

Multi-disciplinary, Multi-faceted Approaches to Fisheries Management: *Do we need to do all this?*

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Abstract. This paper looks at some of the seemingly positive developments in fisheries governance over the last twenty-five years. It asks why fisheries management, if improving, is still failing in its basic objective of managing the people who catch fish so as to ensure that there are enough fish left out there to harvest year after year. The conclusion is that the advent of such frameworks as participatory management, co-management, devolved management, and ecosystem-based management, has greatly improved the context in which fisheries management occurs, but that the fisheries management community has, in the most part, failed to address and resolve the fundamental problem in fisheries – namely, the ability to keep fish in the water for the future. The paper concludes with thoughts for a fresh and unencumbered look at fisheries management and towards the design of fisheries management strategies that create and align incentives.

Keywords: incentives, rights, ecosystems, conflict, co-management, community-based management

1. MULTI-DISCIPLINARY APPROACHES OR DISTRACTIONS TO FISHERIES MANAGEMENT?

At IIFET 2000, John M Ward pointed out that

Economics, biology, and sociology remain separate sciences in the fisheries management process. What is needed is a multidisciplinary approach to fisheries management that integrates all the physical and social sciences into a single framework to address fisheries management problems.

Indeed, we have seen the emergence of an almost overwhelming series of multi-disciplinary approaches to fisheries management over the last several decades. The sustainable development framework, the ecologically sustainable development framework, the participatory framework, the devolutionary framework, the community-based framework, and the ecosystem-based framework, all are intended to improve our ability to manage fisheries. However, we seem unable to effectively grapple with the matter of how to *practically* and *effectively* manage fisheries at the coalface, on the docks and in the water.

Whether explicit or implicit, the bottom line for most fisheries managers is a simple sounding one; namely, to ensure that enough fish remain in the water each year - so that whatever *other* objectives there may be for the fishery can also be achieved on an ongoing basis. From local artisanal settings to high seas industrial fisheries, the related issues of (i) why overfishing occurs and (ii) how to prevent overfishing are not being directly addressed or resolved. Ironically, this omission is a glaring one – because if there are no fish, it does not matter what other objectives are to be achieved.

Despite the fundamental reality of needing fish in the water in order to meet additional objectives, an enormous amount of energy is being expended on related, but ancillary, social, political, cultural, economic and biological debates. Thus, the question we need to ask ourselves is: How can we productively work together to focus energy on the problem of setting up management rules and regulations that make sure that there are fish in the water for fishermen the world over to catch today, tomorrow, and on into the future – so that then we can go on to address these other matters?

The answer: we need to take a fresh, new, and unencumbered look at all systems of fisheries management *and beyond* – and to move towards the design of fisheries management strategies that create and align incentives.

2. ENUNCIATING CHANGE IN FISHERIES GOVERNANCE

Over the last thirty-some years, there have been many changes and developments articulated around the world regarding fisheries governance that reflect both a formal broadening of issues to be considered as part of fisheries management and an increasingly holistic approach to fisheries and, indeed, to oceans governance.

For example, at the international level these have included, but have certainly not been limited to, such milestones as:

- the 1982 United Nations Convention on the Law of the Sea,
- the 1992 United Nations Conference on Environment and Development (UNCED) and Chapter 17 of Agenda 21 (the oceans chapter),¹
- the 1995 UN Food and Agriculture Organization (FAO) *Code of Conduct for Responsible Fisheries*.

These developments have by no means been limited to international levels. Just some of the changes at the national level are exemplified by:

- the 1976 US Magnuson Fisheries Conservation and Management Act,
- the 1983 New Zealand Fisheries Management Act,
- the 1989 Australian policy publication *New Directions for Commonwealth Fisheries Management in the 1990s* and the subsequent development of new national and state fisheries management legislation,
- the Icelandic Fisheries Management Act of 1990,
- the 1992 review of the 1983 European *Common Fisheries Policy* (CFP), and
- the Canadian 1993 *Charting a New Course: Towards the Fishery of the Future*.

More recently, the pace at which agreements and action strategies concerning the oceans are being developed has also been accelerating, especially as the problems in one oceans sector - fisheries - receive ever more publicity. The sentiments regarding fisheries that were captured in two sections of the oceans chapter (Chapter 17) of Agenda 21 reflect civil society's awareness of the need for sustainable use and conservation of marine living resources on the high seas and in areas under national jurisdiction.

This need, and the role of fisheries as one part of the greater ocean environment, has been articulated in strategic policies and directives at various national and international levels, including:

- the 1995 UN Food and Agriculture Organization (FAO) *Code of Conduct for Responsible Fisheries*,
- the 1997 Canadian *Oceans Act* and *Oceans Strategy*,
- the 1998 *Australia's Oceans Policy*,
- the 1999 FAO publication *Indicators for Sustainable Development*,
- the 2001 FAO Reykjavik Conference on *Responsible Fisheries in the Marine Ecosystem*,
- the 2002 European Union review of the CFP,
- the 2002 WWF-Australia publication *Policy Proposals and Operational Guidance for Ecosystem-based Management of Marine Capture Fisheries*, and
- the current development of New Zealand's *Oceans Policy*.

3. FUNDAMENTAL ACHIEVEMENTS

Humans interact with their environment through systems of property rights that are imbedded in social, political, cultural, and economic context. Hanna and Munasinghe (1995)

It is impressive and notable that all of these changes in fisheries governance reflect the ever-growing recognition of the interconnectedness of the environment and of human interactions in the environment. Clearly, the initiatives regarding sustainable development, ecologically sustainable development, and the ecosystem are reflecting increased awareness about the multi-faceted, broad spectrum nature of our fisheries environment.

¹ The full title of Chapter 17 is *Protection of the Oceans, All Kinds of Seas, including Enclosed and Semi-Enclosed Seas, and Coastal Areas and the Protection, Rational Use and Development of their Living Resources*.

However, it is also clear that these initiatives go far beyond fisheries, fisheries managers, and fishermen. Quite simply, the scope of decisions taken regarding use of the marine environment, including its fish resources, now includes much more than just fish, fishermen, and fisheries. Yet, as decision-making has become more inclusive in its consideration of the environment and has had to accept our inevitable lack of information. Precautionary and risk-adverse strategies for coping with uncertainty are increasingly the norm as ways of avoiding inaction in the absence of information and proceeding, albeit cautiously.

So, too, the increased use of conflict management methods has expanded the modes of participation as well as the membership of those who participate in and influence fisheries management and administration.

3.1 Changing Principles and Tools

Changing governance principles reveal a growing interest in the validity of a multitude of constituencies far beyond typical biological and oceanographic communities. As the linkages between science and cultural traditions are built up, alternative sources of knowledge and information are increasingly being used in decision making. In terms of fisheries administration, changes in governance are enabling a gradual shift from top down modes of administration towards participatory administrative management processes. This appears to reflect a growing acceptance of the validity of involving various stakeholders in order to accommodate a broader spectrum of perspectives. Indigenous people, conservationists, recreational fishing groups, and other users of aquatic areas are increasingly sought out to support, supplement, and even lead research and administrative processes. This increased involvement from a variety of stakeholders in the process of fisheries management and greater use of interactive and/or negotiated processes has opened and expanded new rules of participation.

The increased observance of the principles of accountability and transparency – and concomitant mandatory reporting on management activities and performance – is improving the context in which fisheries management occurs, simply by virtue of revealing to the public, quite literally, what is occurring in various fisheries. Increased reporting and assessment by agencies has led to increased scrutiny and involvement by groups previously not part of the fisheries management process. The provision of such information as management objectives, catches, number of participants, other stakeholders, and fisheries managers helps to equalize knowledge and to create incentives for more informed interactions amongst these groups.

The increased use of conflict management methods is also emerging as a valuable approach for expanding participation in fisheries management while also creating positive incentives for various stakeholders to collectively resolve their differences. Because there are many instances where fisheries resources are becoming increasingly scarce, one can expect that conflicts over the allocation of these resources - and associated issues of sharing these resources - will occur with increasing frequency.² Thus, the use of administrative mechanisms based on conflict management processes provides set of useful tools for improved fisheries governance.

Perhaps most impressive, however, is the recognition that imposed solutions may not be the most successful ones. There is growing awareness and acceptance of the notion that cooperatively developed solutions that reflect the social, cultural, political, and economic conditions in which they are being made may result in more durable solutions, even if they are slower to generate.

3.2 Participatory and Co-management Strategies

The use of participatory and co-management strategies is also a positive development in terms of improving the social and cultural context in which fisheries management occurs. The combination of ever-expanding interest in devolved and/or community-based management processes reveals an interest not only to recognize the variety

² Most conflicts over fisheries resources arise when the resource is or, at the very least, is perceived to be so scarce that – in the absence of clear use rights - the matter of sharing, of allocating, a portion of the resource(s) becomes an issue to one or more stakeholder group. In such situations, the lack of definition of the rights to the use of fishery (be it a stock or an area) creates a situation whereby the various participants in the fishery and, indeed, other user groups are likely to develop – and, subsequently, hope to impose - divergent assumptions about what they can and cannot do. The ensuing confusion and debate about how resources may be used, the extent of their use of the resource, and even who may use the resource usually results in conflict.

of valid constituencies, but also to shift decision-making and stewardship roles towards such stakeholders. Furthermore, the growing involvement of stakeholders is helping to drive and shape decision making, so that fisheries management entities are having to meet increasingly rigorous reporting requirements concerning both the transparency in and accountability of their decisions.

For example, the participation of various stakeholders and partners in advisory management groups is useful for increasing the flows of information amongst the members and, potentially, into the respective communities that they represent. Similarly, the increased transparency afforded by the use of standardized due processes enhances the social and cultural context of participants', managers', and other stakeholders' involvement by clarifying their respective responsibilities and roles.

To the extent that participatory management approaches also generate gratification afforded by the conveyance of additional rights and responsibilities from administrators to stakeholders, then such efforts also tend to engender ongoing involvement. However, this last point is worth belaboring because of the following. If participatory management does not include the gratification of additional responsibilities and rights, it is difficult to sustain without conflict. Sharing participatory obligations and responsibilities without the transfer and clarification of rights tends to create both confusion and conflict, and then participants seek additional roles and power in alternative forums outside the participatory structure.

3.3 Devolution, Community-based, and Self-management Strategies

The strategies of devolution, community-based, and self-management all have the potential to improve the context in which fisheries management occurs. However, the extent to which this potential can be realized is very much a function of the capacity of the groups to which management is devolved.

Simply, just as with participatory and co-management strategies, these strategies offer straightforward *mechanisms* for transferring obligations and responsibilities to various stakeholders and partners, i.e. from managers to a community or group of fishers. However, if there is neither a pre-existing skills base nor a concomitant passing of skills, this merely shifts the responsibilities of future fisheries management failures.

3.4 Ecosystem-based Strategies

The current discussions regarding ecosystem-based frameworks are, arguably, a combination of the desire to address sustainable development in a holistic *ecological* (but not necessarily social) manner. The intent is certainly to try to contribute to and improve the context of fisheries management. However, these discussions do not provide direction on the basic issue of how to manage fisheries in such a manner as to keep fish in the water for the future.

For example, the 2001 Reykjavik Conference on Responsible Fisheries in the Marine Ecosystem contained references to ecosystems and fisheries management and was intended as a conference *to identify the means by which ecosystem considerations can be included in fisheries management*. However, the meeting did not directly address the basic issue – how to create regulatory systems that minimize the impacts of humans on fisheries and, therefore, on the ecosystems of which fisheries are a part. At most, there was the recognition that humans cannot manage ecosystems as such, and that fisheries management could and should only try to focus on managing the human activities that are affecting ecosystems.

Similarly, the publication *Policy Proposals and Operational Guidance for Ecosystem-based Management of Marine Capture Fisheries* recently released by WWF-Australia (2002) provides recommendations regarding incentive-aligning activities such as stakeholder and partner engagement, involvement, and partnership in order to create “shared and agreed individual and collective aspirations”. However, the text does not answer the fundamental question of how to create positive incentives for people who catch fish to leave sufficient quantities of fish in the water for the future.

These broadening considerations and increasingly holistic approaches represent fundamental achievements in fisheries management and, indeed, in oceans governance, in terms of participation and process. In short, there has been increased recognition of the legal, policy, sociological, political, economic, and cultural elements of

fisheries management issues – significant and fundamental achievements to improving the context in which fisheries management occurs.

4. THE FUNDAMENTAL FAILURE

These developments are positive ones, yet none of them necessarily seem to result in lots of fish being left in the water for the future. Where, then, is the missing link? What is the source of our failure as we undertake fisheries management?

Perhaps the source of failure is not as elusive as it appears to be. It is clear that there has been a great deal of hard work done on the *contextual* aspects of fisheries and fisheries management. Social, cultural, economic, and political aspects of fisheries management now dominate much of daily fisheries management discussions.

However, for the most part, the underlying core issues - of how to design and to set up actual fishery management plans that create adequate positive incentives for people to harvest fish to keep fish in the water for the future - has been fastidiously avoided. Quite simply, there has been a failure to work on understanding how management systems create incentives that, in turn, shape the way in which people act and interact.

Why this failure? Why has there been so much energy invested in examining the *context* in which fisheries management occurs instead of on the *behavioral incentives* that management rules create and that are at the heart of the managing people and their actions?

There are many reasons, not the least of which is that much of the discussion of alternatives to command and control regulatory strategies has been focused on a particular type of rights system known as individual transferable quotas or ITQs. And, in doing so, discussions have fairly regularly degenerated into polarized debates about the advantages and disadvantages of particular design details of individual transferable quota (ITQ) systems instead of looking at the broader question of how such systems create incentives for participants. What has not occurred is a cogent comparative discussion of all management approaches, of different management systems and the respective and inherent obligations, rights, responsibilities, and incentives that they create.

As a result, in the shorter term - which is frequently the real planning horizon of administrators, budget makers, and politicians - it has been simpler to continue under the *status quo* approach that is based on dictating fishers' participation without clarity on the concomitant responsibilities. As a consequence, the inherent and also exceedingly contentious and difficult issues of allocation, finances, cultural change, and politics have largely gone unattended, creating the unwelcome, but inevitable, results of overfishing, overcapacity, non-compliance and cheating unattended.

5. THE CHALLENGE: A FRESH START ON THE FUNDAMENTAL ISSUE

A fresh, new start is needed to figuring out how to design "adequate" fisheries management systems that can help to resolve the current fundamental failure of managing people who catch fish. Doing so will require thought about both context and rights and, subsequently, about how the power of context and rights can be used in the design of management systems where incentives are constructively aligned to achieve win-win outcomes for fishers, administrators, and others.

There is little need for more or different fisheries management tools. We have what we need. Instead, there is a significant need to rethink how the available tools are currently being used. The issue is to better capture the power of the various incentives management systems create.

One of the major sources of confusion when discussing fisheries management tools is *miscommunication*.

For example, the phrase "property rights" can refer to vastly different bundles of entitlements, privileges, and responsibilities, all of which will produce very different incentives and, hence, management outcomes. The meaning of the phrase "property rights" depends on *how* the "property rights" in question are designed and described for a particular social, cultural, and legal context and for a particular fishery. Yet, this is not typically part of discussions. Thus, there needs to be the recognition of the basic fact that the use of the phrases such as

"property rights" and "rights-based management" are phrases which can mean anything to anyone and which refer to a vast array of both positive and negative incentives that may either support or undermine management objectives. This is an extremely simple point, yet it is all too often forgotten or ignored.

Suggestion 1: Recognize that the phrases "rights-based management" and "property rights" can mean anything to anyone and, as a result, can be very confusing if not used very specifically and carefully.

It may be more productive to use the term incentive-aligning management systems.

Second, possible regulatory solutions can be designed to reflect any degree of incentive alignment amongst partners and stakeholders. Thus, solutions will be a function of the context and rights that are revealed by the entitlements of rights of these groups, noting that:

- **disparate incentives** - may arise when management programs are strictly based on spatial or temporal limitations on access, the use of other controls such as gear restrictions, or total quota systems;
- **group incentives** - may arise if management rights and responsibilities are devolved to communities by means of co-management or even community-based management strategies, including community development, territorial use rights (TURFs), or cooperative quotas;
- **aligned individual incentives** - may arise if rights are relatively well specified- such as those conveyed by the use of individual transferable effort (ITE) or individual vessel quota (IVQ) systems, or systems such as ITQs, ITSQs, IFQs and the like.

There needs to be recognition and acceptance of the fact that, just as for any other management situation, there is no single fisheries management strategy which will provide the solution for all fisheries problems. Fisheries management involves using the most appropriate combination of the available and relevant management tools - and the rights and incentives that are associated with them - when working to create solutions. Again, this is another simple, yet often overlooked, point.

Suggestion 2: Recognize that fisheries management occurs in many ways, in many contexts. Management strategies can and should be designed to meet the needs and align the incentives that are present in each particular situation.

Third, as part of explicitly addressing the current inadequacy, the failure, of fisheries management systems to ensure that there are fish left in the water for the future, it is important to look at the relationship between clarified and strengthened rights and the incentives they create. As Hanna et al (1995) point out:

Property rights regimes are not in themselves sufficient conditions for resource sustainability, but they are necessary conditions.

The issue is one of defining and specifying the entitlements, privileges, and responsibilities created by different types of fisheries management systems and to then understand how, within the context of a fishery, the respective rights create and align incentives to support and reinforce management objectives.

Suggestion 3: It is fundamental to work to understand how systems of rights create incentives that will shape the behavior and actions of people who catch fish.

Fourth, as part of the process of designing a management strategy and *before* working to design a particular regulatory solution, managers and participants need to work to explicitly deconstruct both issues of context and rights so that they may understand the existing incentives.

In terms of *social context*, there is need to consider the answers to questions such as:

- *What are the incentives created and how are they different from the incentives created by other forms of management?*
- *Where and how do the incentives created by different types of property rights become apparent?*
- *What sorts of distributional implications are there, and should these be shaped or altered administratively altered as part of the*
- *Should the design of the management system alter the existing distribution of incentives?*
- *How do different rights systems create positive incentives for indigenous, conservation, tourist, or other equally valid user groups to leave fish in the water?*

In terms of *operational context*, there is a need to consider the answers to the administrative, enforcement, and economic questions such as:

- *What incentives created by different types of management strategies?*
- *What sorts of operational requirements do these different types incentives require in terms of research, enforcement, administration, and actual fishing operations?*
- *What incentives, both positive and negative, are created if rights are assigned and/or reassigned (i) administratively, (ii) by market mechanisms, or (iii) by a combination of administrative oversight and market mechanisms?*
- *When are there advantages and when are there disadvantages to ascribing communal (international, regional, national, or local) rights instead of individual ones?*
 - *Are there different positive and negative economic incentives that are created if rights are clarified and aligned communally (internationally, regionally, nationally, or locally) instead of individually?*
 - *Are there different positive and negative enforcement and compliance incentives that are created if rights are clarified and aligned communally (internationally, regionally, nationally, or locally) instead of individually?*
 - *Are there different positive and negative administrative incentives that are created if rights are clarified and aligned communally (internationally, regionally, nationally, or locally) instead of individually?*

Suggestion 4: It is useful to work to align the incentives that are part of the social, political, cultural, and economic context in which people interact as part of their roles relating to capture fisheries.

- *In free-market, individually-oriented settings, it may be most useful to use management strategies that create strong positive incentives that align regulatory and personal objectives at the level of the individual participant.*
- *In more communal or collective social settings, it may be most useful to design management strategies that create align incentives regulatory and community objectives.*
- *In interjurisdictional or regional settings, it may be most useful to design management strategies that create align incentives regulatory and community objectives – and to then look within the more local contexts to see what sort of system creates and aligns the most positive, win-win incentives.*

These are not simple questions or tasks. There are no easy ways of determining the answers. However, if we are able to dare to work on these, we may just find we are able to meet the challenge of having fish for our future and the opportunity for sustainable development.

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