

## Fishers' Knowledge and the Ecosystem Approach

### El Conocimiento de Los Peces y el Enfoque Ecosistémico de la Pesca

#### Fishers' Connaissances et de L'approche Écosystémique

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#### EXTENDED ABSTRACT

Small-scale fisheries is the basis for about 90% of employment in the fisheries sector in most developing countries including those of the Caribbean. Small-scale fisheries are further responsible for about half of the landings. The data poor situation and the role of small-scale fisheries in poverty alleviation means that many small-scale fisheries are fundamentally open access and either unmanaged or managed inappropriately.

Fisheries Departments in many developing countries are understaffed and underfunded. Their staffs have been trained according to principles originally developed for temperate specialized single species fisheries - principles that are inadequate to deal with the situation in countries dominated by small-scale fisheries targeting a multitude of species.

In the view of many fisheries administrators, to make matters worse, in the last two decades it has increasingly been accepted that fisheries management must move away from the management of the individual stock towards an ecosystem approach to fisheries (EAF) taking into account the interactions and interdependencies between all the compartments of the ecosystem in an attempt to balance ecological, economic and social benefits.

The seemingly dramatic shift in paradigm created concern and frustration among many developing countries already struggling to meet the data requirements of the traditional management system, and now facing a situation where data needs appeared to be multiplied manifold.

However, it is important to understand that while information needs are much broader in the EAF and analysis may require new skills and multidisciplinary approaches. This does not necessarily call for new cost intensive surveys – on the contrary.

The EAF requires that the elements in the ecosystem and the linkages between them are identified. Management focuses on governing processes using adaptive management principles and simple indicators without necessarily requiring high levels of precision.

Second it is important to realize that scientists (who traditionally have been feeding managers with information) do not have a knowledge monopoly, and lack of “scientific knowledge” does not necessarily imply that knowledge does not exist. Fishers have a wealth of knowledge and experience that is extremely valuable for fisheries management of fisheries - and particularly small-scale fisheries. Although it can be argued that the goal of the fisher is maximizing the livelihood of himself and his family in the short to medium term, and that the goal of the fisheries manager is to maximize the benefits for the society in the long term; there is a considerable overlap in the type of knowledge that is relevant for the fisher and the fisheries manager. There is no reason why fisheries management decisions should ignore the knowledge possessed by the fishers especially in situations where no scientific information is available.

Fishers and scientists generate knowledge in different ways and it comes in different formats, ie. scientific knowledge is the result of systematic sampling over short periods at certain intervals while fishers get their knowledge through less systematic, frequent, long term observations. The two knowledge systems are thus to a large extent complementary.

Involvement of fishers in the management process is also consistent with a number of international framework agreements including the Code of Conduct on Responsible Fisheries (FAO 1995), and Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (FAO 2015).

Nevertheless, for a variety of reasons, among which are traditions, cultural differences and mutual distrust, there is still resistance among fisheries managers to involve the fishers in the management process, and a major impediment to the integration of fishers' knowledge in the EAF is the lack of formal guidance on this topic. A recent FAO Fisheries Technical Paper provides a series of reviews and case studies from nine Latin American countries on how to do so (Fischer et al. 2015). The cases cover a broad range of topics including the expertise of fishers and its application to the EAF, as well as

methods and legal instruments to use fishers' knowledge in fisheries assessment and management. The case studies demonstrate what kinds of information can be collected from fishers (in the broadest sense) (Figure 1).

Fischer et al. also discuss how the information should be obtained and the advantages/disadvantages of these methods. Generally speaking you can divide them into "Extractive methods" and Participatory/Collaborative methods. Extractive Methods collect fishers' knowledge with their permission, but without their active participation in the collection, analysis, and evaluation of the data. For this purpose, questionnaires, interviews, surveys, mapping, logbooks, catch reports, tracking devices (GPS, VMS) are the tools used. These methods are both time- and cost-efficient. However, the information may be incomplete and the reliability may be difficult to determine.

Participatory/Collaborative methods on the other hand allow the fishers to participate actively in the development of objectives, design, and use of the information generated through participatory processes. Normally data is gathered through facilitated discussions with institutionalized groups (respecting local governance structure), and through joint activities (analysis, research, mapping, fishing, etc.). The end result will be both highly reliable and comprehensive. The down side is that it consumes both time and resources.

**Figure 1.** The types of information relevant to managing a fishery based on the Ecosystem Approach that can be collected from fishers (based on Fischer et al. 2015).

<u>Biological information</u>	<u>Ecological, Environmental</u>
Habitat use	Species diversity
Migration	Changes over time
Reproduction	Special events
Sizes	Pollution
Feeding	Impact from non-fisheries sectors
<u>Fisheries information</u>	<u>Social and economic</u>
Gear use	Livelihoods
Catch sizes	Labour
Effort	Markets
Catch composition	Value-chains
Trad. management	Costs and benefits
By-catch and discards	Culture and Traditions

#### LITERATURE CITED

- FAO. 1995. *Code of Conduct for Responsible Fisheries*. Food and Agriculture Organization of the United Nations, Rome, Italy. 41 pp. <http://www.fao.org/3/a-v9878e.pdf>.
- FAO. 2015. *Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication*. Food and Agriculture Organization of the United Nations, Rome, Italy. 20 pp. <http://www.fao.org/3/a-i4356e.pdf>.
- Fischer, J., J. Jorgensen, H. Josupeit, D. Kalikoski, and C.M. Lucas (eds.). 2015. *Fishers' Knowledge and the Ecosystem Approach to Fisheries: Applications, Experiences and Lessons in Latin America*. FAO Fisheries and Aquaculture Technical Paper No. 591. 278 pp. <http://www.fao.org/3/a-i4664e.pdf>.