

Chapter 3

Governance of marine fisheries and biodiversity conservation: the integration challenge

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Abstract

Fisheries and biodiversity governance have both generated mixed results. The reasons for this, which are numerous, well known, and to a large extent similar, are briefly reviewed in this chapter, against a sustainable development backdrop. Insufficient integration between policies, institutions and processes of the two governance streams is one of the important factors and the focus of the chapter. The degree of integration and the processes and steps needed to increase it are explored. Factors of convergence and divergence as well as impediments are examined. The integration field on which the two governance processes interact is described in terms of gradients of risk for people and resources. Against this background, the initiatives taken in recent decades toward integration within and across the two governance streams are briefly described, in terms of strategic tensions, competition and synergy. Proposals are made to increase integration.

Keywords: Conservation, governance, integration, interaction, cooperation, competition, synergy, tension

3.1 INTRODUCTION

Fisheries management has always had as its central objective, mandate and responsibility (enshrined in UNCLOS) the conservation of target fishery resources with little explicit concern and few operational measures for broader biodiversity conservation. In the last two decades, following the United Nations Conference on Environment and Development (UNCED), there has been an increasing extension of this narrow utilitarian sectoral concern to address the conservation of marine biodiversity, with objectives going beyond the strict long-term wellbeing of fisheries. The two types of objectives are closely interconnected, however, as the conservation of marine biodiversity requires sustainable fisheries and vice versa. Consequently, there must be positive interaction between the two respective streams of governance, resulting in coherence and in many cases integration of policies and practices.

Coherence and integration are facilitated by a number of factors including obvious common interests, lessons learned from past failures, societal pressure and a common legal framework (UNCLOS). They are slowed down by a number of tensions between: (i) conservation and development; (ii) different administrations (**Chapter 2**); (iii) short-term sectoral economic interests and long-term societal ones; (iv) the rural producing sector and the urban consuming one; and (vi) developing countries (major exporters) and developed ones (major importers). There is also a lack of agreement on transition pathways, even to agreed objectives and outcomes.

Resolving these tensions to reach the globally agreed objective of sustainable use should be a central task of governance. This chapter focuses on that proposition, putting forward the argument – to be explored throughout this book – that better integration of the two administrative processes and possibly structures in charge of fisheries and biodiversity conservation is essential to both fields of governance.

There is a general agreement that the two separate streams of governance have not delivered a sufficient level of harmonization and alignment of visions, conceptual goals and operational objectives. The need to better connect environmental and sectoral policies has been repeatedly expressed for decades in fundamental texts on sustainability such as the World Conservation Strategy (IUCN/UNEP/WWF, 1980), the Bruntland Report (WCED, 1987) and the 2000 Millennium Summit Declaration. The Bruntland report states:

The integrated and interdependent nature of the new challenges and issues contrasts sharply with the nature of the institutions that exist today. These institutions tend to be independent, fragmented, and working to relatively narrow mandates with closed decision processes. Those responsible for managing natural resources and protecting the environment are institutionally separated from those responsible for managing the economy. The real world of interlocked economic and ecological systems will not change; the policies and institutions must” (WCED, 1987, p. 310).

A quarter of a century later, the tension between development and conservation, i.e. between natural resources available and *de facto* expectations for ever-increasing benefits from their use, has not been resolved – a challenge in fisheries and far beyond. Some progress has been made on the conceptual, legal and institutional planes but the above quotation remains largely valid today. The symptoms of the multidimensional misfit within and between the two systems are apparent in the frequent inadequate performance of management, illustrated by risky decreases in the abundance of fishery resources and key elements of biodiversity, poor economic performance, social distress, low compliance, and conflicts. In each sector, experts from various disciplines (including biologists, statisticians, ecologists, environmental scientists, political scientists, economists, sociologists, and lawyers) explained the failures from their disciplinary angle, proposing related solutions. The total result is a poorly harmonized plethora of “solutions” reflecting the complexity of the social-ecological systems (*sensu* Berkes *et al.*, 2000). None of the solutions, alone, are sufficient. Finding the proper mix and balance among them, achieving an adequate level of coordination and, integration to allow implementation, and adapting the mix dynamically as the contexts evolve is the governance challenge (Charles, 2001; Garcia and Charles, 2007; Grafton *et al.*, 2010). Failure leads to fragmented and incomplete implementation, and the risk is that both streams of governance will fail to reach their objectives (Brown, 2003; Persson, 2004; Rice and Garcia, 2011).

Better integration is a *sine qua non* part of the solution. The challenge for fisheries and biodiversity conservation is to build or reinforce connections among the respective policies, strategies and plans. This calls for simultaneous integration of conservation concerns and objectives into fisheries development

and management processes, and of livelihood and food security concerns of fishing communities into biodiversity conservation.

Chapters 1 and 2 have shown that convergence between the two fields of governance has already started, despite a range of difficulties and conflicts. In agreement with Rice and Ridgeway (2010), this Chapter argues that further progress will be limited in the absence of clear empowerment of existing institutions for more integrated governance, keeping in mind that the challenge this represents is only a subset of the more complex and challenging ocean governance integration.

This chapter will examine successively: the sustainable development backdrop to integration (**Section 3.2**), the aim, process and desired degree of integration (**Section 3.3**), the factors of convergence and divergence, impediments to overcome and lessons learned by the two governance streams through history (**Section 3.4**). The on-going interaction and conceptual bridges and frictions are described in **Section 3.5** before providing some concluding thoughts.

3.2 SUSTAINABLE DEVELOPMENT BACKDROP

The interaction between, and potential integration of the governance systems of marine fisheries and of biodiversity conservation is a subset of the more general problem of oceans sustainable development. This section places the analysis within that context.

3.2.1 Definitions

Sustainable development (SD) has been loosely defined by the World Commission on Environment and Development as: *development that meets the needs of present generations without compromising the ability of future generations to meet their own needs* (WCED, 1987). Using this as their foundation, more specific definitions have been elaborated in relation to more specific mandates. The United Nations Environment Programme (UNEP), as an environmental institution, stresses the objective of *improving the quality of life for all of the Earth's citizens without increasing the use of natural resources beyond the capacity of the environment to supply them indefinitely* and the need for *taking action, changing policy and practice at all levels, from the individual to the international* (UNEP, 2009). The Food and Agriculture Organization of the United Nations (FAO), as a sectoral institution, stresses *the conservation of the natural resource base* and the requirement for development to be *technologically appropriate, economically viable and socially acceptable* (FAO, 1991, in Garcia and Grainger, 1997).

In the environment arena, SD has been viewed sceptically as implying sustainable “growth” and disregarding the finite nature of natural resources. This arena embraced instead (and with some hesitation, cf. **Chapter 1**) the closely related concept of “sustainable use” (SU), coined in 1980 in the World Conservation Strategy (IUCN/UNEP/WWF, 1980), and formally adopted in the

Convention on Biological Diversity (CBD) in 1992 and International Union for the Conservation of Nature and Natural Resources (IUCN) in 2000. The CBD (Article 2) defines “sustainable use” as:

The use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations (CBD, accessible at: <http://www.cbd.int/convention/articles/?a=cbd-02>).

The IUCN 2000 Policy Statement on sustainable use¹ recognizes that the use of wild resources, if sustainable, is an important conservation tool because the on-going social and economic benefits derived from such use provide incentives for people to conserve them.

In this chapter, we will consider the concepts of sustainable development, sustainable use, ecologically sustainable development (ESD) and responsible fisheries as equivalent, with similar long-term implications albeit possibly different priorities in the short term.

3.2.2 Sustainability in fisheries

Based on the definitions above, few of the world fisheries could be considered “sustainable” judging from their performance. Problems and solutions have been abundantly identified, for example in Charles (1994), Mace (1997), Garcia and Newton (1997), Garcia and Grainger (1997, 2005), Grafton *et al.* (2009), World Bank (2009), Garcia and Rosenberg (2010) and Ye *et al.* (2012). During the last 60 years, fisheries governance has gone through a dynamic process of testing solutions to conserve target resources, with mixed outcomes. Significant institutional developments have progressively taken place, elaborating States’ rights and responsibilities and reinforcing the legal means available to them in a changing Law of the Sea context (cf. **Chapters 7, 10 and 11**). The 1995 UN Fish Stock Agreement (UNFSA) and FAO Code of Conduct for Responsible Fisheries (CCRF) complemented the 1982 United Nations Convention on the Law of the Sea (UNCLOS), highlighting the States’ duty of care, promoting stricter accountability of States and transparency in decision-making as well as more effective people participation and community empowerment, calling for more careful consideration of environmental impact, and stressing the need for compatibility of management measures across resources distribution range. The general agreement of conservation institutions with these measures is signalled, for example in Greenpeace (1996).

3.2.3 Sustainability in biodiversity conservation

The weak sustainability of present economic developments in the ocean is also reflected in the unsatisfactory state of the ocean environment and biodiversity (MEA, 2005). Some problems are related to fisheries impacts, which, in some regions, predominate. Others have to do with land-based and marine pollution

¹[http://intranet.iucn.org/webfiles/doc/SSC/SSCwebsite/Policy_statements/The_IUCN_Policy_Statement_o
n Sustainable Use of Wild Living Resources.pdf](http://intranet.iucn.org/webfiles/doc/SSC/SSCwebsite/Policy_statements/The_IUCN_Policy_Statement_on_Sustainable_Use_of_Wild_Living_Resources.pdf)

and degradations, including global climate change. The biodiversity conservation framework itself has evolved (cf. **Chapters 1 and 2**) from an early focus on protection to a more dynamic and socially-conscious sustainable use.

The IUCN Policy Statement, referred to above, specifies that sustainable use should minimize biodiversity loss, adapt management to risk and uncertainty (intrinsic to species and ecosystems) and make use of incentives and penalties. The Statement (a) calls for applying the principles of good governance, institutionalizing participation; (b) stresses the importance of systems of rights and of ethical values; (c) recommends removal of incentives and internalization of costs and benefits; and (d) highlights the need to reduce risks of resources degradation, conversion or depletion and to pay constant attention to changing global drivers. Most of these requirements are also part of the principles of responsible fisheries governance as reflected in the CCRF.

3.2.4 Sustainable development and integration

The need for integration of sectoral policies, objectives and programmes has been expressed in major international processes, e.g. the 1992 Rio Declaration (and Agenda 21 Chapter 17); the 2000 Millennium Summit; the 2002 World Summit on Sustainable Development (WSSD); the 2005 Millennium Ecosystem Assessment (MA); and *The World We Want* Declaration of the 2012 Rio+20 Summit. It is a central concern of the United Nations General Assembly (UNGA) and environment programmes (UNEP, 2009, 2012) but the practical implementation of national commitments in that regard is still insufficient.

The term “integration” is often used without clarifying its meaning and implications. In dictionaries, the meaning closer to our concern is: *to unite something with something else; to blend, bring together, parts into a larger functioning whole; to combine two or more things to increase effectiveness*². Integration is both a process and its outcome. In this chapter, “integration” is viewed as in the following:

Integration is the process of reduction of the “functional distance” between the two streams of governance, filling gaps, increasing coherence and promoting synergy with the view to improve stakeholders’ efficiency in reaching agreed objectives. Integration increases information exchange, consultation and cooperation in critical steps of the decision and implementation cycles of the two streams, to reduce the cost-benefit ratio of the processes. Integration follows “good governance” principles, looking for efficiency, coherence, effective participation, and systematic performance assessment.

The integration process might be imposed or endogenous and requires shared priorities and objectives. Its outcome may range from improved harmless harmonization to more demanding full integration (or even an aggressive ‘take over’), and may be achieved with ease or difficulty (see next section).

Chapters 1 and 2 have shown that the two streams of governance have co-evolved in the right direction, within a common legal framework (UNCLOS) but in

² Merriam-Webster’s Collegiate Dictionary (<http://www.m-w.com>); Dictionary.com (<http://dictionary.reference.com/browse/Integrate>)

parallel implementation frameworks and processes not sufficiently conducive to the level of coherence needed. Factors of friction include old entrenched habits and paradigms (e.g. fortress protection; freedom of the seas), administrative cultures, and differences in perceptions of the state of the system and appropriate reference values. Friction also results from disagreement on the parameters of action such as the risk tolerance (aversion) in relation to ecological, economic and social well-being and the ensuing tension between the risks of not protecting biodiversity “enough” and of constraining economic activities “more than necessary”. Last but not least, it emerges from inequitable distribution of costs and benefits of change in any direction.

3.3 INTEGRATION PROCESS

3.3.1 *The aim of integration*

The main objective of integration is the improvement of the overall performance of policy-making and implementation in relation to the long-term achievement of bioecological and socioeconomic goals. However, there is a wide range of not fully coinciding objectives and perceptions of what constitutes “best performance” as well as different opinions on what type of “integration” will work best. These differences can be at the root of some of the greatest challenges to progress on policy coherence and efficiency.

Some conservation champions may see integration as a way to ensure that environmental objectives become principal or overarching societal objectives. For Lafferty (2002, p. 13), for example, integration implies: (i) *the incorporation of environmental objectives into all stages of policy making in non-environmental policy sectors*; (ii) *the aggregation of presumed environmental consequences into an overall evaluation of policy*; and (iii) *a commitment to minimise contradictions between environmental and sectoral policies by giving priority to the former over the latter* (emphasis added). Environmental Policy Integration (EPI) takes a similar perspective, as an approach to ‘mainstream’ environmental objectives into development policies, and environmental policies into economic sectors’ policies.

In both of the above, the proposed integration is de facto ‘one-way’ in that the idea is to integrate environmental considerations into “non-environmental policy sectors” but not the other way around. There is also an unbalanced distribution of costs and assessment of consequences (working with ‘presumed’ rather than demonstrated impacts). The latter might arise in circumstances when environmental risks are very large and/or alternative, cost-effective ways to achieve social and economic objectives are available, but structuring such an outcome in as a precondition is unlikely to be widely embraced as a starting point for integration. In particular, this contrasts with a joint process of finding the most effective solution at the lowest possible aggregate cost for both sets of stakeholders. It is, therefore, not surprising that EPI has attracted great scholarly interest and some political backing, particularly in the developed world, but that *“its practical fulfillment appears to lag well behind aspirations, with deep*

disagreement regarding its actual application... few examples of joint best practices and scarce knowledge of policy outcomes” (Jordan and Lenschow, 2010).

The spirit of SD and SU is that integration, through a *balanced* governance approach, facilitates a compromise *acceptable to all concerned*³, balancing human and natural wellbeing⁴. In general, the inter-governmental debates on policy integration tend to aim more at harmonization between the two fields than a merger of the two or “takeover” by one of the two. Indeed, key policy actions to bring biodiversity considerations into fisheries policy have improved internationally agreed principles (e.g. good governance), approaches (e.g. precautionary and ecosystem approach to fisheries), processes (participation) and instruments (1995 UNFSA, CCRF, etc.) and brought key issues on the table. However, while broadening and better specifying States’ responsibilities, these debates left fisheries policy-making and management practices largely unaltered in most countries (e.g. CBD, 2011; Gilman *et al.*, 2012).

3.3.2 Integrating decision processes

As on-going governance is a necessity, steps to better integrate the two streams of governance must obviously be undertaken dynamically, while the processes are functioning. One might think of two trains moving on not-quite parallel railways, trying to synchronize timing and speed so that their cargo can be transferred, identifying moments and places where this can take place at least risk to both trains. The idea is a challenging one – to achieve benefits of integration, while keeping the overall financial, institutional and political costs to the minimum.

Chapter 8 of Agenda 21, adopted by UNCED in 1992, addressed the issue of integrating environment and development in policy and decision-making and recommended action to: (i) integrate environment and development at all levels of the decision chain (policy, planning and management); (ii) provide an effective legal and regulatory framework; (iii) make effective use of economic instruments and incentives; and (iv) develop systems to integrate environmental and economic accounting. The subsequent summits (WSSD in 2002 and Rio+20 in 2012) focussed on implementation, particularly at the national level. In marine fisheries, implementation at the regional level is also considered a very useful step to promote the necessary cooperation.

³ However, those who study power dynamics argue that there is no reason to expect that outcomes be ‘*satisfactory to all concerned*’ since the outcome is entirely dependent on who has the power when these ‘compromises’ are being worked out.

⁴ Human wellbeing is a condition in which all members of society are able to determine and meet their needs and have a range of choices to meet their potential. Ecosystem wellbeing is a condition in which the ecosystem maintains its diversity and quality -and thus its capacity to support people and the rest of life- and its potential to adapt to change and provide a wide range of choices and opportunities for the future (Prescott-Allen, 2001, p. 5).

Effective integration requires a reduction of the functional distance between the two streams at the various steps of their decision/implementation cycle (see below). It also requires a better integration between the various scales of governance, at local, national, regional and global levels, the interaction of which determines the degree of legitimacy and performance.

Figure 3.1 illustrates the decision cycle followed, in rationally managed fisheries and biodiversity conservation institutions (left and right panels) from the high level policy principles and instruments developed in interaction between the global and national levels, to implementation, monitoring and iterative adaptation. The parallel and loosely coordinated processes use an overlapping set of instruments and it is argued that the institutional distance (degree of independence) between these processes could be further reduced for better joint outcomes, by building more or stronger bridges between the different steps in the process.

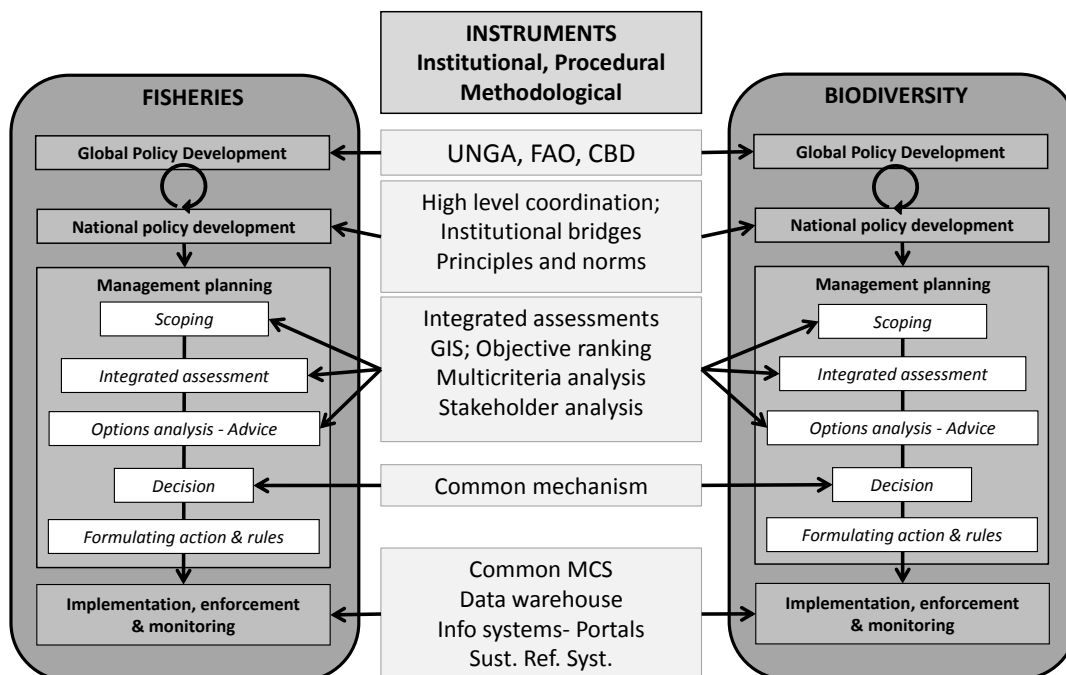


Figure 3.1: Types of integrative instruments that can be used to bridge key steps in the fisheries and biodiversity governance decision cycles

The types of integrative instruments that are or could be used in the process are mentioned and explained in more detail and in context within the different chapters of this book. Following and adapting Eggenberger and Partidario (2000, p. 204) and Persson (2004, p. 27, 36), the integration toolbox includes:

- Legal instruments: consisting of “hard” and “soft” law (cf. **Chapters 7, 15**);

- Overarching policy frameworks such as the Australian ESD (cf. **Chapters 10, 22**) to incorporate key principles in both governance systems (e.g. cross-sectorial integration, spatial basis, user rights, and good governance) as well as to clarify mandates and roles, establish common definitions, objectives, constraints, norms⁵ and approaches⁶, and harmonize national positions in international organizations;
- Institutional instruments: development of the capacity of institutions to interact; establishment of “bridging” hybrid institutions (common committees, task forces, MOUs, audits, joint assessment processes e.g. for integrated and strategic environmental assessment; institutional information exchange (e.g. on best practices); mandatory performance evaluation; and ultimately – if cost-effective – the merging of ministries (cf. **Chapters 10, 12**);
- Common procedures for, e.g., integrated assessment of status and trends (cf. **Chapter 9**), risk assessments, performance evaluation and reporting and conflict resolution;
- Common decision-support tools: GIS, scenario analysis, stakeholder analysis, ecological accounting, multicriteria analysis, agent-based modelling, databases, and shared data collection systems; integrated sets of indicators and sustainability representation systems (cf. **Chapters 13 and 14**); and
- Communication: joint formal communication with stakeholders.

3.3.3 *The degree of ‘integration’*

On a scale of integration ranging from little to total integration, we can identify the following degrees of integration (**Figure 3.2**):

⁵ e.g. for Environmental Impact Assessment or Strategic Environmental Assessment

⁶(e.g. the precautionary and ecosystem approaches or integrated spatial planning

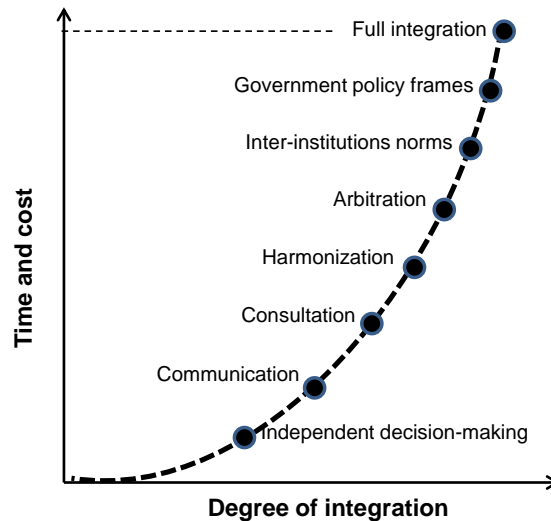


Figure 3.2 Schematic representation of the evolutions of cost and time needed for integration processes as a function of the degree of integration (based on Metcalfe, 1994)

- Independent decision-making. In this situation of ‘infinite functional distance’, the two streams operate separately, with total independence, sometimes mutual ignorance, and usually competing for power and budgets. In reality, total “independence” is very rare as in any reasonably organized government the two streams would be forced to apply similar overriding national policies of a social, economic or environmental nature.
- Communication. In this “dual monologue”, the two streams keep each other informed, voluntarily exchanging information on objectives, constraints, activities and programmes and their outcomes. They may develop a common set of standards for joint databases as well as common toolboxes.
- Consultation. Institutions in each stream consult each other before or during the decision-making, sharing blueprints and white papers, and organizing technical consultation meetings, but eventually each chooses its own path and pursues it independently.
- Harmonization. Both streams seek to build consensus, reduce/eliminate conflicts and look for synergies. They follow similar general lines and aim at adopting compatible objectives and pursuing them in similar or complementary ways. However planning and implementation remain autonomous in each, possibly enhanced by “dialogue meetings”, joint declarations, and inter-ministerial mechanisms for collaboration.
- Arbitration. When horizontal collaboration between fisheries and conservation ministers is stalled, arbitration could be provided by higher authorities. Specifically, at a national level, the office of the President or Prime Minister, for example, might intervene and decide, with the procedure either institutionalized (e.g. in an inter-ministerial body) or *ad*

hoc. In areas beyond national jurisdiction (ABNJ) only the UN General assembly has a mandate to play that role, with high moral albeit less binding authority.

- Inter-institution norms. These are established by higher authorities and represent a permanent mechanism of integration between the two streams. They provide a continuous integration frame and their correct application is evaluated regularly, with appropriate feedback and mandatory adaptive response.
- Government policy framework. As briefly addressed above; this option can be enhanced if a common strategy joint or coordinated implementation plans are adopted.
- Full integration. With zero functional distance, this combines all previous elements of the two streams in a (hopefully) better functioning whole, eliminating redundancies and filling gaps, reorganizing the distribution of powers. Generally, this means that both streams are put under a single ministry. There will still be cultural, substantial and operational differences to overcome between ministerial departments. For example, marine fisheries have already been in and out of other ministries, e.g. agriculture, commerce, or environment.

Policy integration requires comprehensive inputs (with the right scope), a specific and effective process and a systematic check on performance. The transaction costs of the integration process increase rapidly with the degree of integration (even though there may be overall economies of scale in the end and better outcomes). The problem is to find the optimal point offering a type of Pareto equilibrium⁷ between institutions/stakeholders concerned (Underdal, 1980, p. 165).

3.3.4 The integration road map

The processes and conditions leading to better integration of the governance of marine fisheries and biodiversity conservation are similar to those advocated for achieving sustainable development (IUCN/UNEP/WWF, 1980; OECD, 2002, p. 813, box 1; WCED, 1987). The road map includes:

- Review of policy and legal frameworks. Review of national fishery and marine conservation policies, strategies and plans, identifying gaps, conflicts and potential synergies; review of relevant new and existing laws and regulation to check compatibility between objectives; mechanisms for effective feedback between the relevant government levels; review of the two agendas to identify and enhance joint efforts on common issues, mainstreaming the principles of sustainable development/use in both agendas;

⁷ Using Pareto optimality as a criterion when making trade-offs may meet with objective difficulties relative to insufficient knowledge, for example (Parsson, 2004).

- Development of a common understanding. Progressive agreement on common principles, facts and trade-offs, in a pragmatic manner that may not take place in that order. Harmonization of goals and clear operational objectives that are clearly understood by the government, leaders of both streams, and other stakeholders. This may include establishment of a catalogue of best practices with clear examples of benefits, as well as information devices for the sector, the consumers and the public;
- Demonstration of commitment and leadership. Clear commitment towards integration at the highest level, demonstrated over time by effective communication; explicit efforts to bridge gaps between the respective administrative and political agendas; determination of unambiguous joint priorities; maintenance of a sense of urgency; active promotion of joint pilot activities to demonstrate feasibility and benefits;
- Provision of adequate means to implement the integration plans, including plans for incentives and rewards for performance and provision for transitional costs;
- Institutional development. Strengthening of both sets of institutional structures, developing hybrid institutions and other institutional bridges at all levels of decision-making from policy-making to ground-level implementation;
- Conflict resolution mechanisms. Institutions and processes to foster healthy debates between scientists, managers and users on conflicts related to chronic or emerging problems; opening new arenas for negotiation in a dynamic integration process; adopting solutions that minimize conflict, and balance sectoral and societal interests;
- Stakeholder involvement. Use approaches that increase credibility, legitimacy, and compliance by the various stakeholders; adopt legal provisions and elaborate guidelines for active (possibly joint) consultation and participation of interested parties concerned at all levels; systematic evaluation of participative performance in consultations and implementation; mechanisms for ensuring transparency of decisions;
- Procedural enhancements. Elaboration of specific procedures (e.g. in systems of indicators, performance assessments, auditing, etc.) that effectively integrate environment and development concerns; adopt and apply the principles of good governance (UNDP, 1997);
- Knowledge enhancement. Development and management of knowledge bases; establishment of information flows among scientists and between them and the community and decision-makers; mechanisms for managing conflictual knowledge; development of scenarios and options; efforts to promote multidisciplinary research and integrated assessments (as proposed, for example, for small-scale fisheries by Garcia *et al.*, 2008 and in **Chapter 9, 23-26**); and

- Performance assessment. Institutionalization of a framework for assessing performance of organizations in the integration process relative to sustainable development; evaluation mechanisms to support sustainability appraisal in the public sector and use of these evaluations in an adaptive manner, checking and optimizing performance.

The approach to integration might be direct or indirect (Persson, 2004). In a direct (or linear, directive) approach, integration is “imposed” from the top down with objectives, means, milestones, expected outcomes, etc., as in an engineering project. The indirect approach recognizes the difficulties of this strategy and puts in place the conditions needed for the integration to materialise from the interactions themselves. As the governance of complex systems is usually, itself, a complex system of systems (Garcia, 2009), Persson’s indirect approach to integration amounts to promoting it as an emergent property of the complex governance system, more than as an explicit design factor of social engineering.

Given the reality of system complexity, the outcomes of different integration pathways will likely not be completely predictable. For the same reason, no single pathway should be expected to emerge as universally “best”. The common set of external drivers provided by economic globalisation and international cooperation will, however, constrain the *a priori* numerous potential pathways to a limited set, characteristic of places, States, ecosystems, or policy issues with similar histories and sets of constraints.

3.4 INTEGRATION FACTORS

The streams of governance have been functional for about a century for fisheries resources conservation and about half a century for marine biodiversity conservation (cf. **Chapter 1**). Since the Bruntland Report (WCED, 1987), continued efforts have been made to improve fisheries and biodiversity conservation separately. As these efforts progressed, opportunities for integration have arisen and at least in some cases have been taken (**Chapter 2**). Present efforts towards better integration do not, therefore, develop in a vacuum. Legal frameworks, policies, strategies and plans have been developed and are being implemented and lessons have been learned. The potential integration field is encumbered by few successes, many disappointments and strong prejudices. It is complicated by jurisdictional boundaries (EEZs, High Seas and designated areas of all sorts), by administrative inertia and turf-building, as well as by the complexity of the marine ecosystem and the interaction of human and natural sub-systems. In addition, substantial parts of the concepts, strategies and plans for marine biodiversity conservation were developed for terrestrial ecosystems and populations, and jurisdictions where spatially-based ownership was better established than on land. Not all parts of that heritage function with comparable efficiency in marine systems (Rice, 2011; **Chapter 8**).

The result of that interaction, against a backdrop of parallel histories, common policy backgrounds and global drivers is that the “integration” field is presently

loaded with factors of convergence and divergence that may foster or stall integration. These factors are examined below.

3.4.1 Factors of convergence

As stated in **Chapter 1** and developed in **Chapters 12, 15** and **21**, converging policy backgrounds and common global drivers have facilitated convergence of the two streams of governance, notwithstanding the tensions between them.

From a bird's eye view, there are strong similarities in: (1) the conservation targets (resources, biodiversity); (2) the jurisdictional framework (UNCLOS); (3) the law-making processes; (4) most long-term goals and some short-term ones; (5) major management approaches such as the precautionary, ecosystem, participative, good governance and rights-based approaches; (6) the historical shift from species-based to ecosystem-based strategies, from centralized to decentralized governance; and (7) a common desire for higher levels of spatial and sectoral integration of policies and management in highly conflictual areas.

There are also similarities in the challenges to governance effectiveness in both streams: (1) implementation difficulties at the national/local level; (2) capacity and costs of assessment, monitoring and reporting; (3) non-compliance and free riders; (4) decision loopholes, whether involuntary or planned (like opting out procedures); (5) mixed performance and high levels of failure⁸; (6) the complexity of social-ecological systems (Folke, Berkes and Colding, 2000); and (7) insufficient attention to socio-economics, social dynamics and equity. Some of these points are examined in more detail thereafter.

There is complete agreement, in the marine biodiversity and fishery resources conservation arenas, on the fact that ocean fauna and flora are living renewable resources (or are essential to the maintenance of such resources) and part of the Earth's complex system supporting life and human livelihoods. The two streams share the vision of reaching simultaneously long-term ecosystem and human wellbeing, recognizing that conserving biodiversity and maintaining productive ecosystems for future generations requires consideration of the social and economic conditions of present generations (IUCN/UNEP/WWF, 1980; WCED, 1987).

The long-term goals of marine biodiversity and fishery resources conservation (responsible fisheries and sustainable use of biodiversity) are already aligned at the global level, thanks to efforts made by States since the 1972 Stockholm conference within international institutions (FAO, UNEP, IUCN, CBD, etc.) under the UNGA umbrella.

⁸ With notable exceptions, the global performance of both streams of governance has been dismal as shown by the state of the environment and fishery resources (Cunningham and Bostock, 2005; FAO-SOFIA 2010; Millennium Ecosystem Assessment, 2005; OECD, 1994; Sand 2001; Worm *et al.*, 2009;). Failures outnumber successes but, as stressed by Sand for conservation, one cannot tell how much worse the current situation would be without past efforts.

A quick comparison of the conditions for “responsible fisheries” (e.g. as provided in the 1995 FAO Code of Conduct) and for “sustainable use” of aquatic resources (e.g. as provided in the 2000 IUCN Policy Statement) indicate that there is also (i) a high level of concordance in States’ rhetoric about what constitutes an adequate policy framework both for sustainable fisheries and for marine biodiversity conservation, as well as (ii) a high level of commitment to implement such policies. This concordance has led to some progress but much remains to be done (CBD, 2011; Gilman *et al.*, 2012).

The process of reflection over international agreements and commitments in regional institutions and national systems is on-going, boosted by the increasing accountability of States to report at the international level (e.g. the annual UNGA or the 2012 Rio+20 summit) on progress made in relation to (e.g.) the 2000 Millennium Development Goals, the 2002 WSSD plan of implementation targets, the 1992 CBD targets and their 2010 Aichi targets, or the various UNGA resolutions on sustainable fisheries. However, a number of old and some emerging problems remain and the high level conceptual coherence of the two streams is not yet, or too slowly, leading to coherence in ground-level implementation.

3.4.2 Factors of divergence

More or less conspicuous tensions exist between, as well as within, the two streams of governance that interfere with the integration process at various levels. They relate *inter alia* to differences in: (1) the balance in the respective sets of objectives and their relative weightings; (2) perceptions and tolerances of risks faced by ecosystems, resources and people (3) preference for the allocation of costs and benefits; and (4) weighting of present versus future positive or negative outcomes. Some of these points are elaborated below.

First, while the long-term goals underpinning the governance of both marine fisheries resources and biodiversity conservation are largely overlapping, they are not completely so (Salomon *et al.*, 2011) and will probably never be; this naturally generates tensions.

The governance of the fishery sector aims at maintaining a responsible sectoral contribution to national SD, sustaining both ecosystem and human wellbeing. This implies constraining fishing operations with the view to maintaining as far as possible: (1) the resources (target and non-target) at or above their level of maximum biological productivity (MSY⁹); (2) the ecosystem structures and functions in altered but unimpaired states; and (3) viable enterprises and sustained community livelihoods.

⁹ It is recognized that this stock-related reference level cannot be achieved simultaneously for all resources and that an acceptable compromise, at the ecosystem level, must be found. The single population MSY level of abundance, initially considered to be at around 50% of the unexploited level (Beverton and Holt, Schaefer) is now considered to be around 20-40% of the unexploited level (Hilborn and Walters, 1992).

In contrast, the overriding goal of marine biodiversity conservation is to maintain marine life, its supporting environment, and ecosystem processes far above the minimal, critical, level below which their decline (natural or human-induced) may become difficult to reverse, and often, in a state where the human footprint does not dominate over natural variation. This implies constraining human development activities to a level compatible with “typical” ecosystem functioning.

The core objective of one governance stream faces therefore the core constraint of the other and finding common ground (positive overlap) is challenging. For example, limiting the reduction of a (target or non-target) fish population to, say, 20-40% of its unfished biomass, with concomitant changes in age structure, may be considered necessary, acceptable and sustainable by those in charge of fisheries. However, this may be viewed by those in charge of conserving biodiversity as unacceptably adverse impacts, excessive perturbation of ecosystem processes and increased risks of extinction in the face of other stressors (e.g. harsh climatic conditions). This last concern is reinforced by the fact that many stocks appear to be still exploited beyond their MSY (Garcia and Grainger, 2005; Piet and Rice, 2004; Ye *et al.*, 2012) and many recovery plans have failed to achieve their objectives in the time frames initially set (Mora *et al.*, 2009). The difference between the two streams appears to be, as usual, in different weights given to short-term costs and long-term benefits of reducing the sector’s activity as well as the different perception of what a “broad ecosystem health” looks like.

While UNCLOS offers a legal reference (MSY) for yield, mortality and biomass, it does not offer any similar binding guidance in terms proportion of the habitat that can be impacted, a vacuum illustrated in the debate about the relative coverage of MPAs which the CBD tries to fill in its strategic plan objectives.

3.4.3 Common lessons: achievements and impediments

The last half century of numerous failures and insufficient successes should have taught both streams similar lessons. For example: (i) the "common pool" nature of marine biodiversity and fishery resources increases the risk of excessive rates of removal and degradation of productive habitats; (ii) there is a maximum level of tolerable impact, beyond which the risk of irreversible damage becomes unacceptable; (iii) scientific knowledge is limited and needs to be supplemented by traditional and informal knowledge; (iv) scientific advice is necessary and important but the decision belongs to representative policy-makers; (v) there are inconsistencies between development and management strategies; (vi) unresolved conflicts between users are a source of failure; (vii) free riders weaken management strategies and increase non-compliance; (viii) the rules of "good governance" and adaptive management are essential, and similar for both streams; (ix) economic and social incentives have an important role to play in changing attitudes and behaviour; (x) poverty is a major obstacle to the conservation of resources and the ecosystem; (xi) corruption is another; (xii) systems of sound indicators may facilitate management and communication; and

(xiii) the proper valuation of non-market resources must be addressed by environmental economists and social scientists.

These lessons should lead both streams to adopt similar devices in their strategies (e.g. on use rights, economic incentives or spatial integration) and to better explore the potential for synergies (e.g. on joint assessments, monitoring and surveillance systems). Many chapters of the book explore these points in more depth, often showing that despite sharing many challenges and opportunities, the respective institutions may not always take away the same lesson. Where the lessons drawn happen to be the same, the ultimate results generally turn out to be real improvements in governance (cf. **Chapters 2, 10, 11 and 16**). Where differing expectations and risk tolerances lead to the two streams drawing different lessons from a common experience, governance challenges may even have increased (cf. **Chapters 8 and 9**).

The real differences between the two streams of governance generated conflicts, even though, in some instances, these conflicts created arenas for more intensive interaction towards solutions acceptable to both streams¹⁰. Examples of this include: conservation versus traditional use rights, MPAs (1975-ongoing); aboriginal fishing rights (1982-ongoing); bycatch, e.g. of dolphins in tuna purse seine fisheries (1980-2000), of seabirds in longline fisheries (since the late 1980s), of turtles in shrimp trawl fisheries (1994-2001) and of many of the same species in large-scale pelagic driftnets (1998-2001); ghost-fishing by abandoned or lost gear (since the mid-1980s); exploitation of forage species; destructive fishing practices; and the interaction of fisheries, MPAs and biodiversity in ABNJ since the early 2000s. It is encouraging to see that many of the recent issues have been approached less as partisan “conflicts” to be won than as “issues” to be resolved through cooperation and even compromise, perhaps because of the increasing convergence and growing awareness that neither stream can achieve its goals without cooperation with the other.

Some divergences/conflicts affecting integration are also occurring within the two streams of governance. Such conflicts (albeit sometimes marginal in appearance) relate for example to the cost/benefit assessment of integrating social and economic arguments into conservation, and the pros and cons of soft law versus hard law at the fisheries/biodiversity interface (cf. **Chapter 2**). In fisheries governance, the adoption of ecolabelling in FAO and its broad up-take by markets and industry sectors, for example, involved good collaboration between NGOs and the fishery sector. However, until recent accommodations to certification processes were made, the high cost of the ecolabelling process and the required data acquisition, as well as the challenge of meeting stringent sustainability criteria (with the potential to be subject to market discrimination if unable to pay or to meet the criteria) led to opposition from groups of fish-exporting countries, developing countries and small-scale fisheries. Similarly the FAO process to reinforce port States responsibilities (to deter IUU) was originally

¹⁰ The elements of history are available in Chapter 1 and Annex 1

resisted by a number of countries worried about their sovereign rights and duties (S. Beslier, pers. comm.). In the governance of biodiversity conservation, the most emblematic internal conflict is between protection and sustainable use, reflecting the original divergence between utilitarian (anthropocentric) and aesthetic (ecocentric) stands of conservation (cf. **Chapter 1**; de Kemm and Shine, 1993).

Divergences between the two governance streams, and failures at integration, can be traced to internal heterogeneity (and ‘politics’) within each stream. Each stream – and perhaps any governance system at all – has a range of participants, from the pragmatic ‘compromisers’ to the radical ‘ideologues’. Within-stream tensions may be amplified in the context of a negotiation process with the other stream, if the latter fear that their stream may lose sight of its fundamental objectives by compromising through the acceptance of some of the others’ arguments. The dynamics of consensus-building is analysed in some detail in **Chapter 10**.

At a higher level, on-going change management faces a number of well-known problems and challenges, including: (i) lengthy processes for parliamentary endorsement of UN agreements, modification of national legal frameworks, and change of strongly entrenched social behaviours, particularly in areas where incentives and alternative livelihoods are limited; (ii) insufficient capacity in science and administration, at local and central levels, to address the complex wicked problems posed by fishery sustainability and marine conservation and their complex interaction; and (iii) insufficient attention to social dynamics, equity, and the need to design viable transitional pathways¹¹.

3.5 INTEGRATION THROUGH INTERACTION

The preceding sections have provided a brief and certainly partial description of the issues related to integration and the opportunities offered to advance it. Clearly, the “integration field” is complex and it offers potential for further cooperation as well as conflict. Full integration may result from authoritative decisions from a government to merge two ministries into one, or potentially, at an international level, for an RFMO and a Regional Seas organization to merge. More targeted integration may happen when a decision is made to formally establish institutional bridges, e.g. for management in large MPAs. However, the functional distance between the two streams of governance may also be reduced organically, as common understandings, visions, objectives and approaches emerge from daily interaction, as an “evolutionary adaptation”.

¹¹ While the objectives are often agreed, the contrast between immediate conservation costs and delayed conservation benefits create unsustainable tensions in the absence of social safety nets. The Brundtland report (WCED, 1987, p. 313) stated that *policy paths that are sustainable requires that the ecological dimensions of policy be considered at the same time as the economic, trade, energy...and other dimensions on the same agendas and in the same national and international institutions. That is the chief institutional challenge of the 1990s.*” This remained the main challenge more than 20 years later, at the Rio20 summit.

To illustrate this point, the interaction field on which governance of biodiversity conservation and of fisheries meet as they exert their mandates has been represented in **Figure 3.3** in relation to levels of risks. The shades of grey (from white to black) reflect the overall level of risk for the resources (or biodiversity) resulting from the interaction between: (1) their intrinsic bioecological vulnerability (for example, to fishing pressure or climate change), and (2) their vulnerability to market, economic and management aspects – such as attractiveness to industry (e.g. market value, abundance) or management inefficiencies (e.g. distance from shore, assessment and/or management errors)¹².

Where risk is low, fisheries management (and human socio-economic objectives) tend to have the priority, and we might expect that FAO, RFMOs and national fishery management agencies would claim primacy. Where risk of lasting harm and slow recovery is high, the concern for protection takes priority, in which case CITES, CBD, regional and national environmental agencies may claim primacy. This is obviously a caricature as conservation attention is also given in low risk situations and fisheries governance must also intervene to rebuild high-risk fishery resources.

Two particular challenges to governance should be noted here. First, the areas of low and high conservation risk¹³ may be sufficiently contrasted to legitimate the respective primacy of fisheries or conservation governance. However, in-between, there is an area of intermediate levels of risk in which both streams may ‘claim’ primacy, leading to either competition or cooperation. Second, the various institutional actors may well differ in their assessment of the risks, and thus may differ in where they consider the governance issue to lie in relation to their respective “domains”; this could potentially lead to significant conflict.

¹² This reflection on sources of risk is borrowed from FAO work on the CITES listing criteria (FAO, 2000).

¹³ e.g. corresponding respectively to biomass levels at MSY and at recruitment collapse

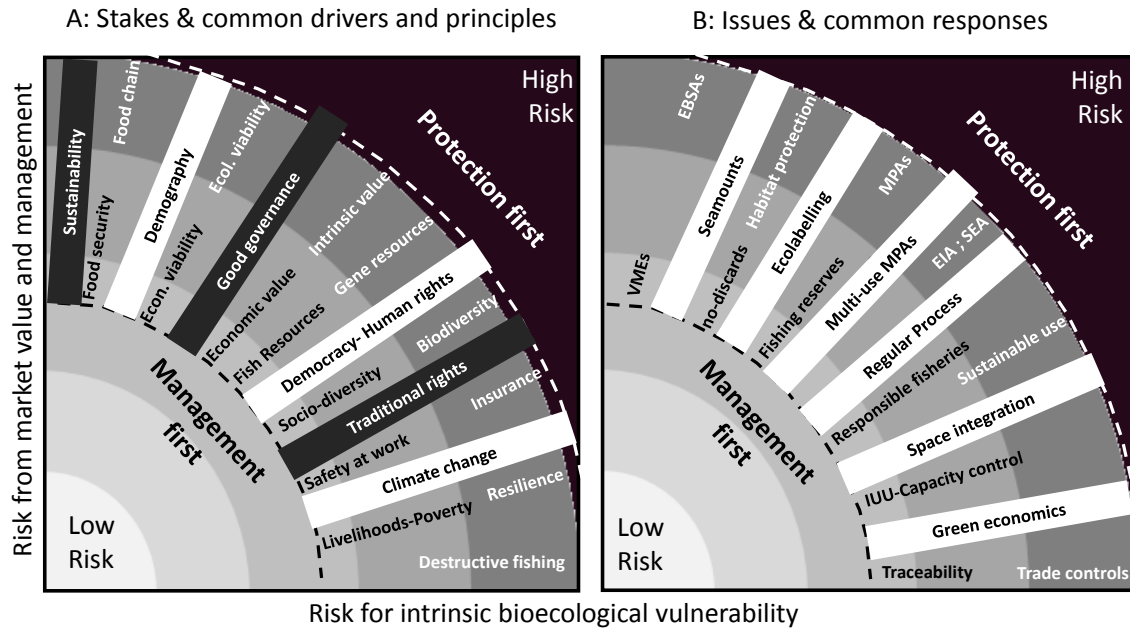


Figure 3.3: Schematic representation of the interaction between fisheries and biodiversity conservation on a risk background. The rectangles depict the common drivers (white, left panel), principles (black, left panel) and issues (white, right panel) that are acting as bridges for improved integration. Modified from Garcia (2010)

In Chapter 2, we have argued that a convergence has been ongoing for at least 4 decades, albeit with difficulties. **Figure 3.3** (left panel) intends to illustrate the fact that incentives for better integration are provided by common drivers such as demography, democracy, human rights or climate change that impact the two streams in a similar manner and should call for similar types of strategies and actions. Convergence is also facilitated by adoption of common governance principles such as long-term sustainability, good governance or consideration of traditional rights. On the other hand, friction may arise from opposition, misalignment or tensions between contrasting ideas, over a diverse spectrum such as: economic vs. ecological viability; food security vs. forage species; human vs. animal community resilience. Many of these tensions are higher on the short-term than on the longer term.

In many ways, bridging is also facilitated by issues faced together, even from different angles (**Figure 3.3**, right panel). For example, vulnerable seamounts, ecolabelling, MPAs, integrated spatial management, and the potential role of economics all offer platforms for encounter, the testing of differences, and reaching agreement. Traceability in fisheries and trade controls in CITES have elements in common, as do responsible fisheries and sustainable use strategies, VMEs and EBSAs, and fishery reserves and MPAs. There may be mutual suspicion, and grounds for conflict, but there is also room for improved mutual understanding and, potentially, compromise and synergy.

Whether a result satisfactory to all parties can be achieved depends, of course, on the context and the power relationships among the actors involved. Furthermore, we recognise that the behaviour of both streams with respect to integration is not necessarily driven by societal optimization, but instead is affected by sectoral ('within-stream') motivations, which can include a desire to maintain or expand jurisdiction. Overall, however, we hypothesize that more progress will be made in both streams through "integration" of efforts across the two streams than through competition, and that this integration implies a lower aggregate cost to society. These hypotheses will be explored throughout in this volume.

3.6 CONCLUDING THOUGHTS

In order to fully tackle the integration process, the institutions and processes involved must have suitable maturity, internal coherence and capacity. Unfortunately, that is often not yet the case. Therefore, in many cases, integration may need to be applied to individual components of each stream of governance, to accelerate positive evolution as well as the converging coevolution (through joint learning and common moves). For example, the science in both streams needs to become integrated itself – a multidisciplinary science of complex systems, with both social and natural sciences, and including complex modeling, traditional knowledge, together with participatory assessment and advisory mechanisms. This is occurring slowly, but the coevolution could be accelerated by the development of joint assessment processes with the above attributes. Availability of a common science foundation then allows institutional design of integrated planning as well as a strategy for conflict resolution, without requiring more difficult merging of policy and management authorities across streams (cf. **Chapter 9**; Garcia *et al.*, 2008).

Similarly, there is a need to foster the integrated use of existing legal instruments through development or better use of existing integrative policy frameworks for sustainability, at national (cf. **Chapter 22**), regional (cf. **Chapters 12, 15-20**), and global levels (cf. **Chapters 7, 10 and 11**). There are particular issues in the high seas where the rights and duties of States are still being specified and instruments developed to help fulfill them. The ongoing debate about the conservation and sustainable use of biodiversity in ABNJ is testing the maturity of the systems intervening in ocean governance and the real willingness of States to accommodate both conservation and development concerns under sustainable use. Agreement on what a sustainably used ocean in ABNJ would look like seems a precondition for constructive dialogue between the streams on the degree of structural integration of governance that is needed in ABNJ.

A better integration of conservation with fisheries requires taking into account the resilience of the already heavily stressed coastal communities concerned, in relation to the change required for impact mitigation or ecosystem rebuilding, or when facing loss of livelihoods and/or development opportunities. Such integration should give significant attention to transition costs not just outcomes,

and develop pathways that minimize the stress on populations while pursuing the intended ecosystem rehabilitation or protection. Community engagement in decision-making is essential (cf. **Chapters 6, 22-25 and 27**).

With the globally rising awareness of ecosystem-level and ocean-wide interconnections, cumulative impacts, and the need for inter-sectoral management, important discussions are also on-going at global and national levels about the potential need and options for high level integration – among sectoral management authorities, as well as between them and their biodiversity conservation counterparts. Integration is advocated at all levels, from the local, community-relevant level, to the EEZ¹⁴, the Large Marine Ecosystem (LME) or whole oceans¹⁵ (IOM). The implications of that perspective are complex, experience is still limited, and the debate is still open (cf. **Chapters 8 and 10**). Additional problems emerge in scaling up, notably an ignorance about and mismatch of the most relevant boundaries and scales of the ecological and social and economic sub-systems (cf. Christie *et al.*, 2005). As the geographical scale of integration grows to higher-level issues, the risk increases that the needed contact and support from local populations will be lost and discontinuous institutions will be over-stretched, leading to efficiency loss and failure.

Integration appears therefore as a utopia, a real reachable opportunity or a source of undue burden, depending on the context; accordingly, its promotion and implementation should be strongly based on local realities and capacity.

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¹⁴ Integrated Coastal Area management (ICAM); Marine Spatial Planning (MSP)

¹⁵ Integrated Ocean Management (IOM)

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