

Information requirements for policy development, decision-making and responsible fisheries management: What data should be collected?

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Why is fisheries information important?

The fisheries and aquaculture sector is extremely important to the Pacific region in terms of food security, revenue generation and employment. Catching or farming aquatic resources makes an integral contribution to rural livelihoods in many parts of the region. Because land-based resources are very limited in many small island developing states (SIDS), people's reliance on aquatic resources is remarkably high in this region. Indeed, the region has one of the highest rates of per capita fish consumption in the world because communities in rural areas often have no alternatives to this vital food item. Fish is also important to SIDS in international trade. Fisheries products bring in valuable foreign exchange earnings; their contribution is as high as 80 per cent of total exported commodities in some countries.

Knowledge of the status and trends of fisheries, including socio-economic information on fishing communities, is a key to using aquatic resources in a sustainable way. Adequate fisheries data and information that are timely and reliable provide a basis for sound policy development, better decision-making and responsible fisheries management. They are required at the national level for the maintenance of food security and for describing social and economic benefits of fisheries, as well as for assessing the validity of fisheries policy and for tracking the performance of fisheries management.

Marine fisheries resources and people's reliance on them are not as "visible" as with resources in other food production sectors (e.g. agriculture) or development sectors (e.g. tourism) because of the location of marine resources and related fishing activities, in water far from the shore. The economic and social contributions of the fisheries sector to each national economy need to be properly evaluated so that appropriate levels of policy attention and resources are directed to the sector for the management of these important resources. In the absence of reliable information to undertake such evaluations, development decisions may be made in favour of other sectors, such as tourism or agriculture development, at the expense of the fisheries sector.

Outside of the government sector, there is also an increasing need for fisheries information; public interest in the current status of fisheries resources has been high. This need is particularly great where decentralised fisheries management systems (e.g. community-based fisheries management) are in place. With more accurate and timely information at the community level, the public is likely to be better informed and supportive of efforts to manage fisheries and aquatic resources in a responsible manner.

Furthermore, fisheries information is either needed for or consistent with many international instruments, initiatives and programmes concerning fisheries. These include:

- the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (1995), which specifies responsibilities for collecting and exchanging data necessary for stock assessments, including provisions for transparency (Article 12);
- the Food and Agriculture Organization (FAO) Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (1993), which requires the exchange of some information on fishing vessels (Article VI);
- the Code of Conduct for Responsible Fisheries, which calls for use of the best scientific evidence available, bilateral and multilateral cooperation in research and data collection (Article 6.4), regional mechanisms for cooperation to compile and exchange data (including information on socio-economic factors; Article 7.4), and publication and dissemination of results (Article 12);
- FAO International Plans of Action (Epées) for implementing various aspects of the Code of Conduct, such as the IPOA for the Management of Fishing Capacity, which broadens the scope of the needed information on the status and trends of fisheries, to include measures of fishing capacity;

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- international conventions, such as the Convention on International Trade in Endangered Species of Wild Flora and Fauna (1973) and the Convention on Biological Diversity (1992), which call for the collection and exchange of information on the status of biota; and
- international programmes that call for or need fisheries information. These programmes include (a) United Nations Environment Programme, (b) Intergovernmental Oceanographic Commission of the United Nations Education, Scientific and Cultural Organization (UNESCO), (c) Large Marine Ecosystem projects sponsored by the Global Environment Facility, (d) Coordinating Working Party on Fisheries Statistics, and (e) Inter-Agency Committee on Sustainable Development.

Difficulties associated with collecting fisheries data and information

Clear needs for adequate and reliable information on fisheries, as described above, do not necessarily secure sufficient investment of resources that will comprehensively improve national systems for collecting fisheries data and information. Chronic problems are prevalent in the national data collection systems of many countries, including SIDS in the Pacific, such as:

- insufficient budget;
- limited number of staff;
- lack of training opportunities for fisheries officers and field enumerators; and
- multiple duties given to field staff.

Such problems result in unreliable, poor-quality information, discouraging people from using statistics for fisheries management and policy development, which in turn leads to dwindling support for the development of data collection systems. There is an urgent need to end this vicious cycle of problems that shortcomings in data collection systems tend to create.

Moreover, certain characteristics of SIDS and countries with tropical small-scale fisheries work against the collection of effective fisheries data in the Pacific. Clearly identifying and recognising difficulties specific to the region would help in formulating appropriate strategies to cope with them. Some typical conditions in the region that are unfavourable for data collection are described below.

Dispersed and diversified small-scale activities for subsistence purposes

The Pacific Islands are blessed with rich reef-associated fisheries resources; many islands are

encircled by extensive fringing reefs or barrier reefs that provide well-protected fishing grounds to the local communities. Coastal fisheries within these reef systems support predominantly small-scale activities to supply fish to rural communities at a subsistence level. These informal activities of harvesting fish, which contribute significantly to rural livelihoods across the region, are highly diversified in terms of fishing gear, methods and targeted species.

The dispersed and diversified nature of coastal fisheries, however, is a disadvantage in that it challenges conventional data collection systems that are based on catch and effort. In contrast, the region's offshore industrial fisheries that target tuna and tuna-like species almost exclusively, are generally monitored well and systematically by regional fisheries bodies or national fisheries departments.

Archipelagic nature of small island countries

Compounding the above problem, many countries in the region are archipelagos, with numerous islands and islets spread over a vast geographical area. Geography of this nature inevitably poses serious logistical problems for data collection. For relatively small fisheries departments in the Pacific, which have very limited human and financial resources as well as means of logistics, covering the area can be simply beyond their handling capabilities.

Weak linkage between policy/management objectives and information generated

In many cases, the fisheries data and information that are currently collected are linked only weakly to policy and management objectives for the fisheries. This suggests that national efforts to clarify information requirements may be insufficient or non-existent.

National data collection systems need to provide information that is more relevant to current policy and management objectives. In this regard, small-scale fisheries are frequently given little attention and hence have low priority in the eyes of governments. This neglect probably stems from the relatively "invisible" contribution that small-scale fisheries make in terms of income to the national economy and of staple foods to local communities. Thus information on resource use in coastal waters, where small-scale fisheries predominate, is often limited and of poor quality. This situation, perhaps underlined by an attitude among policy-makers that nothing can be done with small-scale fisheries, adds to the neglect of policy development for this subsector.

Production-oriented data collection that overlooks socioeconomic aspects

Because small-scale fisheries are often operated for subsistence purposes, they are closely linked with the socio-economic issues of rural development, sustainable livelihood of communities and national food security. Data collection systems that focus on production-oriented data (e.g. catch and effort data) may be unable to address these issues. In the process of formulating data collection strategies, due consideration must be given to the subsectors that require data collection to cover different dimensions.

Invalid framework of data collection system

Until fairly recently, fisheries policies in many countries were directed toward the increase of gross production or expansion of the fisheries sector. National data and information collection systems typically focused on the quantity of fish caught in order to establish how many more fish could be caught. At the same time, little attention was given to small-scale fisheries.

Today it should be recognised that fisheries information systems need to be reviewed when there is a major shift in national policies and priorities. The system framework, including strategies to collect data and information, should still be valid and capable of handling current needs for fisheries data and information.

Adoption of inappropriate methods of data collection

Small-scale fisheries in the Pacific region are typically multispecies and multigear fisheries. It is increasingly recognised that conventional data collection systems that were originally designed for single-species commercial fisheries in temperate waters or offshore industrial tuna fisheries in tropical waters may be unable to meet the data requirements of small-scale fisheries. Therefore, rather than simply adopting the types of data and information used in other areas/subsectors, there is a need to carefully evaluate their relevance to tropical small-scale fisheries.

Ideally, to address the difficulties identified above, an effective fisheries data collection system in the Pacific would:

- use inputs that are low in cost and low in human resource requirements (to fit within the limited financial and human capacity of the line agency);
- employ new approaches of data collection that suit the information requirements of small-scale coastal fisheries in the region; and

- still be capable of generating relevant and reasonably accurate fisheries data and information in a timely manner.

However, in practice it is difficult (if not impossible) to meet these requirements. To take the second requirement as an example, there is no proven method of effective data collection on small-scale multispecies and multigear fisheries that SIDS could adopt.

A logical approach to define information requirements

Certainly there is no easy and immediate solution to the question of how to generate high-quality (i.e. timely, adequate and reliable) fisheries information on small-scale coastal fisheries in SIDS. Yet it does not follow that nothing can be done to improve the current status of fisheries data collection in the region. To the contrary, there already exist some ways of improving the quality of fisheries data and information and their use in policy development or fisheries management.

One starting point to improve the quality of fisheries information is to revisit three basic questions about fisheries information in order to make sure that the current fisheries statistics system is collecting the relevant set of data in an effective way. Frequently, the types of fisheries data collected are adopted from somewhere else, these data are collected as a mandatory routine of the fisheries line agency without considering their adequacy, and ultimately they are not used at all. It is important, therefore, for everyone involved in collecting fisheries data and information to ask themselves the following basic questions:

- Why do you need fisheries information? (Who are the users of the information and for what purpose is the information used?)
- What data do you need to collect in order to meet the users' requirements?
- How best can you collect the required data and information?

In particular, these questions need be asked when a country designs or reviews its fisheries data and information collection system. FAO has been promoting a logically structured sequential pathway in the design/review process, starting from the understanding of *why* (question 1), through the clarification of *what* (question 2), to the consideration of *how* (question 3; for more detail, see FAO 1999). This logical approach is the key to a relevant and effective data collection system; including these basic aspects in any review of a data collection system is important and useful. Figure 1 illustrates a conceptual process of clarifying the information requirements and objectives of data collection (i.e. *why*).

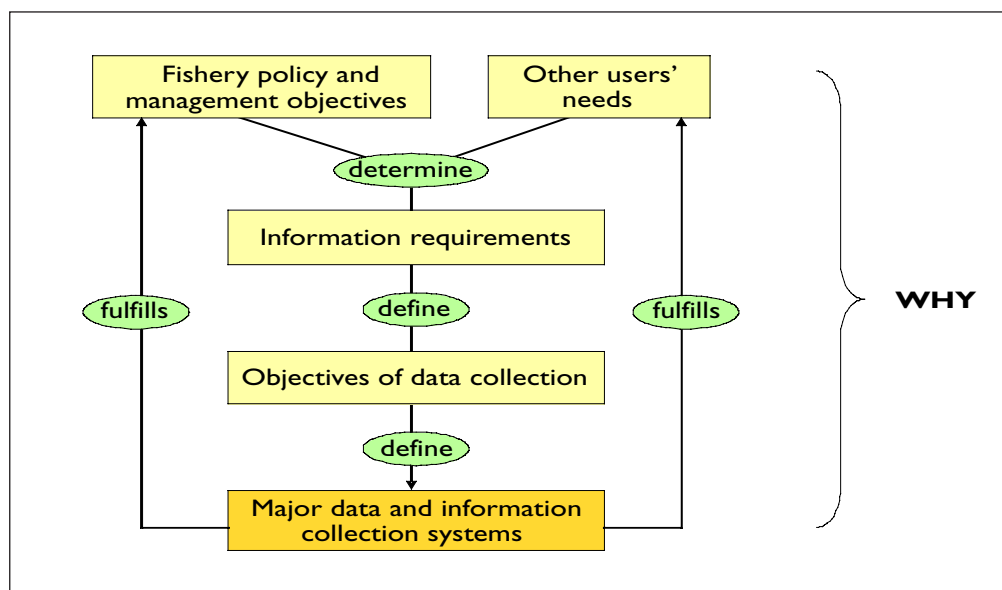


Figure 1. Information requirements and data collection objectives

The following are some critical elements in defining information requirements successfully:

- Stakeholders are involved. In this context, stakeholders are mainly “information users”, not only within the fisheries sector — such as senior officers (decision-makers) of the fisheries line agency and managers of fisheries — but also outside the sector, such as the central economic planning unit of the country, local government organisations and/or non-governmental organisations.
- There is an effective mechanism for consultation among various stakeholders. It would be relatively easy to communicate with information users within the sector.
- Information requirements are reviewed periodically. The information requirements would be changed if, for example, there was a shift in policy emphasis. The data collection system needs to be responsive to such changes.

It would be desirable for each country to initiate a formal national process to identify information requirements. For example, at a national consultation workshop on fisheries data and information requirements, important information users could participate in plans to develop/review the data collection system. The steps of such an exercise could be as follows:

- List important policy and management objectives as well as perceived requirements from other information users, and subsequently list the actions required to achieve these objectives.
- List data and information required for each objective. For example, a country may need to know the current legal framework to support delegation of management authorities, social

structure and systems in local fishing communities, demographic aspects of the communities (number of fishers and their distribution), current pattern of fishing activities, and the purpose of fishing, etc.

- Compare “the data needed” with “the data currently collected”. Then compare the list of required data and information, as identified in step 2, with the existing set of fisheries data.
- Based on the comparisons in step 3, gaps in data collection and/or irrelevancies within the current set of data items collected can be identified. For example, if the required data and information are identified to be A, B, C, D and E, while the data currently collected are A, B, F, G and H, the data items C, D, and E are apparently gaps in data collection. On the other hand, the data items F, G and H are irrelevant items that may not have to be collected. When operational resources are scarce, fisheries departments should not waste their precious resources on collecting this kind of “nice to know” data at the expense of collecting “need to know” data.

The results of this “rapid analysis” could indicate the current quality of information that fisheries departments are producing, and could be used as a basis for formulating strategies to break the vicious cycle of problems related to inadequate fisheries data and information.

Opportunities for improving fisheries data and information

Apart from taking national initiatives as described above, countries in the Pacific region could improve

fisheries data and information by making use of some international instruments currently in place.

Strategy for improving information on status and trends of capture fisheries

FAO has been concerned with the persistent deficiencies of fisheries statistics, data and information systems worldwide. To help overcome these deficiencies, it formulated a "Strategy for improving information on status and trends of capture fisheries" (Strategy-STF; see FAO 2002), which was adopted by the FAO Committee on Fisheries and the FAO Council in 2003.

The Strategy-STF is designed to cover all capture fisheries in inland and marine waters throughout the world. Its main focus is on information concerning fisheries resources and the primary fisheries sector, including socioeconomic information. Its overall objective is to provide a framework for the improvement of knowledge and understanding of fisheries status and trends as a basis for improved policy-making, sectoral planning and management for the conservation and sustainable use of fisheries resources within ecosystems.

The Strategy-STF specifies actions required in the following nine areas:

- capacity-building in developing countries;
- data collection systems in small-scale fisheries and multispecies fisheries;
- expansion of the scope of information on status and trends of fisheries;
- global inventory of fish stocks and fisheries;
- Fisheries Global Information System (FIGIS) participation, structuring and capacity-building;
- development of criteria and methods for ensuring information quality;
- development of partnership arrangements;
- the role of working parties to assess the status and trends of both wild and cultured fisheries; and
- sustaining data and information collection on the status and trends of fisheries.

The Strategy-STF is a voluntary instrument that applies to all states and entities. It calls on states, regional fisheries organisations, FAO, donor countries and non-governmental organisations to assist with its implementation. Its framework to improve the quality of fisheries information is valid and highly relevant for SIDS in the Pacific region.

Project for improving information on status and trends of fisheries

In the implementation of the Strategy-STF, one important instrument that FAO has formulated is a

project for improving information on the status and trends of fisheries (short title: FishCode STF Project) under the umbrella of the FishCode Programme's "Assistance to Developing Countries for the Implementation of the Code of Conduct for Responsible Fisheries". The project is concerned with improving collection, processing and use of data and information on the status and trends of capture fisheries.

The FishCode STF Project is composed of two components with linked immediate objectives.

Component 1: Development of inventories, methodologies and operational guidelines

The immediate objective of component 1 is "improved collection and processing of data and information on capture fisheries (marine and inland) to provide a reliable basis for fish stock assessment, economic analyses and management". It covers the creation of methodological descriptions of fisheries statistical and data collection systems used by all countries and regional fisheries bodies. At the same time it should provide an overview of fish stocks and/or fisheries management units, whether monitored or not, by country and/or region.

The main inventory should cover data systems on all aspects of fisheries, including data on fleets, employment, processing, consumption, trade and sociological and economic aspects. Establishing this inventory should also facilitate an evaluation of data collection and handling practices by each country, of data flows from national to regional and global levels and hence of the data as published by regional fisheries bodies and FAO. Finally, the inventory should form the basis for improvements and identification of training needs in developing countries to be addressed under component 2 (see below).

The implementation of this component should take the following considerations into account:

- There is a need to develop data collection systems that are better suited to small-scale fisheries and multispecies fisheries, and to develop criteria and methods for ensuring information quality and security.
- Because routine data collection on economic and social aspects of fisheries is often neglected, managers are frequently deprived of the data necessary to make decisions in cases of conflict between different types of fisheries, the protection of a labour force engaged in existing fisheries against new arrivals, etc. The FishCode STF Project should investigate requirements and develop systems for the collection of such data.

- Computerised systems facilitate the exchange of data and information, which is the reason behind setting up large databanks such as FIGIS. The project should develop arrangements for the provision and exchange of information and should assist in improving the inputs to FIGIS, including expanding the scope of information on the status and trends of fisheries.
- Ideally fisheries should be managed based on ecosystem considerations. However, ecosystem management requires huge amounts of data. The project should investigate the data requirements and practical solutions for such management systems.

Component 2: Field training and implementation at national and regional levels

The immediate objective of component 2 is “strengthened fishery data collection and processing systems in selected countries, according to the latest global standards and executed by competent staff”. Its aim is to improve substantially the quality of collection and processing of fisheries statistics and other data and information on capture fisheries in selected developing countries with important inland or marine fisheries. Such improvement would lead to better data for fisheries management at national level and, in cases of stocks shared between neighbouring countries, at

regional level as well. Improvements in reporting to FAO and other agencies would be an important additional benefit.

Component 2 covers capacity-building at all levels, and implementation of improved or new statistical and other data collection and processing systems in selected countries. There is also a need for improved interactions among fisheries statisticians, fisheries analysts, socioeconomists and fish stock assessment experts. The FishCode STF Project should facilitate this interaction.

Activities under component 2 will be field-oriented and distributed over developing countries. The beneficiary states will be selected from developing countries with substantial capture fisheries, either inland or marine, that have the potential of becoming an example for other countries in a similar situation.

References

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Humphead wrasse listed as endangered species

At the 13th Conference of the Parties (COP-13) to the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), humphead wrasse (*Cheilinus undulatus*) was listed in Appendix II of the convention. This listing was achieved when the required two-thirds majority voted in support of a proposal to this effect, which had been put forward by Fiji, the United States and the European Union. As a result of this Appendix II listing, trade in humphead wrasse must now be regulated by permits and the importing and exporting countries.

The humphead wrasse, the largest reef fish in the Indo-Pacific waters, is highly prized in the live fish trade. Its population has declined due to both overfishing, encouraged by top-dollar reward for this species, and detrimental catch methods that utilise cyanide.

COP-13 convened from 2–14 October 2004 in Bangkok, Thailand. Drawing together 1200 partici-

pants representing governments, intergovernmental and non-governmental organisations (IGOs and NGOs), the conference considered 64 agenda items on a range of topics, including: reports and recommendations from the Animals Committee and Plants Committee; the 2006–2008 budget and other administrative matters; implementation of the convention; species trade and conservation issues; management of annual export quotas; the relationship between *in situ* conservation and *ex situ* captive breeding; trade control and marking issues; enforcement matters; cooperation with the Convention on Biological Diversity and the United Nations Food and Agriculture Organization; and 50 proposals to amend the CITES appendices.

Humphead wrasse was listed as vulnerable due to multiple and consistent accounts of marked declines, which are linked with heavy fishing and in particular with the recent introduction of export fisheries associated with the international live reef fish trade. Given the projected growth in the trade,