OBSERVATIONS ON GOVERNANCE IN THE GLOBAL ENVIRONMENT FACILITY (GEF) INTERNATIONAL WATERS (IW) PROGRAMME

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2011

Summary

The Transboundary Waters Assessment Programme (TWAP) is a GEF project to develop indicators for monitoring all aspects of the projects in its International Waters (IW) portfolio. This discussion paper addresses the monitoring of governance. The focus is on the Large Marine Ecosystem (LME) component of the IW Programme, however, the points raised may be relevant in other IW areas as well.

The first point made is that governance has received much less attention than the natural science aspects of LME Projects. Therefore, it is far behind in terms of its development and application. The fact that this is also the case in the GEF Transboundary Diagnostic Analysis/Causal Chain Analysis/Strategic Action Plan methodology that underlies its IW programme suggests that this may be an issue in other IW areas as well. The dominance of natural scientists in the LME program is a likely cause of the low effort expended on understanding governance. This may have resulted in an imbalance between the emphasis on ecosystem conservation and resource rehabilitation relative to the social and economic issues that inform and include the establishment and operation of governance institutions.

This deficiency in emphasis on governance is seen as a gap between the GEF IW program and the recent emphasis on human well-being that can be found in the MDGs and WSSD targets. If this gap is allowed to remain, it may diminish the impact that the GEF funding has on global initiatives to ensure that sustainability is pursued in a way that is socially just. Addressing this gap will require that the GEF evaluation process encompass a much wider range of criteria than currently appears to be in use for LMEs.

Two key issues are raised with regard to assessment of resource governance initiatives such as the GEF IW projects. The first is that governance can only be evaluated against context specific goals and objectives. Some global norms can be assumed at the level of principles, but tradeoffs among socioeconomic and conservation objectives must be established through an appropriate process at the level of those affected. The second key issue is the multi-scale, multi-level nature of governance in social-ecological systems (SESs). In our view, these issues preclude the possibility of a simple set of universal indicators that can be used to assess governance across LMEs globally. It indicates the need for a general assessment framework within which each situation can be approached. This framework must allow the flexibility for context specific governance evaluation within IW systems that can nonetheless ultimately be compared across systems for a global perspective.

Based on a review of several of the governance frameworks that are available in the literature, we propose a set of characteristics that an assessment framework should include in order to be flexible while allowing comparison among IW systems. We then describe a policy cycle-based, multi-scale, multi-level LME Governance Framework that appears to have most of the desired characteristics. This framework appears to be useful for both designing interventions to improve governance in LMEs and for assessing governance.

An outline of how this framework might be applied is presented. However, it requires a whole framework approach that is likely to be rather more complex and extensive than what the GEF

was initially seeking in its TWAP. Simpler alternatives that have been presented, however, seem to lead back to the same questions and conclusions regarding the host of criteria that is likely to be needed to properly assess if governance is 'good' in a variety of contexts.

Given the relatively low investment of the GEF in developing governance concepts and approaches for the LME component of its IW Programme it is recommended that in the next phase of this TWAP initiative, the GEF should seek to engage the diversity of current intellectual activity that is taking place regarding governance for sustainability of Social Ecological Systems and focus it on International Waters. This would require a two-phased approach. The first phase would be to synthesize current governance thinking and activities into an assessment framework that can be applied in an IW setting. The second phase would be to test the framework by applying it in a variety of IW situations.

The above two-phased approach could be pursued by establishing a working group comprising individuals with a broad range of experience in governance drawn from groups such as the Resilience Alliance, Fisheries Governance Network and the Earth System Governance Project. In our view, this will serve to enhance the current level of understanding surrounding governance issues within the GEF International Waters portfolio. By complementing the level of effort expended in the natural sciences with a focused effort aimed at the social sciences, the potential for achieving the GEF's International Waters aim of helping countries work with their neighbours to modify human activities can be significantly enhanced.

Acknowledgements

This is a discussion paper prepared for The GEF Transboundary Waters Assessment Programme (TWAP)

Contents

<u>Citation</u>

Mahon, R., L. Fanning, and P. McConney. 2011. Observations on governance in the Global Environment Facility (GEF) International Waters (IW) Programme. Version 3. July 2010. CERMES Technical Report No. 45. 40pp.

1   Introduction

This paper addresses a serious perceived deficiency in the treatment of governance in the GEF IW LME and Open Oceans areas. It proceeds by (1) examining the possible source of the deficiency, then (2) looking at the key components that should be included in GEF IW governance, especially from monitoring and evaluation perspectives, including governance contexts, and (3) concluding with a possible governance evaluation framework.

We try to make the key points in as brief a document as possible. The topic of governance is however a large one and much important background cannot be included here. This is particularly the case for IW governance, where the full range of governance issues is relevant due to the extent of institutional scale that must be considered; from local to global. This paper should therefore be viewed as an attempt to get the topic fully into the IW discussion arena, leaving much to be discussed and developed later, rather than be viewed as being comprehensive and definitive.

2   The imbalance between natural science and governance

2.1   Unable or unwilling

In the GEF IW LME program, a large amount of information has been accumulated based on many years of natural science research documenting changes in the world's oceans in areas of productivity, fish and fisheries and pollution. Together with this is the misconception that simply documenting change and impacts, and making this information available, will jointly lead to the governance changes that are needed to reverse degradation and unsustainable use. While technical information is critical in monitoring the state of LMEs, it is not by itself sufficient to create long-term change. To view the collection and dissemination of scientific information as all that is needed to achieve desired change is a classical technocratic perspective. Scientists of this persuasion appear unable or unwilling to understand that this is not correct and that much more is required to affect the behavioral changes needed to achieve effective governance. Contrast this to increasing use of social marketing in other arenas focused more directly on behavioural change.

2.2   Social and political context

If documenting how bad things are, and even modeling how bad they are likely to become, is not sufficient to bring about change; what more is needed? We propose that it is also essential to have information on the way that people interact with their environment and resources, and how they interact with each other in attempting to manage the benefits from these resources. These interactions take place in the context of value systems that differ according to people's culture and economic status, among many other human dimensions. They take place in the context of institutions that, whether formal or informal, are often resistant to change. They also take place in the context of livelihoods driven by diverse factors ranging from the global profit motives of commercial firms to the need to survive at a very local, individual or household level. This type of information must be obtained through engaging those who affect and are affected

by the decisions being made about the resources. From a research perspective, this is generally the expertise of social and political scientists, economists and people with knowledge and experience in policy and legal analysis, specifically governance.

2.3 New perspectives on governance

The natural-science-driven nature of the GEF IW LME Program has resulted in limited capacity on the part of the main science partners to appreciate the implications of ignoring the values, institutions and interactions that determine whether or not people use their resources and impact their environment sustainably. These are the critical components that constitute governance and that will determine if all or any of the technical information that has been accumulated will be of value or not. This is perhaps linked to the fact that some natural science partners do not appear to have recognized new perspectives on governance now go far beyond the narrow perspective of signing agreements, enacting legislation and implementing enforcement.

2.4 From what to why and how

When confronted with issues of governance, technocrats trained in natural science often argue that they have addressed governance because they have documented matters such as records of compliance, presence of laws and regulations, existence of commissions, existence of committees, etc. These are necessary parts of the process of understanding and assessing governance, but are far from sufficient. There are innumerable examples of laws that do not have any effect, commissions that are dysfunctional, committees that are corrupt and marine protected areas that exist only on paper. Documenting non-compliance with laws or the FAO Code of Conduct for Responsible Fisheries (CCFRF) does no more than once again tell us what is not working. It does not help us to know why it is not working or how to make it work. For these, we must be prepared to go deeper and to examine the processes and institutions that underlie governance and governance failure.

3 Assessing governance

Assessing process and analyzing institutions are investigations in which natural scientists have little training and as such, may understandably shy away. Many of the frameworks and criteria by which governance processes are evaluated are qualitative in nature or at least difficult to quantify with certainty (e.g. Ostrom 2007, Biermann 2007, Mitchell 2008, Young 2008). Assessing governance is also a value-based activity in which values may vary with context. Assessment may include administrative criteria; such as efficiency, effectiveness and responsiveness, which may be among the least difficult to evaluate as they can often be reduced to economic terms. It may also include criteria that are partly in the domain of social justice; such as appropriateness, accountability and transparency, and those that are squarely in the domain of social justice such as; inclusivity, representativeness, legitimacy and equitability (Cooper and Vargas 2004, Mitchell 2008, Newell 2008).

3.1   Social justice

These latter criteria became recognized as critical for sustainable development (Maxwell 2001) and the Millennium Development Goals (MDGs). The World Summit on Sustainable Development (WSSD) took them fully on board with the focus on poverty reduction. For example, it was recognized that achievement of sustainability was unlikely without adequate attention to social justice and the circumstances of the world's poor and marginalized peoples. Their struggle to survive has consequences for resources and environment that affect the likelihood of successfully addressing degradation and unsustainable use. The critical importance of addressing this 'social justice' aspect of governance is underscored by the fact that for the most part the conditions that create and perpetuate poverty are not caused by the poor but by others, who also bear the responsibility for addressing the problem.

The focus on poverty alleviation and the pro-poor responses that are needed include close attention to sustainable livelihoods and equitable sharing of benefits. This is not easily achieved. In the case of small scale fisheries, Béné et al (in press) observe that 'the dominant view in academic and policy arenas is one where the major contribution of capture fisheries to development should be derived from the capacity of society to maximize the economic rent of fishery resources'. They further observe that 'the economic and institutional conditions inside and outside the fishery sector are not in place to ensure the effective 'capture' and redistribution of this rent in most developing countries". They argue that "the welfare function of small-scale fisheries, that is, their capacities to provide labour and cash-income to resource-poor households, should be preserved until the appropriate macro-economic conditions for rent-maximisation and redistribution are fulfilled." Governance interventions and the monitoring of these must be able to provide information on the performance of institutions relative to these criteria.

Unless the GEF IW program takes action to ensure that its monitoring includes the extent to which these social justice criteria are being incorporated in its activities, it is seriously at risk of failing to have an impact, or that its impact will be at the cost of social justice (Goldman 2004, Mitchell 2009). Without taking these criteria into account, the GEF IW may be operating in contravention of the values of the MDGs. Without appropriate governance monitoring, improvement of the planet's ecosystems through reduction of overharvesting and pollution may ultimately be achieved at the expense of the poor and underprivileged. The GEF will be judged harshly if this is found to be the case. Even if this is not actually the case, the GEF could still be found wanting if it cannot demonstrate through appropriate indicators that its activities have been consistent with socially just principles and values.

3.2   Good or bad governance

The problem with the deficiency in attention to governance runs deeper than has been outlined above. While much of the GEF IW program is at present about assessing status, one would expect that it should also be, or should strive to become, about interventions that improve conditions through 'good' governance. Unless 'good' governance practices are documented and encouraged and those that are 'bad' identified and discouraged, there will be limited progress towards 'good' governance. Whether governance is 'good' or 'bad' at any particular point in time can only be determined based on principles that are agreed among stakeholders (e.g.

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Fanning et al 2009b), and that are specific to the geopolitical and cultural context; it cannot be determined from outside (Rothwell and VanderZwaag 2006). The GEF IW must not shrink from assessments that facilitate IW partners to differentiate between 'good' and 'bad' governance, while bearing in mind that these are dynamic concepts (similar to poverty), and that point the way to the former. So, how is this to be achieved?

3.3   Interventions included

In the LME and open oceans programs and (probably in others) the emphasis has been on biophysical assessment and modeling. Governance assessment and modeling has received much less attention and is much less well developed. Consequently, there is much less of a basis on which to build an assessment and monitoring framework for governance, far less an intervention framework that would provide an avenue to better governance. Undoubtedly there have been efforts in various areas and programs. The GEF should seek urgently to consolidate these, to move the governance discourse out of the control of the natural scientists, and to engage others whose focus has been on the area of governance. Many governance issues cut not only across the GEF IW Programs but across its other focal areas as well. There is the need to bring together those who have been working on governance in these areas and to put it at the forefront of GEF sustainable development activities, as an overarching activity, whose needs are served, not driven by the natural sciences. Political and social scientists, economists and managers, legal experts and experts in international relations all with experience in global governance and governance of social ecological systems should be engaged to provide guidance to the GEF. The natural scientists that have had the lead thus far and the bulk of the GEF's resources can be expected to object loudly and defend their current role vigorously. We suggest that rather than being viewed as a competition for funds among the various branches of knowledge, GEF should see this as a broadening of its investment to include the full suite of activities that helps it best achieve its mandate.

Solutions to this situation may be available but they are not assembled, and they are certainly not evident in the GEF IW TWAP exercise. As a start to this, the following section provides some preliminary ideas regarding the assessment of governance.

4   Assessment and monitoring of governance in the GEF IW programme

4.1   Governance perspectives

Governance is largely about interactions among players (actors or stakeholders), the institutions, whether formal or informal, that shape these interactions, and the visions and principles that guide these institutions and interactions. Hence the recent definition of governance from Kooiman et al (2005) "Governance is the whole of public as well as private interactions taken to solve societal problems and create societal opportunities. It includes the formulation and application of principles guiding those interactions and care for institutions that enable them." Similar perspectives are espoused by most groups working on governance of natural resources (Biermann et al 2009, Armitage et al 2008). According to the Science and Implementation Plan of the Earth System Governance Project, their "[...] notion of governance refers here to forms of steering that are less hierarchical than traditional governmental policy-

making (even though most modern governance arrangements will also include some degree of hierarchy), rather de-centralized, open to self-organization, and inclusive of non-state actors that range from industry and non-governmental organizations to scientists, indigenous communities, city governments and international organizations" (Biermann et al 2009).

Understanding and assessing governance is a complex topic that has been receiving increased attention globally. The appreciation that top-down command and control approaches have not worked due to complexity and uncertainty in systems to be governed and governing systems has fueled this attention. A full review of the field is beyond the scope of this paper. Several conceptual models and frameworks have been proposed by various groups (e.g. Ostrom 2007, Biermann 2007, Mitchell 2008, Young 2008, Chuenpagdee et al 2008). Some of these examples are summarised in Appendix 1 to illustrate the variety of thinking that has emerged to address this problem.

One example that has emerged from a decade or more of governance research (Mitchell 2008, Brown et al 2009, Appendix 2) in an international setting is the framework that will be the basis for the research agenda of the IHDP Earth System Governance Project over the next decade. It is built around five analytical problems that will also require attention in developing a framework for IW governance evaluations (Biermann et al 2009 Appendix 1). These include: Architecture of earth system governance; Agents that drive earth system governance and that need to be involved; Adaptiveness of earth system governance; Accountability and legitimacy of governance; and Allocation which is about justice, fairness, and equity. In addition, the Earth System Governance Project emphasizes four cross-cutting research themes: The role of power, the role of knowledge, the role of norms and the role of scale.

The various frameworks may have different emphases but share many common components and agree on many key issues. One conclusion that is relevant to TWAP that can be drawn from examining these frameworks is that a comprehensive suite of indicators will be needed in order to assess governance. Others have reached similar conclusions (Funtowicz et al 1999, Ehler 2003, Ostrom 2007, Chuenpagdee 2008). In order to achieve comparative assessment of governance across a wide-range of IW situations, a case-history based approach may be required (e.g. Christie et al 2009). This would involve the pursuit of context specific enquiry regarding whether governance is 'good' or not in each specific IW situation, but according to a framework that allows comparison across case histories. The framework for this will have to be developed drawing upon the best available ideas from the variety of frameworks available, with a view to being practically applicable within a diversity of governance contexts.

4.2   Assessing governance

To reemphasize the point made in the previous section, assessment and monitoring of governance is largely about evaluating processes (interactions) and the way that these are determined and carried out. Evaluation of institutional arrangements within which the processes take place is part of this; as different arrangements, and the scale at which they occur, are likely to result in different outcomes (Ostrom 2007). Process indicators (Duda 2002) will play a large part in assessing governance according to the criteria discussed in the previous section. Process indicators are critical as much of governance in Social Ecological Systems (SESs)

is about negotiation of trade-offs among competing objectives and needs. Whereas process indicators are essential in assessing governance, the ultimate test of the effectiveness of governance in achieving sustainability is whether pressure and state indicators[1] show that there have been desirable changes in the systems to be governed. However, we reemphasize that these must include all the pressures and states that are relevant to good governance, not just the state of the natural environment and its resources. This point is also emphasized by Olsen (2003) in developing his framework to assess the four orders of coastal governance outcomes. The framework recognizes that Integrated Coastal Management is a process for negotiating and implementing public policy to achieve sustainable coastal development goals. It highlights the importance of changes in state (such as the abundance of fish or quality of life) but also recognizes that for each change in state there are correlated changes in the behavior of key partners and stakeholders within the sphere of influence of the management activity (Olsen 2003, p.348). This creates a demand for social and economic information for effective assessment.

5   Components of an IW governance framework

In this section we draw upon the variety of frameworks that have been proposed to explore some of the key components for assessing governance. In our view, a governance framework for GEF IW will be most useful if it can serve as both an implementation (intervention) framework and an assessment framework.

5.1   The importance of evaluating against goals and objectives

Assessment, whether based on indicators or case histories, has to be carried out with reference to goals and objectives (Ehler 2003). The situation can be summarised as follows.

1.   If there are no goals and objectives then we do not know what is important.
2.   If we do not know what is important then the baseline assessment has to measure everything.
3.   This is the trap that the LME approach has fallen into from the outset.
4.   The majority of its resources have gone into measuring everything in the natural science modules.
5.   This is a deep flaw and there is no easy fix.
6.   How do we know what is important in the specific context, so that we can have indicators that relate to those issues?
7.   We determine what is important by starting with a planning process in which the terms of reference for creating 'the plan' are clearly articulated based on accepted underlying principles, goals, objectives, temporal and spatial boundaries or in which these are developed as a starting point.

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[1] This terminology is used by The GEF to indicate the pressures that result in environmental or resource degradation and depletion and the state of the environment or resources experiencing the pressures.

8. In that regard the IW TDA CCA is on the right track, but has generally been focused on natural science issues and has not served to identify social and economic goals and objectives and agreed governance norms.

This emphasis on objectives puts governance assessment in the context of an iterative planning process or policy cycle. The broad goals and detailed objectives are first determined then actions are taken to achieve them followed by assessment of the success of these actions. The broad goal setting requires a larger societal discussion on what activities we consider appropriate, considering the limits of science to provide the knowledge base for questions that transcend the environmental domain (Knol 2010).

In certain situations, objectives can be assumed from international standards such as those found in multilateral environmental agreements, codes of conduct and the Millennium Development Goals. In terms of pollution, habitat destruction and fisheries overexploitation, such standards have often been assumed to be adequate. For example, it has been assumed by all that recovery of fish stocks to levels at or near those capable of producing MSY is a good thing. All else being equal, it is. However, all else is not equal, and the social justice issues associated with this objective must also be considered (e.g. Béné et al in press).

One cannot assume global norms or criteria fit all situations. They must often be adapted by the stakeholders to fit the context of the specific governance situation. In LME situations, this means they must be developed for multiple scales and at multiple levels and may differ among SES situations within the same LME. This is a main reason why one cannot develop a simple set of indicators to apply in all LME situations, let alone all IW situations. Good governance structure will include the institutional arrangements that allow for inclusive goal and objective setting according to agreed principles. The presence or absence of this capacity and its functionality should be assessed.

5.2 Governance framework properties

The governance framework must embody some key properties:

- It must accommodate both geographical scale and institutional scale, since IW activities are generally large scale and transboundary;
- It must accommodate the different types of governance interactions and processes that must co-occur within the framework if governance is to be appropriate;
- Its processes must be iterative on time scales that are appropriate to adaptation and learning; and,
- It must be structured so that different scale and process appropriate indicators can be used in different parts of the framework.

These properties are discussed in greater detail below.

5.2.1 Scale

'Scale' is the overall label of the feature being measured such as spatial, temporal, jurisdictional, institutional, management arrangements, network, and ecological knowledge scales. "Level" is the particular resolution within a scale. "Multi-scale" means more than one

scale, and "cross-scale" signifies interactions across them. "Cross-level" refers to interactions among different levels within the same scale (Cash et al 2006, McConney et al 2007, Biermann et al 2009).

In most transboundary situations, there will be at least three levels within the institutional scale: local, national, transnational. These will be nested within institutions at the global level, with which interaction is essential. Intermediate levels may occur depending on the size of the region (between national and regional) and of the countries involved (between local and national). Institutions at any level may be governmental or non-governmental (market and civil society) or combinations of the two. They may be sectoral or intersectoral. The processes at different levels may differ in nature and need to be assessed separately according to agreed criteria (Mitchell 2008). Discussions of scale issues and their relationship to governance can be found in Ostrom et al (1999), Ostrom (2007), Young et al (2008) and Biermann et al (2009).

The (mis)match between institutional processes and biophysical processes at different levels in both scales is a matter of governance concern and can be assessed (Galaz et al 2008). The analysis of the Bay of Bengal LME by Bavinck and Salagrame (2008) indicates that different approaches to defining boundaries may be required for different governance issues. Distribution of responsibility between levels is also of concern (Berkes 2002, Lebel et al 2006). The subsidiarity principle states that governance should be at the level closest to the object of governance. For example, governance of a small MPA can be delegated to an arrangement that encompasses its spatial scale and the institutional scale of its key stakeholders; possibly at local or district level. In contrast, governance of transboundary fishery resources or pollution must take place at a multinational institutional level. It should, however, include institutional stakeholders at lower levels so that their interest can be represented, leading to questions of legitimacy and representation. Questions of appropriate subsidiarity are central to governance assessment.

5.2.2 Types of processes

Many governance criteria apply to the way that things are done and are about process. Some indicators may evaluate a process based on properties of its outputs. For example meeting reports may indicate whether all stakeholders took part and whether the meeting conclusions reflected their views. However, the establishment of a commission or any kind of body is not an indicator of the processes that body carries out. Documentation of the process that was followed to establish it may reveal aspects of how it is likely to perform, but a variety of process information would be required to assess this likelihood.

Governance (inevitably cross-scale) requires three orders of activity (hence multi-level) which are interlinked (Bavinck et al 2005, Daily et al 2009). All three orders can and should be assessed. At the lowest order, there is problem solving, opportunity creation and implementation activity. Two examples would be: (1) how many patrols there should be each day and what procedures should be followed when an infraction is encountered; and (2) what time of day or day of the week capacity building should be offered and who will be allowed to attend. In each case, action can be designed to be fair and even or biased and targeted.

At the intermediate order is the design and care of institutions and instruments. Examples include: (1) the design of a management arrangement for a protected area; (2) the composition and operation of a national interministerial committee for marine affairs and how it seeks to engage private sector and NGOs in its deliberations; and (3) the establishment of a body with competence for transboundary pollution monitoring and control. In each case who participates, whether they have adequate capacity and legitimacy to represent their constituency, how decisions are made and how power imbalances are addressed are matters for governance assessment and will affect how social justice issues are handled by the various processes (Jentoft 2007).

At the highest order are processes that determine the visions and principles and thence the policies that define how the other orders are structured (Bavinck et al 2005). Examples include: (1) whether inshore fishery resources should be reserved for local communities or made available to large scale commercial enterprises - equity; and (2) the extent to which management responsibility can be delegated to community groups - inclusiveness. At this order, even the fundamental mental models of governance can be challenged and revised (Bundy et al. 2008, Pahl-Wostl 2009).

5.2.3 Iterative processes

These three orders of governance activity are usually distributed among nested levels on the institutional scale, necessitating that linkages between these levels be functional. All three orders require an iterative process, albeit at different periodicities on the temporal scale (mix of fast and slow variables). A system with iterations occurring at all three activity orders, each with the appropriate degree of timeliness, provides for triple-loop learning which is essential for governance to be truly adaptive and capable of transforming as needed (Pahl-Wostl 2009). As discussed by that author, "The triple-loop learning concept aims at a refinement of the influence of governing variables in terms of governing assumptions and governing values. Single-loop learning refers to an incremental improvement of action strategies without questioning the underlying assumptions. Double-loop learning refers to a revisiting of assumptions (e.g. about cause–effect relationships) within a value-normative framework. In triple-loop learning one starts to reconsider underlying values and beliefs, world views, if assumptions within a world view do not hold anymore."

Iteration in processes is essential for evaluation, learning and adaptation. The most common form of iterative governance process is the standard policy cycle. The generic form of this cycle is one in which a problem is identified, information gathered, analysis conducted to provide advice to managers, decisions taken and implemented, the results evaluated and used to determine further information needs and to revise approaches (Olsen et al 2005). It can be found in many documents that address planning (e.g. Garcia et al 2008). Typically, early cycle iterations take action based on limited information and the information base is improved to a level that is consistent with the needs and approach of the system to be governed. It is within the context of these cycles that technical inputs from the sciences and other sources take place.

The completeness and timeliness of these policy cycles as well as the conditions under which the iterative process take place are of critical importance in governance (Pahl-Wostl 2009). They can be assessed according to the governance criteria mentioned above.

5.2.4 Framework structure or architecture

One of the main values of a structured framework within which to pursue implementation is that all stakeholders know their places and roles in the framework. They know and understand the processes by which each of the above orders of activity takes place in relation to their role. They know how to access the information and decisions that they need. They know who to approach when decisions or actions or principled guidance is needed, whether within their level on a particular scale or on adjacent levels. In short, to each stakeholder, the system is transparent and participants can be held accountable.

The linkages within the framework are also critical to governance (Gehring and Oberthur 2008). Linkages are interactions (processes). Both those linkages intrinsic to the policy cycles, i.e. between the various stages described above and those between the cycles at various scale levels are assessable using standard criteria for interactions: quality of information, responsiveness, transparency, etc.

5.2.5 The context in which governance takes place

The overall ecological, social and economic context within which ecosystem-based natural resource governance must take place will determine the appropriateness, effectiveness and efficiency of various approaches (Cooper and Vargas 2004, p. 83). In addition to the circumstances that are internal or specific to the system to be governed, this context may include externalities, for example the national and regional political situation or the risk of natural disasters. One of the recently recognized reasons for governance failure in social ecological systems is the failure to recognize the unpredictability and uncertainty of these systems and consequently to treat them as if they were deterministic processes that can be predicted and controlled (Folke et al 2002, Wilson 2004, Charles 2006).

Recent perspectives on governance seek to recognize complexity and with it the probability of failure of deterministic approaches and thus to put in place governance processes that can respond to the unpredictable. This is often referred to as adaptive governance, but all governance is adaptive to some extent. The key question is whether it is adaptive on a time scale that is suitable for responding to the time scale on which the unpredictable change will take place. The capacity to respond in time and thus minimize impact is termed resilience and building resilience is becoming an increasingly important part of establishing appropriate governance (Berkes et al 1998, Folke et al 2002, Walker and Salt 2006).There is a large and rapidly increasing literature on this topic that has considerable implications for the way that governance will be approached in the future. It is reaching a point where it can lead to practical approaches, the success of which can be measured by appropriate monitoring.

Assessment processes are increasingly seeking to evaluate the nature of the system to be governed and its vulnerabilities. One example of this approach is Sustainable Livelihoods Assessment (Allison and Ellis 2001, Allison and Horemans 2006, Béné et al 2007); another is the scoping phase of the Integrated Assessment and Advisory Framework for Small Scale Fisheries (Garcia et al 2008) that seeks to place the fishery in a value/complexity space as a context for management (Mahon et al 2008). For these and other reasons, there is the need to assess governance context from a variety of perspectives.

The idea that in LME governance one size does not fit all and that approaches may differ among LMEs according to context is explored by Hoagland and Jin (2008) and Mahon et al (2010). Other than these two papers research on understanding LME governance though comparative analyses of the entire set of LMEs globally is virtually non-existent due to the imbalanced emphasis on the natural sciences. Consequently, the information base from which to approach an understanding of governance context and diversity and build a monitoring framework is very limited.

6 An IW governance evaluation (and implementation) framework: The LME Governance Framework

In this section we describe an attempt to develop a multilevel governance framework; the LME Governance Framework (Fanning et al 2007). Its architecture is based on iterative processes in the form of policy cycles with linkages among them. This was developed as both an implementation framework and an assessment framework. It seeks to bring together in a simple, useable, structured way key ideas relating to governance architecture that can be found in the literature. It incorporates the characteristics outlined in section 3 above and allows for a diversity of governance and governance assessment approaches, depending on the circumstances. It is consistent with frameworks and schema for institutional assessment proposed by Ostrom (2007), Young (2008) Mitchell (2008) and Biermann et al (2009) among others. It addresses many of the linkage and interaction issues identified by numerous authors (Berkes 2002, Young 2006, Gehring and Oberthur 2008). A brief summary of this framework is provided below, followed by an attempt to demonstrate what would be required to apply it across a range of LMEs.

The framework that was developed is based on linked policy cycles at multiple levels, from local to international (Fanning et al 2007). The cycles have a common structure but may vary in nature at different levels and from issue to issue at any given level (Figures 1 and 2). However, they must be complete in order for there to be effective governance at the level or location in question. Cycles must also be linked vertically with two-way flows if they are to be effectively connected with the remainder of the framework (Figure 3). Incompleteness and disconnectedness are two common dysfunctionalities in living marine resource governance. It is also critical for vertical linkages to be established among the decision-making stages of the various cycles. Linkages at other stages such as the technical ones are important but not sufficient. Finally, lateral linkages are also important as they serve to promote shared learning.
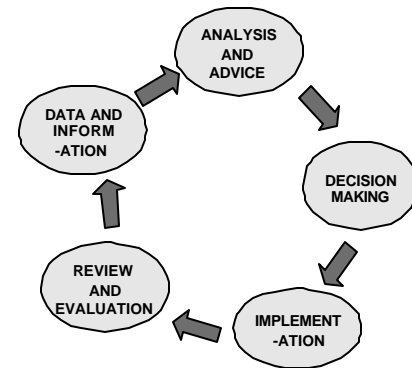

Figure 1. The generic policy cycle used for the proposed LME governance framework (Fanning et al 2007).

Using this framework, the long-term governance goal for the LME is 'fully-functional policy cycles at all appropriate levels with the appropriate vertical and lateral linkages'. This long-term goal can be understood by stakeholders and can be approached incrementally with targeted interventions specifically aimed at:

- Establishing or completing policy cycles,
- Building or enhancing linkages.

All kinds of research and assessment including Traditional or Local Ecological Knowledge, participatory research, oceanography, stock assessment, resource mapping, sociology and economics at all scale levels

All kinds of analysis that is focused on addressing fishery and environmental management problems and that can lead to advice that is useable by decision makers: local groups, national committees, regional scientific bodies and NGOs

Bodies with a mandate to review advice and make decisions, preferably binding, regarding what should be implemented to achieve sustainability in fisheries or environmental use: local NGOs and CBOs, Ministries or Cabinet, regional/international political bodies.

Similar bodies to those that are responsible for analysis and advice and that often oversee the policy cycle

Primarily national and local agencies with a mandate to put decisions into action, whether this be capacity building, new legislation or direct enforcement.
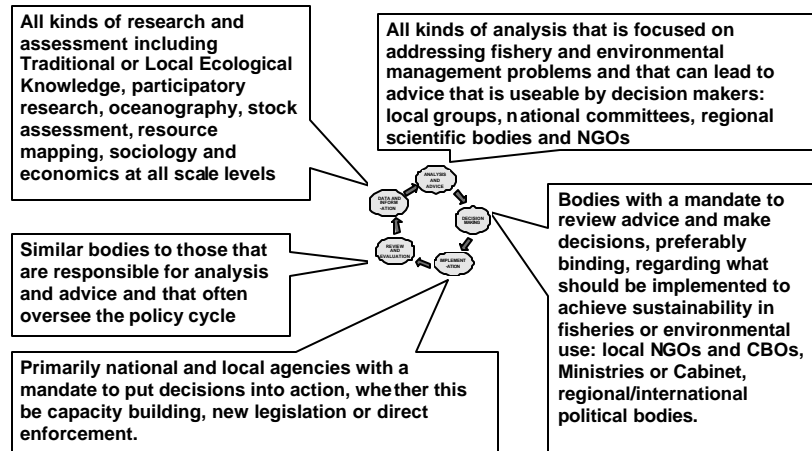
Figure 2. The diversity of stakeholders that may be involved in the policy cycle depending on cycle stage and scale level.

The LME governance framework can accommodate a diversity of policy cycle arrangements and linkages (e.g. Figure 2). This is particularly important given that different policy cycle arrangements are likely to be required in different parts of the framework. In some circumstances, informal or unofficial policy cycles may be appropriate and should be fostered, while in others formal or official cycles are essential (Jentoft et al 2009). It follows from this that the LME Governance Framework provides the flexibility to accommodate the diversity of ecosystem-based management (EBM) approaches that currently exists, as the approach that is appropriate to the particular policy cycle can be pursued, within the context of an overarching approach.

Finally, within the LME Governance Framework, there is flexibility to accommodate existing organizations that have a mandate for ocean governance. While this will often
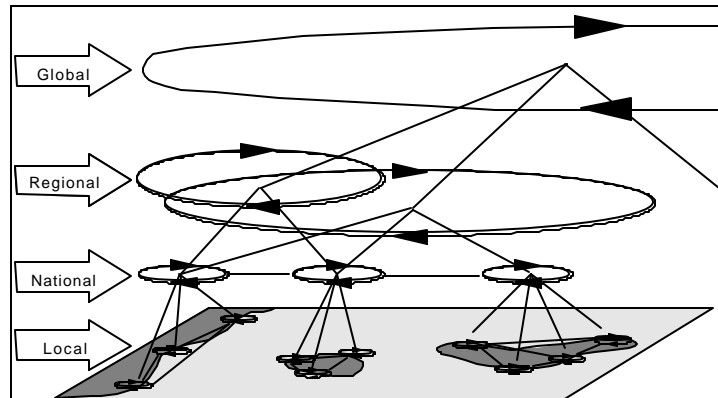
Figure 3. The multi-scale component of the proposed governance framework with vertical and horizontal linkages among the different policy cycles. The multi-level linkages do not necessarily imply a controlling function (Fanning et al 2007).

require that they review and adjust their modes of operation, the framework approach can lead to reduced conflict among organizations and serve to rationalise their roles and interactions.

7   Using the LME Governance Framework for assessment

The proposed methodology for governance assessment in Transboundary Waters systems is based on the LME Governance framework and provides a means to address the diversity of

arrangements that must be clustered and linked to provide effective governance across issues. It is seen as appropriate for all five International Waters focal area (IW) categories (groundwater, rivers, lakes, Large Marine Ecosystems (LMEs) and open ocean). The proposed governance assessment has two phases which will be referred to as the Level 1 and Level 2 governance assessments. The purpose of this assessment is twofold: (1) To provide a holistic picture of governance arrangements for individual water systems as a basis for discussion about how to improve governance at the system level; and (2) To provide a common approach to evaluating governance arrangements across systems to facilitate a global picture. It provides a means to dissect out the parts of the framework that need attention, or identify those that are missing so they can be given a priority level and address separately.

The Level 1 assessment provides a preliminary assessment of governance arrangements for the transboundary water system. It will assess the extent to which transboundary governance architecture is in place for the system, but will not assess the performance or functionality of the arrangements. This Level 1 assessment will be about whether or not the critical transboundary issues are covered by governance arrangements that have full policy cycles. It is expected to reveal the extent to which the issues are covered, whether there are gaps or overlaps in coverage and the nature of the arrangements that are in place.

The Level 2 assessment will assess the functionality and performance of governance arrangements in terms of a fuller range of criteria such as effectiveness, inclusiveness, efficiency and equitability. This methodology remains to be developed. This can be pursued by further integrating the governance models reviewed and presented in this working paper and others such as the Integrated Lake Basin Management (ILBM) guidelines for lake brief preparation (Shiga University Research Center for Sustainability et al 2010) into a comprehensive assessment process. It is proposed that this be undertaken by a small working group of governance experts and IW water category experts and then applied to about 20-40 selected IW situations drawn from the five IW categories.

One of the objectives of the TWAP governance assessment methodology is to develop the approach in a way that it can be applied by key stakeholders with the water system as a self-assessment. Attention will also be paid to how the assessment can be integrated into the GEF IW Transboundary Diagnostic Analysis (TDA)/Causal Chain Analysis (CCA)/Strategic Action Programme (SAP) methodology.

7.1 System governance architecture

Several steps are required to determine the governance architecture in place for a particular water system to be governed (Table 1). The whole architecture is greater than the sum of its parts, especially for integration of governance at the transboundary level. This process as summarised in Table 1 will provide a picture of: The extent to which governance issues are covered (and allow identification of gaps); the match between governance arrangements and issues; the extent to which arrangements extend outside the system; the extent to which issues are covered by multiple arrangements that could result in conflict; and, how well arrangements are clustered to make best use of existing institutions and organisations.

Table 1. Steps required to assess governance architecture in a system to be governed

Step	Key points
Identify system to be governed	Begin with a clear definition of the system to be governed. In the case of the GEF IW program the system is considered to be the entire LME or other IW area. Geographical boundaries of the system and the countries involved in the transboundary system must be clearly identified. In the case of the GEF IW program the system to be governed is considered to be the entire river basin, aquifer, lake or reservoir, LME or other IW area, or portion of the open ocean.
Identify issues to be governed	In some IW systems the issues will already have been identified through a TDA and may have been further explored through CCA. Issues may have both a topical and a geographical component.
Identify arrangements for each issue	Determine the extent to which each issue is covered by an identifiable arrangement, whether formal or informal. Must be specific to the issue and have a complete policy cycle. Each arrangement should have functionality in three modes: (1) The meta-mode (articulation of principles, visions and goals, equating to policies in ILBM parlance); (2) the institutional mode (agreed ways of doing things reflected in plans and organizations; and, (3) the operational mode if it is to be adaptive and effective. These modes may operate at different scale levels within the same arrangement hence the need for linkages within arrangements.
Identify clustering of arrangements within institutions	Examine the way that arrangements are clustered for operational purposes and/or share common institutions/organisations at different levels. Similar issues may be covered by similar arrangements. There may be efficiency in clustering these arrangements. Alternatively, clustering may occur at higher levels for policy setting or institutional efficiency, but be separated at lower levels.
Identify linkages	Identify actual and desirable linkages within and among arrangements and clusters.

IW systems are likely to involve a variety of governance issues. For the purpose of this assessment, five major categories of issues have been identified, several of which cut across IW categories (Table 2). It is expected that all arrangement level issues will fit into these categories to facilitate comparison within and among water categories.

The above process will be used to reduce the governance architecture for each system to a set of scores (Table 3). These will be derived from separate assessments of the issue specific arrangements as shown in Table 4. The approaches to evaluating the arrangements may vary among systems and arrangements ranging from highly expert judgment based to being based on extensive analysis of multilateral agreements, protocols, institutional constitutions and other instruments, supported by sound science and knowledge of stakeholder opinion. This allows for considerable flexibility in approach within each system, but will also mean that the final summaries for the systems will be based on widely ranging degrees of analysis. For this reason it is important that there be provision in the system for extensive annotation in foot or endnotes, so that the user can understand what went into each analysis. The arrangements for clustering and linkages will be reflected in a matrix showing interactions among arrangements.

Table 2. The major categories of issues for IW water categories

Issue category*	IW water category				
	Ground-water	Lakes	Rivers	LMEs	Open Ocean
Water quantity	v	v	v		
Water distribution	v	v	v		
Water quality	v	v	v	v	v
Fisheries		v	v	v	v
Biodiversity	v	v	v	v	v
Habitat destruction		v	v	v	v
Climate change mitigation					v

*Impacts of, and adaptation to, climate variability and change may be integrated in each issue category.

Climate change vulnerability is recognized as being a component of all the above issues. It is expected that as these issues are unpacked and the arrangements are examined, the vulnerabilities to climate change will be made explicit in each issue. Similarly, it is assumed that governance responses will include adaptation.

It should be noted that while the conceptual basis for this methodology is well accepted, the methodology itself is being developed for this purpose and has not been previously used or tested. Therefore, its application will be exploratory and its further development with respect to both purposes above should be an integral part of its application.

Table 3: GEF IW transboundary system governance architecture - System summary[2]

IW category:			Total number of countries:	System name:		Region:
Transboundary issue[3]	**Number of count-ries[4]**	**Priority for count-ries[5]**	**Descriptive or commonly used name for the governance arrangement[6]**	**Complete-ness of governance arrangement[7]**	**Priority for intervention to improve governance[8]**	**Observations[9]**
1						
2						
3						
4						
..n						
Governance index[10]						

Table 4: GEF IW transboundary system governance architecture - Arrangement summary

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[2] This page provides an overview of all the arrangements in the system and their status.

[3] There is the question of how far down in detail these should go. This can be a matter of choice, and part of the flexibility of the system, but i t should ideally be to the level where the transboundary issue requires a separate arrangement for management? To use a fishery example individual species or groups of species may each require their own assessment and measures, but may all be handled in one institutional arrangement. However, for geopolitical reasons some species or groups of species may require separate processes and should be treated as separate issues needing separate arrangements. Ideally, these issues should be identified and quantified in a TDA. If not, experts knowledgeable about the system may have to ID them.

[4] Indicates how many of the total number of countries are involved in the particular issue.

[5] This should be based on the TDA but may have to be based on expert judgement. To be scored from 0-3.

[6] Ideally this would be the name used by the participants in the arrangement

[7] The score given in this column will be derived from the scores allocated on the arrangement specific page. This would preferably be a mathematical derivation weighted by importance of the functions there, but could be an overall expert assessment based on what is there.

[8] This would be a combination of the national priority for the issue and its status (possibly weighted by some country statisti c).

[9] This provides the opportunity for brief comments that may help the user interpret the information provided on the summary page, but is not intended to be a substitute for annotation.

[10] Weighted average based on priority?

Arrangement:		Issue:			
Governance function[11]	**Responsible organisation or body[12]**	**Scale level or levels[13]**	**Complete-ness[14]**	**Priority for attention[15]**	**Observations[16]**
Meta level - preparation of policy advice					
Meta level - Policy setting or decision-making					
Policy cycle - preparation of management advice					
Policy cycle - Management decision-making					
Policy cycle - Implementation					
Policy cycle - Review of implementation at strategic and operational levels					
Policy cycle - Provision of data and information					
Total[17]					

[11] This column lists the governance functions that are considered to be necessary at two levels (a) the policy setting level and (2) the policy cycle level.

[12] Organisation or organisations responsible for the function should be listed here

[13] These are the institutional scale level or levels at which the function is performed

[14] Rate on a scale of 0 = absent, 1 = low (*ad hoc*, irregular, unsupported by formal documentation or little known by stakeholders) , 2 = medium, 3 = high (clearly identifiable, regular, documented or supported by policy and legislation and widely known among stakeholders)

[15] This is aimed at within system assessment of where to intervene rather than at contributing to the global comparative assessment

[16] This provides the opportunity for brief comments that may help the user interpret the information provided, but is not intended to be a substitute for annotation.

[17] Assume each step is equally important and receives equal weighting?

7.2   Level 2 Assessment - Performance of governance arrangements

7.2.1   The approach to assessing governance performance

The Level 2 assessment will evaluate the functionality and performance of governance arrangements according to agreed criteria. The governance arrangement is thought to provide an appropriate assessment unit for governance performance. The Level 2 assessment will focus on systems within which there is a sufficient number of complete issues/arrangements that are sufficiently complete that there is some level of planning and review, and thus the setting of goals and objectives against which to assess governance performance. It will assess the presence, appropriateness, completeness and functioning of policy cycles according to agreed criteria and against agreed objectives. Which of these will be most useful will depend on the nature of the cycle, e.g. whether it is formalized at the organisational level with documentation, or informal and established mainly through practice. Each of the desired criteria can be given scores in a scale depending on stakeholder responses, expert judgment or measured outputs.

Within a single IW system, the arrangements needed may differ considerably among issues and have to be tailored to the specific context or need. The Level 2 assessment should be carried out in collaboration with the organizations involved in governance so as to be sensitive to the specific context of the system to be governed. The team would facilitate (or guide) a self-assessment at the system level. The role of the team would be to ensure a cross section of participants to avoid bias, and in the end, quality control. This could probably be achieved in a facilitated group consultative process at the regional level with observers to minimize bias. The idea would be to get the evaluation as far as possible in the facilitated session.

Linkages within governance arrangements as well as between them are a critical component of the governance system. These can be examined from various perspectives to see what role they play in the functionality of the arrangement. One may investigate whether the linkages are bidirectional and therefore facilitate feedback for adaptation. The nature of the interactions is also relevant. Are they for information exchange only, or do they include aspects of stronger interaction such as cooperation or control? A brief discussion of the criteria that can be used in assessing functionality of governance arrangements is provided in the next section. Ehler (2003) provides a comprehensive list of governance performance indicators that can be applied as appropriate in assessing policy cycles, while Shiga University Research Center for Sustainability et al (2010) present a series of diagnostic questions that can be considered in evaluating water resources governance.

It is proposed that a Governance Working Group be formed to develop and oversee the Level 2 assessments. It should be drawn from a diversity of individuals and organizations that are actively working on concepts and applications of governance in natural resource systems. Some examples would be the Earth System Governance Project, The Resilience Alliance, the Fisheries Governance Network and the Program in Water Conflict Management and Transformation (PWCMT) (Oregon State University). This WG should include members from all five IW water categories.

7.2.2 Governance performance criteria and indicators

Appropriate criteria for assessing governance can be selected from the suite of possible ones drawn from the literature (Table 5). For example, were the objectives developed in an inclusive way that addresses the well-being of all stakeholders; again according to agreed principles? A minimum set should be selected. In Table 5, many of the outcomes ultimately relate to stakeholder confidence in the governance process, willingness to contribute to governance and willingness to comply with decisions taken. This determines the probability of achieving the trends or targets that are identified as being desirable. When systems are not assessed according to these criteria, governance may fail to achieve the trends or targets that are identified as being desirable but it is impossible to say why.

Table 5. Some governance criteria and the expected outcomes of including them in a governance framework

Criterion	Importance to governance	Ultimate outcome
Efficiency	To get the most out of available human and financial resources and to keep transaction costs to a minimum.	More can be achieved with resources and stakeholders are encouraged to participate
Effectiveness	The result that has been identified as desirable is actually achieved, even if the transaction costs are higher than for a strictly "efficient" option	Stakeholder confidence in governance and inclination to participate
Responsive-ness	That the system is able to respond in a timely fashion to changes that if not addressed will result in degradation of resources	Stakeholders perceive governance as acting in a way that addresses problems promptly
Appropriate-ness	That the processes and measures are suitable to the situation in which they are being applied	Stakeholders see that the processes in place meet their needs
Accountability	That those who have undertaken responsibilities that are expected to lead to desired outcomes actually do what they have agreed	Stakeholders have confidence in governance.
Transparency	The actions that are carried out to govern are done so for reasons and in ways that are fully disclosed.	Stakeholders can assess the governance process for themselves using other criteria
Inclusivity	All those who have a stake in the outcome also have a say in planning them	Leads to better informed plans that are more likely to succeed and to better compliance, due to the increased legitimacy afforded the process by the stakeholders
Representative-ness	The people who are taking part in the processes on behalf of stakeholder groups are doing so in a way that reflects what that group thinks, and that discussions and decisions from the processes are accurately reflected back to the group.	This leads to agreed actions being as fully reflective as possible of the stakeholders needs and desires and to their confidence that this is so. The stakeholder groups are more invested in the outcomes
Legitimacy	The perception by stakeholders that governance is genuinely acting in their interest	This leads to support, increased confidence that outcomes will be equitable and to compliance.
Equitability	That the benefits to be derived from resources (use and non-use value) are distributed fairly among stakeholders according to agreed criteria.	Livelihoods are protected and well-being is promoted to the extent that the resource can support.

Ehler (2003) provides a comprehensive list of governance performance indicators that can be applied as appropriate in assessing policy cycles (Appendix 5). Clearly this is a substantial task when the governance arrangement involves several policy cycles at various scale levels. Note also that different sets of indicators may be needed depending on the nature of the cycle and its goals and objectives. Linkages are not as explicit in Ehler's (2003) approach as they are in the LME Governance Framework, as would be expected given his focus on national level ICZM.

Clearly, as Appendix 5 indicates, within each cell of the framework matrix, there are many questions to be addressed and many approaches that can be taken in addressing the questions. Appropriateness in particular is strongly related to principles and values that are context specific. However, it is possible to bring some degree of normative thinking to this assessment. For example, inclusivity and equitability are two principles that are accepted within the wider international community. However, even these principles may not always be nationally or locally accepted.

An important component of applying the assessment process in a given IW situation would be to examine the weighting that the stakeholders give to various principles underlying the criteria in Table 5. This was the purpose of the Caribbean Marine EBM Symposium (Fanning et al 2009a). That symposium will inform future efforts to implement governance towards marine EBM in the Wider Caribbean.

7.3   Emergent framework properties

We also recognize that the system as portrayed here has the properties of a network with sub-networks. Innovative approaches to whole network analysis such as social network analysis hold promise but are still in the realm of research. With appropriate theoretical and case study research, the approach here can be supplemented by whole system metrics that could be used to assess network properties such as responsiveness, resilience and the distribution of power in the network (Bodin and Crona 2009, Sandstrom and Rova 2010).

8   Conclusions and recommendations

We conclude that it does not appear to be feasible to come up with a small set of governance indicators for the GEF IW Programme that can be applied across systems globally. The complexity and value laden nature of governance make this is impractical. There are, however, frameworks within which one can assess aspects of governance. These take different perspectives, but have many common features. The LME governance framework is proposed here as a practical one that includes many aspects of scale and process, but which also allows for flexibility. This framework may allow context specific assessment within IW situations, but also provide the opportunity for comparison among IW systems that could form the basis of a global assessment. Other frameworks may be suitable and should be examined further.

It is a substantial task to assess governance in an LME (or IW) setting because one needs to look at each of the levels within each relevant scale and determine the criteria for the assessment of the cycle and its linkages. These will be IW situation specific, so one set of criteria cannot be

applied across all IW situations; although there may be groupings within which similar approaches can be pursued (Mahon et al 2010). We do not have enough information on governance arrangements across LMEs (or other IW situations probably) to reach a conclusion on that at this stage.

While good governance is seen as a means to an end, rather than an end itself, it is entwined with outcomes in such a way that it may not always be possible to separate the two cleanly. It is a means to achieve outcomes that serve the needs of people for whom governance is being implemented. However, given the range of criteria that can be applied in governance, some of these outcomes may not be ones that resource managers typically concern themselves with, as can be seen from Table 5.

The GEF does not support research per se, but is evidently concerned about the capacity to monitor the impacts of it activities, as evidenced by the TWAP. In the natural sciences areas of the GEF IW LME Program, a great deal of funding has gone into developing global indices for productivity, fish and fisheries and ecosystem health. Comparatively little has been invested in the development of monitoring systems for governance and the associated supporting social and economic information. If governance monitoring is to be at a level where the GEF can be confident that it has brought about governance reforms that meet global standards for effectiveness, adaptiveness and social justice, as well as for environmental sustainability, then it must invest appropriately in developing such evaluation mechanisms. This will require studies to develop frameworks and methodologies that can be used to assess governance and to obtain baseline information at appropriate scale levels.

Governance studies that relate to multi-scale governance architecture, adaptive capacity, resilience and networking may appear esoteric to many. However, there has been considerable effort in these areas in the past few decades that can contribute to assessment of governance. This is an active area in which new research agendas are being defined and programs developed (Young et al 2006, Ostrom 2007, Biermann et al 2009). The GEF IW programme should extend its scope of disciplinary engagement to include individuals from some of these areas of activity. These individuals should be challenged to, and facilitated in, meeting the GEF needs for governance monitoring; including incorporating governance into the TDA/CCA/SAP Process or adapting that process to include appropriate governance assessment and monitoring. Following are some of the arenas of activity that could be usefully brought into the discussion of IW governance assessment:

- Institutional analysis (Ostrom 2007)
- Resilience alliance (http://www.resalliance.org/1.php)
- Interactive Governance Approach and Fisheries Governance Network (http://www.fishgovnet.org/)
- The International Human Dimensions Program, Earth System Governance Project(http://www.ihdp.unu.edu/)

We propose that the LME Governance Framework could be a basis for the approach to assessing governance that needs to be developed. We do not think that this can be done in a short time frame. If the GEF IW Programme is interested in broadening its governance

assessment perspective then we recommend that it invest in developing an approach such as we have outlined here. This would require a two-phased approach. The first phase would be to synthesise current activities into an assessment framework that can be applied. The second phase would be to test the framework by applying it in a variety of IW situations. The first phase should probably be done by a working group over a period of about a year. The working group should attempt to bring in a broad range of experience with governance from groups such as the Resilience Alliance, Fisheries Governance Network and the Earth System Governance Project. The working group could then continue to monitor the testing of the approach in some IW situations.

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Appendix 1. Summaries of governance frameworks that should be considered and integrated to provide an IW governance

Ostrom's diagnostic approach for going beyond panaceas

The abstract from Ostrom's paper is as follows 'The articles in this special feature challenge the presumption that scholars can make simple, predictive models of social– ecological systems (SESs) and deduce universal solutions, panaceas, to problems of overuse or destruction of resources. Moving beyond panaceas to develop cumulative capacities to diagnose the problems and potentialities of linked SESs requires serious study of complex, multivariable, nonlinear, cross-scale, and changing systems. Many variables have been identified by researchers as affecting the patterns of interactions and outcomes observed in empirical studies of SESs. A step toward developing a diagnostic method is taken by organizing these variables in a nested, multitier framework. The framework enables scholars to organize analyses of how attributes of (*i*) a resource system (e.g., fishery, lake, grazing area), (*ii*) the resource units generated by that system (e.g., fish, water, fodder), (*iii*) the users of that system, and (*iv*) the governance system jointly affect and are indirectly affected by interactions and resulting outcomes achieved at a particular time and place. The framework also enables us to organize how these attributes may affect and be affected by larger socioeconomic, political, and ecological settings in which they are embedded, as well as smaller ones. The framework is intended to be a step toward building a strong interdisciplinary science of complex, multilevel systems that will enable future diagnosticians to match governance arrangements to specific problems embedded in a social–ecological context.'
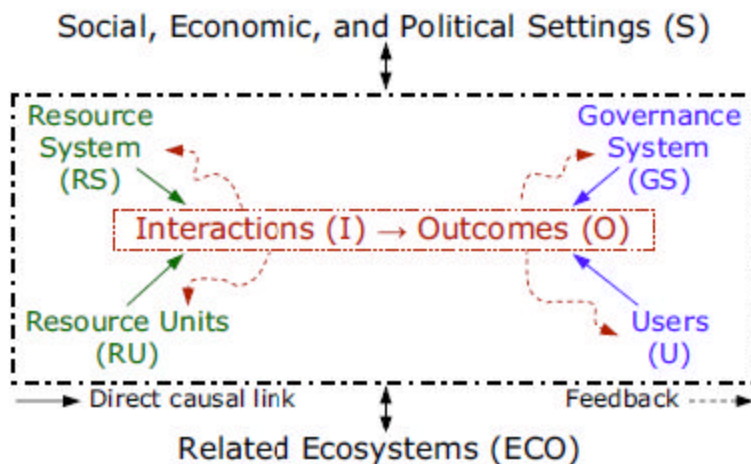

Fig. 1.   A multitier framework for analyzing an SES.

Table 1. Second-tier variables in framework for analyzing an SES

Social, Economic, and Political Settings (S)
S1- Economic development. S2- Demographic trends. S3- Political stability.
S4- Government settlement policies. S5- Market incentives. S6- Media organization.

Resource System (RS)	Governance System (GS)
RS1- Sector (e.g., water, forests, pasture, fish)	GS1- Government organizations
RS2- Clarity of system boundaries	GS2- Non-government organizations
RS3- Size of resource system	GS3- Network structure
RS4- Human-constructed facilities	GS4- Property-rights systems
RS5- Productivity of system	GS5- Operational rules
RS6- Equilibrium properties	GS6- Collective-choice rules
RS7- Predictability of system dynamics	GS7- Constitutional rules
RS8- Storage characteristics	GS8- Monitoring & sanctioning processes
RS9- Location	

Resource Units (RU)	Users (U)
RU1- Resource unit mobility	U1- Number of users
RU2- Growth or replacement rate	U2- Socioeconomic attributes of users
RU3- Interaction among resource units	U3- History of use
RU4- Economic value	U4- Location
RU5- Size	U5- Leadership/entrepreneurship
RU6- Distinctive markings	U6- Norms/social capital
RU7- Spatial & temporal distribution	U7- Knowledge of SES/mental models
	U8- Dependence on resource
	U9- Technology used

Interactions (I) → Outcomes (O)

I1- Harvesting levels of diverse users	O1- Social performance measures
I2- Information sharing among users	(e.g., efficiency, equity, accountability)
I3- Deliberation processes	O2- Ecological performance measures
I4- Conflicts among users	(e.g., overharvested, resilience, diversity)
I5- Investment activities	O3- Externalities to other SESs
I6- Lobbying activities	

Related Ecosystems (ECO)
ECO1- Climate patterns. ECO2- Pollution patterns. ECO3- Flows into and out of focal SES.

The Earth System Governance Project: Conceptual framework of the Science and Implementation Plan

The following is copied from the Science and Implementation Plan of the Earth System Governance Project (Biermann et al 2009).

Earth system governance is defined in this project as the interrelated and increasingly integrated system of formal and informal rules, rule-making systems, and actor-networks at all levels of human society (from local to global) that are set up to steer societies towards preventing, mitigating, and adapting to global and local environmental change and, in particular, earth system transformation, within the normative context of sustainable development. The notion of governance refers here to forms of steering that are less hierarchical than traditional governmental policy-making (even though most modern governance arrangements will also include some degree of hierarchy), rather decentralized, open to self-organization, and inclusive of non-state actors that range from industry and non-governmental organizations to scientists, indigenous communities, city governments and international organizations.

Conceptual Framework

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Based on this general notion, the Earth System Governance Project advances a science plan that is organized, first, around five analytical problems:

 (1) The first analytical problem—the *architecture* of earth system governance -- includes questions relating to the emergence, design and effectiveness of governance systems as well as the overall integration of global, regional, national and local governance. Core questions include: How is performance of environmental institutions affected by their embedding in larger architectures? What are the environmental consequences of non-environmental governance systems? What is the relative performance of different types ofmultilevel governance architectures? How can we explain instances of 'nongovernance'? What are overarching and crosscutting norms of earth system governance?

(2) Second, understanding effective earth system governance requires understanding the *agents* that drive earth system governance and that need to be involved. The research gap is here especially the influence, roles and responsibilities of actors apart from national governments, such as business and non-profit organizations, the ways in which authority is granted to these agents, and how it is exercised. Core questions advanced in this Science Plan are: What is agency? Who are the agents of earth system governance (especially beyond the nation state)? How do different agents exercise agency in earth system governance, and how can we evaluate their relevance?

(3) Third, earth system governance must respond to the inherent uncertainties in human and natural systems. It must combine stability to ensure long-term governance solutions with flexibility to react quickly to new findings and developments. In other words, we must understand and further develop the *adaptiveness* of earth system governance. But what are the politics of adaptiveness? Which governance processes foster it? What attributes of governance systems enhance capacities to adapt? How, when and why does adaptiveness influence earth system governance?

(4) Fourth, the more regulatory competence and authority is conferred upon larger institutions and systems of governance—especially at the global level—the more we will be confronted with questions of how to ensure the *accountability* and *legitimacy* of governance. Simply put, we are faced with the need to understand the democratic quality of earth system governance. What are the sources of accountability and legitimacy in earth system governance? What are the effects of different forms and degrees of accountability and legitimacy for the performance of governance systems? How can mechanisms of transparency ensure accountable and legitimate earth system governance? What institutional designs can produce the accountability and legitimacy of earth system governance in a way that guarantees balances of interests and perspectives?

(5) Fifth, earth system governance is, as is any political activity, about the distribution of material and immaterial values. It is, in essence, a conflict about the *access* to goods and about their *allocation*—it is about justice, fairness, and equity. The novel character of earth system transformation and of the new governance solutions that are being developed, puts questions of allocation and access, debated for millennia, in a new light. It might require new answers to old questions. But how can we reach interdisciplinary conceptualizations and definitions of

allocation and access? What (overarching) principles underlie allocation and access? How can allocation be reconciled with governance effectiveness?

Crosscutting Themes
In addition, the Earth System Governance Project emphasizes four cross-cutting research themes that are crucial for the study of each analytical problem but also for the integrated understanding of earth system governance: these four themes are the role of *power*; the role of *knowledge*; the role of *norms*; and the role of *scale*.

Earth System Governance Project Conceptual Framework (after Biermann et al 2009)

Analytical problems	Themes			
	Power	Knowledge	Norms	Scale
Governance Architecture				
Agents				
Adaptiveness				
Accountability & Legitimacy				
Access & Allocation				

The interactive governance approach

The interactive governance approach was developed by Kooiman (2003), and subsequently applied to fisheries through the activities of the EU Fisheries Governance and Food Security Project (2001-2005)(Kooiman et al 2005, Bavinck et al 2005). It takes a broad perspective on governance and breaks it down into component parts that are relevant to governability (see figure below). It also involves the perspective that in natural resource governance there is a Governing System, a System to be Governed and Governing Interactions between them. The emphasis is on the nature of these interactions and the context in which they take place (Kooiman et al 2008).
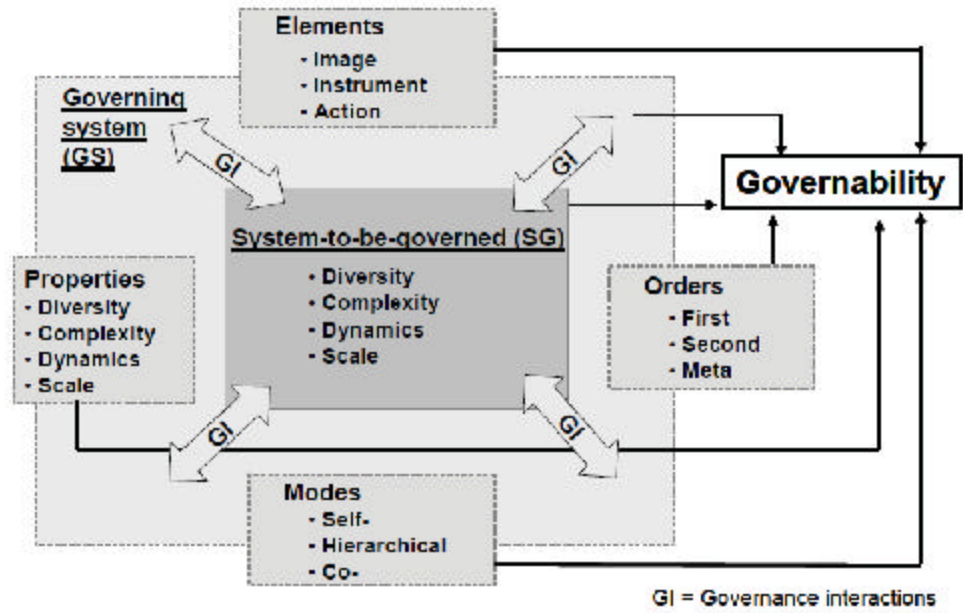
Figure 1. Components of the interactive governance model and their linkages to governability (Adapted from Kooiman and Chuenpagdee 2005; Kooiman 2008).

Appendix 2. Performance evaluation of global environmental institutions.

The following conclusions section from Mitchell (2008) provides a succinct summary of the status of work on performance evaluation of global environmental institutions.

"Research into the performance of institutions that influence global environmental change has made significant progress over the past decade and a half. Scholars have developed careful methods for distinguishing institutional effects from other factors, have identified a range of institutional and exogenous factors that explain variation in institutional performance, and have done considerable empirical work in evaluating – and in some cases comparing – institutional performance. This past progress provides a solid foundation on which to build future efforts to understand institutional performance and its sources better. To develop a rich and nuanced picture of institutional performance that is satisfying to researchers and useful to practitioners requires open-mindedness in terms of both the dimensions of institutional performance evaluated and the metrics used for evaluation. The diversity of interests and skills within the research community can be put to good advantage by encouraging those interested in institutional performance to evaluate performance in more than their preferred dimension and to do so employing as many metrics as are available and feasible to use. Following past practice, research should make careful use of behavioural and environmental counter-factuals but also use goals, problems, and optima as standards. Building on past practice, researchers should evaluate institutions in terms of leading indicators; economic, social, and cultural impacts; and criteria for good governance and institutional function. Methods should be developed and applied for comparing institutional performance, treating performance as multifaceted rather unidimensional, evaluating performance dynamically, evaluating the environmental impacts of non-environmental institutions, and carefully accounting for problem structure and endogeneity. This represents a challenging research agenda but one that offers researchers the opportunity, over time, to discover why some environmental institutions perform differently than others, why some perform better than others, and what institutional and exogenous factors influence those outcomes. Such an understanding, in turn, will allow scholars to make more valuable contributions to the practitioners engaged in designing and operating environmental institutions to mitigate human impacts on the Earth."

Appendix 3: Monitoring and evaluation terminology

The following terminology adapted from Fletcher et al. (2002) is useful in thinking about monitoring and evaluation. It would be very beneficial if the GEF would adopt a common terminology and make it widely known among its projects/partners.

Operational objective

An objective that has a direct and practical interpretation in the context of a fishery and against which performance can be evaluated (in terms of achievement)

Indicator

A quantity that can be measured and used to track changes with respect to an operational objective. The measurement is not necessarily restricted to numerical values. For example, categorical values may be used.

Reference point or trend

The value or direction of change of an indicator that can be used as a benchmark of performance against an operational objective.

The operational objective, indicator, and performance measure (or some other form of interpretation) form a 'package'. Each of the three elements of the package is essential to properly define and interpret an indicator. One or more reference points may form part of the description of the performance measure.

Appendix 4: Applications of the LME Governance Framework

The three examples provided in this appendix illustrate the application of the LME Framework to three specific Caribbean situations as a basis for facilitating and assessing governance. In each case the purpose is to show the different governance issues at policy, strategy and action levels that make up a complete governance arrangement, and how these are distributed among several levels on the institutional scale that typically occur in marine resource governance.

Caveat: The development and refinement of these models by the CLME, PROGOVNET and MarGov Projects for application in the Wider Caribbean Region is work in progress. The results presented here are preliminary and evolving, and thus only for discussion purposes.

In each example, the management objectives are provided in a box on the lower left. The implementation and review of actions undertaken to achieve these objectives, and of the objectives themselves must take place across different levels on the institutional scale, especially for transboundary resources. The diagrams for the three resource governance situations aim to illustrate how the various aspects of this review might be distributed among scale levels in a system where there are complete functional cycles and effective linkages.
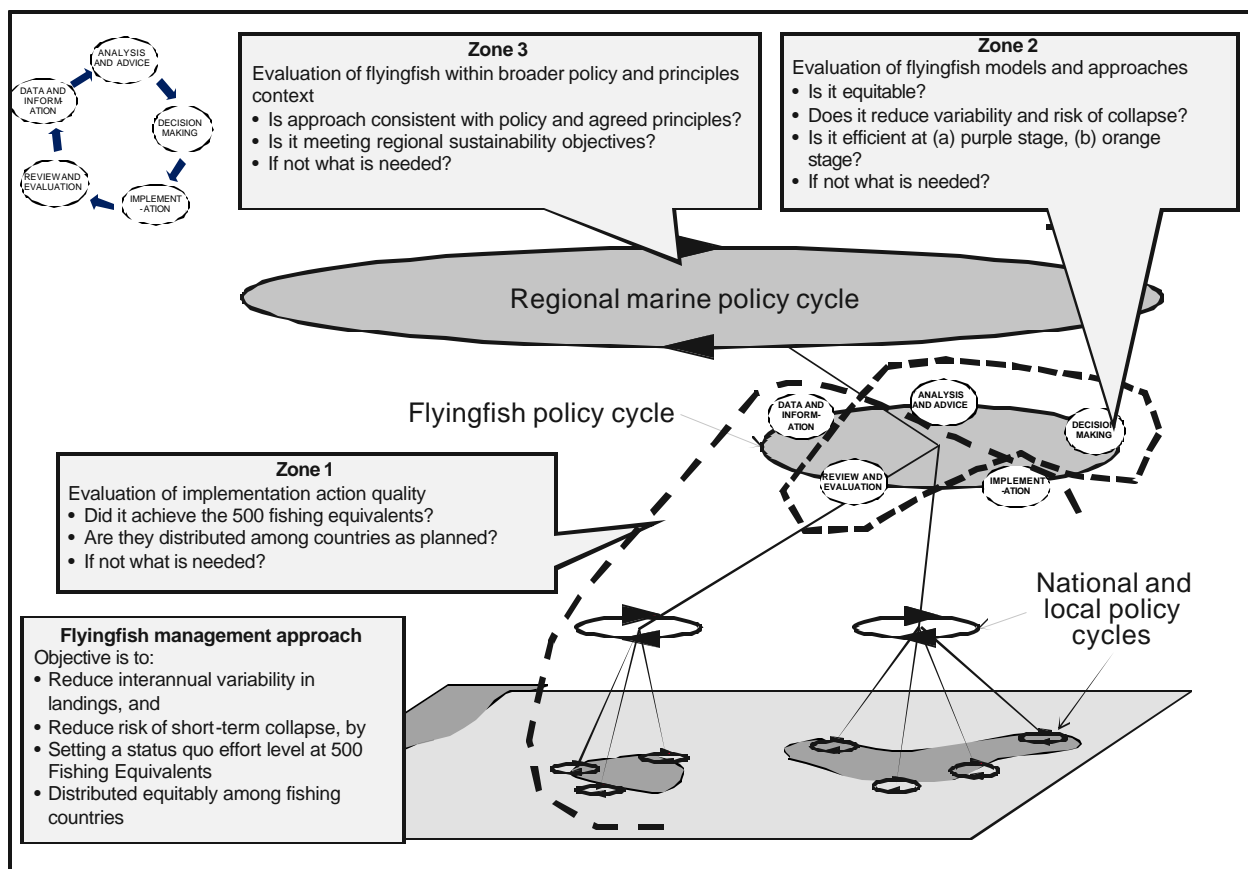
Eastern Caribbean flyingfish fishery

The zones are drawn to indicate the parts of the framework most involved in the particular issues listed for the zone. In each case the objectives include a mixture of conservation, social

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and economic issues that require resolution via high level policy intervention. In the zone below, the policy is translated into planning and instruments for implementation. Finally, there is the lowest zone where implementation actually takes place according to the plans and instruments.
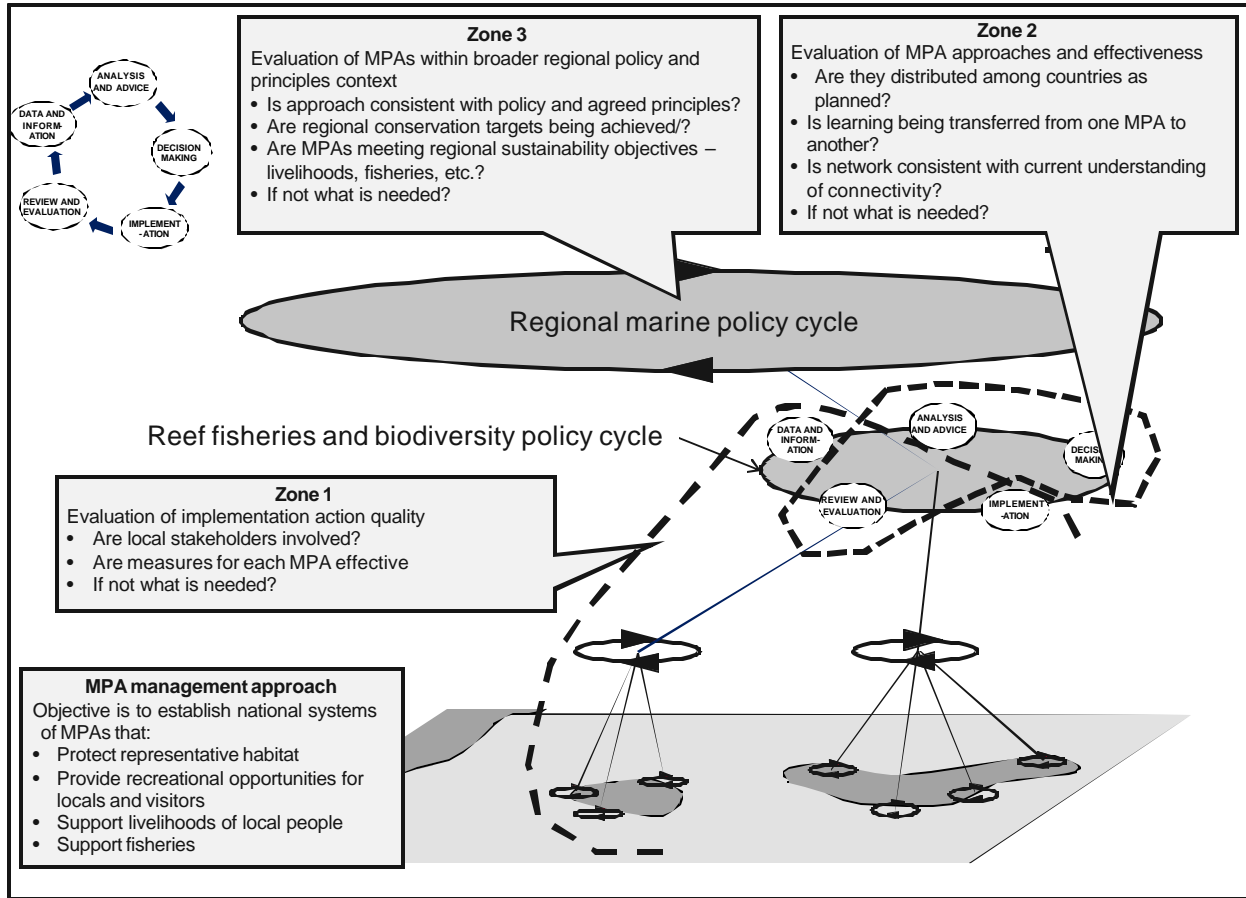
Marine protected areas

In the case of the MPAs, there is a trade-off between conservation, and use, both of which appear in the objectives. There are also potential conflicts among users at multiple levels. These can only be resolved by linking or integrating multi-/cross-level policy decisions within the policy cycles. These must however be harmonized across the region for the approach to be most effective, and this demands cross-scale linkages (geographic, institutional, jurisdictional).

For example, a high-level policy decision to form a regional MPA network for biodiversity conservation will not work if some national level priorities favour tourism and the local aims are for fisheries livelihoods or food security through extraction. Even if there are complete policy cycles at each level (unlikely in this scenario) the lack of integrating linkages will result in the stakeholders at the various levels pursuing incompatible objectives that may separately seem internally consistent. Different issues and actors, but similar dynamics and dysfunctions, are evident in the tuna fisheries example below.
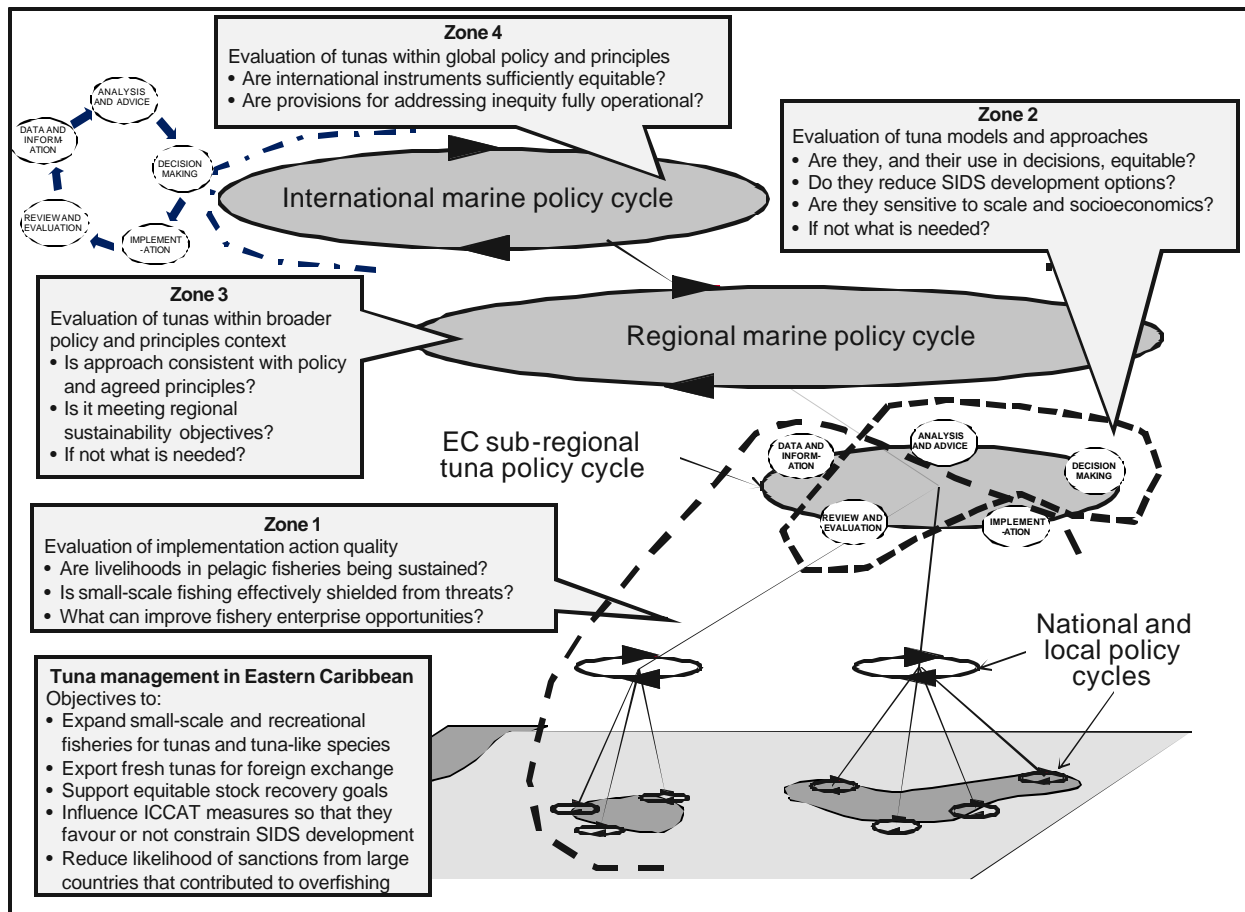
Eastern Caribbean tuna fisheries

Good governance in such complex adaptive systems would entail the policy cycles at each level becoming better linked and repaired in ways that reflect self-organisation and adaptive capacity in the system. This may involve destroying, innovating and re-building governance structures and institutions (see Gunderson and Holling's (2002) panarchy) several times until they become fully functional. If the system was originally close to being functional (according to whatever criteria are used), and only slight adjustments are necessary, then this could be interpreted as a demonstration of resilience. If, however, radical change must take place, then this could be an example of transformation.

Although there may be some externally generated indicators (pressure, state, process) by which we can measure and evaluate adaptive governance in systems, and hence compare across diverse systems, our experience to date points to system-generated indicators being more practically useful in governance. There are several reasons for this, mostly related to stakeholder agency in goal setting and achievement. Such agency is one of the distinguishing features of governance.

We aim to relate these concepts more to real world governance issues and examples as our thinking develops. These three scenarios provide just a glimpse of what lies ahead.

Appendix 5. List of governance performance indicators (Ehler 2003)

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

		• Ability to be adaptive and react to unpredicted change (e.g., climate change) established • Ability to be predictive, anticipatory established • Collaborative, participatory and transparent planning processes adopted • Stakeholders actively participate in regular ICM planning meetings • Access to public coastal resources assured
	Information management capacity	• Adaptive information management system established • Performance indicators established • Information is effectively and appropriately organized, managed, and disseminated • Public access to information is assured • Verifiable information is used to determine management issues
	Public participation	• Public awareness program initiated • Increased awareness of coastal issues • Effective stakeholder participation in all phases of ICM • Stakeholders satisfied with degree of participation • Stakeholders have access to information related to ICM • Assurance that ''unheard voices'' are taken into consideration
Adoption	Formalization and support	• Legitimate authority(s) agree to adopt plan of action • ICM program integrated into national environmental management & sustainable development programs • Plan of action endorsed by constituencies and users • Stakeholders actively seek resources to implement plan of action • Long-term financial support for all elements of ICM (e.g., monitoring) ensured
Implementation	Implementation capacity	• Clear authority provided to write/enforce regulations to change behavior • Clear authority to provide economic and economic incentives to change behavior • Appropriate funding available for implementation activities • Socially beneficial changes in user and institutional behavior as a result of management actions • Diverse activities among institutions and projects are effectively coordinated
	Enforcement capacity	• Appropriate compliance monitoring program in place • Appropriate penalties assessed and collected for non-compliance •
	Conflict resolution	• Mechanisms for resolution of conflicts among agencies identified and implemented • Conflicts among users resolved/mitigated • Future of uses and conflicts anticipated
	Decision making	• Definitive decisions taken • Decision makers held accountable for results
Environmental and socioeconomic outcomes	Coastal and marine environmental quality	• Improvements in water quality over a range of physical, biological and chemical parameters • Increases in percentage of coastline suitable for bathing and recreation • Reduction of human diseases associated with water quality • Socioeconomic benefits from increased tourism and recreation

		• •
	Coastal hazards	• Relocation of people and structures from high risk areas • Reduction of human, environmental, and socioeconomic losses due to coastal hazards •
	Coastal development	• Reduction of conflicts over coastal use • Socioeconomic benefits (jobs, income, revenues) from increased coastal activities •
	Biodiversity/Habitat	• Reduction in percentage of endangered and threatened species • Improvements in structure and function of coastal and marine ecosystems • Socioeconomic benefits from coastal and marine protected areas
	Fisheries	• Reduction of damaging practices (by-catch) and equipment • Recovery of fish stocks • Increase in fish productivity • Socioeconomic benefits from sustainable fisheries
Monitoring and evaluation	Monitoring capacity	• Appropriate management performance monitoring is operational • Appropriate users and communities involved in monitoring • Monitoring and evaluation of social, economic and bio-physical context is operational • Advanced monitoring tools employed when appropriate, available, and fiscally possible
Adaptation and reformulation	Evaluation capacity	• Outcome indicators used to evaluate performance • Evaluation of success/failure of management action fed back to planning • Evaluation results used to reallocate resources • Evaluation results used to change goals, objectives, management strategies, and desired outcomes