REGIONAL COOPERATION
FOR FISHERY STATISTICS PROGRAM
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1.   INTRODUCTION

Fishery statistics have been successfully used to highlight increasing fishery production and contribution of fisheries to national economy. Importantly, it is widely recognized that fishery statistics is an essential input to do formulation of the sector management policies and plans. In recent years, the need for timely and reliable data for the sector management has been highlighted, as the necessity to manage fishery resources intensifies due to increasing competition/conflict among many sectors for access to resource bases, i.e., land and water, and intense exploitation and declining abundance of natural fish stock. Meanwhile, there is also a growing awareness that the statistics are not adequately utilized, particularly for sustainable fishery production, conservation of living aquatic resources and improvement of livelihood fishing and fishfarming communities. For example, the need to facilitate and promote utilization of fishery information and statistics through regional cooperation and collaboration were advocated at the 1994 Regional Workshop on Fishery Information Statistics in Asia (FAO/SEAFDEC/SIFR, 1994). A recent study reported that development and management of aquaculture sector in fourteen Asian countries are seriously affected by ineffective utilization of data and information, and lack of usable data and information for management (FAO/NACA, 1997).

Recognizing the need to strengthen regional capacity to compile and utilize fishery statistics for the sector management and development, ensuring sustainable exploitation of fish stocks, particularly migratory and straddling fish stocks, and development of the fishery industries, at its 25th Session held in 1996, the Asia-Pacific Fishery Commission (APFIC) identified collection, dissemination and exchange of fishery information and statistics as among the priority actions of the Commission (APFIC, 1996).

2.   FUNCTIONS OF REGIONAL FISHERY STATISTICS PROGRAM

Fishery statistics are generally collected and compiled into national and regional yearbooks to demonstrate changes in fishery production from the previous year, or over a given period of time. Annual fishery statistics generally refer to catch statistics, but in recent years it also includes aquaculture and fishery socio-economic data. Fishery census was carried out in several countries in the region, e.g., marine fishery census in Thailand in 1995 and in Sri Lanka in 1995/6 which provide more detailed information on fishing and fishfarming populations.

The integral nature of fishery data and information program in the sector management can be illustrated by the following working definition of fishery management, used in the FAO Technical Guidelines for Responsible Fisheries (FAO, 1997):

"Fishery management is the integrated process of information gathering, analysis, planning, consultation, decision-making, allocation of resources and formulation and implementation, with enforcement as necessary, of regulations or rules which govern fisheries activities in order to ensure the continued productivity of the resources and accomplishment of other fisheries objectives."

This working definition also indicates that collection and compilation of fishery statistics are not an end in itself. Fishery statistics must be analyzed and applied to the management of fishery resources and accomplishment of objectives of the sector.

The SEAFDEC Fishery Statistical Bulletin for the South China Sea Area aims at providing reliable and comparable fishery statistics with standardized definition and classifications to facilitate the exchange of information for the management of fishery resources and planning of various fishery development programs for countries bordering the South China Sea (SEAFDEC, 1997). Thus, the basic function of regional fishery statistics program can be defined as "to facilitate cooperation and coordination in compilation, processing, analysis, packaging and utilization of fishery statistics for development and management fisheries resources and sector in the region" (Figure 1).

To carry out its functions, the regional program undertakes tasks designed to address issues and needs common among participating national programs, while facilitating regional cooperation in compilation and application of fishery statistics. Accordingly, the regional program concentrates mainly on such activities as:

a) assessment of regional needs and data requirement;

b) development of common and compatible data handling methodologies and tools, including standard definitions, classifications and codes;

c) exchange and sharing of data, resources and skills;

d) establishment and strengthening of data exchange networks and linkages among responsible agencies/bodies;

e) analysis and synthesis of data and information for management of aquatic resources that are exploited by more than one country; and

f) regional capacity building through training activities.

Traditionally, it was assumed that a central database is essential to a regional fishery statistics program, equating a central regional database to a regional program. However, with the development of information and communication technologies, functional decentralization, and efficient and effective coordination and cooperation, are essential to the effective regional program. The main role of a regional program is to facilitate and promote collaboration and coordination of activities aimed to accomplish the objectives of the program. A regional program for fishery statistics, therefore, can consist of several closely linked components that serve the needs of target users in the subsectors (Figure 2).

3.   ISSUES AND CONSTRAINTS IN THE COMPILATION AND UTILIZATION OF FISHERY STATISTICS

Regional and international organizations, particularly FAO and SEAFDEC in collaboration with other organizations, have been active in facilitating the compilation and utilization of fishery statistics and information in the region. However, there is increasing concerns about timeliness, reliability and compatibility/comparability of data and data gaps.

For example, the papers presented at the 1994 Regional Workshop on Fishery Information and Statistics in Asia (FAO/SEAFDEC/SIFR, 1994), pointed out that usefulness of fishery statistics has diminished due to time-lag (i.e., delay in compilation), data gaps, unavailability of comparable and reliable data. The main difficulties and constraints in regional exchange and utilization of fishery statistics highlighted at the 1994 Workshop are:

a) Delays in compiling fishery statistics, mainly due to delay caused by the national programs;
b) Incomplete and incorrect or unreliable data;
c) Inconsistencies in national data sets as typified by the changes in the manner in which catches were categorized by species and by gear;
d) Non-correction for nominal catch, non-calendar year reporting time frames and non-localization of catches and non-reporting;
e) Need to review the classification of type of fishing gear and of species in view of the changes in the fishing methods or catch fish resources as previously designated;
f) Incompatibility of data; and
g) Burden imposed on national programs, e.g., national programs often have to re-process data to cater requirements of international or regional agencies.

At the national level, many national programs reported lack of skilled personnel to collect and compile fishery statistics; poor systems of data collection, validation and maintenance; and the need to computerize fishery statistical system. National fishery programs are concerned primarily with publication of fishery statistical yearbook, which are often two or three years old by the time they are published. The manual systems do not facilitate timely accessibility, availability, analysis and synthesis of data.

Furthermore, many of key issues and constraints in availability and accessibility of fishery data and information in the region noted in an APFIC study (APFIC Secretariat, 1996) apply to fishery statistics program. Issues particularly relevant to fishery statistics programs raised included:

a) Lack of political will and commitment;
b) Poor understanding of requirements of users;
c) Poor accessibility;
d) Lack of relevant and usable information;
e) Lacked of skilled manpower;
f) Insufficient channeling of data and information to target user groups; and
g) Inadequate resources and sustainability

Fishery information and statistics programs in the region tend to be preoccupied with "collection" and "organization" of data and information, and keeping up with rapidly advancing information technologies. Little attention and resources have been devoted to improving understanding of user needs and/or improving utility of data and information collected (APFIC, 1996). The constraints noted above underscore the need for the fishery statistics programs to give more attention to the needs of their target user groups, particularly the sector management, and compile, analyze and package statistics in a form that users can readily use; and improve accessibility and availability of data, including efficient flow of data and information among related agencies at all levels.

Naturally, all actions required to alleviate difficulties confronting the fishery statistics programs are indicated in Table 1. Formulation and implementation of remedial actions is basically a national effort through coordination, organization and implementation of activities that address common concerns of national programs, while promoting availability of comparable data in the region. Regional collaboration and cooperation would help not only to share expertise and resources, but also to stimulate regional commitment and political will.

The remedial actions listed above suggest that regional responses are particularly desirable in the areas of:

a)   identification of user needs and determination of minimum data requirements;
b)   establishment and adoption of standardized or compatible data compilation methodologies and tools;
c)   strengthening coordination and linkage mechanisms;
d)   analysis of data and production of information packages for regional fishery management, and
e)   skill development.

4.   STRENGTHENING REGIONAL COMPILATION AND UTILIZATION OF FISHERY STATISTICS

It has been shown that the basic functions of fishery statistics programs are to provide data and information services for the sector management. Thus, regional cooperation in fishery statistics programs must begin with identification of the sector management needs and determination of data requirements to address the needs identified.

The issues and constraints noted above include:

a)   critical factors affecting exchange and utilization of fishery statistics in national capacities to systematically compile data;
b)   establishment and application of common and compatible data handling methodologies and tools; and
c)   analysis and utilization of data in the context of fishery management needs. Obviously, fundamental to effective and efficient utilization of fishery statistics is the willingness and ability of national programs to address issues relating to:

   • Methodological and operational principles in compilation, processing, analysis and utilization of fishery data;
   • Tools for compilation and processing basic or core fishery data/statistics; and
   • Availability of critical mass of skilled personnel at various functional levels, from data collection, processing and integration, analysis and synthesis, and dissemination.

The region has made considerable progresses in developing and establishing common data handling methodologies and tools. The existing regional standards include standard definitions and classifications of fish species, fishing gears and fish products used for compilation of statistics for South China Sea Areas and FAO.

A computer software designed to record artisanal fishery statistics, i.e., ARTFISH/ARTSER, also exist. This software has been successfully tested and implemented in Cambodia. Given the complex processes and resources required in improving the fishery statistics programs, the region needs to adopt a modular approach based on common priority management needs. In view of the urgency to take measures for management and conservation of fishery resources, the region could begin with strengthening statistics to support regional fisheries management framework recommended by APFIC/COMAF.

Many of the required data are already being collected, but reliability, comparability and completeness need to be improved, and some additional data, particularly in the area of fishery efforts, may need to be compiled. While it is necessary for the national programs to determine and agree on minimum data requirements and compilation methodologies, including standard definitions, classifications and units, and implement the agreement, regional coordination and cooperation would help to ensure benefits of shared expertise and resources, and availability of compatibility and comparability of the data (Table 2).

Additionally, a regional action could be taken to develop a software for the compilation and processing of aquaculture statistics. In spite of the fact that eight of ten major aquaculture producing countries are in Asia, the sector lacks common tools that facilitate compilation of reliable and compatible aquaculture statistics. The sector also needs to redefine/clarify the existing definitions and some of the classifications taking into account data requirements for management. Again, actions at the national and regional levels, are needed to expedite progress for the benefit of the region.

There is also a pressing need to streamline the processes of data compilation and processing at all levels, taking advantage of common or established methodologies and information technologies. In effect, this initiative augments the two initiatives noted above. It would be useful to identify applicable methodologies and tools (e.g., ARTFISH/ARTSER) in the context of the sector management needs and explore ways to facilitate systematic application of common methodologies and tools, particularly strengthening data compilation and processing capacity at data collection level. Capacity building and adoption/application of established methodologies and tools at primary data collection level help to improve minimize re-handling data, e.g., re-inputting/recording and re-processing, reduce error rate, improve consistency, make data easily available to local fishery managers, and facilitate data exchange/linkages among agencies responsible for fishery statistics at all levels. More importantly, this leads to electronic access to databases and allow the sector management to benefit from timely data and information services. The region has several established regional mechanisms such as SEAFDEC and APFIC/FAO, that facilitate and provide leadership in fishery statistics programs.

These organizations, in collaboration with other relevant bodies such as AIT, INFOFISH, MRC and NACA, can effectively facilitate regional consultation and cooperation, and play an active role in formulating and implementing regional actions.

5.   CONCLUSION

A number of previous regional fora and studies recognized that:

a)   reliable, relevant and timely data and information are essential inputs to the formulation of policies and action plans for environmentally sound and socially responsible fisheries, and

b)   regional collaboration on fishery information and statistics must be strengthened to support the sector management.

Although attempts were made to establish an information network among Southeast Asian countries, the region is without effective and efficient fishery information and statistics program(s) to support management of the sector. The pressing need to ensure availability and accessibility of reliable and timely statistics for formulation of fishery policies and management plans and actions has been pointed out repeatedly. Formulation and implementation of appropriate responses based on the nature of fisheries and specific needs, are basically national responsibilities.

Nonetheless, regional cooperation and collaboration ensure benefits of shared expertise and resources, and availability of comparable data for management and development of regional fisheries resources and industries. Hence, opportunities for regional cooperation are presented in this paper in order to facilitate the Workshop discussion and formulation of action plan.

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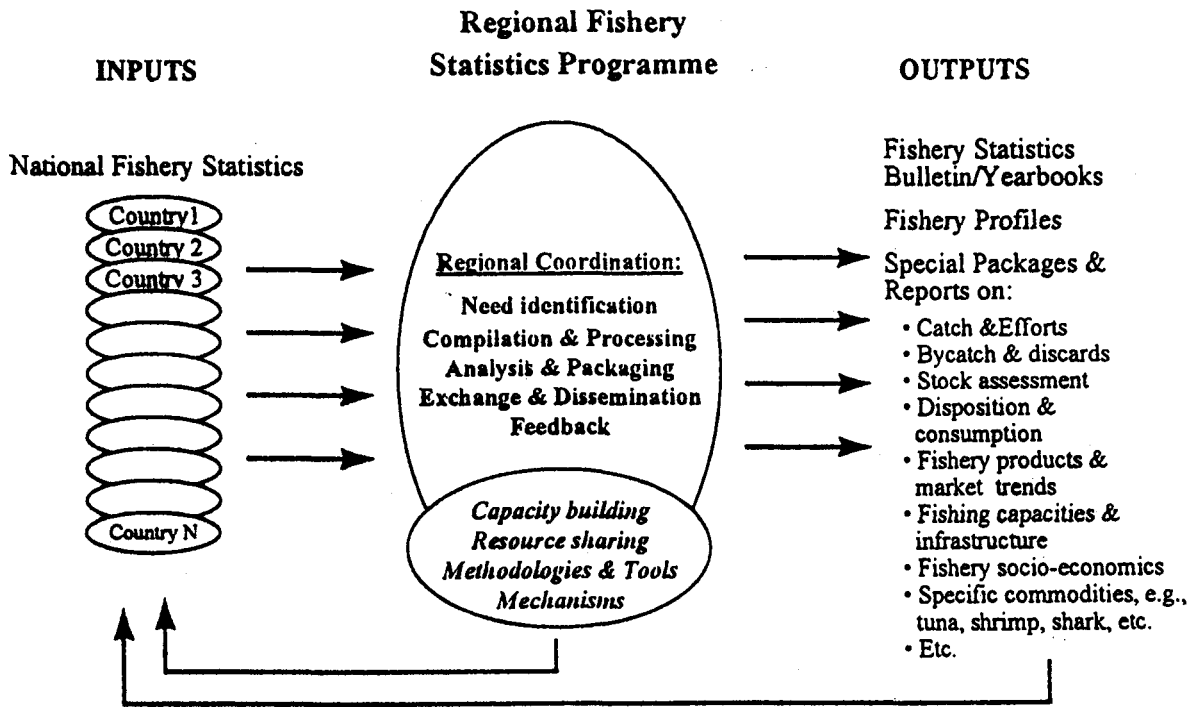
INPUTS

Regional Fishery Statistics Programme

**OUTPUTS**

National Fishery Statistics

Country 1
Country 2
Country 3

Country N

Regional Coordination:

Need identification
Compilation & Processing
Analysis & Packaging
Exchange & Dissemination
Feedback

*Capacity building
Resource sharing
Methodologies & Tools
Mechanisms*

Fishery Statistics
Bulletin/Yearbooks

Fishery Profiles

Special Packages &
Reports on:

• Catch &Efforts
• Bycatch & discards
• Stock assessment
• Disposition &
  consumption
• Fishery products &
  market trends
• Fishing capacities &
  infrastructure
• Fishery socio-economics
• Specific commodities, e.g.,
  tuna, shrimp, shark, etc.
• Etc.

Figure 1.   Functions of Regional Fishery Statistics Programme

Capture Fisheries

Aquaculture

**Regional Fishery Statistics
Programme**

Tuna

Fishery Socio-Economics

Fish Products & Trade
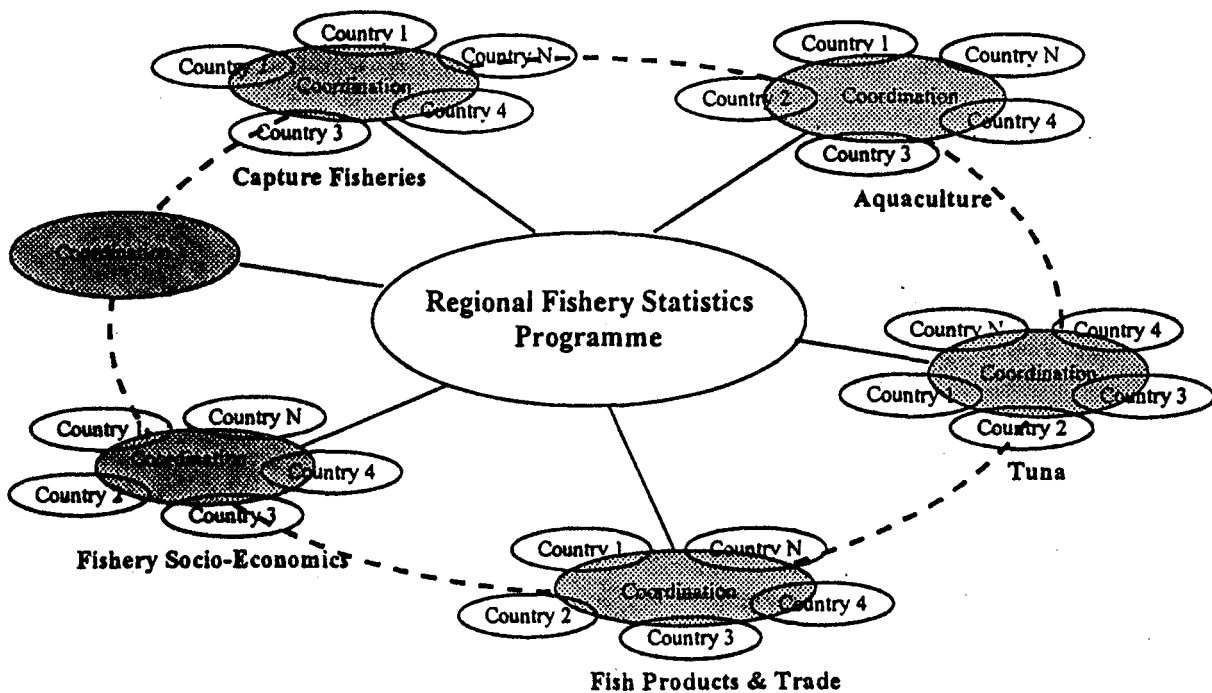
Figure 2.   Components of Regional Fishery Statistics Programme

- 304 -

Table 1. Issues and constraints in fishery statistics programs

Issues and Constraints	Illustrative Remedial Actions
• Delays in compiling and submitting fishery statistics • Burden on national programs, e.g., data have to be re-input or re-process data in order to meet requirements of international or regional bodies	• Determine the data needs and minimum data requirements • Streamline the processes • Establish and adopt standardized/compatible data collection and compilation methodologies and tools • Strengthen coordination and collaboration mechanisms • Skill development
• Incomplete and incorrect or unreliable data • Non-correction for nominal catch, non-calendar year reporting time frames and non-localization of catches, and non-reporting • Inconsistencies in national data sets as typified by the changes in the manner in which catches were categorized by species and by gear	• Establish and adopt standardized/compatible data collection and compilation methodologies and tools • Skill development • Improve and/or strengthen system of data collection and verification
• Need to review the classification of type of fishing gear and of species in view of the changes in the fishing methods or catch fish resources as previously designated	• Determine data needs and minimum data requirements • Periodic review, ensuring data collected meet needs of target users
• Incompatibility of data	• Determine data needs and minimum data requirements • Establish and adopt standardized/compatible data collection and compilation methodologies and tools
• Poor accessibility	• Strengthen functional linkage, and data & information flow • Improve data and information dissemination and exchange mechanisms • Improve capacities for information management and service
• Poor understanding of user needs	• Improve understanding of user needs • Establish/strengthen feedback mechanisms
• Lack of relevant and usable information	• Improve understanding of user needs & determine minimum data requirements • Improve timeliness, reliability, accuracy, compatibility, relevancy and completeness of data (see above other related actions necessary to achieve this) • Improve analysis and packaging
• Lack of skilled manpower	• Develop and make available critical mass of skilled manpower at functional level
• Insufficient channeling of information to target user groups	• Improve understanding of user needs • Improve data & information dissemination and exchange mechanisms • Analyze and package data & information according to user needs • Improve dissemination and delivery methods
• Lack of political will and commitment • Inadequate resources and sustainability	• Increase awareness that timely and reliable data and information are essential input to management • Strengthen leadership and need-oriented fishery statistical programme • Mobilize commitment and will

Table 2. Opportunities for regional cooperation

Opportunities	Key Indicative Actions	Responsible Body
• Statistics for fishery management framework recommended by APFIC/COMAF	• Determination of needs and minimum data requirements • Establishment of common methodologies • Preparation & distribution of manual • Training of (national) trainers • Training of national personnel • Implementation, i.e., data compilation & exchange • Analysis and packaging of data/statistics in the context of user needs	• NP; RP-coordination • NP; RP-coordination • RP • RP • NP; RP-tech. backup • NP • NP; RP
• Software for aquaculture statistics	• Determination of needs and minimum data requirements • Establishment of common methodologies • Development of software & testing • Development & distribution of user guide/manual • Training of (national) trainers • Training of national personnel • Implementation, i.e. data compilation & exchange • Analysis and packaging of data/statistics in the context of user needs	• NP; RP-coordination • NP; RP-coordination • RP • RP • RP • NP; RP-tech. backup • NP • NP; RP
• Adoption of common methodologies and tools	• Determination of needs and minimum data requirements • Identification of appropriate tools and methodologies • Development & distribution of user guide/manual, if required • Training of (national) trainers • Training of national personnel • Adoption & utilization of methodologies and tools • Analysis and packaging of data/statistics in the context of user needs	• NP; RP-coordination • NP; RP-coordination • RP • RP • NP; RP-tech. backup • NP • NP; RP

Note: NP-National Programmes; RP-Regional Programme; tech. - technical