



CARIBBEAN TECHNICAL COOPERATION NETWORK ON

ARTISANAL FISHERIES AND AQUACULTURE

Pauly, D. 1995. When is fisheries management needed?
p.2-7. Circular Letter No. 33. Caribbean Technical Cooperation Network on
Artisanal Fisheries and Aquaculture.

CIRCULAR LETTER No.33

1995 No.33

Network News

January 1996

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As a mechanism for the exchange of information on the Caribbean Technical Cooperation Network in Artisanal Fisheries and Aquaculture, the Network News is published periodically to provide a summary of principal activities carried out by Network members and cooperating institutions, to indicate future activities and provide general information of interest to those persons and institutions working in fisheries and aquaculture development in the sub-region.

Participating Countries

The Governments of Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Christopher and Nevis, Saint Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago have officially endorsed the establishment of the Network and designated their national Fisheries Administration as the national focal point of the Network.

Collaborating Institutions

Caribbean Natural Resources Institute, the Caribbean Fisheries Training and Development Institute, the Fisheries Division of Curaçao, and the University of the West Indies.

**WHEN IS FISHERIES
MANAGEMENT NEEDED?**
by Daniel Pauly

Introduction

Given the sorry state of the world's fisheries (Garcia and Newton in press), and their even gloomier prospects if business continues as usual, no one will contest the need to rethink the way fisheries are managed. There are many calls for this (e.g. Christy 1993, Beddington 1995). Indeed, we might have to rethink the way we *think* about management, including perhaps the way we define it. The literature contains many definitions of fisheries management; in spite of their differences, however, most share enough features to be put into two subsets *viz*:

- (i) Fisheries management *sensu stricto* (*s.s.*), concerned mainly with stock assessment, i.e., with the biology of the stocks, the deployment of fishing gears and their interactions (see e.g., Smith 1994); and
- (ii) Fisheries management *sensu lato* (*s.l.*), concerned with the performance of the fisheries sector as a whole (Gulland 1981), and implying multidisciplinary studies linking biologists with economists, sociologists, anthropologists.

For the purpose of this paper, however, multisectoral coastal area development planning is not considered to be "a part" of fisheries management, even in the widest sense. Rather, fisheries management *s.l.* may be an element of such planning if the local importance of fisheries warrants it.

My personal area of expertise is the development of quantitative methods for the research in (i); also I have developed some concepts pertinent to the multidisciplinary research in (ii).

On the other hand, my experience is much more

limited with regard to multisectoral coastal planning and the reader is thus asked to view the suggestions below as no more than food for thought. In this spirit, I propose to follow through on the ramifications of a medical metaphor for fisheries management (see Bradbury and Reichelt 1981).

A medical metaphor

In 1984 at a conference on multispecies fisheries, I had noted the analogy between fisheries scientists, whose advice is often not heeded, and the staff of a hospital that would diagnose diseases, but could not treat them (May 1984).

I now present another medical metaphor in the hope that it may help us answer the question in the title of this contribution. Although I am personally peaceful, I base this metaphor on the experience of battlefield surgeons who, when faced with a large number of wounded and a shortage of time and other resources, put them (reluctantly, I'm sure) into three groups:

- (i) those that will survive without immediate help;
- (ii) those that require immediate help for survival;
- (iii) those that won't survive, even if provided immediate help;

and who then devote all their attention to group (II).

This concept of "tirage" is the metaphor I propose to apply to fisheries, following the required adaptation to our purposes of the terms "survive" and "immediate help". Survival of a fishery should mean here I presume:

- (a) the continued existence of the biological resource upon which the fishery relies; and
- (b) the continued existence of the social organization that has evolved to exploit that resource.

In contemporary terms, the former implies the maintenance of local biodiversity, while the latter implies a social organization allowing for *sustainable* use of a natural resource, two themes to which we shall return below.

Without *both* of these elements, a fishery — the locus of interaction between fishers and a resource — will not survive.

However, at the risk of displaying a biologist's bias, I would like to stress that (a) and (b) are not equivalent or symmetrical: a resource can continue to exist (as "latent" resource) if the fisheries disappear, but the converse does not hold, and hence the primacy of conservation and maintenance of biodiversity when dealing with the sustainability, i.e., the survival of fisheries.

The concept of "immediate help" is easy to conceive when it applies to battlefield surgeons, and consists of stanching blood losses, avoiding shock, etc. Its analogy, as far as fisheries management is concerned, presumably includes those measures that must be taken to prevent collapse of fisheries, through:

- (i) massive and rapid build-up of fishing effort, resulting in reduction of spawning biomasses and of biodiversity;
- (ii) massive and rapid destruction of habitats, usually resulting in reduction of recruitment;
- (iii) resource access conflicts among groups of fishers or between fishers and other coastal resource users, leading to (i) and/or (ii).

Fisheries that do not need immediate help

What conditions may occur in a fishery that would make it unnecessary for them to be "managed" (i.e., for an external agency to try to influence the way the resource is allocated and effort is deployed)? I should like to assume that such situations exist only when:

- (i) catches are small relative to the size of the resources; and

- (ii) a framework exists for local formulation and enforcement of resource access and gear deployment rules.

Both of these conditions appear necessary: high catches relative to the size of the resources will invariably lead to increasing recruitment fluctuations, and an erosion of the biodiversity of the resource, and thus increasingly strain a local management system.

Conversely, the absence of *any* management system (traditional or not) and of the constraints such system implies will unavoidably lead to relatively high, and eventually unsustainable catches. An example of this may be found in the outrageous *bêche-de-mer* fishery recently opened in the Galapagos Islands, and which promises to wreck much of their ecology by the time the resource is gone.

There appear to be many fisheries in the South Pacific region for which the above two conditions still apply, and which thus may not need to be managed. The "task" ahead may indeed be, in such cases to allow "traditional" (i.e. local) management practice to remain uncodified, so they can continue to evolve and adjust to new challenges and opportunities (K. Ruddle, pers. comm.).

Fisheries that require immediate help

Virtually all textbook in fisheries science and management are written in developed countries, for developed-country students, scientists or fisheries managers. Whether explicitly or not, these books all assume developed country infrastructures, both administrative and scientific, and industrial fisheries (with sometimes considerations of sports fishing). The constraints, in tropical developing countries, to fisheries management such as described in these books are rarely mentioned, and their assimilation into a global view of fisheries management is still pending (Pauly, in press).

For example, quotas, either as free-for-all Total Allowable Catch (TAC) or as treasured Individual

Transferable Quotas (ITQ), the state-of-the-art among developed-country fishery management tools, are utterly useless when the administrative and scientific infrastructure does not allow for (at least nearly) real-time monitoring of catches and landings, i.e., in the small-scale fisheries of tropical developing countries (Munroe 1980).

"Immediate help" to fisheries cannot thus be likened to the routine work of fisheries laboratories in developed countries, which largely consists of estimating next year's TACs or ITQs. Rather, providing "immediate help" may consist of timely interventions, e.g.:

- evaluating newly introduced gears, or of new fishing practices in view of their regulation;
- evaluating the prospects for expansion of a fishery;
- resolving acute access conflicts; or
- providing the scientific basis for new fishery legislation.

Here, the idea is that a fishery management unit should not operate "tactically", i.e., run the fishery, or even provide annually renewed management targets, but contribute "strategically" to its long-term orientation which, once launched, should run largely on its own.

Timely response to such challenges implies that the Department of Fisheries or other administrative unit in charge of fisheries has staff capable of rising to such challenges, which brings up the concept of "critical mass". [Refer to Issue no.32 of Network News for article on "Critical Mass and Productivity in Fisheries Research Institutions" by the same author.]

Fisheries that require more than fisheries management

Fisheries that have collapsed biologically, such as the Newfoundland cod fishery, or in which the massive ecological and social changes have occurred which I term Malthusian overfishing

(Pauly 1994), e.g., in Bolinao, Pungasinan, Philippines (see McManus et al. 1992) and in Maqueda Bay, Samar, Philippines (See Saeger 1994) do not require "fisheries management" (*s.s.* or *s.l.*). Rather, what they require are *intersectoral* arrangements including onshore job creations for redundant fishers. In the above case, this forced the Canadian federal government to:

- (i) close the fishery and save the few spawners left, thus hopefully allowing an eventual rebuilding of the stocks; and
- (ii) provide economic support for over 40,000 fishers and their families, inclusive of training programs to enable young fishers to work in other sectors, and for older ones to retire.

In the Philippines and for understandable reasons, such interventions have not been forthcoming for ailing fisheries (although excellent management plans, inclusive of alternative livelihood programs have been proposed, see McManus et al. 1992). Instead, legislation has recently been passed which delegates much authority over coastal fisheries resources from the central government to local government. This has raised hopes that "co-management" schemes may evolve linking central and/or governments with fisher communities in a shared responsibility for the resources as illustrated in Figure 1.

Though now much talked about in the context of tropical fisheries, this concept cannot belie its Canadian origin (Pinkerton 1989), which shows in its implicit assumptions:

- (i) that the fishers are, with regard to the resources, the only stakeholders that the government needs to deal with; and
- (ii) that the government involved in the axis of Figure 1 has, indeed, "capacities" to contribute to the partnership.

Thus, in Canada, the scientists of the Department of Fisheries and Oceans have (or until recently seemed to have) the capacity to evaluate fisheries

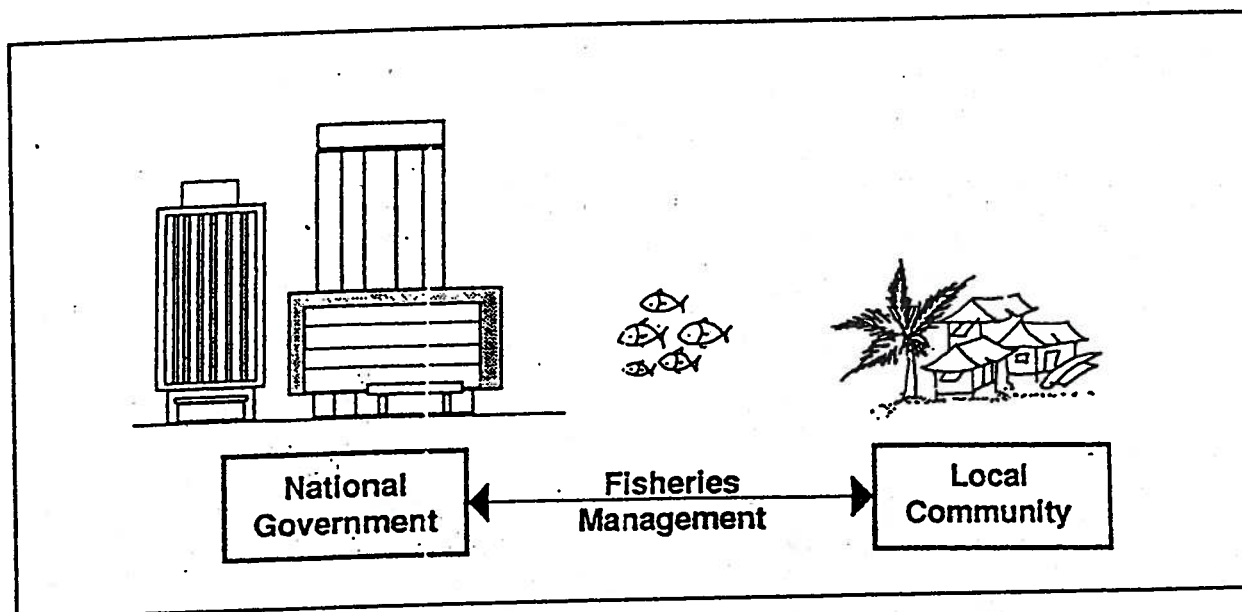


Figure 1

Schematic representation (in ICLARM 1993) of relationship between Government and fishery communities underlying the concept of co-management. The original legend of this graph read: "Co-management: shared authority for fisheries management between community and government. A partnership of capacities and interests of fishing communities with the capability of national governments to provide legislation, institutions, and assistance." Note the implied assumption that governments indeed *have* the capabilities ascribed to them.

stocks, to estimate TAC, etc., and to propose management regimes which the government has (or until recently seemed to have) the capacity to enforce, etc.

Co-management emerged in this context as a battle-cry of marginalized groups with a tradition of fishing (such as the First Nations of Canada) who, understandably, want to participate in the resource allocation process, if mainly to increase their share of the resources.

"Tropicalizing" the co-management concept should have involved an assessment of the capacity of local or central governments in tropical developing countries to serve as counterpart (or counterweight) to fisher communities, and an evaluation of whether these fisher communities should indeed be considered the sole legitimate stakeholders as far as fisheries resources are concerned. I believe this critical examination of the co-management concept has not occurred. Moreover, I believe that a more general concept, that of "governance" as documented on the contributions in Kooiman (1993) better captures the essence of what is required to reach beyond fisheries management (even *s.l.*), and

to accommodate the multisectoral consultations and interventions required for rehabilitating fisheries, which in cases such as mentioned above *must* include massive reduction of fishing effort.

Rather than for government to remain actively engaged in fisheries management (as implied in Figure 1) governance *sensu* Kooiman and colleagues implies the creation, through appropriate legislative action, of a "level field" through which various stakeholders are given the means to articulate their demands for access to a certain good or services*) and where actions must result from consensus, or at least majority agreement among groups of stakeholders.

In the fisheries context, this implies the identification of groups other than fishers with legitimate claims to the resources, e.g., NGOs

* Dr. Jacqueline McGlade, with reference to the German philosopher, J. Habermas, calls the resulting interactions "herrschaftsfreie Diskussion" i.e. discussion not under (government) rule.

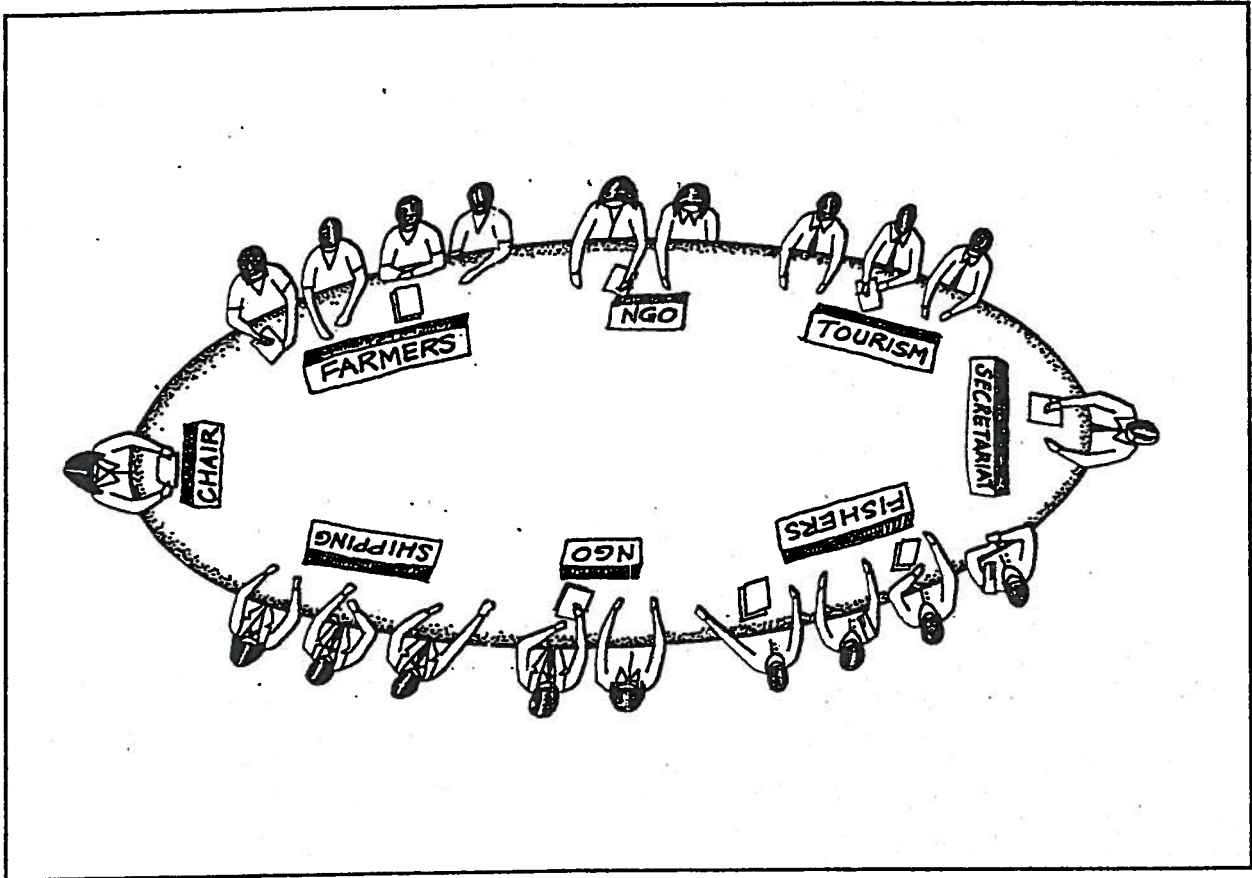


Figure 2

Schematic representation of a situation where joint stewardship of the natural resources of a coastal area has been jointly entrusted to groups of stakeholders, including fishers. NGOs, devoted to local development, or conservation, along with e.g. tourism representatives may, in such case, counter any exclusive claims or actions by the fishers, and in this capacity, replace (local) government.

promoting non-fisheries livelihood programs, conservationists interested in the biological integrity of fish populations endangered by excessive fishing or, in coral reef fisheries, the owner/operators of dive resorts, who will fail to attract tourists if the fisheries have blasted the reefs, etc. Figure 2 is an attempt to illustrate this concept.

This implies that such groups be given joint management authority over a resource. Fisheries management advice, in such a context, would go to the joint authority (e.g., a management council), neither to the government nor the fishers alone, and would then have to be balanced against advice concerning non-extractive use of the resource.

Such balancing would imply that fishers would have to reduce or at least stabilize their effort level to accommodate other groups, and would have several

effects:

- increase catches (and decrease their variability) for those remaining in the fisheries;
- increase diversity within the exploited species complex;
- allow for some rent to be extracted (if indirectly, via taxes paid by other, taxable groups whose activity require healthy stocks, e.g., tourism operators) from fishers, i.e., a group that generally does not pay a resource rent to society at large.

This last point may seem moot to those who consider fishers the only legitimate users of fish resources, but perhaps may be appreciated by

others, who can conceive of fish resources being viewed the same way we now view, e.g., wetlands or tropical forests now widely perceived as being "public" resources, which not even their formal owners have the right to wantonly destroy.

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CO-MANAGEMENT OF THE FISHERIES RESOURCES OF PORTLAND BIGHT, JAMAICA

Jamaican waters are the most overfished in the Caribbean region, and the island shelf is the most overfished.

An interesting experiment in fisheries co-management is under way in Jamaica. Stakeholders in the Portland Bight fishery on the south shelf of the island have come together to form the Portland Bight Fisheries Management Council (PBFMC) in an effort to improve the fishery.

The Natural Resources Conservation Authority (NRCA), the Jamaica Government environment protection agency, intends to declare Portland Bight and surrounding regions a Special Protected Area, and to license the South Coast Conservation Foundation (SCCF), a Jamaican Environment and Development NGO, to manage the area.

The SCCF is committed to co-management, the approach where government, the resource users and all other stakeholders come together to manage the resources, and the PBFMC is only the first in a series of such co-management institutions