as necessary. Finally, Stage 4 provides a means to evaluate the likely success of each option in reducing the risk to people and property, while assessing its likely cost and appraising the outcomes against the original plan objectives set out in the ToR.

Training tools

The framework is supported by four types of tools that facilitate the interrogation and analysis of information. Tool 1 is a stakeholder assessment that provides insight into the major socio-economic drivers, and also allows an assessment to be made of the relationship between the relative influence and importance of stakeholder groups and the intended outcomes identified in the ToR. Tool 2 involves matrices that provide a structure for prioritizing information and for ensuring that discussions become clearly directed and non-sectorally entrenched (Fig. 19.4).

Three forms of the matrix are used:

- The interaction matrix provides a means of exploring the interactions between the main components of the biological, physical and human environment and their expected changes.
- The stakeholder matrix provides an overview of the impacts on people of future changes in the coastal area.
- The options matrix can be used to check for stakeholder benefits from proposed management options, to filter out options that have strong negative impacts on stakeholders and also to enhance management options to maximize stakeholder benefits.

The ICM matrix is used to provide a framework for understanding the coast and the impact of management interventions (Fig. 19.4). However, it can also provide a model for the conflicts of interventions on stakeholder groups to be determined by the delegates. Using this matrix, delegates experience iterative searching for low-conflict management solutions for the target coastline. This virtual scenario approach, coupled with experience with conflict reduction matrices, has been shown to provide coastal managers with a wider appreciation of stakeholder conflict in the coastal zone.

Tool 3 is a risk assessment that can be used to document the evaluation of risk before and after an intervention takes place. By considering a range of alternative management options, an evaluation of the relative risk can be made and management options compared. Tool 4 involves the evaluation of benefits and costs using a simple framework to enable a basic, and subjective,

		COASTAL ENV.					LAND USE		PORTS AND HARBOURS			INDUSTRY			LIVELIHOODS		
		Open shore	Estuaries	Old dunes	Frontal dunes	Wet hinterland	Plantations	Agriculture	Creek harbours	Beach	Constructed ports	Tourism	Fisheries	Aquaculture	Natural material	Semi-Pukka	Concrete houses
COASTAL ENV.	Sea level change	✓	✓	**H**	✓	✓	✓		**F**	✓	**F**	**H**		✓	✓		
	Climate change				✓		✓	✓			✓		✓	✓	**F**	**F**	
	Local erosion	✓	✓		✓					✓					**F**		
	Local accretion	✓	✓						**F**	✓	**F**						
LAND USE	Conversion of wetlands		✓			✓								✓			
	Construction – tourist			**H**	✓							**H**					
	Construction – general			✓								✓					
	Railway			✓								**H**					
PORTS AND HARBOURS																	
INDUSTRY	Pollution – aquaculture		✓			✓								✓			
	Pollution – sewage											✓					
	Pollution – litter											**H**					
	Failing aquaculture													✓			
	Increasing tourists											**H**					
	Declining CPUE												**F**				
LIVELIHOODS	Urban expansion														✓	✓	✓

Fig. 19.4. An example of a completed matrix. The columns indicate system components categorized into functional groupings of the natural coastal and human-built environment. Rows identify forces of change originating from each of the functional groups. Where a change will interact with a component of the system, it is checkmarked. No attempt is made to qualify whether the impact is positive or negative, or its magnitude. Two primary stakeholders are identified: hoteliers and fishermen allowing changes that are threats to users and uses of the system to be revealed. The matrix identifies the principal foci of management needs against which the goals and objectives of the plan should be directed. CPUE, catch per unit effort; F, fishing; H, hotels.

assessment and comparison of the benefits and costs associated. This can be used to evaluate the various management options for a particular issue.

Course design

The framework formed an underpinning guide that supported a course structure built around the virtual scenario case study approach organized into three modules. The first module involves the role of information and knowledge in ICM, whereby delegates sort through information on the designated area and try to build cross-sectoral linkages. The second module involves field visits to key sites identified from the previous stage, as well as meeting with a range of stakeholders to provide a closer appreciation of the main issues and problems within the designated area. The final module involves writing an outline ICM plan. The task of the coastal management plan is to advise on ways in which coastal resource development can be integrated into a coastal system with-

out any loss of the resource or functional integrity of the environmental system in order to reduce risks to people, their livelihoods and their property.

Discussion and Conclusions

The training framework described here addresses a concern that training for development should be focused on strengthening the capacity to practise (Franks, 1999; Mann, 1999). This is particularly important in many countries where coastal problems are both so acute and persistent (Olsen *et al*., 1997) that there is not time to engage in long-term research programmes in order to obtain the perfect management solution.

Previous models for ICM, based on GESAMP (1996) and Olsen *et al*. (1997), have largely focused on identifying the stages in the ICM process with little guidance on the nature of information required to support such a process. The framework described here aims to provide guidance in a training scenario that will allow coastal practitioners to engage in the ICM process.

The approach to training facilitates integrative thinking, active *versus* passive learning and unambiguous communication (Grant, 1998), as well as re-orienting attitudes towards a cross-sectoral and multidisciplinary approach that supports concepts of sustainability (Hopkins *et al*., 1996; Pooley and O'Connor, 2000). This ensures an inclusive process for all sectors and disciplines, avoiding polarization of different groups within the management process or the development of a 'closed' language with minimal multisectoral ownership (Endter-Wada *et al*., 1998; Norton, 2000).

Training programmes, using the framework described here, have been given to cadres of officers from the federal and state government in India in 2000 and 2001, and personnel associated with the Char Development and Settlement Project II in Bangladesh in 2001. Immediately after the course, all participants were asked to evaluate the training provided using a scoring and comment format. Results showed that participants scored at least 70%, and as high as 93%, in the categories of attainment of course objective, relevance, structure of course and presentation, and their comments suggested that the courses would be beneficial to their professional roles in delivering ICM within a range of coastal areas in southern Asia.

References

Belfiore, S. (ed.) (1999) *Education and Training in Integrated Coastal Management: The Mediterranean Prospect*. FrancoAngeli, Milan, Italy.

Bowen, R. and Riley, C. (2003) Socio-economic indicators and integrated coastal management. *Ocean and Coastal Management* 46, 299–312.

Burbridge, P.R. (1997) A generic framework for measuring success in integrated coastal management. *Ocean and Coastal Management* 37, 175–189.

Chircop, A. (1998) Introduction to capacity-building section. *Ocean and Coastal Management* 38, 67–68.

Chircop, A. (2000) Teaching integrated coastal management: lessons from the learning arena. *Ocean and Coastal Management* 43, 343–359.

Ducrotoy, J.P. and Pullen, S. (1999) Integrated coastal zone management: commitments and developments from an international, European, and United Kingdom perspective. *Ocean and Coastal Management* 42, 1–18.

Endter-Wada, J., Blahna, D., Krannich, R. and Brunsonet, M. (1998) A framework for understanding social science contributions to ecosystem management. *Ecological Applications* 8, 891–904.

Fletcher, S. (2001) Empowering learning through design: a comparative analysis of ICM course development for web-based and classroom delivery. *Marine Policy* 25, 457–466.

Franks, T. (1999) Capacity building and institutional development: reflections on water. *Public Administration and Development* 19, 51–61.

GESAMP (IMO/FAO/UNESCO-IOC/WMO/WHO/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection) (1996) *The Contributions of Science to Coastal Zone Management*. Reported studies, GESAMP, 72 pp.

Grant, W.E. (1998) Ecology and natural resource management: reflections from a systems perspective. *Ecological Modelling* 108, 67–76.

Harvey, N., Clarke B.D., and von Baumgarten, P. (2002) Coastal management training needs in Australia. *Ocean and Coastal Management* 45, 1–18.

Hopkins, C., Damlamian, J. and Ospina, G.L. (1996) Evolving towards education for sustainable development: an international perspective. *Nature and Resources* 32, 2–11.

Knight, J. (1992) *Institutions and Social Conflict*. Cambridge University Press, New York.

Mann, P. (1999) Knowledge, training and development: an overview. *Public Administration and Development* 19, 1–3.

Nichols, K. (1999) Coming to terms with 'integrated coastal management': problems of meaning and method in a new arena of resource regulation. *Professional Geographer* 51, 388–399.

Norton, B.G. (2000) Biodiversity and environmental values: in search of a universal earth ethic. *Biodiversity and Conservation* 9, 1029–1044.

Olsen, S.B. (1996) *Increasing the Efficiency of Integrated Coastal Management*. Coastal management report No. 2220, Coastal Resources Centre, University of Rhode Island, Rhode Island, 10 pp.

Olsen, S.B. (2000) Educating for the governance of coastal ecosystems: the dimensions of the challenge. *Ocean and Coastal Management* 43, 331–341.

Olsen, S., Tobey, J. and Kerr, M. (1997) A common framework for learning from ICM experience. *Ocean and Coastal Management* 37, 155–174.

Ostrom, E., Walker, J. and Gardner, R. (1992) Covenants without a sword: self-governance is possible. *American Political Science Review* 86, 404–417.

Poitras, J., Bowen, R. and Wiggin, J. (2003) Challenges to the use of consensus building in integrated coastal management. *Ocean and Coastal Management* 46, 391–405.

Pooley, J.A. and O'Connor, M. (2000) Environmental education and attitudes: emotions and beliefs are what is needed. *Environment and Behavior* 32, 711–723.

Sudara, S. (1999) Who and what is to be involved in successful coastal zone management: a Thailand example. *Ocean and Coastal Management* 42, 39–47.

Suman, D. (2001) Case studies of coastal conflicts: comparative US/European experiences. *Ocean and Coastal Management* 44, 1–13.

Turner, R.K. and Bower, B.T. (1999) Principles and benefits of integrated coastal zone management (ICZM). In: Salomons, W. *et al*. (eds) *Perspectives on Integrated Coastal Zone Management*. Springer-Verlag, Berlin, pp. 13–34.

UNESCO (1988) Year 2000 Challenges for Marine Science Training and Education Worldwide. *UNESCO Reports in Marine Science*.

Vallega, A. (2000) Introduction: coastal education – a multifaceted challenge. *Ocean and Coastal Management* 43, 277–290.

Wilson, D. and Jentoft, S. (1999) Structure, agency and embeddedness: sociological approaches to fisheries management institutions. In: Symes, D. (ed.), *Alternative Management Systems for Fisheries*. Blackwell Science Ltd., Oxford, UK.