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THE COLLECTION AND USE OF FISHERY STATISTICS

BY

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A Keynote Address to the Workshop

Introduction

During this session we will be discussing the collection and use of fishery statistics primarily in relation to monitoring local inshore subsistence and commercial sectors. At the outset it is relevant to ask the question : "Why do we collect fisheries statistics?" While the particular reasons for collecting and using fishery statistics may vary from place to place the activity itself is logically derived from a commonly-shared desire to learn to obtain optimal benefits from potentially renewable resources. I am very sure all of us here are well aware of the importance attached to reef and nearshore fisheries resources, especially when considering the opportunities available to most Pacific Island governments for promoting economic and socio-economic development. Ideally, the better we understand our fisheries the closer we come to benefiting from them to the fullest possible extent. It is this quest for greater understanding in an endeavour to improve the quality of life that underlies the collection and use of fishery statistics.

What are fishery statistics?

In general, the term "statistics" may be defined as a collection of information that is in the form of numbers. Fishery statistics then is a body of numerical information that describes a fishery, or at least certain aspects of one. The term "data" is often used interchangeably with the term "statistics" even though its definition is slightly different. "Data" may be defined as a collection of facts, or information that is known to be true, from which conclusions may be drawn. Therefore, while statistics are always considered to be numerical information, data are not.

Traditionally, there are three broad categories of fishery statistics and these include numerical data which are scientific, economic and socio-economic in nature. Some examples of scientific fishery statistics include data on catch, effort, catch rates, species composition, length frequency and other measurements taken from biological samples. Numerical data on commercial landings, market purchases, imports and exports, consumption, vessels, gear units, employment, and foreign and local catch and effort are some examples of economic fishery statistics. Different types of numerical data from household surveys, population censuses, etc. which relate to fishing or fish consumption are common examples of socio-economic fishery statistics.

How are fishery statistics collected?

In most situations, there exist many avenues and opportunities for the collection of fishery statistics. A brief randomly ordered listing of those most commonly applied to monitoring inshore fisheries in the Pacific region would include the following :

- a. Fisherman interviews
 - on fishing grounds
 - at landing sites
 - at home
- b. Non-contact surveys
 - by land
 - by sea
 - by air

- c. Test fishing records
 - government vessels
- d. Log books
 - government vessels
 - commercial vessels
- e. Marketing surveys
 - municipal markets
 - small markets
 - roadside sellers
 - retail outlets
- f. Receipt books
 - municipal markets
- g. Import/export records
 - transshipment sites
 - markets
- h. Vessel registration
- i. Population censuses

The specific methods employed in the collection of fishery statistics usually vary in response to several factors. The nature of the fishery being investigated (eg. subsistence, artisanal, industrial, recreational), along with the reason for the investigation (eg. stock assessment, monitoring, management) often have a strong bearing on how statistics are collected, and also have influenced which statistics are required. For example, the data required for the on-going monitoring of a fishery have often been quite distinct from the generally more specialised statistics utilitised for stock assessment purposes, and frequently the methodology and approach to each have been quite different. Furthermore, there are usually unique, logistical, economical, cultural and political factors which should be considered in the design of a specific fisheries data collection system.

What is a fisheries data collection system?

A fisheries data collection system may be viewed as an effective means of detailing and numerically describing the component sectors of the total fishery of an island or country. Such sectors may be subsistence, artisanal, industrial or recreational in nature. The complete system formally allows for collecting, storing and analysing fisheries statistics for each sector. It may be a computerised system, but does not necessarily have to be. The important thing is that the system contains sound data and yields relevant results for the sectors it does cover.

One of the critical steps in designing a fisheries data collection system is the early identification of clearly defined objectives. Sufficient forethought should be aimed at identifying obstacles to data collection and analysis so that stated objectives will be realistic. Although the same basic set of fisheries statistics is often required for monitoring most types of fisheries, it is the overall collection and data processing methodologies which must be adapted to best fit the circumstances at hand. This will greatly assist in developing a fisheries data collection system that is considered to be workable within identifiable constraints such as politics, culture and technical ability. Testing potential data collection and data processing methods prior to actual implementation is always a valuable exercise and one of the best ways to ensure that the chosen approach will be relatively efficient and productive in terms of yielding results which meet specific objectives.

This is particularly relevant in the case of monitoring subsistence fisheries in many Pacific Islands where numerous difficulties in data collection and processing capabilities often exist. These difficulties are underscored by the fact that the subsistence fishery is usually the most important sector of the island's total fishery. Some of the major obstacles in the monitoring of subsistence fisheries include the following :

- a. Large numbers of small fishing units which often operate over extensive fishing grounds.
- b. Very few (if any) central launching and landing sites in many areas.
- c. A wide variety of fishing methods associated with variable intensities of effort related to time, lunar phase, season, economic, sociological and other factors.
- d. Large multispecies catches.
- e. Widely scattered atolls, islands and villages with associated limitations in accessibility and communication.
- f. Under-funded government agencies charged with the responsibility of maintaining data collection.
- g. Inadequate numbers of trained people to collect and process data.
- h. Cultural barriers to obtaining data on fishing practices or to gaining access to fishermen or fishing grounds.

Overcoming obstacles such as these is not always impossible, and there are some reasonably simple ways to ensure that a workable fisheries data collection system can evolve. Aside from the early identification of major obstacles, the prioritization of clearly defined objectives, and the testing of data collection methods prior to actual programme implementation, it is worthwhile early on to develop a formal workplan. That is, all of the phases of data collection and data processing for each component of the system should be listed out in detail. Thought should be given to how much time will be required to accomplish each activity. Consideration should be given to even the most menial tasks such as copying enough blank survey forms, filling gas tanks, filing and other paperwork, etc. The better organised the system is at the beginning the easier it will be to make refinements to it later on.

Although the ultimate goal of a fisheries data collection system might be to provide complete coverage of all sectors of the total fishery, there is no reason it has to start out that way. The realistic goal should be to provide reliable coverage for each sector based on what is possible within budgetary and personnel constraints. In short, it is better to collect good statistics on a portion of the total fishery than it is to end up with a lot of bad data on all sectors. It is important to remember that the establishment of a workable fisheries statistics system is usually the result of an evolutionary process.

Other general constructive activities that should help the process along are mainly educational ones. Meetings with traditional leaders, village members, and fishermen themselves, will provide an opportunity to explain the nature of the data collection programme, and may help in refining it into a more efficient one. Developing a positive rapport with the fishing community can greatly facilitate data collection. Sharing the results of data collection with traditional as well as governmental leaders can positively influence the overall success of the programme.

Opportunities for receiving technical assistance and training in improving data collection do exist and should be requested whenever possible. Acquiring additional funding from external sources and even from within one's own government can still be accomplished given the right circumstances and some ingenuity. Experimenting with different innovative approaches to designing workable fisheries data collection systems can solve apparent problems and pay off with positive results. It should always be acknowledged that due to the dynamic nature of most fisheries, no matter what fisheries data collection system may be in use at any given time it should regularly be scrutinised and improved in response to the changing conditions which affect the fishery that is being monitored.

How are fisheries statistics used?

The uses to which fisheries statistics are often put generally fall within the realms of assessment, monitoring, and management. Within each of these areas there are numerous ways in which statistics are used. Assessment deals not only with direct scientific research on fish stocks, but also with the economic appraisal of fishing activities, employment possibilities in fisheries, and the calculation of certain revenues and fees associated with fishing. It also deals with determining the importance of fishing to the general population in terms of employment and nutritional potentials.

Within the realm of monitoring, fisheries statistics are most often used to identify changes in the status of fish stocks or in the successfulness of different fishing methods as they relate to levels of catch. They are also used to monitor changes in the economic values associated with fishing and the evolution of occupational involvement in fisheries, as well as revenues generated by fishing. Monitoring the socio-economic aspects of fishing also requires the use of fisheries statistics as in the cases of identifying changes in the occupational and nutritional importance of fishing and fishery products.

In fisheries management, statistics are useful in the regulation of fishing for conservation purposes, the development of new fishing techniques, economic planning in the development of fisheries infrastructures, and the establishment of license fee schedules associated with the regulation of fishing operations. The planning of new fisheries development projects based on realistic production potentials in conjunction with occupational and social considerations also involves the use of existing fisheries statistical databases. In many situations fisheries statistics are used to better understand fisheries resource utilisation patterns in order to identify priorities in attempting to balance the needs of subsistence fishing with those of commercial fisheries development.

The actual users of fisheries statistics encompass a wide range of individuals from different sectors of the community. Among the prominent users are government personnel at many levels such as internal and external affairs coordinators, resource managers, economic development administrators, planning statisticians, and public health officials. Research scientists and educators in both government and private sectors make extensive use of fisheries statistics in a multitude of ways. National and international agencies charged with the administration of grant funding and technical assistance programmes may also rely heavily at times on available fisheries statistics. Private consulting groups involved with a diverse array of projects and investigations are also important users of fisheries statistics. Development loan banks also often utilise fisheries statistics in funding new or existing fishing businesses.

Finally, it is the fishermen themselves that sometimes constitute one of the prime user groups of fisheries statistics. Although this seems very logical, it is certainly not always the case and if greater emphasis was put into developing this situation into a more widespread reality, the effects would likely benefit just about every other user segment as well. There do exist opportunities in this regard, but it will undoubtedly take a good deal of imagination and organisation from influential sources at all levels to bring this about even within localised areas.

Earlier today the area of stock assessment was covered, and later during the workshop the topic of resource survey techniques and fishery management will be addressed. In just a few minutes we will hear several presentations which deal primarily with the ways in which Pacific Island governments are attempting to collect and utilise fishery statistics for monitoring purposes. In doing so, these governments are mainly seeking to acquire a statistical time series of information on the various scientific, economic and socio-economic facets of their fisheries. Ultimately, this information combined with relevant stock assessment information may be particularly useful in guiding planners, managers and fishermen themselves in developing their fisheries toward optimum levels as they are interpreted in each case.

SUGGESTED DISCUSSION TOPICS

1. Should governments be willing to make the long-term committment in terms of funding and personnel resources required to sustain fishery data collection programmes or should they depend on external sources for this?
2. What possibilities exist within government structures for improving inshore fishery data collection, particularly with regard to funding?
3. Should the users of inshore fishery resources share the responsibility for data collection and management and what possibilities exist for this?
4. What cultural and sociological barriers to inshore fishery data collection exist and how could they possibly be reduced?