

## How Can Collaborative Research be More Useful to Fisheries Management in Developing Countries?

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### Abstract

Most fisheries management schemes in industrialised and developing countries have not delivered sustainability, the goal usually pursued by them. This short communication takes a look at some ways in which collaborative research and the mobilisation of a wider range of societal actors, such as promoted under the ACP-EU Fisheries Research Initiative, can make a more useful contribution to fisheries management in developing countries.

### Introduction

Most fisheries management schemes in industrialised and developing countries have not delivered sustainability, the goal usually pursued by them. Garcia and Newton (1997) pointed out that 70 per cent of the world's marine capture fisheries are overexploited, fully exploited or recovering. As Gréboval and Munro (1999) state in their introduction to an FAO Fisheries Technical Paper based on a Technical Working Group on the Management of Fishing Capacity, convened in La Jolla, USA from 15-18 April 1998: "Regardless of how one chooses to interpret the term 'fully exploited', there are substantial grounds for expressing deep concerns about the state of world capture fishery resources." A series of recent publications add quantitative analyses and new perspectives to the crisis in fisheries (e.g. Pauly *et al.* 1998a; Christensen 2001; Froese and Reyes, in prep.).

We therefore see more scepticism about research and applications, which confine themselves purely to the 'technical' aspects of fisheries management. These and the underlying 'reductionist' attitudes have been contributing factors to major fishery collapses and a generalised decline in ecosystem health.

On closer examination, the economics and incentive systems at work are believed to neutralise if not pervert many management attempts. Imperfect markets appear to mask scarcity effects as fish prices of previously undesirable species have increased in price relatively faster than now much scarcer 'high value' species (mostly ground fish and large pelagics) much reduced by overfishing, but which have maintained or only moderately increased their market prices (Sumaila 1999; Sumaila *et al.*, 2000). The information allowing investors in fisheries to make better economic decisions is found lacking (Des Clers 1998) and this shortcoming appears to be of concern for other stakeholders as well. Most recently, Watson and Pauly (2001) showed that global marine catches have declined since reaching a peak of about 80 million tons in the late 80s instead of increasing as official world statistics have misled us into believing. Misreported national statistics were disseminated through FAO which, as an intergovernmental organisation, relies on official national communications. This may have unwisely influenced planners and investors alike.

But perhaps equally importantly, the mechanisms are largely underdeveloped, which would allow more effective dialogue between sector stakeholders to create conditions for the success of management. The gap between the broad principles of the FAO Code of Conduct for Responsible Fisheries (FAO 1995), the demand for ecosystem-based management as incorporated in the Jakarta Mandate agreed by the 1995 Conference of the Parties to the Convention of Biological Diversity (<http://www.biodiv.org/decisions/default.asp?lg=0&m=cop-02>) and the harsh realities of depleted resources, degraded ecosystems (Pauly *et al.* 1998a), loss of productivity and aquatic diversity (Froese and Torres 1999), remains unbridged so far. Some of the issues may be illustrated through the case of a co-operation project sponsored under the Fisheries Research Initiative between African, Caribbean and Pacific (ACP) Countries and the European Union (Anon. 1995, 1996, 1997a, 1997b).

## Missing Links

The Project 'Strengthening of Fisheries and Biodiversity Management in ACP Countries' set out specifically to make FishBase and related analytical tools available to African, Caribbean and Pacific (ACP) partners enriching it through collaboration. More generally it was to contribute to a positive environment for ACP participants under the ACP-EU Fisheries Research Initiative. Interaction with ACP researchers and fisheries administrators during the years of implementation illustrate a number of obstacles in the way of effective biodiversity and resource management. With the benefit of hindsight, these seem not to be confined to the project itself but to be indicative of a more generalised set of problems in relation to fisheries management in many developing countries.

Fisheries departments are usually responsible for fisheries management in their respective countries; however, closer examination reveals a lack of means and an unsatisfactory institutional framework to carry out their mandate. Indeed, others may *de facto* influence decisions, which would be incumbent on the fisheries department or other departments of the ministry overseeing fisheries rather than those who are directly in authority. There are cases in which fisheries departments lumbered with conflicting mandates of 'extension' and 'law enforcement' are hindered in delivering either effectively. Environment and resource conservation is only gradually perceived as offering the most interesting opportunities for socio-economic development. In most cases, the human resources, institutional arrangements and budgets available for management and sector policy fall short of what is necessary. Training and retraining of fisheries officers are often found wanting when faced with the evolving nature of the task at hand.

Finally, to embed fisheries management in the wider picture, it should be mentioned that macro-economic demands are frequently put onto the sector administration without it being equipped institutionally and politically to handle them (Cunningham pers. comm.). Conversely, macro-economic decisions impact the fisheries sector, sometimes even more so than sector management (Dahou and Deme 2001). This socio-economic connectivity is, however, not further developed here.

Fishers themselves, small- and large-scale alike, though to different degrees, may not feel bound by the management scheme in place, if any, to contribute their share to long-term sustainability, when shorter-term cash flow or even survival problems loom large. Other

stakeholders tend to have little or no representation on any formal scheme. Among these, fish processors and traders, who, especially at the small-scale level are often women, may come to mind easiest. But conservationists and consumers are equally legitimate stakeholders with significant interest in long-term productivity of the resources.

Researchers working on the fisheries sector, including its ecological and socio-economic framework, should interact with all of them, though this has not always happened in the past. Research in many tropical and sub-tropical countries is insufficiently funded to make the contributions towards the overall goal of sustainable fisheries expected of them given the importance of aquatic resources and resource use in many economies. This may be aggravated by insufficient collaboration between universities, sector institutes depending on ministries in charge of fisheries, and even other research establishments or documentation centres. Each of these bodies addresses part or all of the ecological and socio-economic issues, on which decision makers need information and understanding.

The sample of stakeholders mentioned does not necessarily represent homogeneous groups, but a broad-brush picture leaving their internal subtle differences, complementarities and conflicts aside.

All too often, conservationists and fishers have identified with group interests perceived as diametrically opposed with little communication existing between them. Consumers are increasingly remote from production as indicated by the high percentage of fishery products entering global trade (FAO 2000). Since the establishment and enforcement of stricter health standards in the major import markets (Japan, European Union and North America) in the mid 1990s, worries have sometimes been aired that consumers and the veterinary inspection services in these import markets are more concerned with their own food safety than with the living conditions of the original producers (eg Jansen 1997).

These are but highlights on some of the fault lines. There is no shortage of attempts to establish better communication or to improve information exchange. However, the missing links enabling a reversal of the downward course of fisheries have so far been elusive.

## What Could Make a Difference?

The dialogue, which laid the foundations of the ACP-EU Fisheries Research Initiative, showed the potential for relationships of voluntary co-operation based on mutual respect and shared responsibility (Anon. 1997b). It underscored needs for foresight and scientific pro-activeness.

There is also increasing realisation that foresight and pro-activeness depend on a good understanding of the history of the ecosystem or society under study (Putman 1993; Pauly 1995; Pauly *et al.* 1998c; Nauen 1998a). Two scientific conferences at EXPO 98 under the Fisheries Research Initiative made contributions to address the historical dimension (Pauly *et al.* 1999, Pullin *et al.* 1999). This has so far attracted little attention in the context of management, concerned as it is with solving problems on a short-term scale. However, without an understanding of the history of a system no baseline exists to appreciate the range of options for decision making enabling socio-economic and ecological sustainability.

These considerations bring home yet again the need for transdisciplinary work in recognition of the complexity around us. Yet, piecing the picture together and particularly how to deal with uncertainty and risk, opens many new questions.

In the biological and ecological fields, FishBase makes available information on all 25,000 finfish in the world. The information spans many disciplines and is structured around species and their higher taxonomic aggregates as they represent current understanding of evolution (Froese and Pauly 2000). The data structure allows different 'communities' of stakeholders to draw on the database's content (and enrich it with their own specific data and knowledge, by now even through remote data entry for experts assuring quality control). It enables them to carry out their preferred types of analysis on a broader quantitative basis than they would be able to do in isolation. Experienced users thus gain new insights into their own fields and their limits, allowing them also to venture into other areas of information and analysis.

The core data are available on the Internet (<http://www.fishbase.org>). The site now attracts some 150,000 users per month. Many of the website visitors are from industrialised countries. The spread of the Internet in developing countries and increased emphasis on language translation is bound to increase access there beyond their current share of about 25% of users. To compensate for remaining logistical problems, several thousand conventional CD ROMs have been shared with project partners and other interested individuals and institutions over the last few years. Froese (2001) summarises some key lessons underlying the success so far.

There are a few emerging lines, where the existing collaboration allows the development of new or complementary analytical tools responding to user needs. Extracting data and indicators relevant to ecosystems modelling such that fishery resources can be analysed in their ecosystem context enables researchers to ask new management questions (Christensen 1996; Christensen 1997). Thanks to these new concepts and outreach initiatives, managers and the public can assess fisheries in a different light.

Another opening was developed by Sumaila's analysis of price trends in fisheries products (1999) to probe not only the market equivalent of ecosystem changes provoked by fisheries, but also the role of protected areas as hedges against uncertainty (1998). Other areas of importance, e.g. particularly the less-developed areas of analysing the social costs of fisheries and policy research warrant future collaborative efforts. These and several other promising avenues can best be explored through collaborations, which build on the existing knowledge and develop it further under the guiding principles of the Research Initiative.

The uncertainty associated with the complexities of the large marine ecosystems, environmental forcing factors and the interconnectedness of sub-systems (eg through global scale oscillations) have implications on fisheries management (e.g. Durand *et al.* 1998; Bakun 1998). While enriching the research agenda is overdue, the inherent uncertainty in fisheries resource systems warrants *a priori* recognition that assessments cannot reasonably be expected for all resources and that consequently management approaches need careful rethinking (e.g. Walters 1998).

This also returns us to the initial question of who the legitimate stakeholders are and how to devise institutions that enable the transition from top-down fisheries management towards greater societal participation (McGlade 1994; Nauen *et al.* 1996; Adams 1997; Chakalall *et al.* 1997; Fontenelle 1997; Ruddle 1997).

## Society's Increased Expectations in Relation to Research and the Role of Dialogue

There is convergence in the analyses that legitimate parties in fisheries are not just in the triangle between the fisheries administration, 'fishermen' and research. Each of these three poles is differentiated depending on the actual economic and institutional conditions and possibilities. New actors have already entered the scene (Nauen 1999), foremost in the continuum from small-scale to international interest in processing, handling and trade. The latter is a powerful, and often controversial, driving force with leverage throughout the sector and beyond. More visible for the general public, local, national and international NGOs promoting environment and biodiversity conservation have espoused reduced fishing on global and local scales.

As far as the on-going collaboration under the FishBase Project is concerned, it is acknowledged that it has not yet led to any reversal in the downward trend in fisheries and biodiversity. The project has compiled substantial amounts of relevant information, made them available through a user-friendly interface, promoted new concepts and reached many of the institutional users in ACP countries as intended (Froese *et al.* 1999). But this is not enough.

The concepts and approaches promoted under this specific project are still relatively new to many partners and need to be more fully appropriated, in order to engender significant impact (see e.g. Fontenelle 1997). Intensified capacity building of ACP institutions, ACP-EU collaboration is the natural response to seek more visible impact in terms of rehabilitated fisheries and reduced threat to aquatic biodiversity.

In general terms, research itself will have to evolve in the process not only in terms of advancing scientific knowledge but also by interacting more with society under the partnership concept for a truly 'New Deal' (Viegas 1999). Indeed, new governance institutions as advocated in Kooiman (1997) invite the recognition of all stakeholders as providers and users of information and knowledge, new arrangements in the relations based on mutual respect.

With the recognition of the complexity of the aquatic and socio-economic systems, their spatial and temporal scales and dynamics, the role of research and knowledge can thus only increase. Approaches, such as the establishment of protected areas, are new options for managers to rehabilitate lost productivity (Roberts *et al.* 2001). Therefore, approaches to fisheries management must and can change. So great is the convergence between the general analysis and fisheries that new institutions and a 'New Deal' have also been demanded in fisheries management (Pauly *et al.* 1998b; Nauen, 1999).

Building on the good foundations of the ongoing co-operation, a strengthened ACP-EU initiative could support the wider appropriation of these new concepts and selectively help those local stakeholders, countries or regions, which have already invested in fisheries rehabilitation or will be doing so. The skills and competencies developed under the present project and other complementary ones of local and external partners would then combine to have a visible impact on fisheries. It is time to turn around some 'real life' fisheries onto a sustainable path.

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