Improvement of Fishery Data and Information Collection Systems in Southeast Asia

Proceedings of the FAO/SEAFDEC Regional Workshop on the Improvement of Fishery Data and Information Collection Systems

Bali, Indonesia, 15 to 18 February 2005

Volume 1: Report of the Workshop

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FISHCODE – STF PROJECT FOR IMPROVING INFORMATION ON STATUS AND TRENDS OF CAPTURE FISHERIES

SOUTHEAST ASIA FISHERIES DEVELOPMENT CENTER

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Bangkok, 2005

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SUMMARY

Improvement of Fishery Data and Information Collection Systems in Southeast Asia: the Proceedings of the FAO/SEAFDEC Regional Workshop on the Improvement of Fishery Data and Information Collection Systems was prepared based on the outcomes from the Regional Workshop on the Improvement of Fishery Data and Information Collection Systems, collaboratively organized by FAO FishCode-STF Project and SEAFDEC, in Bali, Indonesia, from 15 to 18 February 2005. The Proceedings are published in two volumes: Volume 1: Report of the Workshop, and Volume 2: Regional Synthesis and Country Papers.

Distribution:

Participants of the Workshop
FAO Fisheries Department
SEAFDEC Member Countries
Relevant international/regional fishery organizations

VOLUME 1: REPORT OF THE WORKSHOP

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ABBREVIATIONS

ASEAN	Association of Southeast Asian Nations
CCRF	Code of Conduct for Responsible Fisheries
COFI	Committee on Fisheries
CPUE	Catch per Unit of Effort
CWP	Coordinating Working Party on Fishery Statistics
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
JICA	Japan International Cooperation Agency
MEY	Maximum Economic Yield
MSY	Maximum Sustainable Yield
SEAFDEC	Southeast Asian Fisheries Development Center
SSB	Spawning Stock Biomass
Strategy-STF	Strategy for Improving Information on Status and Trends of Capture Fisheries
VMS	Vessel Monitoring System

EXECUTIVE SUMMARY

The FAO/SEAFDEC Regional Workshop on the Improvement of Fishery Data and Information Collection Systems was held in Bali, Indonesia from 15 to18 February 2005. It was attended by senior fishery officers (decision makers who use information) and technical officers (who provide information) from Southeast Asian countries in order to increase the use of fishery statistics for sound policy-development, better decision-making and responsible fisheries management through improving the quality of fishery information.

Prior to the workshop, a set of questionnaires were distributed to participating countries to describe their national fishery data and information systems in a complete and comparable manner, which were subsequently analyzed and synthesized to identify critical shortcomings and weaknesses of the systems.

Based on the results of regional synthesis, the workshop dealt with a variety of issues concerning to fishery statistics in the region, which includes 1) identification of information requirements for selected policy objectives, 2) consideration of immediate follow-up actions (e.g. needs for capacity development) and the way to address new requirements of fishery data and information, 3) adoption of regional guidelines on fishery statistics, 4) identification of minimum requirements for regional compilation of fishery statistics (framework for the new fishery statistical bulletin of the SEAFDEC), 5) streamlined mechanism for reporting of fishery statistics to FAO and SEAFDEC.

It was reported that existing fishery data and information collection systems in the region reflected traditional monitoring systems, focusing more on total catch and value. To support development and implementation of sound policies and sustainable management, more appropriate indicators are required. It was also confirmed by the regional synthesis that small-scale fisheries were not being given due attention and not well monitored. It is necessary to actively develop and implement multi-sectoral approaches, including socio-economics and livelihood aspects, for data collection and analysis of small scale fisheries.

It was suggested that useful information for fisheries management purposes are often available from non-fishery institutions; however, the possibility of using such fishery-independent information has not been fully exploited. The workshop recommended some measures to promote/improve the use of existing fishery-independent information.

The regional analysis indicated that, in the Southeast Asian region, some countries have advanced monitoring systems while others are just starting to develop their systems. It is therefore recommended to make use of the regional expertise for capacity building.

In the process of developing the minimum requirement and framework of fishery statistical bulletin for the Southeast Asian (SEA) region, needs of the follow-up actions were clearly identified. These include;

- SEA countries to confirm their respective sub-areas reflecting appropriate eco-systems and management requirements.
- SEA countries to review classifications of species for marine and freshwater capture fisheries and aquaculture; fishing gear (including national/local name); fishing boats; water bodies; types of aquaculture; and types of processing
- In case of countries that use horsepower for classification of fishing boats, a study to develop conversion ratio from horsepower to gross tonnage should be conducted.

- SEAFDEC Secretariat to seek formal confirmation from Indonesia, Malaysia and Vietnam on the proposed adjustment of the demarcation lines between Area 71 and 57 for the Malaysian water in the Malacca Strait and between Area 71 and 61 for the Tonkin Gulf
- SEAFDEC Secretariat to consult with the Coordinating Working Party of Fishery Statistics (CWP) on the proposed adjustment

The Workshop confirmed that regional guidelines on fishery statistics was an useful instrument and could be used as a basis to formulate future follow-up activities in implementation of the Code of Conduct for Responsible Fisheries and in improving fishery information and statistics in the region.

As a basis for formulation of future regional collaborative program on fishery statistics, the Workshop identified the following priority areas:

- Development of minimum requirement and standard definitions and classifications for fishery statistics in Southeast Asia
- Development of the Southeast Asian Status of Fisheries and Aquaculture (SEASOFIA)
- Promotion of timely preparation of fishery statistics through the Application of Database and Information Technology (in the design, development and testing of software, documentation, and training of concerned personnel)
- Human resources development on data collection, processing, analysis, interpretation and reporting
- Strategic planning/system review of fisheries and aquaculture statistics
- Development of statistical system for small-scale coastal fisheries, inland fisheries and aquaculture

1 BACKGROUND

Knowledge of the status and trends of capture fisheries, including socio-economic aspects, is a key to sound policy-development, better decision-making and responsible fisheries management. It is necessary at the national level for the maintenance of the food security and for describing social and economic benefits of fisheries. Such information is also essential for assessing the validity of fisheries policy and for tracking the performance of fisheries management. With increasing number of countries taking up a scheme of decentralized management of fisheries, more accurate and timely information should reach at community level and result in a better-informed public that supports efforts to manage fisheries and aquatic resources in a responsible manner.

The collection and analysis of fishery data and information is a costly and timely exercise. To be relevant and cost-effective, fishery data and information collection systems must have a clear set of objectives and appropriate strategies to collect data, which should be based on priorities and requirements of data users. However, chronic problems of insufficient human and financial resources allocated for data collection often resulted in poor quality of information that further led to non- or limited use of statistics for fishery management and policy development. Consequently only dwindling support was given to systematic improvement of national fishery data and information collection systems. There is an urgent need to terminate this vicious cycle of problems.

Concerned with those persistent deficiencies of fisheries data and information collection systems worldwide, FAO has introduced the "Strategy for improving information on status and trends of capture fisheries" (Strategy–STF)[1] in order to provide a practical framework for the improvement of knowledge and understanding of fishery status and trends. It is a document that provides guiding principles for implementation arrangements, and sets forth objectives, policies, programmes, actions and decisions that define who will do what and why.

As one of major instruments to implement the Strategy- STF, FAO formulated a project for improving information on status and trends of fisheries (FishCode STF Project) under the umbrella of the FishCode Programme "*Assistance to developing Countries for the Implementation of the Code of Conduct for responsible Fisheries*". The project is aimed at addressing the improvement of collection, processing and use of data and information on the status and trends of capture fisheries.

Southeast Asian Fisheries Development Center (SEAFDEC) plays a prominent role in fishery statistics in the Southeast Asian region and has been assembling regional fishery data and information for decades. The ASEAN-SEAFDEC conference on sustainable fisheries for food security in the new millennium "*Fish for the people*" held in 2001 reaffirmed the importance of fishery statistics and information. In response to such needs, SEAFDEC has committed itself to strengthen national fishery statistical systems, maximize their use for fisheries planning and management, and develop standard definitions and classifications to facilitate regional fishery statistics and information exchanges. It is currently implementing four fishery statistics and information related projects in the region[2].

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1 FAO, 2002. Report of the technical consultation on improving information on the status and trends of capture fisheries. Rome, 25-28 March 2002. FAO Fisheries Report No. 680. Rome, FAO. 75p.

2 These are the projects on "*Improvement of Fishery Statistical Systems and Mechanisms*" (Project SDI-2), "*Information Gathering for Capture Inland Fisheries in ASEAN Countries*" (Project SDI-6), "*Identification of Indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region*" (Project SDI-5), and "*Information Collection on Sustainable Pelagic Fisheries in the South China Sea*".

Development or improvement of any fishery data and information collection system requires a logically structured approach as recommended by technical documents of both FAO[3] and SEAFDEC[4]. The structured approach includes a sequential pathway, starting from the understanding on "Why data are needed?" through the clarification of data requirements (What data need to be collected?), and the consideration of "How data will be collected?". The results of this practice can be compared with the existing fishery data and information collection system in order to identify gaps in monitoring and, crucially, to assess the validity of the system. Clear description of existing fishery data and information collection systems, if available, will certainly help this process.

In general, Southeast Asian countries share a number of common features in their environment, ecosystems, aquatic resources, sector structures and socio-cultural aspects of fishing communities. Many fisheries in the region are typically characterized as multi-species/multi-gear tropical fisheries, in which large number of small-scale operations predominated. Monsoon climates bring rich freshwater resources and people naturally rely on easily accessible aquatic resources that forms an integral part of wet-rice production based culture. Several large rivers run across the region and create seasonal inundation, where cross-boundary ecosystems have been established including migratory aquatic species. The geographically dispersed archipelago is another marked characteristic of some countries, which illustrates the diversity and spatial dispersion of fishing communities and activities in the region. In terms of fishery data and information collection, these are also areas that pose serious challenges to national fishery line agencies. The complexity and diversification of fisheries activities are often simply beyond the capabilities of the national agencies to deal with.

It is, therefore, required for the countries in the region to join hands to improve the quality of national fishery data and information systems in a collaborative manner. Each should have something to offer to, and benefit from, the others.

2 OBJECTIVES OF THE WORKSHOP

In order to address the issues mentioned above, the FAO/SEAFDEC Regional Workshop on the Improvement of Fishery Data and Information Collection Systems was held with the overall objective of increasing the use of fishery statistics for sound policy-development, better decision-making and responsible fisheries management through improving the quality of fishery information. National fishery data and information collection systems are a primary vehicle to produce fishery information and therefore should be capable of providing reliable and relevant information to the users in a timely manner.

The workshop was tasked with the following immediate objectives:

- To discuss the future usage of fishery statistics and the way to improve the quality of fishery data and information in the Southeast Asian region based on the national review of fishery data and information collection systems and regional synthetic analysis;
- To exchange national knowledge and experiences in designing and developing fishery data and information collection systems among participating countries;

[3] Guidelines for the Routine Collection of Capture Fishery Data, FAO Fisheries Technical Paper 382, Rome 1999.

[4] Handbook on Collecting Fishery Statistics for Inland and Coastal Fisheries, SEC/SP/60, 2004.

- To identify shortcomings and weaknesses of fishery data and information collection systems as well as identifying the needs for capacity development in fishery data collection;
- To finalize the scope and framework of the new Regional Fishery Statistical Bulletin for the Southeast Asian Region that will be published annually by SEAFDEC; and
- To discuss on streamlining process of the reporting of fishery statistics by the Member Countries to both FAO and SEAFDEC through the development of the simplified and regionalized reporting mechanism.

3 PARTICIPATION

The workshop was attended by senior fishery officers who were in charge of decision making in fisheries management and technical officers who were responsible for fishery data and information collection duties. The workshop was designed to provide a valuable opportunity to facilitating dialogue between information users (decision makers) and information providers (technical officers). Such dialogue is important in terms of building awareness among decisions makers on quality issues of fishery data and information, and on the other hand, assisting information providers to better understand information requirements as well as how raw data should be interpreted into meaningful "information".

The list of participants appears as **Annex A**, workshop agenda as **Annex B** and the list of documents placed before the Workshop as **Annex C**.

4 MECHANISM OF THE WORKSHOP AND FORMAT OF THE REPORT

Prior to the workshop, each participating country was requested to fill up the questionnaires on the national fishery data and information collection systems, which were then analysed and synthesised as background for workshop discussion. The workshop was composed of plenary and smaller working group discussions aimed at effective exchange of views and ideas among decision makers and technical officers towards achieving the objectives of the workshop.

The background paper on regional synthesis of fishery data and information collection systems in the Southeast Asian region and country reviews were compiled separately as **Volume II** of the workshop report.

5 OPENING OF THE WORKSHOP

Dr. Subhat Nurhakim, Director of Research Center of Capture Fisheries, Agency for Marine Fisheries Research. Ministry of Marine Affairs and Fisheries, Indonesia addressed welcoming remark to participants. In his remark, Dr. Subhat expressed the gratitude to FAO and SEAFDEC for supporting the organization of the workshop (**Annex D)**. It was followed by the remark by Mr. Niwes Ruangpanit, Secretary-General of SEAFDEC (**Annex E**) and a keynote presentation entitled "The need for better information on status and trends of fisheries" by Dr. Richard Grainger, Chief, Fisheries Information and Data Unit, Fisheries Department, FAO. Dr. Grainger stressed the importance of quality information in describing the benefits of fisheries as well as in addressing management of fisheries.

Mr. Freddy Numberi, Minister of Marine Affairs and Fisheries opened the Workshop. Mr. Numberi emphasized that generation of improved information is not the end itself but the information should be accessible to all stakeholders in timely manner. The information will serve as the eyes of decision-makers (**Annex F)**.

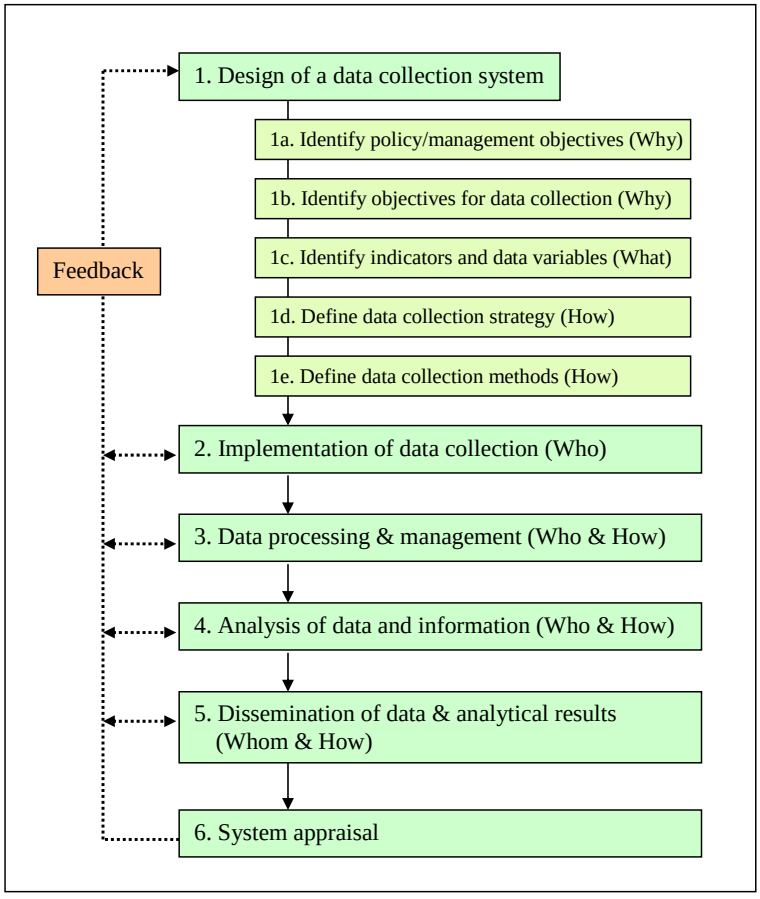
6 INFORMATION REQUIREMENTS FOR SOUND POLICY-DEVELOPMENT, BETTER DECISION-MAKING AND RESPONSIBLE FISHERIES MANAGEMENT

Formulation of fishery policies and management plans need to be based upon analyses of reliable data that can only be obtained through:

1. Proper design of data and information collection;
2. Proper field implementation of data and information collection;
3. Proper processing of the data collected in the field;
4. Proper analyses of the data and;
5. Proper dissemination of the information generated to target information users in particular the policy makers

In other words, fishery data collection can be considered as ***"A chain of events and flow of information"***. This implies that a flaw with a component of the process or a broken link/error in the chain will result in errors and unreliable estimates of the indicators. This characteristic of fishery data collection has to be considered in any analysis of national fishery data and information collection systems.

The chain of events in design and implementation of fishery data and information collection systems is described in a number of FAO publications such as "*Guidelines for the routine collection of capture fishery data*"(FAO Fisheries Technical Paper 382), describe the sequential pathway of designing and implementing a fishery data and information collection system, starting from the understanding of **WHY** data are needed, through the clarification of data requirements (**WHAT** data need to be collected), and the consideration of **HOW** data should be collected.



During the work on the regional analysis of data collection systems it was realised that not all regional

partners were familiar with this chain of events or with the existing guidelines. In order to familiarise with this "logical thinking process", small group discussions/exercises were taken place which include the following components:

- Practice of designing a data collection system[5] taking into account the logical development of the process: WHY--WHAT--HOW--WHO
- Identification of information requirements for different policy objectives. A typical set of objectives were pre-selected for this purpose such as
  - Sustainable use of marine resources
  - Maintain food security
  - Increase export earnings from fisheries
  - Improve the livelihood of coastal communities
- Selection of indicators, determination of strategies, selection of methods and consideration of implementation arrangements (see **Figure 1**):

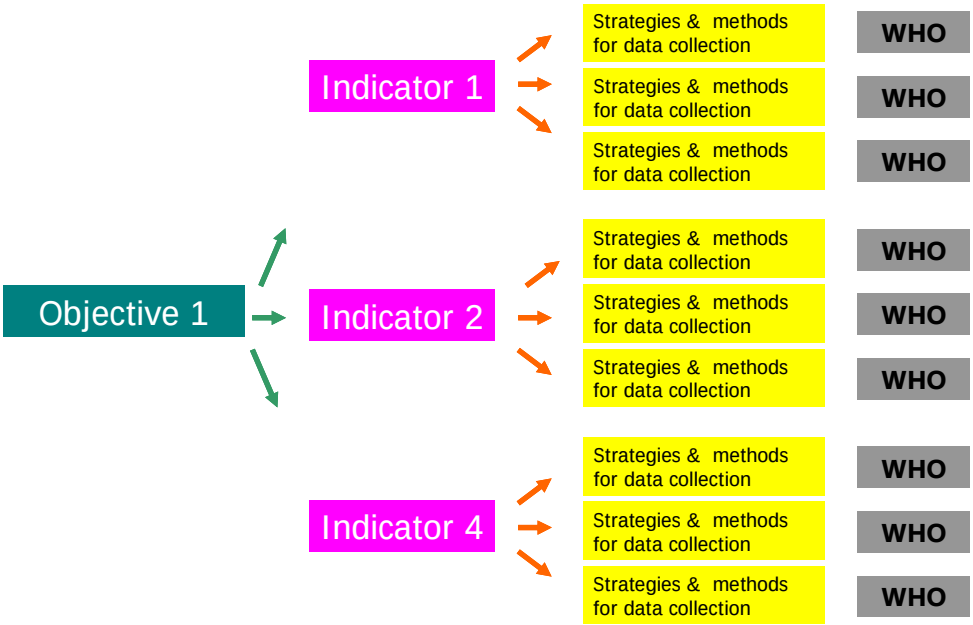


Figure 1: Why, What, How and Who

All groups finalised the design of a data collection system for the objective "Sustainable use of marine resources". The indicators and strategies/methods selected by the three groups are summarised and presented in **Annex G** and **H**.

[5] The data collection system was designed for the fictive country "Pais Pesca"

7 FUTURE DIRECTION, CONSIDERATIONS AND IMMEDIATE FOLLOW-UP ACTIONS INCLUDING CLARIFICATION OF INFORMATION NEEDS, AREAS OF IMPROVEMENT AND THE WAY TO PROMOTE THE NEW REQUIREMENTS OF THE DATA AND INFORMATION

In order to prioritize actions in the region and to identify gaps a list of indicators (**Table 1**) was screened on importance and practicality by the participants of the different countries.

Table 1: Indicators for sustainable use of resources and livelihood of small scale fishers

Country:			
Fishery Sector:			
Data items	Score importance	Score Practicability	Are you using it
	1-2-3-4	1-2-3-4	Yes /No
SUSTAINABLE USE OF RESOURCES			
Biomass (Standing stock)			
CPUE			
Recruitment / Spawning Stock Biomass			
Max Length			
Length at 1st maturity			
Species composition			
Length/Age structure in Catch			
By catch / discards			
MSY			
MEY			
Total catch			
Number of vessels			
Number of gears			
LIVELIHOOD OF SMALL SCALE FISHERS			
Distribution of fishing income			
Total income			
Distribution of fish consumption			
Employment			
Access right to fishing			
Social status			
Sharing mechanism of catch			
Seasonal dependency patterns			
Credit			
Total catch			
Fish price			
No of fishers/effort			
CPUE			
Access to education			

The total score[6] for indicators related to the sustainable use of resources and for improving the livelihood of fishers is presented in Figure 2 and Figure 3.

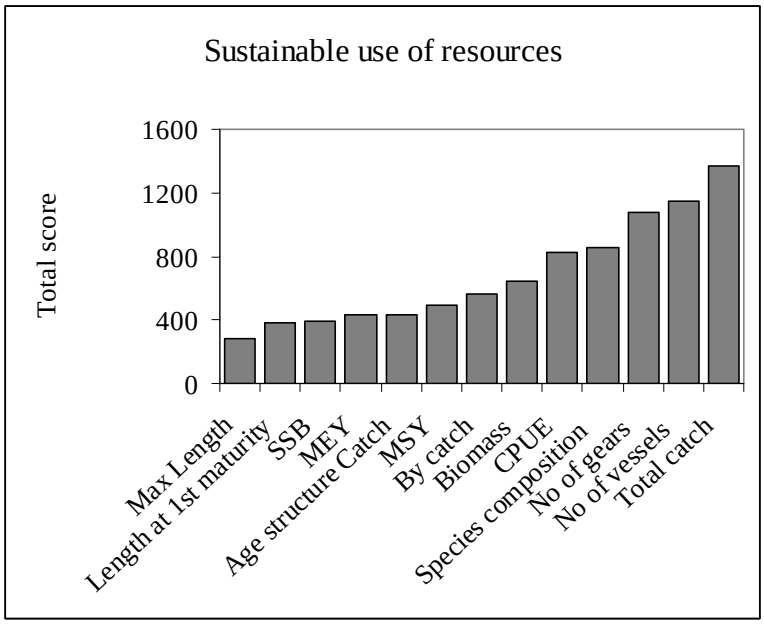


Figure 2: Total score for indicators related to sustainable use of resources

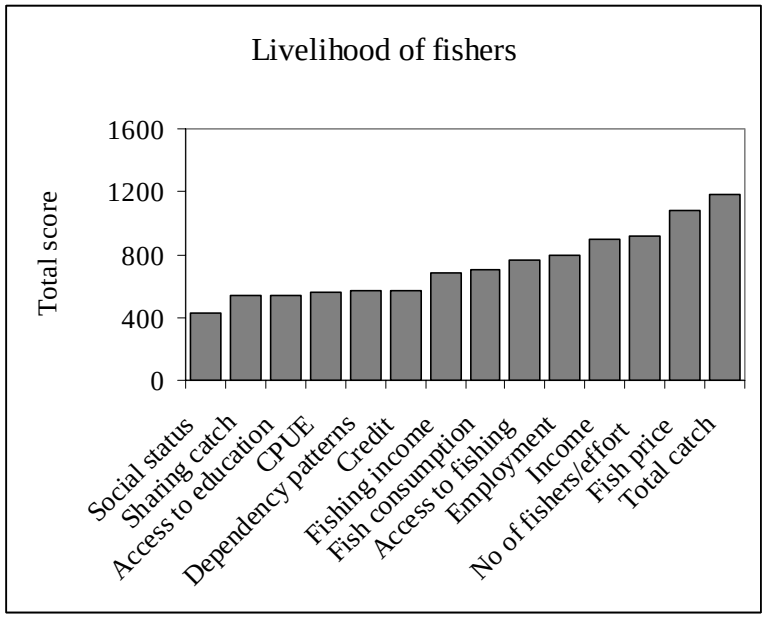


Figure 3: Total score for indicators related to improvement of livelihood of fishers

In both cases the highest scores were given to such indicators as total catch, total value/fish price, no. of fishers/vessels/gears, clearly reflecting the historical tradition of fisheries monitoring which tend to focus more on production and fishing capacity than on information to support fisheries management.

[6] Calculated as Sum of Importance/(1/Sum of practicability)

8 SPECIAL PRESENTATION ON THE EXPERIENCE OF DEVELOPING FISHERIES STATISTICAL SYSTEMS IN SOUTHEAST ASIA

The presentation on "Experience of Developing Fishery Statistical Systems in Southeast Asia" was made by Dr. Tadashi Yamamoto who has extensive experiences of developing/improving national statistical systems in the region. It was suggested that this presentation could be used as guidance when developing future programs/activities to improve fishery statistics in Southeast Asia. The following is the summary of the presentation.

Need for fishery statistics

Fishery Statistics are required at various levels

- Local level within a country
- National level
- Regional level (e.g. SEAFDEC Regional Bulletin)
  - Annual (e.g .catch and fishing units)
  - Occasional (e.g .fishing boat, fishermen)

Mode of data collection

There would be two options in terms of modality of data collection:

- Though municipal offices - requesting municipal offices to fill out data required into a set of reporting forms (the system as adopted in Japan till 1945).
- Through local fishery offices - sample surveys such as developed in Indonesia.

Statistical data items

Data items to be collected should include;

Capture fisheries	Aquaculture
.1 Fishery Establishment .2 Fishing Unit .3 Fishermen .4 Catch in Quantity and Value	.1 Aquaculture establishment .2 Water Area under culture .3 Persons engaged .4Yield in Quantity and Value

Objectives for the collection of fishery statistics

General set of objectives of collecting fishery statistics includes

- To assist Fisheries/Aquaculture Establishments through Fisheries Administration
- To assess Fisheries Resources
- To establish Fisheries Management Program by means of self management as far as possible

However, fishery statistics will serve for different purposes at different levels.

- To support Community based fisheries management at local level within a country :
- To assist policy formulation for fishery development and fishery management of industrial fishery the at national level :
- Regional collation of fishery statistics such as SEAFDEC's fishery bulletin at the regional level
- To clarify status and trends of fisheries at the international level

Statistics to be released by SEAFDEC

It was suggested for SEAFDEC to consider dissemination of statistical information through

- Newsletter, which scope is limited to such data items as catch of marine and inland water
- Annual Bulletin
- Occasional Report

It was remarked that considerable efforts have been exerted in the region to improve national statistical systems. Reference should be made to these activities carried out by FAO/SEAFDEC when new actions are planned in order to draw lessons learnt from them.

- FAO Training Courses in 1952&1954
- FAO Working Party in 1969, '72 & 74 to establish statistical standard and classification (FAO Fishing Reports)
- FAO Fishery Statistician served to Asian Countries '65-'78 (UNDP Project)
- SEAFDEC Consultation on Fishery Statistics 1999
- FAO/SEAFDEC Expert Consultation on Variables and Terminology for Aquaculture Monitoring in Asia 2000
- Aquaculture 2001&2002
- FAO/SEAFDEC Workshop2005

In conclusion, the following four points were highlighted:

a. As for capture fishery, such data items as fishery establishment, fishing boat, fisher and fishing unit and catch in quantity and value are considered as the minimum items to be covered. As for aquaculture, aquaculture establishment, water area under culture and persons engaged in aquaculture and yield in quantity and value are the minimum items to be covered.

b. Fishery statistics should be compiled not only at national level but also at local level such as provinces and district levels. This will give a great incentive and interest to local fisheries officials for the collection of fishery statistics.

c. For the collection of fishery statistics from the field, all fishery officials stationed in the field should be involved. In other words, no field system, which is fully responsible for the collection of fishery data only, should be established, as such a full time enumerator will get tired in repeating the same survey every day and start to cook up data staying at home or will retire from his post.

d. Fishery statistics compiled at local level are required for the development of community based fisheries management.

9 REGIONAL GUIDELINES ON FISHERY STATISTICS IN SOUTHEAST ASIA

To assist the ASEAN Member Countries in the implementation of the Code of Conduct for Responsible Fisheries (CCRF), SEAFDEC initiated a regional collaborative program on "Regionalization of the Code of Conduct for Responsible Fisheries (RCCRF)" since 1998. The program aimed at translating the CCRF into actions accommodating regional priorities and uniqueness of fisheries.

As one of the major outcomes of the RCCRF program, SEAFDEC developed a Regional Guidelines on Responsible Fisheries Management in Southeast Asia, which has been endorsed by the high-level authorities of ASEAN and SEAFDEC for implementation. Within the scope of fisheries management in the CCRF, the importance of quality statistics and information was stressed as a tool to facilitate development planning and management of fisheries. Due to a large number of issues covered in the regional guidelines for responsible fisheries management in Southeast Asia, the guidelines that address the issue related to fishery statistics were still broad and needed more elaboration. This is to enable the countries in the region to clarify a clear direction for actions to improve fishery statistics.

In response to the above requirement, SEAFDEC has initiated to substantiate issues related to fishery statistics as included in the regional guidelines for responsible fisheries management. This is to clarify actions of the Member Countries for the improvement of fishery statistics. The draft Regional Guidelines for Fishery Statistics was developed at the Core Expert Meeting on Fishery Statistics held in December 2004 based on the Regional Guidelines for Responsible Fisheries in Southeast Asia (RCCRF) - Fisheries Management focusing on Sub-article 7.4 and relevance sub-articles.

The final draft regional guidelines for fishery statistics will be submitted to higher authorities of ASEAN and SEAFDEC for consideration and endorsement. These guidelines are envisaged to provide an important framework for formulation of ASEAN-SEAFDEC collaborative programs on fishery statistics and information as well as for supporting cooperation among the countries in Southeast Asia and international/regional organizations.

10 MINIMUM REQUIREMENT AND FRAMEWORK OF THE NEW REGIONAL FISHERY STATISTICAL BULLETIN FOR THE SOUTHEAST ASIAN REGION

Fishery statistics is considered as a tool that has been used as a basis to facilitate development planning and management of fisheries. Fishery statistical items and data set collected by countries may be different based on priority needs and objectives of fishery statistics in the countries. The need for the use of fishery statistics does not only exist at national but also at regional and international levels to facilitate comparable and analysis of fishery status and trends for development planning and management in broader scope.

In Southeast Asia, compilation of fishery statistics has been regularly conducted by SEAFDEC over the past twenty years in the form of “Fishery Statistical Bulletin for the South China Sea Area”. Due to the escalated situation in fisheries practices in the region and new geo-political set-up of ASEAN, there is a need to revise the existing framework of the regional fishery statistics and the usage of this bulletin. Considering that there are some differences in the current national statistical systems of the countries in Southeast Asia, the revision targets at a basic requirement that can possibly be achieved by countries in the region.

Based on the policy directives given at the 36th Meeting of SEAFDEC Council, SEAFDEC Secretariat organized a series of consultations with the Member Countries to develop a new framework for SEAFDEC Fishery Statistical Bulletin. Based on these consultations, SEAFDEC Secretariat, in close consultation with the national focal points of fishery statistics, will agreed on the draft minimum requirement and framework for submission for consideration and approval by the SEAFDEC Council.

The minimum requirement was, to a large extent, based on the explanatory note of the existing SEAFDEC Fishery Statistical Bulletin and the FAO Fishery Statistical Yearbook. It is suggested that the minimum requirement targets at a basic data set to facilitate timely provision of quality fishery statistics to be compiled at the regional level. It is expected that the minimum requirement, once agreed among the countries in the region, can also be used as a framework to facilitate long-term improvement of fishery statistics at the national level through sharing common goals and experience. It should be emphasized that accuracy and reliability of regional aggregation of fishery statistics would ultimately depend on upon the quality of national data sources, collection, methods, periodicity of up-dating, and reporting.

Proposed Framework of the Fishery Statistical Bulletin for the Southeast Asian Region

Based on development of the draft new framework of the Bulletin from the Experts Meeting on Fishery Statistics organized in December 2004, the proposed structure and contents of the new Framework of SEAFDEC Bulletin are as follows.

a. Geographical Coverage

The data covers all production by large-scale and small-scale fisheries and aquaculture activities in freshwater, brackish water and marine water designated by FAO Fishing Area 71 (Pacific, Western Central), 57 (Indian Ocean, Eastern) and 04 (Asia, Inland Water).

b. Main Contents and Data items

The contents and data items of the new framework are as follows.

1. Introduction
- *1.1 Definition of Minimum Requirement*
- *1.2 Objectives of Fishery Statistics*
- *1.3 Coverage of "Fishery Statistical Bulletin for the Southeast Asian Region"*
- *1.4 National focal points*

2. Geographical coverage of the Bulletin
- *2.1 Fishing Areas Coverage*
- *2.2 Countries and Sub-areas*
  - *a) Brunei Darussalam*
  - *b) Cambodia*
  - *c) Indonesia*

West Sumatra	*South-west Kalimantan*
South Java	*East Kalimantan*
Malacca Strait	*South Sulawesi*
East Sumatra	*North Sulawesi*
North Java	*Maluku-Papua*
Bali-Nusa Tenggara	

  - *d) Lao PDR*
  - *e) Malaysia*
    - *West Coast of Peninsular Malaysia*
    - *East Coast of Peninsular Malaysia*
    - *Sabah*

Sarawak

f) Myanmar

g) Philippines

Luzon

Visayas

Mindanao

h) Singapore

i) Thailand

Gulf of Thailand

Indian Ocean

j) Timor Leste

k) Vietnam

North Vietnam

Central Vietnam

South Vietnam

3. Definition of Fishery Sector

3.1 Fishery Sector

1. Capture Fishery

- Marine capture fishery

- Inland capture fishery

2. Aquaculture

- Marine aquaculture

- Brackish water aquaculture

- Freshwater aquaculture

3.2 Capture Fishery

3.3 Aquaculture

4. Statistics on Marine Capture Fishery

4.1 Coverage and Definition

4.2 Production in Quantity and Value

4.3 Classification of Production

1) Production by species:

2) Production by type of fishing gear

4.4 Fishing Effort

4.5 Fishing Boat

1) Coverage of fishing boat

2) Classification of fishing boat

Fishing boats are classified into:

- Non-powered boat,

- Out-board powered boat

- In-board powered boat

Less than 5tons, 5-10 tons, 10-20 tons, 20-50 tons, 50-100 tons
100-200 tons, 200-500 tons, More than 500 tons

4.6 Fishers

1) Coverage of fishers

2) Classification of fishers

a. Full time fishers

b. Part time fishers

5. Statistics on Inland Capture Fishery

5.1 Coverage and Definition
5.2 Production in Quantity and Value
5.3 Classification of Production
1) Production by Species

5.4 Classification of Water body
1) Reservoir
2) Lake
3) River
4) Others
5.5 Fishing Units
5.6 Fishing Boats
5.7 Fishers
1) Coverage of fishers

6. Statistics on Aquaculture

6.1 Coverage and definition
6.2 Production in Quantity and Value
6.3 Classification of aquaculture
1) Mariculture
2) Brackishwater aquaculture
3) Freshwater aquaculture
4) Artificial Seed Production (fry, fingerling, seed)
6.4 Classification of Aquaculture Production
1) Production by Species
2) Production by Types of Culture
6.5 [Area under Culture by Type of Culture]/[Aquaculture Unit]
6.6 Fish farmers

7. Statistics on Price of Fresh [Live] Fish

7.1. Coverage
7.2 Definition of price
7.3 Unit of price

8. Statistics on Disposition of Catch

8.1 Coverage
8.2 Classification and definition

9. Statistics on Fish Processing

9.1 Coverage
9.2 Classification and definition
9.3 Counting principle for number of processing establishments (units)

10. Statistics on Exports and Imports of Fishery Commodities

10.1 Coverage
10.2 Classification and definition

11 STREAMLINED REPORTING MECHANISM OF FISHERY STATISTICS FOR FAO AND SEAFDEC

SEAFDEC initiated a fishery statistical program in 1976 and publishes "*Fishery Statistical Bulletin for the South China Sea Area*" since 1978. The Bulletin is aimed at providing reliable and comparable fishery statistics to facilitate exchange of information for the management of fisheries resources and planning of fishery development programs in the countries bordering the South China Sea.

FAO is mandated to compile, analyze and disseminate fishery data and information and provide advice and objective information services to the Member governments to promote responsible aquaculture and fisheries. FAO works together with countries to improve fishery statistics, primarily in order to meet national needs with regard to food security and fisheries management, but also to meet the needs of regional fishery bodies and FAO.

Although statistical inquiries by SEAFDEC and FAO include common data items, the inquiries are conducted separately using different questionnaire formats. With a very limited number of staff, many fishery statistics units experience difficulties to fulfill the reporting obligations to a number of international/regional organizations. As a consequence, inconsistencies in reporting and/or significant delays in or no reporting of national fishery statistics to both FAO and SEAFDEC often occur.

Proposal to streamline FAO and SEAFDEC annual fishery inquiry process

In order to alleviate the problems mentioned above and also to reduce the reporting burden on the national officers, the following actions were proposed and scrutinized by the workshop participants.

1) Integration of Questionnaires

SEAFDEC basically employs harmonized concepts, classifications and definitions with FAO and compiles more data items (in particular fishing effort related data) than FAO does. Therefore integration of questionnaire would be a practical solution of the problem. In this way, responses to annual inquiries of both FAO and SEAFDEC can be as simple as that countries fill up FAO questionnaires and send them to both organizations at the same time while SEAFDEC requests additional data items to be reported by countries.

2) Reporting areas

For reporting areas, FAO data have area reference and they should be able to fit in SEAFDEC Bulletin format. In this connection, SEAFDEC can have more detail sub-areas (based on each country national system), which can be raised up according to the broader areas of FAO. Results of FAO's recent efforts to revise FishStat AQ questionnaires should be reflected in integrated questionnaires.

3) Shared National Focal Points

National focal points reporting to both organizations officially designated by the countries are usually officers of very senior level such as head of line agency or national statistical office. This is necessary since reporting procedures for statistical inquiries have to conform to official protocols. However, this communication procedure can delay reporting as the questionnaires have to reach technical officers, who are in charge of filling up the forms.

Therefore it was advisable that FAO and SEAFDEC have common national focal points for annual inquiry of fishery statistics and share the list of both official focal points and technical

officers. By having direct contact with national technical officers, both FAO and SEAFDEC can increase communication/consultation with these officers, which will help solving minor technical problems (e.g. estimation of production figures) that these technical officers may face in the course of filling up the questionnaires. It would also facilitate compilation of additional information. The lists of national focal points and technical officers should be periodically reviewed and official requests should always be copied to technical officers.

4) Compilation Framework

Timely submission of questionnaires has been one of the most difficult tasks in the whole FISHSTAT related process of FAO as well as the publication of SEAFDEC Bulletin, which always involve continuous efforts of reminding national statistical offices to submit questionnaires in time.

Time frames set by FAO and SEAFDEC including the working cycle/plan for sending the questionnaires to the countries, dates for submission of questionnaires, compilation and publication of annual yearbooks/bulletin need to be harmonized.

Other Important Issues

Apart from the efforts toward streamlined reporting of fishery statistics to FAO and SEAFDEC, there are some important issues for consideration.

1) Estimation method of parameters

In the case that countries fail to submit their fishery statistics in time for annual publication of bulletin, SEAFDEC needs to consider how to deal with these cases; whether SEAFDEC should use the same estimation (projection) method as FAO or not. In the absence of reported data and reliable basis of estimation, FAO simply repeats the same figures that previously obtained from the country in question. It would be preferable for countries to make the necessary estimation when the data of the reporting year has not been available. In such cases, however, brief explanation of the method of estimation is required.

2) Missing data/data are not available

Based on the current format of the SEAFDEC Bulletin, there are a number of data items that some countries have yet to collect systematically. This causes a large number of blank cells in statistical tables in the bulletin. This issue needs to be considered and agreed with possible or appropriate options for solution.

Proposed Supporting Actions for Streamlining Exercise

In addition to the proposed actions for streamlined reporting of fishery statistics to FAO and SEAFDEC, the following actions were proposed to supplement the streamlining exercise.

1) Collaborative efforts for improving quality of national statistics

It is inherent to the nature of assembling data that their quality is subject to the quality of original data. Therefore, it is paramount that both organizations strive to improve the quality of original data. Consultations and close collaboration with countries are required when both organizations plan for improving national level statistical systems in order to coordinate and harmonize the efforts.

2) Coordinated efforts in approaching countries

FAO and SEAFDEC should make concerted efforts in approaching member countries in terms of annual statistical inquiries. Increasing communication and consultation from both ends would facilitate the solutions of minor technical problems in responding the inquiry.

It should be accepted as a collaborative spirit for all concerns to exert utmost efforts in ensuring the timely provision of fishery statistics. Where possible, recognition of those involved in the process such as members of the established National Focal Points on Fishery Statistics in the ASEAN Region should be publicized to create momentum in support to these initiatives.

3) Exchange of supplementary information

Member countries of FAO and SEAFDEC should exchange available supplementary information and publications of fishery statistics to facilitate compilation/collation process where possible.

4) Conduct R & D Activities

FAO and SEAFDEC could undertake research and development activities such as regional workshops to improve quality of fishery statistics and data submission process.

12 ADOPTED CONCLUSIONS AND RECOMMENDATIONS

Future Directions and Collaboration with FAO for FishCode-STF

With the view to promote the implementation of the Strategy-STF, the Workshop discussed the regional synthesis of fishery data and information collection systems in the Southeast Asian region, and information requirements for sound policy-development, better decision-making and responsible fisheries management. Based on the above discussion, the Workshop identified future directions, considerations and immediate follow-up actions for the improvement of fishery statistics as follows:

Results of the regional analyses and working group discussions indicate that existing fishery data and information collection systems in the region reflect traditional monitoring systems, focusing on total catch and value. To obtain information on status and trends of capture fisheries and to support development and implementation of sound and sustainable policies and management, both main objectives of CCRF and STF, more appropriate indicators (CPUE, species composition and fishing effort, etc.) are required.

Although in nearly all countries in the Southeast Asian region some indicators are collected, it is still difficult to obtain reliable information needed for management and planning due to a variety of constraints.

Estimated Catch per Unit of Effort (CPUE) and effective effort on a regular basis is the most commonly used method to describe trends in fisheries.

For countries in the Southeast Asian region, implementation of fisheries management on the basis of analysis of status and trends requires the following actions:

a. Evaluating how far direct measurement of CPUE and effective fishing effort are currently made by individual countries
b. Indicating feasible and sustainable methods for direct measurement of CPUE and effective fishing effort, taking into account the characteristics of fisheries in the region
c. Investigating how to progressively incorporate these feasible methods into national data and information collection systems.

FAO welcomes the initiative formulated by the Southeast Asian countries in their "Plan of Action on Sustainable Fisheries for Food Security for the ASEAN region" on the use of practical and simple indicators for small-scale multi-species fisheries as a substitute for classical fisheries management models. This initiative is in line with the principles of the Strategy for improving information on status and trends of capture fisheries. The FAO FishCode-STF project actively supports the development and field-testing of such indicators and therefore calls for proposals from the Southeast Asian region.

It has been recognized by COFI that small-scale fisheries are not being given due attention and are not well monitored. For the Southeast Asia region this was confirmed by the regional synthesis presented. The Strategy-STF outlines the importance of monitoring this sector particularly in the socio economic aspects. It is therefore recommended to improve the monitoring of small-scale multi-species fisheries by:

a. Actively developing and implementing multi-sectoral approaches, including socio-economics and livelihood aspects, for data collection and analysis; and
b. Raising awareness on the importance of small-scale fisheries among all stakeholders involved in the sector; and

The FAO FishCode-STF project actively supports the development of sustainable methods of multi sectoral monitoring of small-scale fisheries and calls for proposals from the Southeast Asian region for pilot projects.

Some information to support the development of fisheries policy and management in majority of countries in the Southeast Asian region is available from non-fishery institutions. The regional analyses and the discussions during the working group sessions indicated that the existing fishery-independent data and information collection systems that could be useful for fisheries management purposes are not fully exploited. It is recommended to improve the use of such information through:

a. Actively participating in the designing of such collection systems to ensure the inclusion of information of direct relevance to the fisheries sector.
b. Enhancing cooperation with non-fishery institutions on data exchange and applied methodologies.
c. Making use, when appropriate, of fishery-independent data or information to formulate data collection strategy and methods in the fisheries sector.

The Strategy-STF outlines the importance of capacity building of developing countries, which need to be enhanced so that they can fulfil existing commitments to collect fishery statistics and to conduct fisheries research. The regional analysis indicates that, in the Southeast Asian region, some countries have advanced monitoring systems while others are just starting to develop their systems. It is therefore recommended to make use of the regional expertise for capacity building.

Recommended actions described above are in line with the main activities envisaged by the FAO FishCode-STF Project, and will therefore be supported in close coordination with on-going and planned SEAFDEC activities.

The Workshop recommended that the regional synthesis of the fishery data and information collection systems in the Southeast Asian region finalized in consultation with the Southeast Asian Countries will be published by FAO FishCode-STF Project for future reference.

Special Presentation on the Experience of Developing Fishery Statistical Systems in Southeast Asia

The Workshop welcomed the "Experience of Developing Fishery Statistical Systems in Southeast Asia" as presented by Dr. Tadashi Yamamoto and suggested that it can be used as a basis when developing future programs/activities to improve fishery statistics in Southeast Asia.

Based on the above presentation, the Workshop noted information on the opportunity for statistical training organized by JICA and that the Southeast Asian countries could consider applying to participate.

Minimum requirement and framework of the Fishery Statistical Bulletin for the Southeast Asian region

In finalizing the draft Minimum Requirement and Framework of Fishery Statistical Bulletin for the Southeast Asian Region, the Workshop suggested the following actions to be followed up by SEAFDEC Secretariat and the SEA countries through the national focal points of fishery statistics:

SEA countries

- To confirm their respective sub-areas reflecting appropriate eco-systems and management requirements.
- To review classification of species for marine and freshwater including that of aquaculture used for the Bulletin.
- To review the classifications of fishing gear (including national/local name), fishing boats, water bodies, types of aquaculture and types of processing.
- To provide above information to SEAFDEC Secretariat in the similar form provided in the current SEAFDEC Fishery Statistical Bulletin by 31 March 2005.
- In case of countries that use horsepower for classification of fishing boats, a study to develop conversion ratio from horsepower to gross tonnage should be conducted.

SEAFDEC Secretariat

- To seek formal confirmation from Indonesia, Malaysia and Vietnam on the proposed adjustment of the demarcation line in between Area 71 and 57 for the Malaysian water in the Malacca Strait by using demarcation of east and west coast Peninsular Malaysia as well as Area 71 and 61 for the Tonkin Gulf by using the Vietnam-China boundaries. This will be assisted by the Workshop representatives of the above countries to facilitate the confirmation.
- To consult with the Coordinating Working Party of Fishery Statistics (CWP) on the proposed adjustment.
- Based on the confirmation and information provided by the SEA countries, to circulate the revised draft Minimum Requirement and Framework to the SEA countries for the preparation of the final draft.
- To submit the final draft minimum requirement to the forthcoming meeting of the ASEAN-SEAFDEC Fisheries Consultative Group and SEAFDEC Council for consideration and endorsement.

Draft Regional Guidelines on Fishery Statistics in Southeast Asia

The Workshop reviewed the draft regional guidelines on fishery statistics in Southeast Asia as presented by SEAFDEC Secretariat. The Workshop suggested that the draft should, in close consultation with the SEA countries, be further reviewed and finalized in future opportunity.

The Workshop also suggested that the current draft could be used as a basis to formulate future follow-up activities in implementation of the Code of Conduct for Responsible Fisheries in improving fishery information and statistics in the region.

Streamlining of Reporting of Fishery Statistics to FAO and SEAFDEC

The Workshop supported the proposed streamlining of reporting of fishery statistics by the Southeast Asian countries to FAO and SEAFDEC and suggested the following:

- FAO, SEAFDEC and the SEA countries to identify/confirm common focal points to facilitate communication, reporting and compilation of fishery statistics in the Southeast Asia as well as to promote planning and implementation of regional collaborative programs on Fishery Statistics
- FAO and SEAFDEC to jointly develop an integrated questionnaire and a common work timeframe based on FAO requirements and the Minimum Requirements and Framework for Fishery Statistics in the Southeast Asian Region
- Where there is missing or delay of submission of data, data from other sources or that of the previous year data may be used. This will be updated once the actual data becomes available.
- Sharing of supplementary information/publication of fishery statistics of the SEA countries to FAO and SEAFDEC to support aggregation of fishery statistics at regional/international levels.
- Develop R&D such as regional workshops to improve quality of fishery statistics and data submission process.

Future Follow-up Actions

As a basis for formulation of future regional collaborative program on fishery statistics, the Workshop identified the following priority areas:

- Development of minimum requirement and standard definitions and classifications for fishery statistics in Southeast Asia
- Development of the Southeast Asian Status of Fisheries and Aquaculture (SEASOFIA)
- Promotion of timely preparation of fishery statistics through the Application of Database and Information Technology (in the design, development and testing of software, documentation, and training of concerned personnel)
- Human resources development on data collection, processing, analysis, interpretation and reporting
- Strategic planning/system review of fisheries and aquaculture statistics
- Development of statistical system for small-scale coastal fisheries, inland fisheries and aquaculture

Vote of Thanks to the Host Country

The participants of the Workshop expressed gratitude and appreciation to the Government of Indonesia for hosting this Workshop. The participants also thanked the Ministry of Marine Affairs and Fisheries for its hospitality and excellent organization of the Workshop.

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ANNEX B: AGENDA AND ARRANGEMENTS OF THE WORKSHOP

15-18 February 2005
Prata Bali Resort, Denpasar, Bali, Indonesia

15 February 2005 (Tuesday)

0830-0900	**Registration**
0900-0930	**Agenda 1.** Opening of the Workshop Welcome Address by Dr. Subhat Nurhakim, Agency for Marine Fisheries Research. Ministry of Marine Affairs and Fisheries, Indonesia Remark by SEAFDEC Secretary-General Remark by Chief, Fisheries Information and Data Unit, Fisheries Department, FAO Opening Remark by Mr. Freddy Numberi, Minister of Marine Affairs and Fisheries
0930-1000	Group photography session
1000-1020	**Agenda 2.** Introduction of the Workshop
1020-1040	**Agenda 3.** Adoption of the Agenda and Arrangement
1040-1230	**Agenda 4.** Regional synthesis of fishery statistics and data collection systems in the Southeast Asian Region
1400-1530	**Agenda 5.** Information requirements for sound policy-development, better decision-making and responsible fisheries management 5.1 Presentation 5.2 Introduction to Group Discussion
1545-1630	**Agenda 6.** Future direction, considerations and immediate follow-up actions, including clarification of information needs, the areas of improvement, the way to promote the new requirements of the data and information 6.1 Group Discussion

16 February 2005 (Wednesday)

0900-1030	**Agenda 6.** Future direction, considerations and immediate follow-up actions, including clarification of information needs, the areas of improvement, the way to promote the new requirements of the data and information (Cont'd) 6.2 Group Discussion (Cont'd)

1045-1230 **Agenda 6.** Future direction, considerations and immediate follow-up actions, including clarification of information needs, the areas of improvement, the way to promote the new requirements of the data and information (Cont'd)
6.2 Group Discussion (Cont'd)

1400-1530 **Agenda 6.** Future direction, considerations and immediate follow-up actions, including clarification of information needs, the areas of improvement, the way to promote the new requirements of the data and information (Cont'd)
6.3 Group Discussion and Preparation for Group Presentation

1545-1630 **Agenda 6.** Future direction, considerations and immediate follow-up actions, including clarification of information needs, the areas of improvement, the way to promote the new requirements of the data and information (Cont'd)
6.4 Presentation and Plenary Discussion

1630-1700 **Agenda 7:** Special Presentation on the Experience of Developing Fisheries Statistical Systems in Southeast Asia

17 February 2005 (Thursday)

0900-1030 **Agenda 8.** Regional Guidelines on Fishery Statistics in Southeast Asia
7.1 Presentation
7.2 Discussion

1045-1230 **Agenda 8.** Regional Guidelines on Fishery Statistics in Southeast Asia (Cont'd)
7.2 Discussion (Cont'd)

1400-1530 **Agenda 9.** Minimum requirement and framework of the new Regional Fishery Statistical Bulletin for the Southeast Asian region
9.1 Presentation
9.2 Discussion

1545-1700 **Agenda 9.** Minimum requirement and framework of the new Regional Fishery Statistical Bulletin for the Southeast Asian region (cont'd)
9.2 Discussion (Cont'd)

18 February 2005 (Friday)

0900-1030 **Agenda 9.** Minimum requirement and framework of the new Regional Fishery Statistical Bulletin for the Southeast Asian region (cont'd)
9.2 Discussion (Cont'd)

1045-1230 **Agenda 9.** Minimum requirement and framework of the new Regional Fishery Statistical Bulletin for the Southeast Asian region (cont'd)
1230-1400 9.2 Discussion (Cont'd)

1400-1500	**Agenda 10.** Streamlined reporting mechanism of Fishery Statistics for FAO and SEAFDEC 10.1 Presentation 10.2 Discussion
1515-1700	**Agenda 11.** Adoption of the Conclusion and Recommendations
1700	**Agenda 12.** Closing of the Workshop

ANNEX C: LIST OF DOCUMENTS

Information Papers

INF01	Information Note for Participants
INF02	Provisional Prospectus
INF03	List of Documents

Working Papers

WP01	Agenda
WP01a	Agenda and Timetable
WP01b	Annotated Agenda
WP02	Regional Synthesis of Fishery Statistics and Data Collection Systems in the Southeast Asian Region
WP03	Draft Regional Guidelines on Fishery Statistics in Southeast Asia
WP04	Draft Minimum Requirement and Framework of the Fishery Statistical Bulletin for the Southeast Asian Region
WP05	Streamlining Process of the Reporting of Fishery Statistics by the ASEAN Member Countries

Reference Papers

REF01	Strategy for Improving Information on Status and Trends of Capture Fisheries
REF02	Handbook on Collecting Fishery Statistics for Inland and Coastal Fisheries
REF03	Returned Questionnaire from Brunei Darussalam (edited)
REF04	Returned Questionnaire from Cambodia (edited)
REF05	Returned Questionnaire from Indonesia (edited)
REF06	Returned Questionnaire from Lao PDR (edited)
REF07	Returned Questionnaire from Malaysia (edited)
REF08	Returned Questionnaire from Myanmar (edited)
REF09	Returned Questionnaire from the Philippines (edited)
REF10	Returned Questionnaire from Singapore (edited)
REF11	Returned Questionnaire from Thailand (edited)
REF12	Returned Questionnaire from Vietnam (edited)

ANNEX D - WELCOME ADDRESS BY DR. SUBHAT NURHAKIM, DIRECTOR OF RESEARCH CENTER OF CAPTURE FISHERIES RESEARCH AGENCY FOR MARINE AFFAIRS AND FISHERIES, MMAF, INDONESIA

His Excellency, Minister of Marine Affairs and Fisheries Republic of Indonesia,
Governor of Bali, Mr. Dewa Berata
First Echelon Officials from the Ministry of Marine Affairs and Fisheries,
FAO-Chief on Fishery Information, Data and Statistics Unit, Dr. Richard Grainger
SEAFDEC Secretary General, Dr. Niwes Ruangpanit
Distinguished guests, Ladies and Gentlemen,

Good morning, and welcome to the FAO-SEAFDEC Regional Workshop on the Improvement of Fishery Data and Information Collection System in this magnificent place on the exotic Island of Bali.

It is a great pleasure for me, on behalf of the workshop organizer to extend our welcome to all of you who are present here, including the workshop participants from Southeast Asia and Japan. This is truly an event which signifies our common interest to improve the quality of fishery statistics, either for short term or long term use.

I would like to take this opportunity to thank FAO and SEAFDEC for giving Indonesia the chance to host this workshop. I am still recalling the initial meeting we had more than a year ago with Dr. Indroyono Soesilo and Dr. Richard Grainger, where we discussed the need to hold a workshop on the improvement of methodology on fisheries information. The objective then was to hold a regional meeting on capacity and data collection of fishery statistics to provide accurate information on the status and trends of the fisheries in this region. And now, that idea is being put into action through this workshop.

His Excellency, Ladies and gentlemen,
I am proud to report that in this workshop, there are 38 participants from ASEAN and SEAFDEC member countries including Cambodia, Japan, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor Leste, Vietnam and Indonesia. These are all senior fishery officials who are responsible for fishery data and information collection system in each respecting country. Also, there are resource persons and representatives from FAO office in Rome and SEAFDEC Secretariat in Bangkok who will provide guidance and facilitations during the workshop.

During the next 3 days, all together we will be sharing and exchanging our experience to provide a framework for an increased used of fishery statistics for policy-development and responsible fisheries management by improving the quality of fishery information. This objective is crucial to the decision-making process that involves not only the government but also other stakeholders in the fishery sector.

I would like to take this opportunity to express my sincere gratitude to the Minister of Marine Affairs and Fisheries of the Republic of Indonesia for coming to Bali to attend the opening ceremony and officially open this workshop. Also, my appreciation to the Chairman of the Agency for Marine and Fisheries Research and all my colleagues at the agency, as well as to those from the other Directorate Generals who have been supportive of this workshop. I want to acknowledge the role of my counterpart from the province of Bali, who has significantly helped the work of the organizing team. Lastly, allow me to thank my SEAFDEC counterpart

for the discussions leading to the implementation of this event, which would be all towards the benefits of better fisheries management in this region.

Finally, I wish you all a pleasant stay in Bali, and a successful workshop. Later at this program I would like to respectfully invite his Excellency to open the workshop.

Thank you.

ANNEX E – REMARK BY MR. NIWES RUANGPANIT, SECRETARY-GENERAL OF SEAFDEC

Honorable Excellency Mr. Freddy Numberi, Minister of Marine Affairs and Fisheries of Indonesia, and the Senior Officials of Indonesia,
Dr. Richard Grainger, Chief of Fisheries Information, Data and Statistics Unit, Fisheries Department, FAO
Distinguished delegates from the ASEAN-SEAFDEC Member Countries and Timor-Leste,
Representatives and resource persons from FAO and SEAFDEC,
Ladies and Gentlemen,

Good morning,
It brings me a great pleasure to give a Remark here, at the FAO-SEAFDEC Regional Workshop on the Improvement of Fishery Data and Information Collection Systems. First of all, on behalf of SEAFDEC, I wish to express my sincere gratitude to FAO for a very long and close collaboration with SEAFDEC particularly on the development of fishery information and statistical systems in the Southeast Asian region.

In making this activity possible, it is therefore a timely opportunity for me to extend our appreciation to the Ministry of Marine Affairs and Fisheries, Indonesia for hosting this workshop.

Before starting the workshop, I would like to recall all the previous work of SEAFDEC in relation to fishery statistics. Since 1978, we started the compilation of fishery statistics and published our first Fisheries Statistical Bulletin of 1976 covering the area of the South China Sea. From 1994, SEAFDEC had organized several workshops on fishery information and statistical systems, of which many were organized in close collaboration with FAO. In 1999, a Regional Plan of Action for Improvement of Fishery Statistics was adopted with strategies and actions being elaborated toward this direction.

To confirm the importance of fishery statistics, at the ASEAN-SEAFDEC Conference in 2001, fishery statistics was identified as one of the prioritized areas to be undertaken by the region. The Conference resolved to '*strengthen national fishery statistical systems and maximize their use for fisheries planning and management and develop standard definitions and classifications to facilitate regional fishery statistics and information exchanges*'.

Throughout the year 2002 up to now, SEAFDEC has conducted several activities both at the national and regional levels, most of which in close collaboration with FAO, and identified future directions and activities to further improve fishery statistics in the region. This FAO-SEAFDEC Regional Workshop on the Improvement of Fishery Data and Information Collection Systems, to be organized for 4 days from now on, is another significant venue for people working on fishery information and statistics in our region to discuss issues, with particular emphasis on how to improve the current information collection and statistical systems either at the national, regional or global levels, and how the information could best be used to support objectives such as fisheries policy planning and management.

Along the line with various SEAFDEC activities in improving fishery statistics, during the 36th Meeting of SEAFDEC Council, the Council also endorsed the modification of the Fishery Statistical Bulletin in several aspects. I would therefore like to take this opportunity to discuss and obtain views and comments, particularly on the draft Bulletin framework and the

minimum requirement for fishery statistics, as well as the Regional Guidelines for Fishery Statistics, which was elaborated from the CCRF Regional Guidelines for Responsible Fisheries Management, in order to facilitate SEAFDEC and Member Countries future work both in the improvement of national fishery statistical system, and compilation of statistics at the regional level.

In addition, it is also envisaged that SEAFDEC would play more and more active role to enhance collaboration among SEAFDEC, the Member Countries and FAO, as well as the Coordinating Working Party on Fishery Statistics or CWP, for the improvement of fishery statistics in the ASEAN region, and ensure that issues and priority of the Member Countries are accommodated in relevant regional and global initiatives.

I believe that with the knowledge and experiences of all participants and resource persons from FAO and other organizations, this Meeting would certainly come up with productive results, which allow all of us to work toward the common goal in improving fishery data and information collection systems, and eventually contribute to the well-managed and sustainable development fisheries in the Southeast Asian region and beyond.

Thank you.

ANNEX F - OPENING REMARK BY MR. FREDDY NUMBERI, MINISTER OF MARINE AFFAIRS AND FISHERIES, INDONESIA

The Governor of Bali, Mr Dewa Berata,
SEAFDEC Secretary General, Dr. Niwes Ruangpanit,
FAO-Chief on Fishery Information, Data and Statistics Unit, Dr. Richard Grainger,
Officials from the Ministry of Marine Affairs and Fisheries,
The participants of FAO-SEAFDEC Regional Workshop,
Distinguished guests, Ladies and Gentlemen.

Good Morning.
First of all, I would like to welcome you all to beautiful Bali for the FAO-SEAFDEC Regional Workshop on the Improvement of Fishery Data and Information Collection System. I also want to thank FAO and SEAFDEC for giving the opportunity to Indonesia to host this workshop.

The demand for fisheries products as protein sources has shown a significant increase due to the growing global population. Thus, it is logical to anticipate that the pressure for exploitation on fisheries resources will also increase. A sound management practices that can ensure sufficient supply of fish products and protection of the resources is highly required. In order to accomplish this task, we need to continually improve the fisheries management and policy-development by providing accurate information which reflects the status and trends of the fishery itself.

The need for reliable fishery data and information is evident for countries in Southeast Asia which have utilized the fishery resources for the prosperity of their people. We know that fishery resources cross international boundaries, and therefore the need for regional cooperation is crucial. I welcome the idea of this workshop, and the participants who are coming from this region.

Ladies and gentlemen,
If we look closer into -Southeast Asian region, we will find similar characteristics of fisheries management, including the problems that we are facing. In this region, as shown in other tropical areas, the fisheries are characterized by multi-species and multi-gear fisheries, which are highly influenced by the monsoon seasons. These characteristics have made the information collecting system more difficult, let alone the logistics due to lack of accessibility in collecting such information. Most statistics and data information on capture fisheries that have been collected are sometimes difficult to use for analysis on the status and trends of a particular fishery. However, we must also remember that fishery statistics by species and area are not the only types of data that are required for good fish stock assessment. There is an increasing need for solid economic data on the fishing industry and artisanal fisheries as a basis for socio-economic and bio-economic studies.

As the host country, I would encourage the participants to develop an improved reporting and data-management system which should be accessible to our stakeholders in timely manner. The current system should be updated by taking the advantage of the rapidly increased information and technology for statistic and data management. It is said that statistics are the eyes of the policymakers, since it is the main basic information available to assess the status and trends of the fisheries, given it’s artisanal or industrial scale. I believe that this workshop is a great opportunity for the participants from each country to share the experience that will

ultimately help establish the methodology for the provision of an accurate and reliable fishery data.

Distinguished Guests, Ladies and Gentlemen,
Another important aspect that (should be discussed)/ needs to be addressed in this workshop is how to develop a methodology that can estimate the amount of Illegal Unreported and Unregulated or IUU Fishing. Indonesia has lost tremendous amount of our natural resources through IUU fishing. We have now launched a national campaign to combat IUU fishing through vessel monitoring system, and intensification of marine patrol to capture illegal vessels. This will help the improvement of fishery statistical data to be used by the government and other decision makers to implement the Code of Conduct for Responsible Fisheries, which Indonesia is taking very seriously. I am confident that the output of this workshop would reflect this objective, and once again, I highly appreciate the effort of FAO and SEAFDEC for organizing this workshop

Ladies and Gentlemen,
I am hoping that the output of this workshop will also be followed by the improvement of capacity building of fishery officers and statisticians who will implement the methods that will be developed in this workshop. Indeed, I believe FAO and SEAFDEC should play a major role in the implementation of the methods being developed here in each individual country, but also in the regional level as well.

I wish you the best of time during the workshop, and please enjoy the beauty that Bali could offer to you.

Finally, I now declare that the FAO-SEAFDEC Regional Workshop on the Improvement of Fishery Data and Information Collection System is officially opened.

ANNEX G: INDICATORS FOR SUSTAINABLE USE OF MARINE RESOURCES IDENTIFIED BY THE DIFFERENT GROUPS

Group A	Group B	Group C
Catch, Landings	Total catch	Catch
Biomass	Biomass	
MSY, MEY	MSY	
Effort	CPUE	Effort
No. of vessels, Fleet capacity	No of fishing boat	Number of boat
Type of gear, Size of gear	No of fishing gear	
Legal and illegal fishing		
VMS	No. of fishers	
Household		
Fishers earnings		
Fish consumption	Price	
Fish price	Contribution to GDP	
Value of production	Export value and quality	Value and volume of Exports
Fish export (volume)		
Trophic level	Good health	Length
Lc50	Biodiversity	Weight,
Lm 50%	Primary Productivity	Maturity
L∞ or max Length of fish		

Note: *This is not an exhaustive list of indicators for the sustainable use of marine resources as participants had time limitations for this exercise and hence only came up with the preliminary list of indicators*

ANNEX H - CONSOLIDATED RESULTS OF GROUP DISCUSSIONS ON INDICATORS, METHODS AND STRATEGIES

Policy Objective	Sector	Indicators	Strategy	Method	Timeliness	Who
Sustainable use of resource	Industrial Tuna Fishery	Total catch	Full enumeration	Logbook Questionnaire to processing plants		DOF
		Effort	Full enumeration	Logbook, Observer reports	Quarterly	DOF /Research Institute
		Number of Boats	Full enumeration	Register	Yearly	DOF
		CPUE	Sampling	Observations at fishing ports		DOF/Research Institute
		No. of fishers	Full enumeration	Census		Others
		Export value	Full enumeration	Registration		Others
		Catch composition	Sampling	Observations, survey at ports/landing centres, research		DOF
		Length, Weight, Maturity	Sampling	Interview processing plants	Quarter	Research Institute
	Small Scale Tuna Fishery	Effort	Seasonal sampling	Questionnaire		DOF
	Shrimps Trawlers	Catch & Effort	Sampling	Observers	Quarterly	DOF
		Number of Boats	Full enumeration	Register	Yearly	DOF
		Length, Weight, Maturity	Sampling	Observers	Quarterly	Research Institute
	Artisanal Fisheries	Catch	Sampling	Household survey, Observing		DOF
		Catch composition	Sampling	Research , survey in villages		DOF
		Effort-frame	Full enumeration	Fishery census, village reporting		DOF
		Effort	Sampling	Fishing village observations		DOF
		Number of Boats		Agriculture Census Questionnaire	2 years or 10 years	DOF or Department of rural affairs
		Primary productivity	Sampling	Observations		Research
		Biodiversity	Sampling	Observations		Research
		Price	Sampling	Questionnaires		Research
Exports	Industrial Tuna Fisheries	Value & volume of exports	Full enumeration	Reports	Quarter	Custom Office
	Shrimps	Value & volume of exports	Full enumeration	Reports	Quarter	Custom Office
Livelihood		Access to education	sampling	Questionnaire		Others
		Health	sampling	Questionnaire		Others
		Income	sampling	Questionnaire		Others
		No. of households	full enumeration	Census		Others

Improvement of Fishery Data and Information Collection Systems in Southeast Asia

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Bali, Indonesia, 15 to 18 February 2005

Volume 2: Regional Synthesis and Country Papers

FishCode-STF-WP2005/2 **SEC/SP/66**

Improvement of Fishery Data and Information Collection Systems in Southeast Asia

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FISHCODE – STF PROJECT FOR IMPROVING INFORMATION ON STATUS AND TRENDS OF CAPTURE FISHERIES

SOUTHEAST ASIA FISHERIES DEVELOPMENT CENTER

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Bangkok, 2005

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations and SEAFDEC concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

FAO-SEAFDEC, 2005. Improvement of Fishery Data and Information Collection Systems in Southeast Asia: Proceedings of the FAO/SEAFDEC Regional Workshop on the Improvement of Fishery Data and Information Collection Systems, Bali, Indonesia, 15-18 February 2005. Volume 1: Report of the Workshop, 38 pp.

SUMMARY

Improvement of Fishery Data and Information Collection Systems in Southeast Asia: the Proceedings of the FAO/SEAFDEC Regional Workshop on the Improvement of Fishery Data and Information Collection Systems was prepared based on the outcomes from the Regional Workshop on the Improvement of Fishery Data and Information Collection Systems, collaboratively organized by FAO FishCode-STF Project and SEAFDEC, in Bali, Indonesia, from 15 to 18 February 2005. The Proceedings are published in two volumes: Volume 1: Report of the Workshop, and Volume 2: Regional Synthesis and Country Papers.

Distribution:

Participants of the Workshop
FAO Fisheries Department
SEAFDEC Member Countries
Relevant international/regional fishery organizations

VOLUME 2: WORKING PAPERS

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1 REGIONAL SYNTHESIS

1.1 Introduction

One of the main components of the FishCode-STF project is the improvement of fishery monitoring, which includes the description of fishery statistical and data collection systems used by individual countries and regional fisheries bodies. The aim of this exercise is to obtain a complete picture of all monitoring systems in use in order to critically assess the quality of the systems and to identify gaps and shortcomings in fishery monitoring. This inventory of fishery data and information collection systems should cover all the data collection activities on all aspects of fisheries including production, fishing capacity (fleets and fishing gear), employment, processing, consumption, trade and socio-economic aspects. The availability of such information on statistical methods and data used in various countries is expected to facilitate an evaluation of data collection and handling practices by country, the flows of data from national to regional and global levels, and hence the quality of the data as published by regional fishery bodies and FAO. This inventory can also be used as a dynamic reference framework to give indication of the quality of statistical data available in each country, progress made and improvements still required. Finally, it should form the basis for improvements and identification of training needs in developing countries to be addressed in the second phase of the Project.

This regional synthesis covers nine countries in the Southeast Asian region, namely Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam. Prior to the workshop, a set of questionnaires were distributed to participating countries to describe their national fishery data and information systems in a complete and comparable manner, which were subsequently analysed and synthesised to identify critical shortcomings and weaknesses of the data collection systems. (See chapter 3 for the questionnaire format and the explanatory note provided for national respondents). The results of the regional synthesis and comparative analysis conducted by the project staff were presented at the workshop as background for group discussions.

The questionnaires consist of two parts, the first part of which is concerned mainly with information requirements and hence information users (e.g. policy makers) were requested to fill in this part. The second part of the questionnaire is related to operational aspects of national fishery information and data collection system, which technical officers (e.g. fishery statistician) were requested to handle. The edited version of the returned questionnaires can be found in the Chapter 2.

1.2 Fishery data collection: “A chain of events and flow of information”

Formulation of fishery policies and management plans need to be based upon analyses of reliable data that can only be obtained through:

1. Proper design of data and information collection systems;
2. Proper field implementation of data collection;
3. Proper processing of the data collected in the field;
4. Proper analyses of the data and;
5. Proper dissemination of the information generated to target information users in particular the policy makers

In other words fishery data collection is ***"A chain of events and flow of information"***. This characteristic of fishery data collection needs to be addressed in a regional analysis of the national fisheries monitoring systems. One broken link or error in the chain will inevitably lead to generation of irrelevant information and/or erroneous estimates of indicators and variables. Such unreliable fishery information could have serious implications in the process of policy formulation and sector management.

The chain of events in design and implementation of fishery data and information systems is described in a number of FAO technical guidelines[1]. The different parts of the chain, which basically clarify WHY, WHAT, HOW and WHO in the process, are presented in **Figure 1**. The regional aspects for each part of the chain will be discussed in the following chapters. For each topic in the following analyse, summary points of the topic are firstly presented in a textbox, which are extracted from the guidelines for the routine collection of capture fishery data (FAO, 1999).

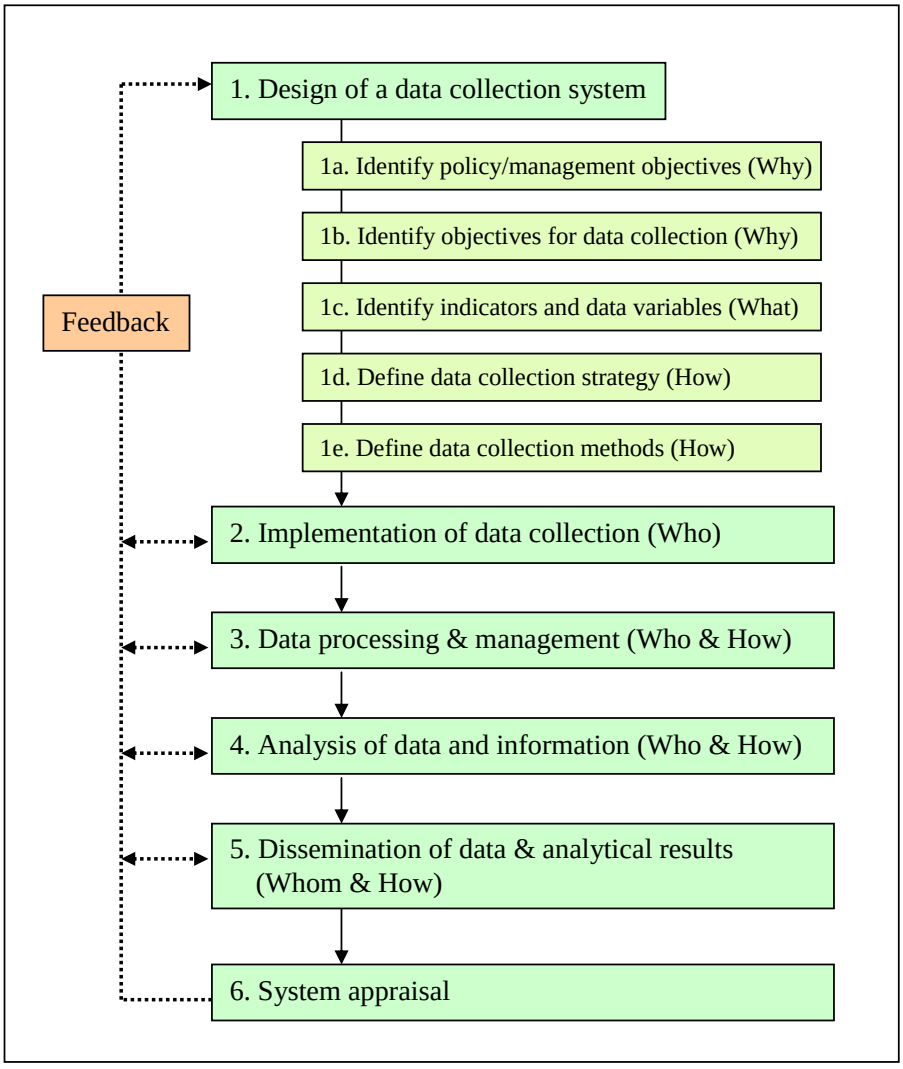

Figure 1. Chain of events in fisheries information systems

[1] Manual on sample-based data collection for fisheries assessment, FAO Fisheries Technical Paper 398, Rome 2000., Guidelines for the Routine Collection of Capture Fishery Data, FAO Fisheries Technical Paper 382, Rome 1999. and Introduction to tropical fish stock assessment FAO Fisheries Technical Paper 306, Rome 1998.

1.2.1 Identify Policy Objectives

Fisheries policy and management objectives need to be based upon analyses of reliable data. Policy and management issues can be broadly divided into food security, socio-economic and environmental concerns, each of which certain types of information for decision masking. While the precautionary approach could be used when information is insufficient, management in general should be based on the "best scientific information available" and this has important implications in terms of type, quantity and quality of data to be collected (FAO, 1999)

Based on the analysis of the general issues in the national fisheries policies in the region (**Figure 2**) it becomes clear that all countries have some policies relating to sustainable use of aquatic resources. Many countries refer to biodiversity and environment with less reference to food security, livelihood of fishers, increased fish production and earning of foreign currency.

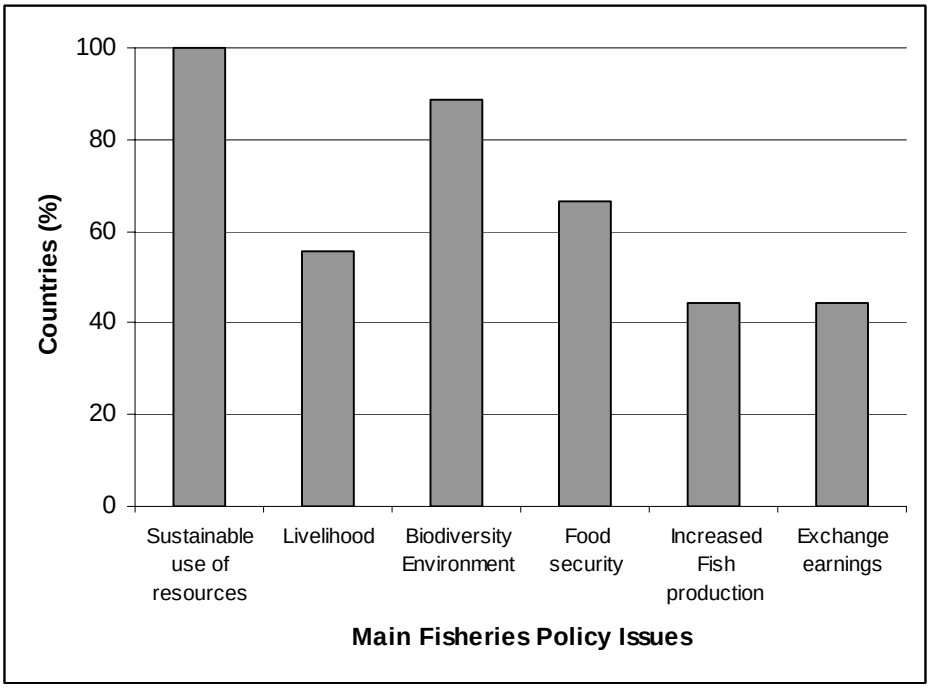

Figure 2. National fisheries policy issues in the Southeast Asian countries

1.2.2 Objectives of data collection

Data are needed to make rational decisions, evaluate the fisheries performance in relation to management objectives and fulfil regional requirements. The extent to which objectives are achieved is assessed using indicators, which are generated from data. There is no standard set of indicators, but all must be tailored to each fishery dependent on which social, economic or environmental concerns are important. Appropriate indicators can be developed which measure the state of the resource, the performance of fishing controls, economic efficiency, socio-economic performance and social continuity. A fishery authority may also be obliged to supply information to regional and international organisations and other states with respect to straddling or highly migratory stocks

Many countries collect data for the purpose of the regular publication of a yearbook or annual fisheries statistics by the government. The statistical yearbook typically presents the overall description of the fisheries sector, which is essential for any rational management of the fishery, and/or analysis of status and trends of fisheries. However, the yearbook does not always contain the type of information needed to support the formulation of policies and to evaluate the implementation of the policies and the validity of specific management measures. In properly designed fishery information systems the data types should align with the domains as indicated in the national policies.

The major areas of information needed for various fisheries management issues in the Southeast Asian region as indicated by participants of the workshop, are presented in **Figure 3**.

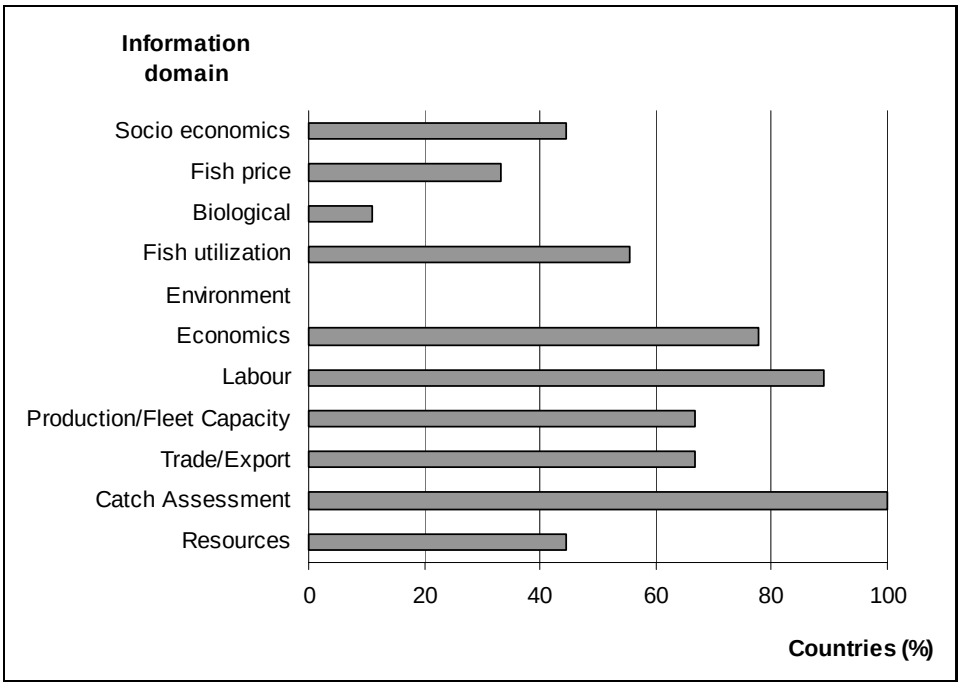

Figure 3. Major areas of information needed for fisheries management

The results of this analysis indicate that catch, employment, economics and fishing fleet capacity and trade are the five major areas of information requirements. Surprisingly it also indicates that “Environment” does not seem to be considered as an important area of data collection, despite the fact that many countries included environment issues in their policies.

1.2.3 Identify policy indicators

Once policy and management objectives are defined with their relative reference points, appropriate performance indicators can be identified, and so can the variables which are needed for their estimation. However, there is feedback between choice of indicator and data variables, since it is at this stage that logistics and costs have a significant influence on the data collection programme. Besides the demands of an indicator, choice of variable is influenced by:

- *the operational characteristics of the fishery which dictates what can feasibly be collected;*
- *the total number of variables which can realistically be collected*
- *the number of indicators which a variable can be used for;*
- *how often the data needs to be collected; (or the variable needs to be sampled)*
- *the expected data quality and quantity that can be obtained;*
- *issues of standardisation*

However, the primary factor is the link between the necessary operational, biological, economic and socio-cultural indicators and their associated variables.

The commonly used indicators and data variables for different types of fisheries policies are presented in the Table.1 and the extent of the use of different indicators for the different types of policies is presented in **Figure 4.**

Sustainable use of resources	**Biodiversity**
Biomass	Species composition
Catch per unit of effort (CPUE)	Status of key indicator species
Recruitment / Spawning Stock Biomass	Status of endangered species (CITES)
Maximum length ($L\infty$)	
Length at 1st maturity	**Increased production (quantity & value)**
Species composition	Total production (quantity)
By catch / discards	Total production (value)
Length/Age structure of individual stocks	
Livelihood (social performance/micro level)	**Exchange earnings (macro)**
Distribution of fishing income	Total export by quantity and value
Distribution of fish consumption	Contribution to GDP
Employment	Added value/processing developments
Access right to fishing	
Social status	
Sharing mechanism of catch	**Food security**
Seasonal dependency patterns	Social stability
Credit	Per capita consumption
Total catch	Per capita availability
G-index	Household budget
Fish price	Fish price
No of fishers/effort	
CPUE	

Table 1. Commonly used indicators by type of fisheries policy objective

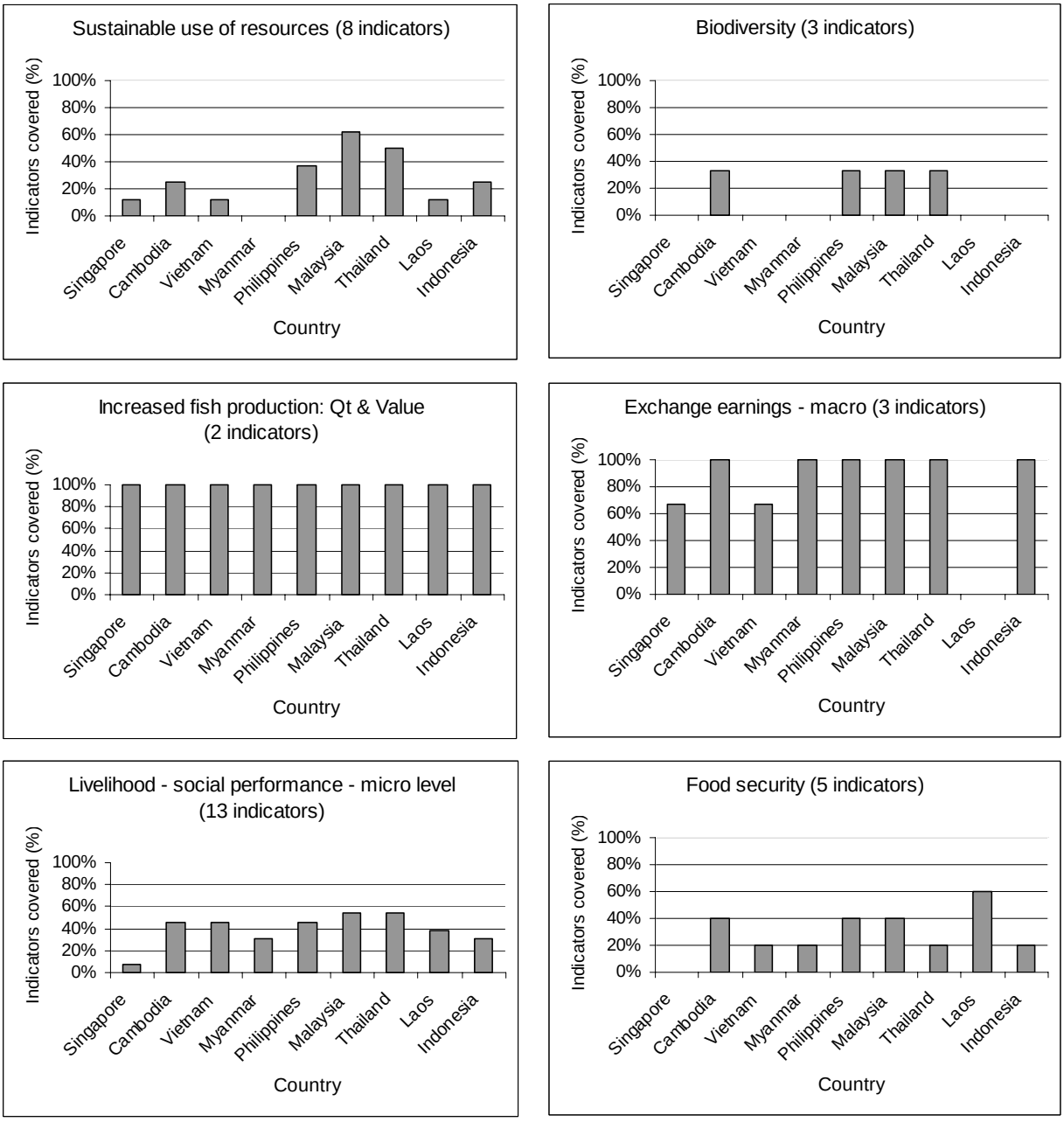

Figure 4. The coverage of policy related indicators for fisheries in the Southeast Asian countries

Realizing that the questionnaire does not provide a complete coverage of this topic, it is clear that the "traditional indicators and data variables" such as total catch, value and exchange earnings have a high coverage (60-100%) in the Southeast Asian countries, while the indicators for sustainable use of resources, food security, biodiversity and social performance have a much lower coverage (0-40%). This result of analysis clearly suggests that more efforts should be place on collecting data relevant to policy development and fisheries management. It raises a question if data are collected for "supporting national policies" or for the publication of "annual yearbook".

1.2.4 Define data collection strategy & data collection methods

Defining a data collection strategy

Before looking at the details of the data collection methods, an overall strategy is required. The way in which different data variables are collected needs to be tailored to the structure of the fishery. A key element in design is the degree to which fishers and others co-operate, an issue which is most effectively addressed by using a co-management approach. Designers must choose which variables need to be collected through complete enumeration and which should be sampled. Complete enumeration is expensive for many variables, but must be carried out for some if totals (e.g. total catch) are to be estimated for the fishery. Sampling is more cost effective, but care is required in designing the distribution of sampling effort in time and space. Finally, the strategy will be strongly influenced by the budget and personnel available.

In practice defining a data collection strategy is to make a good combination of different enumeration methods such as:

- A full enumeration and how often it should be carried out
- A stratified sampling programme and what type of stratification need to be applied.

In the Southeast Asian countries both full enumeration and stratified sampling are applied in fishery monitoring (see **Table 2**).

Country	Data types collected through full enumeration	Data types collected through (Stratified) sampling
Cambodia	▪ Fishing lots (industrial fisheries) by types of fishing gear – registration ▪ Middle-scale fishing gears-licensing ▪ Marine fishing gears-licensing ▪ Catch from fishing lots - log book	▪ Catch and effort for fishing lots – direct observation ▪ Catch and effort for meddle scale fisheries-licensing information, catch report and direct observation ▪ Fishers – project based surveys
Laos	▪ Structural information on fisheries -– rural census	▪ Socio economic indicators – Lao Expenditure and Consumption Survey
Malaysia	▪ No of fishing vessel by category – licensing ▪ Total catch – landing site survey	▪ Catch and effort - observation
Indonesia	▪ No of establishments, fishing boats and fishing units with motor - a complete survey ▪ Large fishing boats- licensing	▪ Non-motorized fishing units-complete survey in sample village
Philippines	▪ Structural information of the fisheries sector-–Fishery census	▪ Catch and effort by fishing ground, by species and by gear - random sampling
Vietnam	▪ Structural information of the fisheries sector-–Fishery census	▪ Catch and effort by gear – project based survey
Singapore	▪ No. of vessels - licensing	
Myanmar	▪ Fishing lots (leasable fisheries) – registration	
Thailand	▪ Structural information of the fisheries sector-–Fishery census	▪ Catch and effort by - random sampling and logbook

Table 2: Combination of different approaches in data collection in Southeast Asian countries

Defining method

The choice of method is influenced by the data collection strategy, the type of variable, the accuracy required, the collection point and the skill of the enumerator. Links between a variable, its source and practical methods for its collection can help in choosing appropriate methods. The main data collection methods are:

***Registration**: registers and licences are particularly valuable for complete enumeration, but are limited to variables that change slowly, such as numbers of fishing vessels and their characteristics.*

***Questionnaires**: forms which are completed and returned by respondents. An inexpensive method that is useful where literacy rates are high and respondents are co-operative.*

***Interviews**: forms which are completed through an interview with the respondent. More expensive than questionnaires, but they are better for more complex questions, low literacy or less co-operation.*

***Direct observations**: making direct measurements is the most accurate method for many variables, such as catch, but is often expensive. Many methods, such as observer programmes, are limited to industrial fisheries.*

***Reporting**: the main alternative to making direct measurements is to require fishers and others to report their activities (Logbooks). Reporting requires literacy and co-operation, but can be backed up by a legal requirement and direct measurements*

1.3 Define data processing & management

Fishery data must be stored securely, but made easily available for analysis. The design of a data management system should follow the basic data processing principles. The database should store the original raw data. The data management system should be integrated with the data collection system as far as possible. Database design and software development can vary in approach from adapting an existing system to designing a new system from scratch. In all cases, the system should be well documented. The human-computer interface needs to guide the user in getting the best out of the system, including help and local language facilities. Data entry should integrate import functions and validation controls, processing should use embedded functions for common procedures, and reporting should be flexible and include an export facility. The responsible authority must commit adequate financial and personnel resources for maintenance, make regular archives to protect the data, and periodically re-evaluate the design to be sure the system is meeting its objectives. Access should be controlled to ensure database integrity and confidentiality, but interfere as little as possible with legitimate access

The regional analysis of the questionnaire (**Figure 5**) shows that some significant progress could be achieved in most countries concerning the use of computerised tools specialized for management and analysis of the data and publication of fishery information. Among the possible improvements, we can cite:

- Use of regional and international standards, which would improve compatibility of data and facilitate exchange of data sets
- Better dissemination of information, using low cost electronic format as a complement to the statistical yearbooks

- Use of specialized distributed systems in order to (i) decentralize data entry and make possible quality controls at the source, (ii) facilitate storage of raw data time series at central level, etc...

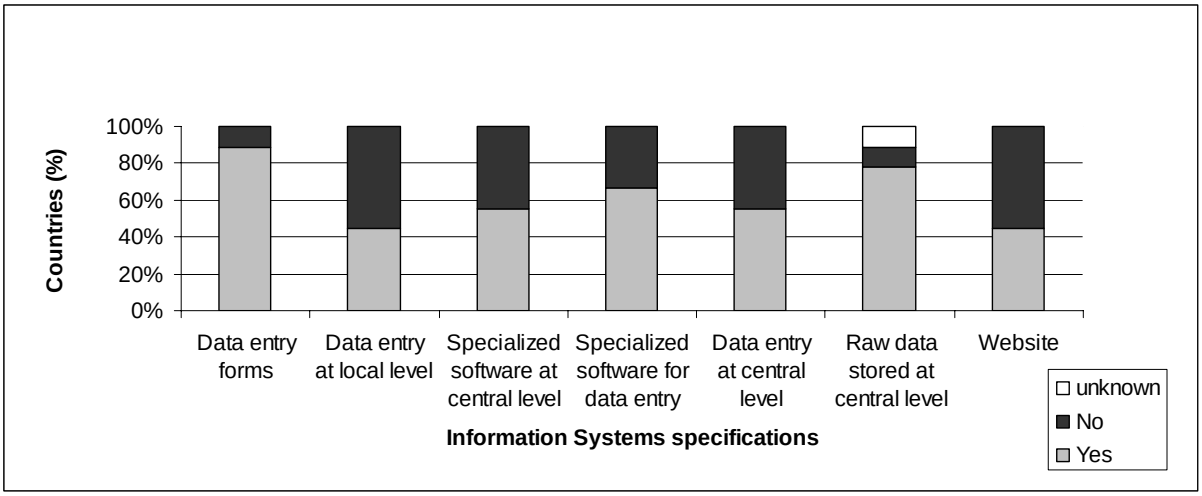

Figure 5. Data management systems in the Southeast Asian countries

1.3.1 Analysis of data and estimation of indicator values

Data must be analyzed to become meaningful information before they are disseminated to the intended users. This means that the process of analysing data is as important as designing monitoring programmes. The description of the analytical process can also indicate the reliability of the information generated. However, the returned questionnaires did not provide enough information on this important aspect.

1.3.2 Constraints and plans for improvement

Almost all countries (89%) claimed that their systems produced the information timely. However, this may simply mean that the statistical yearbooks and bulletins are produced in time. The analysis also indicated that only 11 % of the countries felt that the system met their information requirements. One question remains if this is due to outdated designs of the data collection systems that are not conforming to the needs of policy or due to technical or logistic constraints.

The questionnaire survey indicated that in 89% of the countries fisheries monitoring is hampered by a variety of constraints. The common constraints reported by countries in the region include:

- insufficient financial support
- lack of adequate facilities
- lack of manpower in terms of number and quality
- inadequate trained personnel
- lack of recognition from policy makers
- lack of cooperation from stakeholders
- lack of input from users
- lack of observer scheme
- lack of validation process

More quantitative details are presented in **Figure 6**.

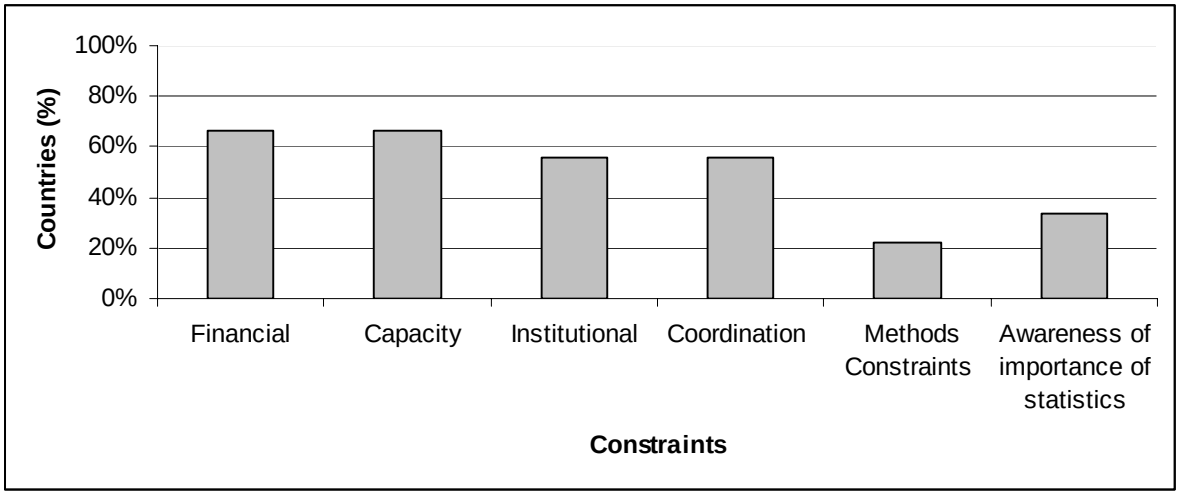

Figure 6. Common constraints in fisheries monitoring in Southeast Asian countries

The problem of insufficient human and financial resources seems to be still persistent and remains as the major constraining factor to affect data collection. Most of the constraints mentioned by the countries are related to technical aspects of data collection process (i.e. WHAT and HOW part in the data collection flow) and few problems are reported in relation to the relevance and appropriateness of the system design (WHY part).

In 75% of the countries there are plans to improve the system. These plans can be summarised as follows (see also **Figure 7**):

<u>System design improvement</u>

- flexible system design to allow easy modification to be responsive to changes in fisheries
- regular implementation of fishery census to obtain valid frame information
- enhance dialogue with stakeholders (fisheries industry and fishers' groups) and information users (scientists, MCS officers and fisheries managers) to raise their awareness and obtain feed back

<u>Methodological improvement</u>

- direct measurement of CPUE as an important basis for trend analysis
- improve logbook system for industrial fisheries to obtain catch statistics by fishing grounds (instead of by landing)

<u>Operational improvement</u>

- regular review of field implementation
- introduction of a computer-based data management system
- decentralised data management and analysis
- training of field officers and enumerators
- more controlled verification and validation actions

<u>Others</u>

- improve communication and coordination among other agencies that collect relevant data and information

Similar to the reported areas of problems and constraints, focus in plans for improvement is directed toward technical aspects of data collection such as training of enumerators/processors and/or improvement of data collection and processing. Enabling institutional arrangement (e.g. cooperation and specialization of functions) is also mentioned as an area of imrovement

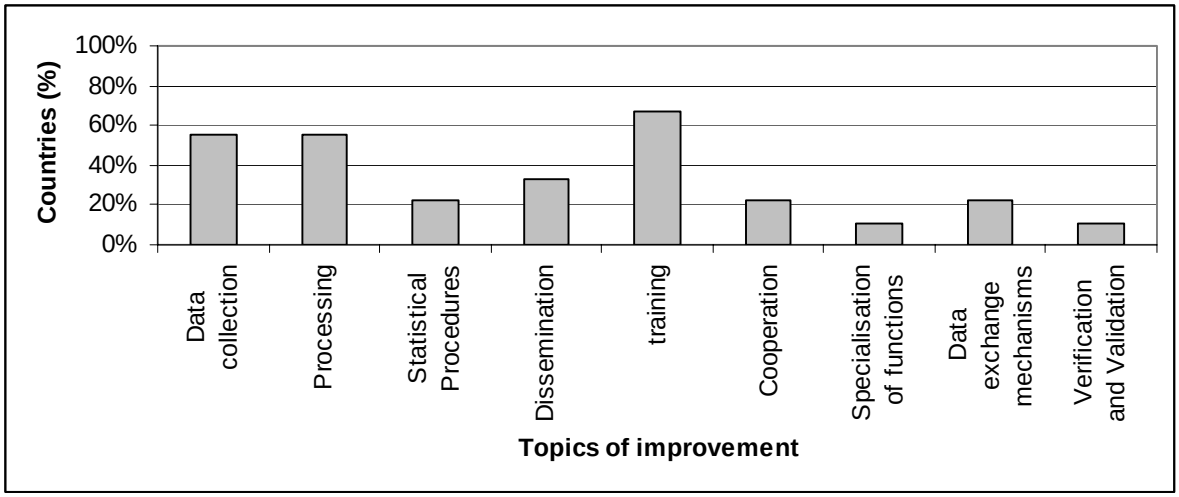

Figure 7. Planned areas of improvement of fisheries monitoring systems

1.4 Suggested issues to be addressed

1.4.1 Monitoring small-scale fisheries and socio-economic aspects of fisheries

The 25th Session of Committee on Fisheries (COFI) in 2003 recognised that small scale fisheries have not been given due attention and that small scale fishery in developing countries are not well monitored. One of the main objectives of the FishCode-STF project is to support improvement of monitoring of small-scale and multi-species fisheries, especially the socio-economic and livelihood aspects. The project supports the development of alternative methods that can appropriately monitor those fisheries.

The analysis confirmed the general world-wide trends in monitoring small-scale fisheries: it is also the case in Southeast Asian countries that the importance of fisheries for coastal and inland communities is not given due attention in national policies as well as in routine data collection (**Table 3**).

	Livelihood issues included in the national fisheries policy	Socio-economic data identified as an information need for fisheries policy and management	Socio-economics subject in routine data collection system
Cambodia	Yes	No	No
Indonesia	Yes	No	No
Laos	No	No	No
Malaysia	Yes	Yes	Yes
Myanmar	No	Yes	No
Philippines	No	Yes	No
Singapore	No	No	No
Thailand	No	Yes	Yes
Vietnam	Yes	No	No

Table 3: Status of monitoring socio-economic aspects of small-scale fisheries in ASEAN countries

1.4.2 Catch per Unit of Effort (CPUE) monitoring

Large number of countries in the region reported that their fishery data and information collection system allow measurement of CPUE while precise measurement of fishing efforts may not have been in place. This implies that CPUE may have been measured inappropriately. Such measurement of CPUE may not represent the actual index of fish abundance and therefore trend of CPUE may mean nothing. Caution is therefore of importance. The real fishing effort exerted to any fish stock combined with its associated catch should represent index of abundance of fish stock. A good measurement of CPUE is obtained from, for example, a log book survey of fishing vessel for which observer aboard could make field check from time to time. Most of fishery statistics in the region focuses on measurement of “landings” and non of fishing gears and boats. Simply dividing landings by number of boats or fishing gear could lead to erroneous results even though time series analysis may show a beautiful downward trend.

1.4.3 Coordination of existing survey works

Problems of insufficient support in terms of finance and human capacity seem to be common among all ASEAN countries and this situation may be persistent in the near future. With this situation, efforts should be made how best to improve the existing data collection system rather than unrealistically attempt to obtain additional funds and human resources.

It was observed that there were a number of related survey frameworks in place within a country, however, there were little linkage and coordination among different surveys. Significant improvement in fishery data collection can be made if all the survey works are conducted in a coordinated manner. **Figure 8** illustrates a sample case of better utilization and coordination of existing survey frameworks. If one country conducts a fishery census or an agriculture/rural census, which is a decennial event in many cases, the up-to-date frame information of the fisheries sector can be provided to improve the process of routine collection of data (e.g. to update the sampling frame). More reliable and relevant information can then be made available for target information users such fishery planners and policy makers). At the same time, research institutions or externally funded projects are often engaged in ad hoc fishery surveys producing detailed or area specific fishery information. Such information are very valuable to supplement and validate routinely collected data. If the timing of all information generating activities are well-coordinated as shown in the figure 5, it would significantly contribute to improve the existing survey works and thus could feed the quality information in the national sector planning cycle in a timely manner to support informed decision making.

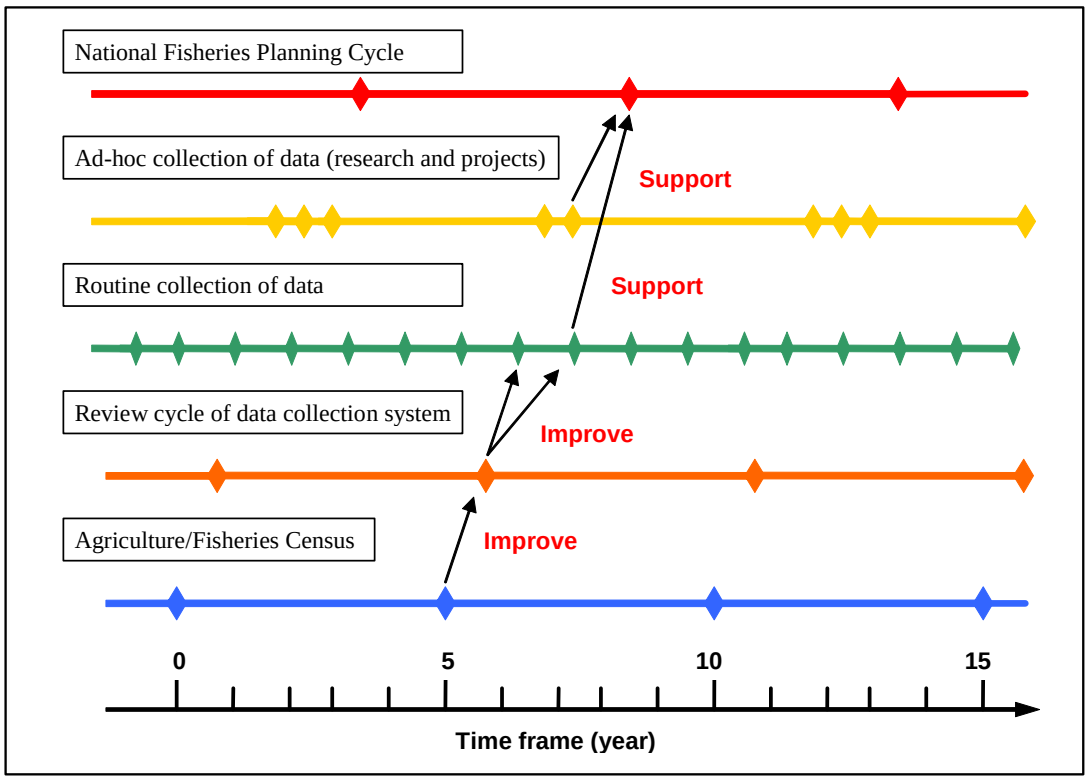

Figure 8. A sample case of coordinated survey works

1.4.4 Feedback

The analysis of the questionnaires indicates that 70% of systems do not meet users' requirements. On the other side, data providers have sometimes difficulties to understand why data are collected, why they have an interest to collaborate in the system. Table 4 presents subjects of feedback between different actors participating in data collection, analyses and policy formulation. In order to improve the quality and efficiency of fisheries data and information collection systems, these subjects should be discussed among the actors involved on regular basis.

Table 4: Feedback/interactions between the different actors participating in data collection, analyses and policy formulation

FROM / TO	Decision makers	Scientists Statisticians	Data Collection System managers	Field officers/ enumerators	Stakeholders
Decisions makers		▪ Meta data on analysis: hypothesis, limits of utilization	▪ Constraints / Problems encountered		▪ Understanding of management measures
Scientists & Statisticians	▪ Clarify information requirements ▪ Evaluate relevance & timelines of data		▪ Meta data on data provided: accuracy, raising procedures	▪ Problems in collecting data	▪ Information not included in routine data collection
Data Collection System managers	▪ Clarify information requirements ▪ Evaluate relevance & timelines of data	▪ Validate and verify the data collected and its process		▪ Technical/operational difficulties in collecting data	
Field officers/ enumerators		▪ Importance of the data collection procedures ▪ How the data are used	▪ Technical /operational guidance ▪ How the data are used		▪ Information not included in routine data collection
Stakeholders	▪ Inform fishery policy ▪ Justification of management measures	▪ Importance of statistics ▪ Feed back the results of analysis	▪ Awareness building on the importance of statistics ▪ Feed back the results of analysis	▪ Awareness building on the importance of statistics ▪ Feed back the results of analysis	

2 COUNTRY REPORTS

2.1 COUNTRY REPORT: CAMBODIA

2.1.1 Summary

Why is Information Needed and Who is Collecting it

The strategic goals for the development of the fisheries sector includes; sustainable harvest of fisheries resources; development of participatory fisheries management; safeguard the livelihood of fishers; maintain food security and safeguarding of critical habitats.

Data on fisheries is collected by

1. Department of fisheries (DoF) for data collection of inland and marine fisheries
2. National Institute of Statistics (NIS), Ministry of Planning for structural information on communities
3. Custom office for export data

The information would support the development of fisheries management plans and will be used by International/regional organizations such as FAO, Mekong River Committee (MRC), NGOs and researchers.

What would be Needed

The aim of the different institutions involved is to collect data on inland and marine capture fisheries (quantity and value); fish consumption; exportation, socio economic issues of community fisheries, population census, income, and employment

What and How is Data Collected

A large part (70%) of the data is actually collected through:

1. (Inland fisheries) stratified monthly sampling based on a frame survey of fishing gears. The data items include, district wise catch by species and by gear and value of the catch. Presently only the large and middle sized gears (fishing lots) are monitored.
2. (Marine fisheries) license information, logbook information and interviews
3. (Fish export and trade) customs office
4. No of fishers, income and other socio economic data are obtained through regular census

How is Data Processed and Analysed

All data collected by DoF are entered in a central data base. Inland fisheries data are analyzed with ArtFish, and marine fisheries data and the socio-economic data are analyzed with simple spreadsheets. The data are made available in hard and softcopy and through a website and published annually

Major Constraints and Improvements of the System

The major constraints of the system and its implementation are**:**

- Limited funds
- Insufficient capacity building activities have been implemented
- Low salary and limited incentives for data collection

- Limited number of man power
- Insufficient capacity although some capacity building activities have been carried out.

Presently there are no direct plans for improvement of the system.

2.1.2 Edited Country Questionnaire

The returned country questionnaires were analysed in a systematic way in order to allow comparison of the different systems used. For this a check list was made. Below the answers of the questionnaire are presented in the different "Text boxes" after which the results of the checklists are provided. For the checklist, the answers from the questionnaire were used in combination of existing information obtained from various FAO and SEAFDEC reports. Not all of the topics could be covered and during the workshop it will be attempted to fill in the gaps

PART 1: WHY

A WHY FISHERY DATA AND INFORMATION ARE NEEDED

A.0 ***Check if a national policy and/or management objectives are formulated for the country***

The strategic goals that are being adopted to guide fisheries sector development in Cambodia includes:

1. *All living aquatic resources should be harvested within their sustainable limits by 2010;*
2. *Governance systems and procedures that allocate resources use rights and obligations through democratic means and community participation are in place and fully operational by 2010;*
3. *The supply of fish and fishery products will keep pace with increasing demands to safeguard the nutritional standards, and the social and economic well-being of communities depending on fisheries for their livelihood;*
4. *Effective and adequate support is provided to help private sector development and expansion in fisheries, in particular aquaculture where Cambodia has significant comparative advantages; and*
5. *Critical habitats used for fisheries and aquaculture is safeguarded.*

A.0.1 Country policy available Yes—No
A.0.2 Year of when latest policy established: 2000 (still draft with WB support)
A.0.3 List major topics of national fisheries policy:
A.0.3.1: Sustainable management
A.0.3.2: Participatory management
A.0.3.3: Livelihood & food security
A.0.3.5: Private sector development
A.0.3.6: Protection of critical habitats

A.2 Describe the existing national policy and management objectives for which fishery information is required:

A.1 What data/information do you need or wish to have for policy and management

We need the following information:

- *Inland and marine capture fisheries, quantity and value*
- *Fish consumption, exportation, and the contribution of fisheries in GDP*
- *Socio economic issues of community fisheries, Population census, income, and employment*

A.1.1 Indicate if the answers on information requirements are belonging to one of the following groups:

A.1.1.1 Resource
A.1.1.2 Catch assessment
A.1.1.3 Trade/export
A.1.1.4 Production/fleet capacity
A.1.1.5 Labour
A.1.1.6 Economics
A.1.1.7 Environment
A.1.1.8 Fish utilization/processing
A.1.1.9 Biological
A.1.1.10 Fish price

A.3 List other needs of information

Fisheries information is widely used and needed not only by the government itself, but also by others include:

- *FAO*
- *The Mekong River Commission*
- *Local/international NGOs of relevant fisheries activities*, *Academic researchers*

A.3.1 Other users' needs identified Yes – No
A.3.2 If yes, then requirements are related to:

A.3.2.1 Inter/regional agreements
A.3.2.2 Needed for other sector planning
A.3.2.3 For private sector
A.3.2.4 Other agencies
A.3.2.5 NGOs & Universities

A.4 Describe objectives of fishery data collection

- *Understand the production and resource base of both marine and inland fisheries*
- *Identify endangered and extinct fish species*
- *To support decision making and prioritizing of development projects*

A.5 Description on how objectives of data collection are implemented through major data collection systems

As a routine work, fisheries data collection has so far followed two systems:

- *MRC project-trained collection system: it has been implemented in Cambodian inland capture fisheries, in which, method of data collection was scientifically trained.*
- *Existing data collection system: it has been implemented in Cambodian marine capture fisheries, in which, government relies on the catch data in fishermen's log book.*

A.5.2 Are there specialised systems/functions in A5: Yes---No

A.6 Indicate whether intended users of fisheries information receive required information

Yes, at the moment although there is inadequate information or not very accurate one, fisheries information users still receive required information. FAO, SEAFDEC and researchers, for instance, always look at the information gap and do many necessary activities in their relevant projects to achieve their goals.

A.6.1 Is the way information produced from data collection systems submitted to intended users fulfil their needs #---1---2---3---4---5

A.6.2 Are the dissemination channels diverse enough to assume that users are satisfied: #---1---2---3---4---5

PART 2 --- WHAT

PART 2-1: INDICATORS AND DATA VARIABLES

B WHAT SHOULD BE COLLECTED

B.1 What are the data items (indicators and variables) that are currently collected

The data items that are currently collected:

- *Inland capture fisheries (Fishing lot, Middle-scale, Family fisheries and rice field fisheries.*
- *Marine capture fisheries*
- *Aquaculture (Production from pond, cage, and pen)*
- *Fish processing (fish frozen factories of both inland and marine)*
- *Fish export (fresh fish, processed fish)*
- *Fishing gears*
- *Fishing boats*
- *Man power (No. of fishermen)*
- *Fisheries income*

B.1.1 Identify the gap between "wanted" and "have"
How large is the gap calculates as number of "do"/number "wanted":
Score from the table: 70%

	Wanted	***Actual do regularly***
1	*Inland capture fisheries*	*Inland capture fisheries (Fishing lot, Middle-scale, fishing gears)*
2	*Marine capture fisheries*	*Marine capture fisheries (fishing boats)*
3	*Fish consumption*	
4	*Export and contribution to GDP*	*Fish export*
5	*Socio economics*	
6	*Income and employment*	*Fisheries income*
7	*Census*	

B.2 Indicate whether different sets of data items are collected for different subject areas of fisheries

The sets of data items are collected for different fisheries: small scale, medium scale, and large scale (fishing lot) fisheries

B.2.1 can we identify the list of subject areas covered by each collection system:
Yes---No
B.2.2 How many subject areas indicated: 3
B.2.3 Name them:

B.2.3.1: Marine
B.2.3.2: Inland
B.2.3.3: Aquaculture

B.2.4 Are indicators provided specifically for different subject areas: Yes---No
B.2.5 Is there an overlap in indicators between the subject areas: Yes----No---Don't know

B.3. Provide definitions for classification terms used in the data collection

They have but not provided

B.3.1 Are definitions provided for subject areas and fisheries segments identified above: Yes--No
B.3.2 Are definitions existing at national level: Yes---No
B.3.3 Are definitions compatible with regional/international defined classifications: #---1—2—3—4--5

PART 2-2: INSTITUTIONAL ARRANGEMENTS FOR DATA COLLECTION, PROCESSING AND REPORTING.

C. HOW ARE DATA COLLECTED AND MANAGED

C.1 INSTITUTIONAL ARRANGEMENTS

C.1.1 Indicate the national structure for fishery data collection, compilation, analysis and dissemination

The responsible fisheries data collection, compilation, analysis and dissemination body is the statistical section of the Department of Fisheries. The statistics so far have been taken from provincial fisheries offices ranging from aquaculture, inland and marine fisheries (Fig.1). The provincial fisheries offices also compile the report from their own fisheries districts through fishermen's logbook. The lack of funds, skills, and techniques has been an obstacle of the operation of the statistical data collection and analysis. The available statistics so far are not very reliable and need to be improved.

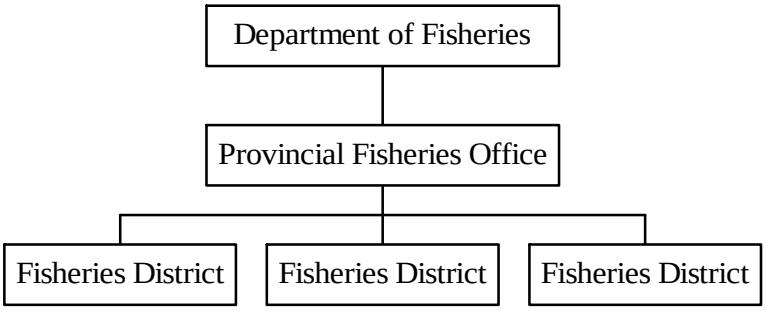

Fig. 1 Old System of the Statistical Data Collection and Compilation

After the establishment of the cooperation project between Department of Fisheries and Mekong River Commission in 1994, data and information on fisheries have been improved and is more reliable. We have understood more on the status of the inland fisheries both on biological and ecological aspects.

Part of the overall DoF/MRC Capture Fisheries Project activities was the assessment of fish catch and value from fisheries. The project applied a stratified sampling scheme. The estimate was the fish catch by month, by gear, by season, by district, by province, price and value for large and medium-scale fisheries. The administrative structure of the project for data collection and analysis is shown in Figure 2. The first comprehensive socio-economic survey on small and medium scale fisheries was carried out in 1995/96.

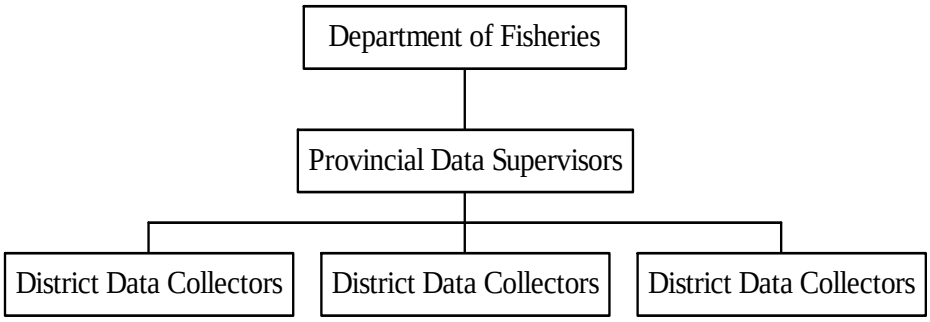

Fig. 2. The Project System of the Statistical Data Collection and Compilation

C.1.1.1 Institutional arrangements: How many institutes involved: 3 (Custom office, NIS and DoF)

C.1.1.2 Is there coherence between the institutes involved and the subject areas / major data collection systems as defined in B2/B3: #---1---2---3---4---5

C.1.1.3 Does the organigram reflect a specialisation of the functions vertically / horizontally: #---1---2---3---4---5

C.1.1.4 Is there a vertical distribution of responsibilities for data collection and management at different levels: #--1--2---3--4--5

C.1.2 Describe the coordination mechanisms among agencies/institutions concerned

The coordination mechanism among agencies/institutions concerned are: FAO, SEAFDEC, MRC, UNEP, Sida, DEFID, ADB, WB, AIT etc. Others within the country are: the Ministry of environment, Ministry of Planning, and custom officers

C.1.2.1 Are there communication mechanisms between these institutions: Yes---No

C.1.2.2 Is there a coordinating body: Yes---No---Don't know

C.1.2.3 Are responsibilities identified: #---1---2---3---4---5

C.1.2.4 Are partners for different responsibilities identified: #---1---2---3---4---5

C.1.2.5 Is the structure complex: #---1---2---3---4---5

C.1.3 Describe operational resources allocated for data collection for both central and local levels

The operational resources allocated for data collection for both central and local levels.

1. *Central level (DoF): The fisheries information is under planning office that has five staffs.*
2. *Local level: The fisheries information is under provincial fisheries office that has 3-4 staffs.*
3. *Opportunities for training and other capacity development on the how to collect data and information, improving data collection system, how to use computer soft ware (Art fish, access, excel, SPSS).*
4. *Operational resources: N/A*

C.1.3.1	Is there a budget problem	Yes---No---Don't know
C.1.3.2	Is there a staffing problem	Yes---No---Don't know
C.1.3.3	Is there an equipment problem	Yes---No---Don't know
C.1.3.4	Is there a coordination problem	Yes---No ---Don't know
C.1.3.5	Organisation at central level 1= simple... 5= complex: #---1---2---3---4---5	
C.1.3.6	Organisation at local level 1=simple.... 5= complex: #---1---2---3---4---5	

PART 2-3: TECHNICAL ASPECTS OF DATA COLLECTION, PROCESSING AND REPORTING

C.2 DATA COLLECTION

C.2.1 Describe methodologies for data collection for each subject area or fishery

The methodologies for data collection for each fishery:

Inland fisheries: Data collection is conducted on three types of fisheries: Fishing lot, middle-scale fisheries and family fisheries by using licensing and sampling methods.

Marine fisheries: Licensing and estimated at the landing site
Under the old system, still used in the marine sector, data were collected from the log books, fishing licenses and interviews with the fishermen. Those statistics did not record any species of fish, but briefly categorized the catch into three grades of fish based on prices. These statistics were collected by the provincial fisheries offices before being sent to the Fisheries Department. However, the use of the burden books is still the basis for catch estimation.*
In contrast, the system of data collection and analysis of Project for the Management of the Freshwater Capture Fisheries of Cambodia is done with more scientific methods. A stratified random sampling system is applied based on a frame survey of fishing gears. Data collection records all species captured, catch by each gear, by month, by season, by sector districts, and the price/kg (at the landing site) and the total value are also recorded. At present only the large and middle scale fisheries are being monitored

C.2.1.1 Is there evidence of a description by major data collection system and/or subject area: Yes---No

C.2.1.2 Are we able to understand the provided procedures for elaborating indicators by group of indicators / subject area: Yes---No

C.2.1.3 The methods encompass:

C.2.1.3.1 Frame survey
C.2.1.3.2 Effort survey
C.2.1.3.3 Catch survey
C.2.1.3.4 Quality check survey
C.2.1.3.5 Logbook survey
C.2.1.3.6 Census methods
C.2.1.3.7 Nutritional/consumption survey
C.2.1.3.8 Others
C.2.1.3.9 Registration/License

C.2.1.5 Are stratification procedures explained: #--1---2---3---4---5

C.2.2 How often is the data collected on what time basis. Provide a time line indicating the approximate schedule of data collection

C.2.2.1 Are time, space and other criteria (e.g. species, gear types, etc) defined, are their level of precision / resolution defined, and are these levels highly aggregated or allowing detailed reporting

C.2.2.1.1 Time inland #---1---2---3---4---5
C.2.2.1.2 Space inland #---1---2---3---4---5
C.2.2.1.3 Species inland #---1---2---3---4---5
C.2.2.1.4 Gears inland #---1---2---3---4---5

This is for inland fisheries, not enough information is available for marine fisheries

C.2.2.2 Are there existing standards for statistical units and approaches and at which level (national, regional, international):

National #---1---2---3---4---5
Regional #---1---2---3---4---5
International #---1---2---3---4---5

C.3 DATA PROCESSING

C.3.1 Are there different methods of estimation for different subject areas or fisheries, if so please list

Inland fisheries:

- *Fishing lot: by using logbook*
- *Middle-scale: Licensing*
- *Family fisheries: Socio-economic (during MRC-no longer in use), spreadsheet (no. of fishers- census data multiplied by fish consumption per year –from MRC project(1994-98)*

Marine fisheries: Licensing (log book) and estimated at the landing site, spreadsheet

For the production by less than 33 hp boats- local officer interviews fishers average catch by boat then multiplied by no of boats in the area.

C.3.1.1 Are there different processing methods for different subject areas:
Yes---No---Don't know

C.3.1.2 List the different methods

C.3.1.2.1: Spreadsheet

C.3.2 Describe the processes of data compilation and storage including hardware and software used

Processed data are compiled as hard and softcopy (Excel). Compiled data are compared with the data from other sources (e.g. consumption data from a MRC project) – however quality of secondary data is often questionable.

Data entry sheets (inland fisheries only):

C.3.2.1 Includes some sort of quality control procedures
Yes----No---Don't know

C.3.2.2 Standardized entry forms: Yes---No---Don't know

Data entry in a computerized system:

C.3.2.3 made by data collectors: Yes---No

C.3.2.4 using a specialized database: Yes---No---Don't know

C.3.2.5 Simple software like word, excel, access
Yes---No---Don't know

C.3.2.6 Directly in the central system: Yes ---No---Not provided

C.3.2.6.1 Remote---Direct

C.3.2.7 Include data validation / quality control procedures:
Yes---No---Don't know

C.3.2.8 Data review at local level: Yes---No---Don't know

C.3.2.9 Data review at sub national level: Yes---No---Don't know

C.3.2.10 Data review at national level: Yes---No---Don't know

Central System:

C.3.2.11 Specialized software: Yes---No---Don't know
C.3.2.12 Automated procedure to import data from decentralized entry points Yes---No---Don't know
C.3.2.13 Includes data validation procedures: Yes---No---Don't know
C.3.2.14 Merged data coming from different data collection systems: Yes---No---Don't know
C.3.2.15 Stores raw data: Yes---No---Don't know
C.3.2.16 Stores aggregated data: Yes---No---Don't know
C.3.2.17 Does the system facilitate integration of data from different sources: Yes---No---Don't know

Timeliness:

C.3.2.18 Time between data collection and entry (or import) in the central system in month: monthly basis

Logbook submission (monthly) -District to province (once a month) - Province to Central (once a month) – data entry at central level (monthly)

C.3.3 How is the analysis of statistical data conducted and by whom is information from other sectors/institutions outside fisheries sector used to provide a more holistic approach?

No, in general there is no fisheries statistical data conducted by others that are being used for a more holistic report, except the statistic data conducted by MRC project on the management of inland capture fisheries.

C.3.3.1 Analysis is: Centralized----Decentralized---Both
C.3.3.2 Are the raising procedures well described: Yes---No---Don't know
C.3.3.3 Are the procedures following a standardized method: Yes---No---Don't know
C.3.3.4 Are statistical procedures applied: Yes---No---Don't know
C.3.3.5 Statistical procedures encompass:

- C.3.1.5.1 No procedures
- C.3.1.5.2 Sample size check
- C.3.1.5.3 Stratification of PSU
- C.3.1.5.4 adaptation and check of raising factors

C.3.3.6 Is there an independent review procedure Yes---No---Don't know

C.4 REPORTING

C.4.1 In what form are the data/information packaged, presented and disseminated

C.4.1.1 Reporting format: Paper ---Digital---Website (statistical bulletin)

C.4.2 Are there statistical reports routinely prepared for information users, how often are they made available

C4.2.1 Reporting schedule: Quarterly---Annually
C4.2.2 Timeliness (Last published report): 2003

PART 2-4 IMPROVEMENT OF SYSTEM

D HOW CAN THE SYSTEM BE IMPROVED

D.1 System design

The data and information collecting system of inland fisheries in particular, were once improved in 1994 by MRC project. The existing information collection system from the record of fishermen's log books were changed by focusing on:

- *CPUE*
- *The composition fish species and their status*
- *Catch and value at landing site and retail market*
- *Ecological information*
- *Fishing effort (number of gears, days, gear types, number of fishers*
- *Quantity of export of fish and fishery products*

D.1.1 Describe the designing process of the data collection system and major historical changes in the design or implementation of the system

D.1.1.1 When was the system originally designed: estimation of total production re-started in 1980 and licensing (logbook) in 1989.
D.1.1.2 Changes in the past: Yes --- No---Don't know
D.1.1.3 How many times it changed: not known
D.1.1.4 When was the last change: about 16 years ago
D.1.1.5 Why changes:

- D.1.1.5.1 Shift in policy (new fishery law introduced in 1987)
- D.1.1.5.2 Technical improvement (estimation method revised in 1994 by MRC project)
- D.1.1.5.3 Budget constraints
- D.1.1.5.4 Statistical improvement
- D.1.1.5.5 Institutional improvement
- D.1.1.5.6 International requirements

D.1.2 Indicate whether the information users were consulted in the planning and reviewing process in order to meet their needs

There are some advice from academic researchers in relation to the improvement of information gathering, but financial support is still the only obstacle

D.1.2.1	Are stakeholders formally involved in the formulation process	Yes---No---Don't know
D.1.2.2	How many stakeholder groups:	

D.1.3. Is there any metadata available

D.1.3.1	Methodology notes available	Yes---No---Not provided
D.1.3.2	Manuals available	Yes---No---Not provided
D.1.3.3	Statistical procedures described	Yes---No---Don't know
D.1.3.4	Metadata available	Yes---No---Don't know

Reporting obligation and process as a condition of licensing is described in the fishery law.

D.2 Data quality and improvements

D.2.1. What are the perceived weaknesses and problems with the current data collection system

D.2.1.1	Does system meet requirements	Yes---No---No opinion
D.2.1.2	Produces information timely	Yes---No---No opinion
D.2.1.5	Is the system static or evolving	#---1---2----3---4---5

D.2.2 What are the constraints and opportunities in improving quality aspects of information

The constraints:

- *Limited funds*
- *Insufficient capacity building activities have been implemented*
- *Low salary and limited incentives for data collection*
- *Limited number of man power*
- *Insufficient capacity although some capacity building activities have been carried out.*
- *Language problems of data collectors in the field*
- *Lack of incentive for data collectors to continue their work after the completion of projects.*

Opportunities:

- *Training involved personnel on the statistical data and information handling techniques.*
- *Strengthening the communication and cooperation between FAO-SEAFDEC and the Department of Fisheries in exchange information and assistance from FAO-SEAFDEC*

D.2.2.1 Constraints in improving quality Yes---No---Don't know
D.2.2.2 Constraints are:
D.2.2.2.1 Financial
D.2.2.2.2 Capacity
D.2.2.2.3 Institutional (experienced officers often leave public service as they are lured by higher wages in NGOs/private sectors)
D.2.2.2.4 Coordination
D.2.2.2.5 Methods
D.2.2.2.6 Awareness of importance of statistics
D.2.2.3 Opportunities

FAO –SIDA project

D.2.3 Describe plans and actions necessary to improve current information

D.2.3.1 Is there a plan for improvement Yes---No---Don't know
D.2.3.2 Improvement encompass:
D.2.3.2.1 data collection
D.2.3.2.2 processing
D.2.3.2.3 statistical procedures
D.2.3.2.4 dissemination
D.2.3.2.5 training
D.2.3.2.6 cooperation
D.2.3.2.7 specialisation of functions
D.2.3.2.8 data exchange mechanisms
D.2.3.3 Financial and institutional support is secured for improvement
Yes---No---Don't know

E SUPPLEMENTARY INFORMATION

E.1 Institutional arrangements of the fisheries administration

E.1.1 Indicate the administrative structures responsible for fisheries management, development and monitoring for each administrative division (if any) Describe the roles of each institution involved

1- *Director of Fisheries Department*
2- *Four Deputy Fisheries Department: Helping the Director with different jobs.*
3- *Seven heads of office*
4- *One Inland Fisheries Research and Development Institute*
5- *Twenty three provincial fisheries offices.*

E.1.1.1	Different administrative divisions responsible:	Yes---No---Don't know
E.1.1.2	How many divisions:	CFDO only
E.1.1.3	Are local communities involved:	#---1---2---3---4---5
E.1.1.4	Are there activities for CCRF:	Yes---No---Don't know
E.1.1.5	Is there frame for CCRF	Yes---No---Don't know
E.1.1.6	Is this frame well developed:	#---1---2---3---4---5

E.1.2 Indicate related articles of fisheries and statistical laws that specify reporting responsibilities

Fisheries Law (Fiat Law) No. 33, 1987. It is now in the process of drafting new Fisheries Law

E.1.2.1	Are the laws provided:	Yes---No
E.1.2.2	Are there specific laws for reporting responsibilities	Yes---No---Don't know

E.2 Non fishery information and non statistical information

E.2.1 Is there statistical non-fishery information available, if any, please list

- *Population Census (Ministry of planning, 1998)*
- *Labour Force Survey of Cambodia (The ministry of planning 2000)*
- *National Accounts of Cambodia 1993-2000*
- *Socio-Economic Assessment of Freshwater Capture Fisheries.*

E2.1.1 Is non fisheries information available: #---1—2—3—4—5
E2.1.2 Is it used Yes---No---Don't know

E.2.2 Is there any non-statistical information that can be used to supplement the statistical data

Market research on fish price (collected by provincial fisheries officers)

E.2.2.1 Is there useful non statistical information**:** #---1---2---3---4---5
E.2.2.2 If available is it used: Yes---No---Don't know

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2.2 COUNTRY REPORT: INDONESIA

2.2.1 Summary

Why is Information Needed and Who is Collecting it

The national fisheries development plan is formulated every five year under the so-called Strategic Plan (RENSTRA) to which supported by annual development plan (REPETA). Current five-year fisheries development plan is under RENSTRA 2000-2005. The general fisheries policy is also embedded the new Fisheries Law No.31/20041 for which the objectives of fisheries development include the sustainable management of the resources, enhanced socio-economic benefits, food security, foreign exchange earnings and conservation of marine biodiversity.

The Directorate General of Capture Fisheries (DGCF) is responsible of the collection of data related to marine and inland capture fisheries. Initial processing of data is done at district level; data are then compiled at the provincial level and finally at the central level for analysis and dissemination.

What would be Needed

Fisheries managers need information on catch composition (species and size), productivity, stakeholders (fishers, traders, processors, etc.), socio-economic data and distribution.

What and How is Data Collected

Information on production means (fishing units, establishments and fishers) is collected through frame surveys or licensing system especially for industrial fisheries. Catches and values are sampled in ports and landing places.

How is Data Processed and Analysed

Production means are estimated annually, where estimation of catch and effort is done quarterly. Report is published every two years on paper and in electronic form initiated in 2004.

Major Constraints and Improvements of the System

Data collection on industrial fisheries still faces constraints owing to the non-cooperative attitude of a number of fishing companies. Methodologies for data collection on tuna industrial fisheries, is being revised to respond to needs relating to global trade for which IOTC plays a part in the revision of species list and methodology in data collection. A specialized computerized system is being developed for which data processing at district/provincial levels are the main targets for improvement.

2.2.2 Edited country questionnaire

The returned country questionnaires were analysed in a systematic way in order to allow comparison of the different systems used. For this a Check list was made. Below the answers of the questionnaire are presented in the different "Text boxes" after which the results of the checklists are provided. For the checklist, the answers from the questionnaire were used in combination of existing information obtained from various FAO and SEAFDEC reports. Not all of the topics could be covered and during the workshop it will be attempted to fill in the gaps.

PART 1: WHY

A WHY FISHERY DATA AND INFORMATION ARE NEEDED

A.0 Check if a national policy and/or management objectives are formulated for the country

A.0.1 Country policy available Yes—No

The fisheries sector policy is well described in RESTRA as well as in annual fisheries development plan. The current fisheries policy emphases on efficient and sustainable management of aquatic resources and the rehabilitation of damaged coastal and marine ecosystems, through improved spatial planning.
Further objectives for fisheries management as contained in the Fisheries Act include:

- *sustainability of the marine resources*
- *introduction of appropriate technical, economic and biological management measures*
- *enhanced socio-economic benefits*
- *supply of fish protein and food security*
- *foreign exchange earnings*
- *employment opportunities*
- *development of management plans*

A.0.2 Year when latest policy established: 2004
A.0.3 List major topics of national fisheries policy:
A.0.3.1 Sustainable management of marine resources
A.0.3.2 Socio economic benefits
A.0.3.3 Food security
A.0.3.5 Foreign exchange earnings
A.0.3.6 Conservation of marine biodiversity

A.2 Describe the existing national policy and management objectives for which fishery information is required:

1. *Reduction of fishing pressure in overexploited area and expansion of fishing in underexploited areas.*
2. *Strengthening of MCS for foreign fishing through provision of VMS scheme.*
3. *Improvement of livelihood of fishers, especially for the small-scale fisheries sector*

A.1 What data/information do you need or wish to have for policy and management

1. *Catch composition (species and size)*
2. *Productivity*
3. *Information of stakeholders (fishers, traders, processors, etc.)*
4. *Socio-economic data*
5. *Distributions*

A.1.1 Indicate if the answers on information requirements are belonging to one of the following groups:

A.1.1.1	Resource
A.1.1.2	Catch assessment
A.1.1.3	Trade/export
A.1.1.4	Production/fleet capacity
A.1.1.5	Labour
A.1.1.6	Economics
A.1.1.7	Environment
A.1.1.8	Fish utilization/processing
A.1.1.9	Biological
A.1.1.10	Fish price

A.3 List other needs of information

1. *Revenue*
2. *GNP and GDP*
3. *Fisheries workers*
4. *Fisheries industry*

A.3.1 Other users' needs identified: Yes – No

A.3.2 If yes, then requirements are related to:

A.3.2.1	Inter/regional agreements
A.3.2.2	Needed for other sector planning
A.3.2.3	For private sector
A.3.2.4	Other agencies

A.4 Describe objectives of fishery data collection

1. *To monitor status of development of fisheries*
2. *To fulfil the need of fisheries planning*
3. *To fulfil the need of fisheries management*
4. *To fulfil the need of other users*

A.5 Description on how objectives of data collection are implemented through major data collection systems

The objectives of data collection are currently achieved from:

- *routine data collection*
- *non-routine data collection, such as socio-economic data for certain areas.*

A.5.2 Are there specialised systems/functions in A5: Yes---No

A.6 Indicate whether intended users of fisheries information receive required information

The information collected by the National Fisheries Agency has been distributed only to Provincial and District Fisheries Agencies, as well as Research Center for Capture Fisheries Agency. It is expected that those agencies (Provincial and District Agencies) could inform further the information.

A.6.1 Is the way information produced from data collection systems submitted to intended users fulfil their needs: #---1---2---3---4---5

A.6.2 Are the dissemination channels diverse enough to assume that users are satisfied: #---1---2---3 --4---5

PART 2--- WHAT

PART 2-1: INDICATORS AND DATA VARIABLES

B WHAT SHOULD BE COLLECTED

B.1 What are the data items (indicators and variables) that are currently collected

Capture fisheries data:

1. *Production and value by species and by fishing gear*
2. *Disposition of production by type of disposition*
3. *Number of boats by category and tonnage*
4. *Number of fishing units by fishing gear*
5. *Number of establishment by category*
6. *Number of fishers*

B.1.2 Identify the gap between “wanted” and “have” How large is the gap calculates as “number do”/”number wanted”: score from table: 25%

	Wanted	*Actual do regularly*
1	*Catch composition*	*Production by species and gear*
2	*Productivity*	*Frame vessel and gears*
3	*Stakeholders information*	*Frame fishers*
4	*Socio economics*	*Frame establishments*
5	*Distributions*	

B.2 Indicate whether different sets of data items are collected for different subject areas of fisheries

Data items above are collected for marine and inland water fisheries in all areas

B.2.1 Can we identify the list of subject areas covered by each collection system: Yes---No

B.2.2 How many subject areas indicated: 2

B.2.3 Name them:

- B.2.3.1 Marine fisheries
- B.2.3.2 Inland Fisheries
- B.2.3.3 Aquaculture
- B.2.3.4 Industrial fisheries
- B.2.3.5 Artisanal Fisheries
- B.2.3.6 Socio Economics
- B.2.3.7 Biodiversity
- B.2.3.8 Other

B.2.4 Are indicators provided specifically for different subject areas: Yes---No

B.2.5 Is there an overlap in indicators between the subject areas: Yes----No---Don't know

B.3. Provide definitions for classification terms used in the data collection

Statistics year book provides some definitions of terms used.

B.3.1 Are definitions provided for subject areas and fisheries segments identified above: Yes--No

B.3.2 Do definitions exist at national level: Yes---No

B.3.3 Are definitions compatible with regional/international defined classifications #---1—2—3—4--5

PART 2-2: INSTITUTIONAL ARRANGEMENTS FOR DATA COLLECTION, PROCESSING AND REPORTING

C. HOW ARE DATA COLLECTED AND MANAGED

C.1 INSTITUTIONAL ARRANGEMENTS

C.1.1 Indicate the national structure for fishery data collection, compilation, analysis and dissemination

- *Data compilation, processing, analysis & dissemination – DGCF*
- *Data compilation & processing – Province Offices*
- *Data processing – District Offices*
- *Data collection – Sub Districts, Fishing Ports, Fish Landing Places*

C.1.1.1 Institutional arrangements: How many institutes involved: CBS (Office of the President), Custom Office (Min. of Finance), and MMAF (the research institutes are under MMAF): 3

C.1.1.2 Is there coherence between the institutes involved and the subject areas / major data collection systems as defined in B2/B3: #---1—2—3—4—5

C.1.1.3 Does the organigram reflect a specialisation of the functions vertically / horizontally: #---1—2—3—4—5 (Organigram is for MAFF only)

C.1.1.4 Is there a vertical distribution of responsibilities for data collection and management at different levels: #--1--2---3-4--5

C.1.2 Describe the coordination mechanisms among agencies/institutions concerned

Indonesia has a national system on fisheries statistics. The task and responsibility of capture fisheries statistics are under Directorate General of Capture Fisheries (DGCF) in cooperation with Provinces and Districts Fisheries Offices. Data collection is the responsibility of District Offices (including data collection in Fish Landing Places) and Fishing Ports Offices. DGCF provides input to CBS in the designing of population and agriculture census.

C.1.2.1 Are there communication mechanisms between these institutions: Yes---No

C.1.2.2 Is there a coordinating body: Yes---No---Don't know

C.1.2.3 Are responsibilities identified: #---1---2---3---4---5

C.1.2.4 Are partners for different responsibilities identified: #---1---2---3---4---5

C.1.2.5 Is the structure complex: #---1---2---3---4---5

C.1.3 Describe operational resources allocated for data collection for both central and local levels

1. *The enumerators are District staff who work in Sub Districts, and Fishing Port staffs as well as Fish Landing Places staffs. The number of enumerators is decided by District, Fishing Ports and Fish Landing Places, respectively.*
2. *DGCF through Deconcentration Budget in individual Provinces provides operational cost for data collection, however it is still not yet sufficient for collecting data in all Sub Districts and Fish Landing Places. Additional budget for data collection of capture fisheries in 2005 will be available.*
3. *DGCF also provides operational cost for data collection in Fishing Ports that serves as Central Technical Implementing Unit through Fishing Ports Budget.*
4. *DGCF faces financial constraints as it can not yet provide facilities for data collection in Sub District considering the huge number of Sub Districts.*
5. *Training of enumerators in Sub Districts and Fish Landing Places is conducted by each respective Province Office, meanwhile training of enumerators in Fishing Ports is conducted by DGCF.*

C.1.3.1 Is there a budget problem: Yes---No---Don't know
C.1.3.2 Is there a staffing problem: Yes---No---Don't know
C.1.3.3 Is there an equipment problem: Yes---No---Don't know
C.1.3.4 Is there a coordination problem: Yes---No---Don't know
C.1.3.5 Organisation at central level 1= simple... 5= complex:
#---1---2---3---4---5
C.1.3.6 Organisation at local level 1=simple.... 5= complex:
#---1---2---3---4---5

PART 2-3 TECHNICAL ASPECTS OF DATA COLLECTION, PROCESSING AND REPORTING

C.2 DATA COLLECTION

C.2.1 Describe methodologies for data collection for each subject area or fishery

1. *Methodology for data collection of marine capture fisheries is :*
   - *The number of establishments, fishing boats and fishing units of outboard and inboard motor are collected as a complete survey in District.*
   - *The number of establishments, fishing boats and fishing units of without boat and non-powered boat are collected as a complete survey in Sample Village.*
   - *The number of fishing boats with central license (≥ 30 GT) is collected based on the license record.*
   - *Fishing trip and production of marine fisheries are collected in :*
     1. *Fishing companies*
     2. *Fishing Ports and Fish Landing Places*
     3. *Fishing Villages*
2. *Methodology for data collection of inland open water capture fisheries is :*
   - *The number of establishments, fishing boats and fishing units are collected as a complete survey in Sample Village.*
   - *Fishing trip and production of inland open water capture fisheries are collected as a sample survey in Sample Village.*
3. *List of species that is used in data collection is a national standard which refers to the international standard but without coding.*

C.2.1.1 Is there evidence of a description by major data collection system and/or subject area: Yes---No

C.2.1.2 Are we able to understand the provided procedures for elaborating indicators by group of indicators / subject area: Yes---No

C.2.1.3 The methods encompass:

- C.2.1.3.1 Frame survey
- C.2.1.3.2 Effort survey
- C.2.1.3.3 Catch survey
- C.2.1.3.4 Quality check survey
- C.2.1.3.5 Logbook survey
- C.2.1.3.6 Census methods
- C.2.1.3.7 Nutritional/consumption survey
- C.2.1.3.8 Others
- C.2.1.3.9 Registration/License

C.2.1.5 Are stratification procedures explained: #--1---2---3---4---5

C.2.2 How often are the data collected on what time basis. Provide a time line indicating the approximate schedule of data collection

- *The number of establishments and fishing boats of marine and inland capture fisheries are collected annually, meanwhile number of fishing units is collected quarterly.*
- *Data collection in fishing companies is conducted every month (though still not yet successful).*
- *Data collection in fishing ports and Fish Landing Places are conducted every month based on the daily record in each fishing port and landing place.*
- *Data collection of both marine and inland capture fisheries in sample villages is conducted every quarter.*
- *The number of establishments, fishing boats and fishing units compiled by District Office from enumerators and processed annually, and then reported to Province Office. The Province Office reported to DGCF annually too.*
- *The trip and production data compiled by District Office from enumerators and processed quarterly. District reported to Province Office quarterly and then Province Office reported to DGCF also quarterly.*

C.2.2.1 Are time, space and other criteria (e.g. species, gear types, etc…) defined, are their level of precision / resolution defined, and are these levels highly aggregated or allowing detailed reporting

C.2.2.1.1	Time	#---1---2---3---4---5
C.2.2.1.2	Space	#---1---2---3---4---5
C.2.2.1.3	Species	#---1---2---3---4---5
C.2.2.1.4	Gears	#---1---2---3---4---5
C.2.2.1.5	Others	#---1---2---3---4---5

This is based on the answers in D1 where is indicated that a part of the system is based on full census, i.e. fishing effort and catch is monitored for all ports and landing sites. The design is fine but cannot be implemented due to constraints

C.2.2.2 Are there existing standards for statistical units and approaches and at which level (national, Regional, international):

National	#---1---3---4---5
Regional	#---1---3---4---5
International	#---1---3---4---5

C.3 DATA PROCESSING

C.3.1 Are there different methods of estimation for different subject areas or fisheries, if so please list

Yes, there is different estimation system between inland and marine capture fisheries sector in the absence of landing facilities in the inland fisheries.

C.3.1.1 Are there different processing methods for different subject areas:
Yes---No---Don't know

C.3.1.2 List the different methods

C.3.1.2.1

C.3.1.2.2

C.3.1.2.3

C.3.2 Describe the processes of data compilation and storage including hardware and software used

- *Districts send the form of data reporting to Province to be forwarded to DGCF. DGCF compiles and processes raw data from Districts using "excel".*
- *Some Provinces have compiled and processed data from Districts in its work area. These Provinces send their processed data to DGCF.*

C.3.2 The questions to address the "quality" of the data processing system i.e.:

Data entry sheets:

C.3.2.1 Includes some sort of quality control procedures: Yes----No---Don't know

C.3.2.2 Standardized entry forms: Yes---No---Don't know

Data entry in a computerized system:

C.3.2.3 Made by data collectors: Yes---No

C.3.2.4 Using a specialized database: Yes (in the process)---No---Don't know

C.3.2.5 Simple software like word, excel, access: Yes---No---Don't know

C.3.2.6 Directly in the central system: Yes ---No---Not provided

C.3.2.6.1 Remote---Direct

C.3.2.7 Include data validation/quality control procedures:
Yes (to a certain degree)--No---Don't know

C.3.2.8 Data review at local level: Yes---No---Don't know

C.3.2.9 Data review at sub national level: Yes---No---Don't know

C.3.2.10 Data review at national level: Yes---No---Don't know

Central System:

C.3.2.11 Specialized software: Yes (being developed)--No---Don't know

C.3.2.12 Automated procedure to import data from decentralized entry points:
Yes---No---Don't know

C.3.2.13 Includes data validation procedures: Yes---No---Don't know

C.3.2.14 Merged data coming from different data collection systems:
Yes---No---Don't know

C.3.2.15 Stores raw data: Yes---No---Don't know

C.3.2.16 Stores aggregated data: Yes---No---Don't know

C.3.2.17 Does the system facilitate integration of data from different sources:
Yes---No---Don't know

Timeliness:

C.3.2.18 Time between data collection and entry (or import) in the central system in month: within one year

C.3.3 How is the analysis of statistical data conducted and by whom. Is information from other sectors/institutions outside fisheries sector used to provide a more holistic approach

- *Analysis of national statistical data is conducted by Statistical Division of DGCF after data processing finished.*
- *Statistical reporting to DGCF only based on data collection and processed data of fisheries.*

C.3.3.1 Analysis is: Centralized----Decentralized---Both
C.3.3.2 Are the raising procedures well described: Yes---No---Don't know
C.3.3.3 Are the procedures following a standardized method:
Yes---No---Don't know
C.3.3.4 Are statistical procedures applied: Yes---No---Don't know
C.3.3.5 Statistical procedures encompass:
C.3.3.5.1 Sample size check
C.3.3.5.2 Stratification of PSU
C.3.3.5.3 adaptation and check of raising factors
C.3.3.6 Is there an independent review procedure: Yes---No---Don't know

C.4 REPORTING

Data/information in District, Province and DGCF are presented and disseminated in book form, however commenced in 2004, DGCF provides data in electronic file.

C.4.1 In what form are the data/information packaged, presented and disseminated

Reporting format: Paper ---Digital---Website

C.4.2 Are there statistical reports routinely prepared for information users, how often are they made available

C4.2.1 Reporting schedule: Quarterly---Annually
C4.2.2 Timeliness (Last published report): two years

PART 2-4 IMPROVEMENT OF SYSTEM

D HOW CAN THE SYSTEM BE IMPROVED

D.1 System design

D.1.1 Describe the designing process of the data collection system and major historical changes in the design or implementation of the system

1. *The original data collection system was established in 1973.*
2. *Following the fisheries development, some methodology of data collection is changed, such as :*
   - *Data of fishing boats in all size was collected in District. The system is changed due to the license system. The license of fishing boats size ≥ 30 GT issued by DGCF and license of fishing boats size < 30 GT issued by Province and District Offices. Data of fishing boats size ≥ 30 GT is collected by DGCF based on license record, meanwhile data of boats size < 30 GT is collected by Province Offices and District Offices.*
   - *In the previous system, data collection in fishing port/landing place only conducted in one major landing place in each District every week. Now, all fishing ports and Fish Landing Places have to record their activities everyday. Following this condition, the system for collecting data also changed from landing place sample to all fishing ports and Fish Landing Places.*
   - *To improve data collection system for industrial tuna fisheries in Indian Ocean, IOTC – OFCF is preparing the methodology based on the fisheries condition in Benoa Port (Bali), Cilacap Fishing Port (Central Java) and Nizam Zahman Fishing Port (Jakarta).*

D.1.1.1 When the system was originally designed: 1973 The system is 32 years old
D.1.1.2 Changes in the past: Yes --- No --Don't know
D.1.1.3 How many times it changed: once, only a modification for sampling
D.1.1.4 When was the last change: a recent change for data processing is till in progress
D.1.1.5 Why changes:
- D.1.1.5.1 Shift in policy
- D.1.1.5.2 Technical improvement
- D.1.1.5.3 Budget constraints
- D.1.1.5.4 Statistical improvement
- D.1.1.5.5 Institutional improvement
- D.1.1.5.6 International requirements

D.1.2 Indicate whether the information users were consulted in the planning and reviewing process in order to meet their needs

In some fisheries meeting/workshop, statistical data are often discussed to meet the needs for planning and management

D.1.2.1 Are stakeholders formally involved in the formulation process
Yes---No---Don't know
D.1.2.2 How many stakeholder groups:

D.1.3. Is there any metadata available

Yes, DGCF has various metadata including the following:

D1.3.1	Methodology notes available:	Yes---No---Don't know
D.1.3.2	Manuals available:	Yes---No---Don't know
D.1.3.3	Statistical procedures described	Yes---No---Don't know
D.1.3.4	Metadata available	Yes---No---Don't know

D.2 Data quality and improvements

D.2.1. What are the perceived weaknesses and problems with the current data collection system

The current system does not yet fulfil the need of information on industrial fisheries since the data collection in fishing companies can not yet be implemented. Until now, data of industrial fisheries is obtained from data collection in ports, however it is indicated still underestimate due to some catches unloaded direct to processing plants

D.2.1.1	Does system meet requirements:	Yes (to some degree)-No---No opinion
D.2.1.2	Produces information timely:	Yes---No---No opinion
D.2.1.5	Is the system static or evolving:	#---1---2----3---4---5

D.2.2 What are the constraints and opportunities in improving quality aspects of information

Constraints:

- *Data processing personals in District Offices and enumerators in Sub Districts not specific working for statistics.*
- *District Offices can't provide budget and infrastructure for data collection since the data collection doesn't yet be a priority activity.*
- *Some policy makers in Province and District do not yet aware on the statistical activities.*

Opportunities:

- *System has been developed on Central – Province – District. Each level has task and responsibility of statistical works.*
- *The policy makers in Central Government give attention and action to solve the statistical problems.*
- *DGCF provides budget through deconcentration budget in Province to be used for data collection.*
- *Many users give feedback of statistical information and propose their needs to be accommodated in statistical information.*
- *Statistical meeting in Central and provinces can be conducted routinely every year. Some Province Offices are able to conduct statistical meeting with District Offices more than two times per year.*

Training on data processing and data collection can be conducted in Central and Provinces

D.2.2.1 Constraints in improving quality: Yes---No---Don't know
D.2.2.2 Constraints are:
D.2.2.2.1 Financial
D.2.2.2.2 Capacity
D.2.2.2.3 Institutional
D.2.2.2.4 Coordination
D.2.2.2.5 Methods
D.2.2.2.6 Awareness of importance of statistics
D.2.2.3 Opportunities

D.2.3 Describe plans and actions necessary to improve current information

- *Implementation of methodology of industrial tuna fisheries in Indian Ocean.*
- *Implementation of System Information of Capture Fisheries Statistics (Electronic system of data processing and data reporting from District Office Province Office – Central Office) in all provinces.*
- *Conducting training on data processing for Statistical staffs of Districts, Fishing Ports, Fish Landing Places and Provinces Offices.*
- *Conducting training on data collection for enumerators in Sub Districts, Fishing Ports and Fish Landing Places.*
- *Continued coordination with Central Bureau of Statistics on GNP, export, import and other related data, as well as national census.*

D.2.3.1 Is there a plan for improvement Yes---No---Don't know
D.2.3.2 Improvement encompasses:
D.2.3.2.1 data collection
D.2.3.2.2 processing
D.2.3.2.3 statistical procedures
D.2.3.2.4 dissemination
D.2.3.2.5 training

D.2.3.2.6 cooperation
D.2.3.2.7 specialisation of functions
D.2.3.2.8 data exchange mechanisms

D.2.3.3 Financial and institutional support is secured for improvement
Yes---No---Don't know

E SUPPLEMENTARY INFORMATION

E.1 Institutional arrangements of the fisheries administration

E.1.1 Indicate the administrative structures responsible for fisheries management, development and monitoring for each administrative division (if any) Describe the roles of each institution involved

Since the autonomy law has been implemented, management of marine fisheries in area < 12 miles and management of inland waters are under region authority. In this connection, central government provides national policy, technical policy, and coordination among agencies.

E.1.1.1 Different administrative divisions responsible: Yes---No---Don't know
Under the on going decentralization processes redistribution of responsibilities for developing of management plans is in progress
E.1.1.2 How many divisions:
E.1.1.3 Are local communities involved: #---1---2---3---4---5
E.1.1.4 Are there activities for CCRF: Yes---No---Don't know
E.1.1.5 Is there frame for CCRF: Yes---No---Don't know
E.1.1.6 Is this frame well developed: #---1---2---3---4---5

E.1.2 Indicate related articles of fisheries and statistical laws that specify reporting responsibilities

Statistical Law No. 16, year 1997 mentions that:

- *Government institutions can develop organization unit to undertake sector statistics.*
- *Data collection of sector that is undertaken by government institutions has to be submitted to Central Bureau of Statistics (CBS).*
- *Institution that undertakes sector data collection has to give same opportunity to the stakeholders for obtaining benefit of statistical available.*

Fishery Law No. 31, year 2004 mentions that government develops fisheries statistical information system, which can be accessed by national and international users.

E.1.2.1 Are the laws provided: Yes---No
E.1.2.2 Are there specific laws for reporting responsibilities Yes---No---Don't know

E.2 Non fishery information and non statistical information

E.2.1 Is there statistical non-fishery information available, if any, please list

Some books are published by Central Bureau of Statistics available in DGCF, such as population census, agriculture census, national income, socio-economic survey, statistics of Indonesia, etc.

E2.1.1 Is non fisheries information available: #---1—2—3—4—5
E2.1.2 Is it used Yes---No---Don't know

E.2.2 Is there any non-statistical information that can be used to supplement the statistical data

Yes, those information generated from CBS.

E.2.2.1 Is there useful non statistical information**:** #---1---2---3---4---5
E.2.2.2 If available is it used: Yes---No---Don't know

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2.3 COUNTRY REPORT: LAO PDR

2.3.1 Summary

Why is Information Needed and Who is Collecting it

During the past few years, policies and strategies for fisheries and related matters have been developed and it can be concluded that the fishery policy is part of the overall food security of the Ministry of Agriculture (MoA). In respect to fisheries, the policy focuses on: conservation of natural resources; awareness raising on the use of destructive fishing methods and the use of exotic species in aquaculture

1. Data on household expenditure and fish consumption are collected by the National Statistic Center (NSC)
2. Technical information for fishery management such as fishery production, topology of fisheries, number of fishing units, fishing gear, fish price, number of hatcheries, rate of fish consumption, rate of fry survival, fish feed production and type of fish farming is collected and compiled by the Department of Livestock and Fisheries in collaboration with Living Aquatic Resources Research Center (LARReC), Provincial and District Livestock and Fisheries Units.

What would be Needed

For appropriate policy formulation, the organisation involved would like to have data on annual fish production, catch of the different gears, biological information of resources, fish consumption, inventory of wetland and household expenditure and consumption.

What and How is Data Collected

Except for the biological data and wetlands inventory, most of the needed data is collected through:

1. The household expenditure and consumption survey of NSC, which is a stratified survey through questionnaires and diaries
2. The data of reservoir fisheries collected by LARReC implemented through a catch and effort monitoring system in one reservoir

How is Data Processed and Analysed

Data is processed by the Department of Fisheries Livestock and Fisheries information Unit in a basic database and results are published in an Annual Bulletin

Major Constraints and Improvements of the System

A major constraint of the present methods is the accuracy and adequacy of information obtained for appropriate policy formulation. This is due to a limited budget, lack of human resources and capacity for data collection, data analysis and processing

Plans to improve the system include; training of enumerators, capacity building of staff involved in data compiling, processing, analyzing and disseminating and establishing a network between MAF and the provinces

2.3.2 Edited Country Questionnaire

The returned country questionnaires were analysed in a systematic way in order to allow comparison of the different systems used. For this a Check list was made. Below the answers of the questionnaire are presented in the different "Text boxes" after which the results of the checklists are provided. For the checklist, the answers from the questionnaire were used in combination of existing information obtained from various FAO and SEAFDEC reports. Not all of the topics could be covered and during the workshop it will be attempted to fill in the gaps

PART 1: WHY

A WHY FISHERY DATA AND INFORMATION ARE NEEDED

A.0 Check if a national policy and/or management objectives are formulated for the country

A.0.1 Country Fisheries policy available: Yes—No
Fishery policy is part of the food security policy of the Ministry of Agriculture (MoA)
A.0.2 Year when latest policy established: Don't know
A.0.3 List major topics of national policy

A.2 Describe the existing national policy and management objectives for which fishery information is required

During the past, few information, policies and strategies, have been developed with respect to fisheries development and related matters. But guidance was directed towards the conservation of natural resources and the development of fish farming by decentralizing the fisheries management functions to local authorities, building awareness on the adverse impacts on the use of illegal and destructive fishing gears, promoting the sustainable exploitation and use of indigenous fish species, the establishment of fish breeding facilities, the use of non-carnivorous species in aquaculture, the careful use of exotic species in aquaculture etc. The fisheries management measures have been enforced by local authorities with many prejudices, conflicts and problems because of lack of scientific based information responding to the root causes of the situations. This was guided, later on by the Prime Minister Decree 118 on 5 October 1989 concerning the management and conservation of aquatic animals, wild animals, the hunting and fishing. The real fisheries management in Lao PDR was conducted in man made reservoir and Mekong River.

1) Conservation of natural resources
2) Awareness raising on the use of destructive fishing methods
3) Promoting the sustainable exploitation of indigenous species (aquaculture)
4) Exotic species in aquaculture

A.2 Check if the policy described in the questionnaire is coherent with the country profile

A.2.1 Described policy is coherent: #---1—2—3—4—5

A.1 What data/information do you need or wish to have for policy and management

- *Annual total fish productions and values including aquaculture.*
- *Number of Full time fishers and part time fishers.*
- *Price of fish.*
- *CPUE*
- *Fish consumption*
- *Potential fish species*

A.1.1 Indicate if the answers on information requirements are belonging to one of the following groups:

A.1.1.1 Resource
A.1.1.2 Catch Assessment
A.1.1.3 Trade/export
A.1.1.4 Production /fleet capacity
A.1.1.5 Labour
A.1.1.6 Economics
A.1.1.7 Environment
A.1.1.8 Fish utilization/processing
A.1.1.9 Biological
A.1.1.10 Fish price
A.1.1.11. Fish consumption
A.1.1.12 Aquaculture

A.3 List other needs of information

- *Type of fishing gears*
- *Number of Wetland and its valuation*
- *The volume of fish export and import*
- *Economically import fish life cycle*

A.3.1 Other users' needs identified: Yes – No

A.3.2 If Yes, then requirements are related to:

A.3.2.1 Inter/regional agreements
A.3.2.2 Needed for planning
A.3.2.3 For private sector
A.3.2.4 Others

A.4 Describe objectives of fishery data collection

- *Description of role of fisheries in food security (not mentioned)*
- *Contribution to national economy/society (conservation of natural resources)*
- *Management of rivers and reservoirs (conservation of natural resources)*
- *Understanding ecology (not mentioned)*
- *Wetland conservation (not mentioned)*

A.5 Description on how objectives of data collection are implemented through major data collection systems

General data such as area of aquaculture and number of fish cage culture was provided by routine collection of data, but aquatic animal consumption status was conducted by ad-hoc researcher teams.

A.5.2 Are there hints of specialised systems/functions in A5: Yes---No

In principle there are two systems:

- The Household expenditure and consumption survey of NSC
- The data of reservoir fisheries collected by LARReC

A.6 Indicate whether intended users of fisheries information receive required information

They are not adequately informed

A.6.1 Is the way information produced from data collection systems submitted to intended users fulfil their needs #---1---2---3---4---5

A.6.2 Are the dissemination channels diverse enough to assume that users are satisfied: #---1---2---3---4---5

PART 2--- WHAT

PART 2-1: INDICATORS AND DATA VARIABLES

B WHAT SHOULD BE COLLECTED

B.1 What are the data items (indicators and variables) that are currently collected

- *Annual fish production mainly aquaculture,*
- *CPUE on pilot site,*
- *Study important fish live cycle.*
- *Aquatic animal consumption*
- *Household expenditure and consumption*
- *Wetland inventory*

B.1.2 Identify the gap between “wanted” and “have”. How large is the gap calculates as “number do”/”number wanted”: score from table: 100%

	Wanted	*Actual do regularly*
1	*CPUE*	*CPUE*
2	*Effort*	*Effort*
3	*Fish price*	*Consumption*
4	*Fish consumption*	*Labour*
5	*Labour*	*Price*
6		*Biological data of fish*

B.2 Indicate whether different sets of data items are collected for different subject areas of fisheries

There are two different set of data items being collected such as for policy maker /planners and technical researchers.

Laos has two data sets:
1) CPUE for reservoir fisheries
2) Biological data to support further development of the fisheries

B.2.1 Can we identify the list of subject areas covered by each collection system: Yes---No
B.2.2 How many subject areas indicated: 2
B.2.3 Name them: Reservoir fisheries
- B.2.3.1 Marine fisheries
- B.2.3.2 Inland Fisheries
- B.2.3.3 Aquaculture
- B.2.3.4 Industrial fisheries
- B.2.3.5 Artisanal Fisheries
- B.2.3.6 Socio Economics
- B.2.3.7 Biodiversity
- B.2.3.8 Biology/ecology

B.2.4 Are indicators provided specifically for different subject areas: Yes---No
B.2.5 Is there an overlap in indicators between the subject areas: Yes---No

B.3. Provide definitions for classification terms used in the data collection

B.3.1 Are definitions provided for subject areas and fisheries segments identified above: Yes--No
B.3.2 Do definitions exist at national level: Yes---No
B.3.3 Are definitions compatible with regional/international defined classifications #---1—2—3—4--5

PART 2-2: INSTITUTIONAL ARRANGEMENTS FOR DATA COLLECTION, PROCESSING AND REPORTING

C. HOW ARE DATA COLLECTED AND MANAGED

C.1 INSTITUTIONAL ARRANGEMENTS

C.1.1 Indicate the national structure for fishery data collection, compilation, analysis and dissemination

C.1.1.1 Institutional arrangements: How many institutes involved: 2
CSO---Household expenditure and consumption census
LARReC of MoA --- Reservoir & biological study but they are all under MoA.

C.1.1.2 Is there coherence between the institutes involved and the subject areas / major data collection systems as defined in B2/B3:
#---1—2—3—4—5

C.1.1.3 Does the organigram reflect a specialisation of the functions vertically / horizontally: #---1—2—3—4—5

C.1.1.4 Is there any vertical devolution of responsibilities for data collection and management at different levels: #---1---2---3---4---5

C.1.2 Describe the coordination mechanisms among agencies/institutions concerned

Before conducting any survey, the host institutions have to invite related organizations to attend the meeting to consult and discuss the purpose of survey and collection of data. The results of survey also have to be clarified through the meeting.

C.1.2.1 Are there communication mechanisms between these institutions: Yes---No

C.1.2.2 Is there a coordinating body: Yes---No
(*There is a committee to meet for the census)*

C.1.2.3 Are responsibilities identified: #---1—2—3—4—5

C.1.2.4 Are partners for different responsibilities identified: #---1—2—3—4—5

C.1.2.5 Is the structure complex: #---1---2---3---4---5

C.1.3 Describe operational resources allocated for data collection for both central and local levels

In Lao PDR there are two sources of financial support. One is from local finance and the other is in the form of foreign assistance.

C.1.3.1 Is there a budget problem: Yes---No—Don't know

C.1.3.2 Is there a staffing problem: Yes---No—Don't know

C.1.3.3 Is there an equipment problem: Yes---No—Don't know

C.1.3.4 Is there a coordination problem: Yes---No—Don't know

C.1.3.5 Organisation at central level (1= simple... 5= complex):
#---1—2—3—4—5

C.1.3.6 Organisation at local level (1= simple.... 5= complex):
#---1—2—3—4--5

PART 2-3: TECHNICAL ASPECTS OF DATA COLLECTION, PROCESSING AND REPORTING

C.2 DATA COLLECTION

C.2.1 Describe methodologies for data collection for each subject area or fishery

Total production:

Capture fisheries: Until now Lao PDR does not conduct any fishery census, but it organized the house hold expenditure and consumption surveys in 1992-93, 1997-98 and 2002-03 and agriculture census in 1999. From those surveys we got basic information on fisheries. However in order to get total production, we estimate through the area and yield of catch and checked with taking sampling survey in specific topography.

For aquaculture we collected data and information from the survey and also from the routine reporting form.

C.2.1.1 Is there evidence of a description by major data collection system and/or subject area: Yes---No

C.2.1.2 Are we able to understand the provided procedures for elaborating indicators by group of indicators / subject area: Yes---No

C.2.1.3 The methods encompass

- C.2.1.3.1 Frame survey
- C.2.1.3.2 Effort survey
- C.2.1.3.3 Catch survey
- C.2.1.3.4 Quality check survey in the reservoir study they also carried out a household consumption survey
- C.2.1.3.5 Logbook survey
- C.2.1.3.6 Census methods
- C.2.1.3.7 Nutritional/consumption survey
- C.2.1.3.8 Others
- C.2.1.3.9 Registration License

C.2.1.5 Are stratification procedures explained: #---2---3---4---5

C.2.2 How often are the data collected on what time basis. Provide a time line indicating the approximate schedule of data collection

The agriculture census data have been collected every five years. But regarding annual fish production including aquaculture data information, we have conducted every year.

C.2.2.1 Are time, space and other criteria (i.e. species, gear types, etc.) defined, are their level of precision / resolution defined, and are these levels highly aggregated or allowing detailed reporting:

C.2.2.1.1 Time: #---1---2---3---4---5
C.2.2.1.2 Space: #---1---2---3---4---5
C.2.2.1.3 Species: #---1---2---3---4---5
C.2.2.1.4 Gears: #---1---2---3---4---5
C.2.2.1.5 Others: #---1---2---3---4---5

C.2.2.2 Are there existing standards and at which level (regional, national, international): #---1---3---4---5

C.3 DATA PROCESSING DO FOR EACH DIFFERENT SURVEY

C.3.1 Are there different methods of estimation for different subject areas or fisheries, if so please list

As mentioned earlier, in order to get total production we estimate through the area and yield of catch and checked through taking sampling surveys in specific topography. For aquaculture we collected data and information from the survey and also from the routine reporting form.

C.3.1.1 Are there different processing methods for different subject areas: Yes---No---Don't know

C.3.1.2 List the different methods

C.3.1.2.1
C.3.1.2.2

C.3.2 Describe the processes of data compilation and storage including hardware and software used

In the Department of Livestock and fisheries has one information unit. This unit is responsible for data collection, compiling, analyzing and disseminating. The used software is basic database

C.3.2 Questions to address are again "Quality" of the data processing system i.e.:

Data Processing:

C.3.2.1 Includes some sort of quality control procedures: Yes----No---Don't know
C.3.2.2 Standardized forms: Yes---No---Don't know

Data entry in a computerized system:

C.3.2.3 made by data collectors: Yes---No
C.3.2.4 using a specialized database: Yes---No---Don't know
C.3.2.5 simple software like word, excel, access: Yes---No---Don't know
C.3.2.6 directly in the central system: Yes ---No---Don't know
C.3.2.7 includes data validation / quality control procedures: Yes---No---Don't know
C.3.2.8 Data review at local level: Yes---No---Don't know

C.3.2.9 Data review at regional level: Yes---No---Don't know
C.3.2.10 Data review at national level: Yes---No---Don't know

Central System:

C.3.2.11 Specialized software: Yes---No---Don't know
C.3.2.12 Automated procedure to import data from decentralized entry points: Yes---No---Don't know
C.3.2.13 Includes data validation procedures: Yes---No---Don't know
C.3.2.14 Merged data coming from different data collection systems Yes---No---Don't know
C.3.2.15 Stores raw data: Yes---No---Don't know
C.3.2.16 Stores aggregated data: Yes---No---Don't know
C.3.2.17 Does the system facilitate integration of data from different sources: Yes---No---Don't know

Timeliness:

C.3.2.18 Time between data collection and entry (or import) in the central system in month: xxx month---Don't know

C.3.3 How is the analysis of statistical data conducted and by whom. Is information from other sectors/institutions outside fisheries sector used to provide a more holistic approach

Analysis of statistical data is conducted by statistic and information unit in the Department of Livestock and Fisheries. Yes information came from other sources such as specific research on consumption of aquatic animal. This information came from projects.

C.3.3.1 Analysis is: Centralized----Decentralized
C.3.3.2 Are the raising procedures well described: Yes---No---Don't know
C.3.1.4 Are statistical procedures applied: Yes---No---Don't know
C.3.1.5 Statistical procedures encompass:
- C.3.1.5.1 No procedures
- C.3.1.5.2 Sample size check
- C.3.1.5.3 Stratification of PSU
- C.3.1.5.4 adaptation and check of raising factors

C.3.1.6 Is there a scientific review procedure: Yes---No---Don't know

C.4 REPORTING

C.4.1 In what form are the data/information packaged, presented and disseminated

C.4.1 Reporting format: Paper ---Digital---Website

C.4.2 Are there statistical reports routinely prepared for information users, how often are they made available

C4.2.1 Reporting schedule: Quarterly----Annually
C4.2.2 Timeliness: (Last published report): 2002

PART 2-4 IMPROVEMENT OF SYSTEM

D HOW CAN THE SYSTEM BE IMPROVED

D.1 System design

Firstly set up the questionnaire, then followed by training of the enumerators and testing of the questionnaire

D.1.1 Describe the designing process of the data collection system and major historical changes in the design or implementation of the system

D.1.1.1 When the system was originally designed: 1997
D.1.1.2 Changes in the past: Yes --- No---Don't know
D.1.1.3 How many times it changed: 1 time
D.1.1.4 When was the last change: 1998
D.1.1.5 Why changes:
- D.1.1.5.1 Shift in policy
- D.1.1.5.2 Technical improvement
- D.1.1.5.3 Budget constraints
- D.1.1.5.4 Statistical improvement

D.1.2 Indicate whether the information users were consulted in the planning and reviewing process in order to meet their needs

Once the information has been disseminated, information users are consulted by being asked which part of questionnaire should be upgraded in order to meet their needs for the next data collection.

D.1.2.1 Are stakeholders formally involved in the formulation process
Yes---No----Don't know
D.1.2.2 How many stakeholder groups

D.1.3. Is there any metadata available

D.1.3.1 Methodology notes available: Yes---No---Don't know
D.1.3.2 Manuals available: Yes---No---Don't know
D.1.3.3 Statistical procedures described: Yes---No---Don't know
D.1.3.4 Metadata available: Yes---No---Don't know

D.2 Data quality and improvements

D.2.1. What are the perceived weaknesses and problems with the current data collection system

Data officially published by the Ministry of Agriculture and Forestry is limited in terms of scope and quantity. As the result general users my not receive sufficient information and do not gain benefit from information.

- *Present method and procedure of data collection does not assure high degree of data accuracy and reliability.*
- *Data analysis for disseminating and the purpose to serve policies are not sufficient.*

D.2.1.1 Does system meets requirements: Yes---No---No opinion
D.2.1.2 Produces information timely: Yes---No---No opinion
D.2.1.3 Is the system static or evolving: S---E

D.2.2 What are the constraints and opportunities in improving quality aspects of information

- *Budget for conducting a survey and data collection are limited*
- *Human resource for data collection, data analysis, processing and dissemination are limited.*

D.2.2.1 Constraints in improving quality: Yes---No---Don't know
D.2.2.2 Constraints are:
D.2.2.2.1 Financial
D.2.2.2.2 Capacity
D.2.2.2.3 Institutional
D.2.2.2.4 Coordination
D.2.2.2.5 Methods
D.2.2.2.6 Awareness of importance of statistics

D.2.3 Describe plans and actions necessary to improve current information

- *Training enumerators*
- *Improve knowledge of staff who involves in data compiling, processing, analyzing and disseminating.*
- *Establish the network between MAF and provinces*

D.2.DD.2.3.1 Is there a idea/plan for improvement Yes---No---Don't know
D.2.3.2 Improvement encompasses:
D.2.3.2.1 data collection
D.2.3.2.2 processing
D.2.3.2.3 statistics
D.2.3.2.4 dissemination

D.2.3.2.5 training
D.2.3.2.6 cooperation
D.2.3.2.6 specialisation of functions
D.2.3.2.7 data exchange mechanisms

D.2.3.3 Financial and institutional support is secured for improvement
Yes---No

E SUPPLEMENTARY INFORMATION

E.1 Institutional arrangements of the fisheries administration

E.1.1 Indicate the administrative structures responsible for fisheries management, development and monitoring for each administrative division (if any) Describe the roles of each institution involved

See Annex

E.1.1.1 Different administrative units responsible: Yes---No---Don't know
E.1.1.2 How many divisions: 2
E.1.1.3 Are local communities involved: #---1---2---3---4---5
E.1.1.4 Is there a frame for CCRF: Yes---No---Don't know
E.1.1.5 Is this frame well developed: #---1---2---3---4---5

E.1.2 Indicate related articles of fisheries and statistical laws that specify reporting responsibilities

Laos does not have any law related to fishery

E.1.2.1 Are the laws provided: Yes---No
E.1.2.2 Are there specific laws for reporting responsibilities:
Yes---No---Don't know

E.2 Non fishery information and non statistical information

E.2.1 Is there non-fishery information available, if any, please list

None

E.2.1.1 Is non fisheries information available: #---1—2—3—4—5
E.2.1.2 Is it used: Yes---No---Don't know

E.2.2 Is there any non-statistical information that can be used to supplement the statistical data

None

E.2.2.1 Is there useful non statistical information ad hoc surveys**:**
#---1---2---3---4---5

E.2.2.2 If available is it used: Yes---No---Don't know

ANNEX

Generally speaking, statistical data and information on the economic significance of the fisheries sector is difficult to obtain because of the limitation of financial support, limitation of human resources and knowledge of fishery scientists in statistics. A lack of information and statistical data on inland fisheries has undermined their importance and the subsequent management of the resources. With a growing population, it is important to maintain the contributions of inland fisheries to food security and to increase production. Concerted action is required in this regard. There is a need to improve the collection of statistical data that can be interpreted in economic, scientific and ecological terms for use in planning and development.

Although not currently functioning properly for providing fisheries information, a basic structure for data collection seems to be in place and is currently used to collect statistics on livestock, agriculture and forestry. Data collection at village level is performed by means of the village headman, a "model farmer" or the relevant veterinarian worker. Usually at least one, but more often, all three of these are present in each village. Each is responsible for data reporting to the Ministry of Agriculture and Forestry. These people submit completed questionnaires through the district and provincial authorities to the national line departments in Vientiane. However, it is reported that relationships between villagers and government officers are less than ideal and there is widespread under-reporting. The main problem appears to be the usual fear that statistics will be used for taxation purposes. The level of formal training in data collection and statistics, in general, is weak at both provincial and district level.

In Lao PDR, the fishery statistics system is a subsystem of the agricultural system, which in turn is a part of the different statistical agencies whose primary functions are the generation, processing, analysis and dissemination of official statistics. The government agencies directly involved in the generation of fishery statistics are:

- *National Statistical Center under the Committee for Planning and Cooperation; the National Statistical Centre (NSC) has been developing methodologies and standards leading to a uniform system of data collection. The NSC policy is to work with a de-centralised structure where all line Ministries will be responsible for data collection in their own field;*
- *Department, Ministry of Agriculture and Forestry (MAF);*
- *Department of Livestock and Fisheries (MAF);*
- *Living Aquatic Resource Research Center of National Agriculture and Forestry Institute (MAF);*
- *Provincial Livestock and Fishery Sections;*
- *District Livestock and Fishery Units.*

In the past, there were several types of information available that were relevant to the fishery at the National Statistic Center and the Ministry of Agriculture and Forestry such as:

- *Lao Expenditure and Consumption Survey 19921993 (LECS 1);*

- *Collection of CPUE in Khong Island in 1993;*
- *Lao Expenditure and Consumption Survey 1997-1998 (LECS II);*
- *The Agriculture Survey Census 1998-1999;*
- *Meat and Fish Consumption in Xiengkhouang Province 1998;*
- *Foreign Trade Statistics;*
- *Consumer Price of Fish Index;*
- *Compilation of GDP;*
- *Baseline study in five provinces on aquaculture development projects supported by FAO (1998);*
- *Fisheries Surveys in Luang Prabang Province 1999.*

The production figures of capture fisheries are based on the sampling data of the yields per unit area for several types of topology. However, the information on aquaculture was obtained from data collection. Data on capture fisheries were mainly taken from fish landing sites such as Nam Ngum Reservoir and Nakasang Village on Khong Island.

The Department of Planning (DOP) under the Ministry of Agriculture and Forestry (MAF) is responsible for disseminating basic statistical information on agriculture including crop production, crop area, crop yield, livestock population, animal production and fisheries. This information is prepared by technical departments and institutions such as the Department of Livestock and Fisheries (DLF), Department of Agriculture, Department of Forestry, Department of Irrigation and Living Aquatic Resource Research Center (LARReC). Technical fishery management information such as fishery production, topology of fisheries, number of fishing units, fishing gear, fish price, number of hatcheries, rate of fish consumption, rate of fry survival, fish feed production and type of fish farming is collected and compiled by the Department of Livestock and Fisheries in collaboration with LARReC, Provincial and District Livestock and Fisheries Units. This includes specific information (standard of fish stocking in pond, rate of raising in rice field, etc.), and aquatic animal health information. The trade data on fish and fish products are collated and reported by the National Statistical Center. Their data clients are decision-makers, scientists, planners and vendors.

Statistical data are not readily available or, if available, are scanty and not always accurate. There are only estimated data on inland fisheries such as estimates of fish production by sampling the yield per unit of a particular type of water body then multiplying by the water area. The main reasons for the poor knowledge of these fisheries are the large number, dispersion, variety and dynamic nature of inland water bodies and the diversity of their aquatic fauna. These account for the complex and numerous fisheries giving rise to a variety of distribution and marketing systems. This makes the collection of data costly, but when weighed against the contributions of the sector in the larger socio-economic context, it may be well worth undertaking.

A household expenditure and consumption survey was taken from March 1992 to the end of February 1993 by the National Statistic Center (NSC). The sample was made up of 2 940 households from 147 villages. All household expenditure and income were recorded in a diary over a one month period. At that time the amount of expenditure on fish by household was similar to the estimated official fish production figures.

The second household expenditure and consumption survey was taken from March 1997 to the end of February 1998 by NSC. This time the survey included household data on fish production in terms of value, rate of consumption from their own production and fish expenditure (Table 2).

In 1997, a field study on meat and fish consumption was conducted by Chanphengxay in Xiengkouang Province. The sample sites were taken in two districts (Pek and Phoukout) in one month of the dry season. One was representative of urban areas while the second was representative of rural areas. The figures show that the rate of fish and aquatic animals consumed was around 4.7 kg/head/year and 4.4 kg/head/ year respectively. In rural areas it was 2.5 kg/ head/year for fish and 2.8 kg/head/year.

The first Lao Agricultural Census was conducted from 1998 to 1999 by NSC in cooperation with the Ministry of Agriculture and Forestry. it covered all 141 districts in the country. The census was undertaken in two parts: a complete enumeration of all 798 000 households to collect basic data about agriculture, and a sample survey of the households to collect more detailed information mainly on crop production and livestock, including some data on the number of families involved in fishing and aquaculture and the area of fish ponds.

Potential improvements to existing systems

Coates (2002) pointed out that a major and immediate task for Lao PDR is to re-assess its current official figures for capture fisheries based upon a review of historical and recent information and data for the fishery. Much information is locally available and certainly more than enough to produce very realistic estimates. In this process, information based upon data from credible surveys should take precedent over all other information. Once survey data are accepted (within the normal margin of error) extrapolations based upon resource and population distribution are difficult to challenge. This must be done by the appropriate Lao authorities, not externally. The current report serves only to illustrate the need to do this. In common with many countries, Lao PDR needs to consolidate a more flexible, interactive and inclusive approach to the generation of national fishery statistics. There are encouraging signs that this is happening. It appears to have already been achieved recently with the figures for aquaculture. Only when this is achieved also for capture fisheries should the information be allowed to influence planning.

As mentioned by Souvannaphanh et al. (2003), because the resources required for the collection of these data have decreased, the quality, availability, reliability, accuracy and timeliness of data compilation at the national level is not satisfactory. The strengthening of the national fishery statistical systems as an integral part of a planning and decision-making process should be a major national fisheries objective in the drive towards sustainable fisheries and food security. The need to improve and strengthen data collection systems should not be limited to an individual country alone. The prospect of developing a harmonized fisheries statistics system among the countries in the region should be encouraged so that the region can share and use the data more readily to facilitate the management of their fisheries, especially in the case of shared stocks.
Since the collection and analysis of fisheries data is costly and time consuming, the needs and objectives for the statistical system must be clear and a thorough review of national statistical frameworks must be undertaken, including their linkage with priorities and objectives and the needs of respective data users. As management of the fisheries should be based on the best scientific information available, these data are critical to the sustainable management of fisheries resources.

Main issues and constraints to improving fishery information:

- *Lack of feedback from users;*

- *Lack of objectives and incentives for enumerators and other staff to produce quality data*
- *Lack of awareness, especially by policymakers, of the importance of the sector in planning and development;*
- *The collected data is not always used which further contributes to the lack of motivation among enumerators;*
- *Low levels of capacity among personnel, especially at the local level, who are mandated to collect the raw data.*

Fisheries statistics are not used effectively in the determination of national fisheries policy, the formulation of national management frameworks and actions or even as a basis for understanding the status and condition of fisheries resources. Since the production of effective and timely fishery statistics is a costly exercise, improvement in the use of statistics at the national level should be accorded high priority.

In the case of inland fisheries operating within an international river basin such as the Mekong Basin, these methodologies need to be harmonized with adjacent countries, and the catchment approach promoted in this regard. Once the minimum requirement for a national fishery statistical system is achieved, a gradual strengthening process can be conducted, taking into consideration the national capacity and priorities.

Fisheries statistics are a key component of a fisheries information system required for policy, planning, monitoring and management of fisheries. Improvements to national and regional fisheries statistical systems including data collection, analysis and reporting are required to maximize the utility, timeliness, accuracy and reliability of fisheries statistics.

A review and reassessment of current statistics for the capture fishery is needed to obtain accurate and reliable information. The compilation and exchange of fishery statistics for the region is required to provide a wider view of the importance and status of fisheries in the economies of basin countries. Clearly, the collection and analysis of data should be standardized to facilitate this exchange. Comparable information technology and databases will assist in this regard.

Souvannaphanh et al. (2003) make the following recommendations for improvements of fisheries statistics:

<u>National Level</u>

Strengthen national fisheries statistics systems as part of a national decision framework for policymaking, planning and monitoring to achieve sustainable fisheries by:

- *Determining the objectives and minimum requirements of fishery statistics data and information with particular reference to national and local requirements;*
- *Coordinating collection and use of fisheries statistics data between the national fisheries authorities and other authorities including those responsible for trade, vessel registration, freshwater aquaculture and rural development;*
- *Building capacity at both national and local levels to collect, compile, analyze and disseminate quality statistical data and information in a timely manner as an empirical basis for formulating policies and decisions for fisheries management;*

- *Prioritizing statistical data and information needs with particular reference to practical indicators for fishery management and the specific requirements of the region's fisheries;*
- *Applying internationally or regionally standardized methodologies for statistical data to facilitate regional compilation and data exchange where appropriate; and*
- *Reviewing the national fishery statistics systems to identify areas needing improvement.*

Regional Level

- *Supporting, upgrading and expanding regional fisheries statistical systems by developing regionally compatible methodologies for national statistical data to facilitate regional fisheries assessment and data exchange; and*
- *Promoting technical cooperation between national agencies responsible for fisheries statistics to improve national systems, including development of guidelines and handbooks.*

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2.4 COUNTRY REPORT: MALAYSIA

2.4.1 Summary

Why is Information Needed and Who is Collecting it

In Malaysia, the latest fisheries policy was formulated in 1997. The policy focuses on increasing the fish production at 5.5% per year; rehabilitation of fisheries resources; limitation of fishing effort; protection of traditional fisheries; and the conservation of endangered species

Data on fisheries is collected by the following institutions;

- Department of Fisheries (DoF): Routine collection of fisheries statistics
- Ministry of Science, Technology & the Environment (MOSTE): Stock assessment and environmental data
- Department of Statistics : Structural information of the fisheries/aquaculture sector
- Department of Custom Exercise: Data on trade and Export

As well as supporting development of fisheries policies and management plans, the data are used by the fishing industry and also used for other sector planning purposes

What would be Needed

The different organizations involved in data collection wish to collect data on: landings (species, gear, vessel); effort (gear, vessel); value (gear, vessel); biological data; cost & earnings; socio economic; fish trade; fishers; market prices; compliances; resource rent& economic profit; fish consumption; number of employment; and processing.

What and How is Data Collected

A large part of the data, especially for marine fisheries is collected through

- Catch and effort monitoring programme based on a frame from vessel registration system and monthly fine tuning and stratified monitoring of catches in administrative districts
- Biological stock assessment programmes as part of fisheries research programmes
- Regular census programmes of the Department of Statistics
- Monitoring of trade and export data by the Department of Custom Exercise

For inland fisheries, there is no regular programme and only rough estimates are made.

How is Data Processed and Analysed

All the fishery collected under the routine monitoring system are entered at district level in a central specialized database system through internet applications.

The data for marine fisheries are analysed annually through extrapolation/raising the data to the frame survey. The results are published in the Annual Fishery Statistical Bulletin, but also made available through a website in digital forms.

Major Constraints and Improvements of the System

Major constraints are:

- The low priority given to collection of fisheries data and information
- Lack of confidence in the data produced
- Sincerity of enumerators

Department of Fisheries planned to improve the data collection, processing, dissemination and verification and validation procedures of the system.

2.4.2 Edited Country Questionnaire

The returned country questionnaires were analysed in a systematic way in order to allow comparison of the different systems used. For this a Check list was made. Below the answers of the questionnaire are presented in the different "Text boxes" after which the results of the checklists are provided. For the checklist, the answers from the questionnaire were used in combination of existing information obtained from various FAO and SEAFDEC reports. Not all of the topics could be covered and during the workshop it will be attempted to fill in the gaps

PART 1

A WHY FISHERY DATA AND INFORMATION ARE NEEDED

A.0 Check if a national policy and/or management objectives are formulated for the country

The Government of Malaysia adheres to the objectives of the National Agricultural Plan of 1992-2010 with respect to the fisheries sector to achieve total fish production of 2.9 million metric tonnes in 2010 with an annual growth rate set at 5.5% per annum.

These policies and strategies include those focused on:

- *direct limitation of fishing effort through the licensing of fishing gear and fishing vessels through the Fisheries Licensing Policy;*
- *identification of nursery areas that should be protected and managed as a nursing area to ensure survival of juveniles of commercially important fish species through use of closed areas, seasons, establishment of marine park areas (MPAs) and reserves, and zoning by vessel size;*
- *facilitation of cooperative research effort between government and academic institutions to provide data essential for the formulation of area management plans through transparent management planning involving the stakeholders – fishers and their associations, universities, government at all levels, processors and marketing agents;*
- *establishment of a strict Monitoring, Control and Surveillance (MCS) scheme to enforce fisheries laws and regulations and address illegal fishing;*
- *rehabilitation of resources through the establishment of artificial reefs and coral replanting programmes; and*
- *conservation of endangered species and biodiversity of marine ecosystems.*

A.0.1 Country policy available: Yes—No
A.0.2 Year when latest policy established: 1997
A.0.3 List major topics of national fisheries policy:
- A.0.3.1 Increase fish production with 5.5% per year
- A.0.3.2 Manage, conserve and rehabilitate fisheries resources in a sustainable way
- A.0.3.3 Limiting of fishing effort
- A.0.3.4 Rehabilitate resources
- A.0.3.5 Conserve endangered species
- A.0.3.6 Protect traditional fisheries
- A.0.3.7 Upgrade the socio-economic status of the fishermen community

A.2 Describe the existing national policy and management objectives for which fishery information is required:

Data and information are needed for fisheries management, planning and development purposes. It is used also to indicate whether objectives are achieved.

A.1 What data/information do you need or wish to have for policy and management

For fisheries management purposes, basic information requirements would be as follows:

a) Landings data
b) Effort data
c) Value data

These data sets should be according to the categories like area, species, gear type, boat tonnage etc. These categories should be in accordance to the fisheries management policies to be formulated. The availability of such additional data sets as biological data (e.g. length-frequency data, trawl-surveys, acoustic surveys etc) can be very helpful.

For fisheries planning purpose, these data sets could assist fisheries planning

a) Cost and Earning
b) Socio economic data
c) Fish trade
d) Fishers
e) Market prices
f) Compliances
g) Resource rent and economic profits
h) Fish consumptions
i) Employment in fisheries

A.1.1 Indicate if the answers on information requirements are belonging to one of the following groups:
- A.1.1.1 Resource
- A.1.1.2 Catch assessment

A.1.1.3 Trade/export
A.1.1.4 Production/fleet capacity
A.1.1.5 Labour
A.1.1.6 Economics
A.1.1.7 Environment
A.1.1.8 Fish utilization/processing
A.1.1.9 Biological
A.1.1.10 Fish price
A.1.1.11 Socio economics
A.1.1.12 Aquaculture

A.3 List other needs of information

Apart for management and planning, it is also required for development of the fisheries industry itself. It is also required by other sectors for their planning purposes. Occasionally it is required for other socio-economic needs like for example compensations to fishers

A.3.1 Other users' needs identified: Yes – No

A.3.2 If Yes, then requirements are related to:
A.3.2.1 Inter/regional agreements
A.3.2.2 Needed for other sector planning
A.3.2.3 For private sector
A.3.2.4 Other agencies
A.3.2.5 NGOs & Universities

A.4 Describe objectives of fishery data collection

- *fisheries management,*
- *resource utilization;*
- *fisheries planning;*
- *fisheries development;*
- *Policy making;*
- *As indicators to indicate whether objectives set or policies implemented are met;*
- *Food security*

A.5 Description on how objectives of data collection are implemented through major data collection systems

Ensure that relevant, accurate data are timely collected;
- *Ensure that data collected can be processed efficiently into the required timely information.*
- *Ensure that management can access the data easily;*
- *Ensure that data collected can be efficiently analyzed into information needed for management, planning and other activities;*

- *Ensure that data are consistent and can be presented in the correct manner to all who require them;*
- *Ensure timely dissemination of data to all users through various channels;*

These can be achieved by having a good data collection system based on sound methodologies suitable for local conditions and also based on availability of resources;

Facilities to capture the data and to process the data into the needed information are also very important. This can be achieved by having a good IT based application system at various levels;

1. DoF: Routine fisheries Statistics
2. MOSTE: Stock assessment and environmental studies (with several partners)
3. National Statistics Department (NSD): Census
4. Customs Excise Department: Trade & export

A.5.2 Are there specialised systems/functions in A5: Yes---No

A.6 Indicate whether intended users of fisheries information receive required information

Presently information are only available via bulletin published annually and also production of ad-hoc reports from the data collection section. Plans are in place to encourage end-user computing by the development of IT based EIS application systems.

A.6.1 Is the way information produced from data collection systems submitted to intended users fulfil their needs #---1---2---3---4---5

A.6.2 Are the dissemination channels diverse enough to assume that users are satisfied: #---1---2---3---4---5

PART 2--- WHAT

PART 2-1: INDICATORS AND DATA VARIABLES

B WHAT SHOULD BE COLLECTED

B.1 What are the data items (indicators and variables) that are currently collected

CPUE, MSY, MEY

B.1.1 Identify the gap between "wanted" and "have"
How large is the gap calculates as "number do"/"number wanted":
The score from table: 86%

	Wanted	*Actual do regularly*
1	*Landings data (species, gear, vessel)*	*CPUE*
2	*Effort data (gear, vessel)*	*Frame*
3	*Value data (gear, vessel)*	*Custom*
4	*Biological data*	*Stock assessment*
5	*Cost & earnings*	*Annual survey*
6	*Socio economic*	*NSA*
7	*Fish Trade*	*Custom*
8	*Fishers*	*Frame*
9	*Market prices*	*Survey*
10	*Compliances*	
11	*Resource Rent& economic profit*	*Is output*
12	*Fish consumption*	*HES/NSD*
13	*Employment*	*NSD*
14	*Processing*	

B.2 Indicate whether different sets of data items are collected for different subject areas of fisheries

No information on this question

B.2.1 Can we identify the list of subject areas covered by each collection system Yes---No

B.2.2 How many subject areas indicated: 4

B.2.3 Name them:

B.2.3.1: Marine fisheries

B.2.3.2: Inland fisheries

B.2.3.3: Aquaculture

B.2.3.4: Economics

B.2.4 Are indicators provided specifically for different subject areas: Yes---No

B.2.5 Is there an overlap in indicators between the subject areas: Yes----No---Do not know

B.3. Provide definitions for classification terms used in the data collected

B.3.1 Are definitions provided for subject areas and fisheries segments identified above: Yes--No

B.3.2 Do definitions exist at national level: Yes---No---Don’t know

B.3.3 Are definitions compatible with regional/international defined classifications: #---1—2—3—4--5

PART 2-2: INSTITUTIONAL ARRANGEMENTS FOR DATA COLLECTION, PROCESSING AND REPORTING.

C. HOW ARE DATA COLLECTED AND MANAGED

C.1 INSTITUTIONAL ARRANGEMENTS

C.1.1 Indicate the national structure for fishery data collection, compilation, analysis and dissemination

Data are collected at each administrative district. For capture marine fisheries, data are collected by full time enumerators. Data are entered into the computer at this district level. These data are complied at State Fisheries Offices which is under the responsibility of the State Fisheries Director. Data are processed at these levels to produce state level reports. The data are then forwarded to the Data Collection/Statistic section at the Fisheries Head Quarters. This section processed the data into the required annual bulletin.

C.1.1.1 Institutional arrangements: How many institutes involved: (5)
DoF, MOSTE, NSD, Customs Excise Department and Planning and strategic division

C.1.1.2 Is there coherence between the institutes involved and the subject areas/ major data collection systems as defined in B2/B3: #---1---2---3---4---5

C.1.1.3 Does the organigram reflect a specialisation of the functions vertically / horizontally: #---1---2---3---4---5

C.1.1.4 Is there a vertical distribution of responsibilities for data collection and data management at different levels: #---1--2---3--4--5

C.1.2 Describe the coordination mechanisms among agencies/institutions concerned

Statistics of all agriculture based agencies are coordinated by the Planning and Strategic Division of the Ministry of Agriculture. On the highest level, all statistics units of all departments/ministries fall under the purview of the National Statistic Department.

C.1.2.1 Are there communication mechanisms between these institutions: Yes---No

C.1.2.2 Is there a coordinating body: Yes---No---Don't know

C.1.2.3 Are responsibilities identified: #---1---2---3---4---5

C.1.2.4 Are partners for different responsibilities identified: #---1---2---3---4---5

C.1.2.5 Is the structure complex: #---1---2---3---4---5

C.1.3 Describe operational resources allocated for data collection for both central and local levels

For marine capture fisheries, all personnel involved in data collection including the full time enumerators are employed by the Federal Government. Budgets are also allocated on a yearly basis by the central government. The Administration and Finance Division of the department allocates these resources according to the request of the Data Collection section.

C.1.3.1 Is there a budget problem: Yes---No---Don't know
C.1.3.2 Is there a staffing problem: Yes---No--- Don't know
C.1.3.3 Is there an equipment problem: Yes---No--- Don't know
C.1.3.4 Is there a coordination problem: Yes---No--- Don't know
C.1.3.5 Organisation at central level (1= simple... 5= complex):
#---1---2---3---4---5
C.1.3.6 Organisation at local level (1=simple.... 5= complex):
#---1---2---3---4---5

PART 2-3: TECHNICAL ASPECTS OF DATA COLLECTION, PROCESSING AND REPORTING

C.2 DATA COLLECTION

C.2.1 Describe methodologies for data collection for each subject area or fishery

Marine Captured Fisheries

A frame is established based on the on-line Vessel Registration System which records every transaction of licensing activities on all fishing boats. This frame survey is conducted every two years for every State. The frame information is fine-tuned every month to include some illegal fishing vessels (which is only about 2%) and to exclude fishing vessel that do not go out fishing for the month. A sampling plan is then designed based on categories such as area (administrative districts), fishing gear, and size of vessel (GRT). Data are then collected based on each of this sub-stratum for 121 commercial species of commercial fishes. Data are collected by enquiry and observations. Total landings are then estimated by extrapolating the sampling data to the frame. It is also important to note here that, complete enumeration is done for a category of deep-sea fishing vessels. Their landings are then just added to the total estimated production. These data are collected by enumerators that visit these fishing vessels for each trip. The log book system is not used as the data collected by such method is highly unreliable.

Inland Fisheries

Production from inland fisheries is estimated at about 0.01% of total fish production in Malaysia. However data are collected from public bodies by a rough estimation based on the landings at market places. There is no fix statistical methodology for the collection of inland fisheries data.

Aquaculture

A frame is also constructed by listing all aquaculture activities in the State by administrative districts. All big farms where their production is significant are identified. Data are obtained from these farms on a monthly basis. There is therefore a complete enumeration done for such farms. Data from farms which are isolated and where production is categorized as medium or low are collected using sampling. Sampling is done based on culture methods such as cage, ponds, raceways, ex-mining pools and etc.

C.2.1.1 Is there evidence of a description by major data collection system and/or subject area: Yes---No

C.2.1.2 Are we able to understand the provided procedures for elaborating indicators by group of indicators / subject area: Yes---No

C.2.1.3 The methods encompass:

- C.2.1.3.1 Frame survey
- C.2.1.3.2 Effort survey
- C.2.1.3.3 Catch survey
- C.2.1.3.4 Quality check survey
- C.2.1.3.5 Logbook survey
- C.2.1.3.6 Census methods
- C.2.1.3.7 Nutritional/consumption survey
- C.2.1.3.8 Stock assessment
- C.2.1.3.9 Registration/License

C.2.1.4 Are stratification procedures explained: #--1---2---3---4---5

C.2.2 How often are the data collected on what time basis. Provide a time line indicating the approximate schedule of data collection

Data are collected on the monthly basis,

C.2.2.1 Are time, space and other criteria (i.e. species, gear types, …) defined, are their level of precision / resolution defined, and are these levels highly aggregated or allowing detailed reporting

- C.2.2.1.1 Time #---1---2---3---4---5
- C.2.2.1.2 Space #---1---2---3---4---5
- C.2.2.1.3 Species #---1---2---3---4---5
- C.2.2.1.4 Gears/Vessels #---1---2---3---4---5

(This is for Marine fisheries data collection only)

C.2.2.2 Are there existing standards for statistical units and approaches and at which level (national, regional, international):

- National #---1---2---3---4---5
- Regional #---1---2---3---4---5
- International #---1---2---3---4---5

C.3 DATA PROCESSING

C.3.1 Are there different methods of estimation for different subject areas or fisheries, if so please list

.

C.3.1.1 Are there different processing methods for different subject areas:
Yes---No---Don't know

C.3.1.2 List the different methods

C.3.1.2.1:

C.3.1.2.2:

C.3.2 Describe the processes of data compilation and storage including hardware and software used

Data are collected using special data collecting forms. The data are then keyed into a database using a computer system. Previously data are keyed in from the State Offices and these data are then forwarded to the main database server in Headquarters. However, presently this has been upgraded thereby data are keyed in from the district level via a network PC. The PC is wired to the database server in the State Office via a Wide-Area Network. Data from the state database are then forwarded to the main server in Kuala Lumpur also through the leased line. Data entry machines used are normal PC, whereas database servers are mostly network servers. HQ uses a RISC UNIX based machine with Oracle Data Base Management System.

Data processing is basically done using fixed application program to convert the data to structure reports as seen in the Annual Statistical Bulletin

Data entry sheets (Marine only):

C.3.2.1 Includes some sort of quality control procedures: Yes----No---Don't know

C.3.2.2 Standardized entry forms: Yes---No---Don't know

Data entry in a computerized system:

C.3.2.3 made by data collectors: Yes---No

C.3.2.4 using a specialized database: Yes---No---Don't know

C.3.2.5 Simple software like word, excel, access: Yes---No---Don't know

C.3.2.6 Directly in the central system: Yes---No---Don't know

C.3.2.6.1 Remote---Direct

C.3.2.7 Include data validation/quality control procedures:
Yes---No---Don't know

C.3.2.8 Data review at local level: Yes---No---Don't know

C.3.2.9 Data review at sub national level: Yes---No---Don't know

C.3.2.10 Data review at national level: Yes---No---Don't know

Central System:

C.3.2.11 Specialized software: Yes---No---Don't know

C.3.2.12 Automated procedure to import data from decentralized entry points:
Yes---No---Don't know

C.3.2.13 Includes data validation procedures: Yes---No---Don't know

C.3.2.14 Merged data coming from different data collection systems:
Yes---No---Don't know
C.3.2.15 Stores raw data: Yes---No---Don't know
C.3.2.16 Stores aggregated data: Yes---No---Don't know
C.3.2.17 Does the system facilitate integration of data from different sources:
Yes---No---Don't know

Timeliness:

C.3.2.18 Time between data collection and entry (or import) in the central system in month: 1 month---Don't know

C.3.3 How is the analysis of statistical data conducted and by whom? Is information from other sectors/institutions outside fisheries sector used to provide a more holistic approach?

Presently data analysis on an annual basis is done by the Data Collection/Statistic section. The product is produced into the Annual Fisheries Statistical bulletin. However based on these reports, analysis is frequently done by all users when needed. Involvement of other sectors is quite minima

C.3.3.1 Analysis is: Centralized---Decentralized---Both
C.3.3.2 Are the raising procedures well described: Yes---No---Don't know
C.3.3.3 Are the procedures following a standardized method:
Yes---No---Don't know
C.3.3.4 Are statistical procedures applied: Yes---No---Don't know
C.3.3.5 Statistical procedures encompass:
C.3.3.5.1
C.3.3.6 Is there an independent review procedure: Yes---No---Don't know

C.4 REPORTING

The main product is the Annual Fisheries Statistical Bulletin. This annual report is distributed to all in the department and also other agencies and the industry. Lately this annual report is produced in digital format (CDs) for easy dissemination and reproduction as well as providing the data in digital format. Presently the department's homepage display only summarized statistics. Plans are being made to produce the whole bulletin on the homepage

C.4.1 In what form are the data/information packaged, presented and disseminated

C.4.1 Reporting format: Paper ---Digital---Website

C.4.2 Are there statistical reports routinely prepared for information users, how often are they made available

The Annual Fisheries Statistical Bulletin is produce and disseminated as mentioned in C4-1. However analytical reports are produce as when required either by users themselves or if more detail information are needed, these special reports are prepared by the Data Collection section

C4.2.1 Reporting schedule: Quarterly---Annually
C4.2.2 Timeliness (Last published report): 2003

PART 2-4 IMPROVEMENT OF SYSTEM

D HOW CAN THE SYSTEM BE IMPROVED

D.1 System design

D.1.1 Describe the designing process of the data collection system and major historical changes in the design or implementation of the system

The design of the data collection system can be described as in the reports above at various sections. If there need to make any change in the system, for example, adding new species, such a change can be easily accommodated through modification of the forms. The IT based application system is designed with relational database management system and therefore can accommodate such changes very easily.

D.1.1.1 When the system was originally designed: Do not know
D.1.1.2 Changes in the past: Yes --- No---Don't know
D.1.1.3 How many times it changed: Don't know
D.1.1.4 When was the last change:
D.1.1.5 Why changes:
- D.1.1.5.1 Shift in policy
- D.1.1.5.2 Technical improvement
- D.1.1.5.3 Budget constraints
- D.1.1.5.4 Statistical improvement
- D.1.1.5.5 Institutional improvement
- D.1.1.5.6 International requirements

D.1.2 Indicate whether the information users were consulted in the planning and reviewing process in order to meet their needs

Yes, users always complain when they do not get what they want. The Data Collection section does consult information users through regular meetings

D.1.2.1 Are stakeholders formally involved in the formulation process: Yes---No---Don't know
D.1.2.2 How many stakeholder groups: Don't know

D.1.3. Is there any metadata available

Yes. Apart from application systems created for the data collection and processing, there are other application systems developed for other fisheries management activities including such systems as the Vessel Registration System and Compliance systems etc. They all share a metadata dictionary

D.1.3.1 Methodology notes available: Yes---No---Don't know
D.1.3.2 Manuals available: Yes---No---Don't know
D.1.3.3 Statistical procedures described: Yes---No---Don't know
D.1.3.4 Metadata available: Yes---No---Don't know

D.2 Data quality and improvements

D.2.1. What are the perceived weaknesses and problems with the current data collection system

- *Accuracy, timeliness and data consistency;*
- *In some places especially East Malaysia, logistic problems.*
- *Users at all levels not being able to access the database to do their analysis to establish useful information.*

D.2.1.1 Does system meet requirements: Yes---No---No opinion
D.2.1.2 Produces information timely: Yes---No---No opinion
D.2.1.3 Is the system static or evolving: #---1---2---3---4---5

D.2.2 What are the constraints and opportunities in improving quality aspects of information

- *Lack of awareness of importance of data collection.*
- *Low priorities given to this activity;*
- *Lack of confidence in the data produced;*
- *Sincerity of enumerators;*

D.2.2.1 Constraints in improving quality Yes---No---Don't know
D.2.2.2 Constraints are:
D.2.2.2.1 Financial
D.2.2.2.2 Capacity
D.2.2.2.3 Institutional

D.2.2.2.4 Coordination
D.2.2.2.5 Methods
D.2.2.2.6 Awareness of importance of statistics
D.2.2.3 Opportunities

D.2.3 Describe plans and actions necessary to improve current information

Actions that have been taken for improvement includes the following:

a) Awareness program been given to all levels on a yearly basis. This is done via the annual convention of all enumerators.

b) Various training been given to enumerators on identification of species. Additional training on data collection methodologies and gear identifications planned.

c) Plans also in place to conduct a regular management meeting with state directors to increase awareness program and to get full support and backing for states to assist data collection. This is important because data collection for aquaculture for example is based on questionnaires from farm operators. Networking with these entities from the top is very essential;

d) More controlled verification and validation actions by having "spot checks" on data collection activities.

e) Plans should also be on the way to integrate data collection activities with other MCs activities.

f) A very important action being taken is the development of end-user computing applications. Presently data are kept in the database. Information are produced on structure reports using programs set by IT personnel. AN EIS (Executive Information System have been developed for end-users to drill and access the database for useful information).

D.2.3.1 Is there a plan for improvement Yes---No---Don't know
D.2.3.2 Improvement encompass:
D.2.3.2.1 data collection
D.2.3.2.2 processing
D.2.3.2.3 statistical procedures
D.2.3.2.4 dissemination
D.2.3.2.5 training
D.2.3.2.6 cooperation
D.2.3.2.7 specialisation of functions
D.2.3.2.8 data exchange mechanisms
D.2.3.2.9 Verification and validation
D.2.3.3 Financial and institutional support is secured for improvement:
Yes---No---Don't know

E SUPPLEMENTARY INFORMATION

E.1 Institutional arrangements of the fisheries administration

E.1.1 Indicate the administrative structures responsible for fisheries management, development and monitoring for each administrative division (if any) Describe the roles of each institution involved

E.1.1.1 Different administrative units responsible: Yes---No---Not Provided
E.1.1.2 How many units: *DoF, MOSTE, Fisheries Development Authority (LKIM), and Law enforcement authorities*
E.1.1.3 Are local communities involved: #---1---2---3---4---5
E.1.1.4 Are there activities for CCRF: Yes---No---Don't know
E.1.1.5 Is there frame for CCRF Yes---No---Don't know
E.1.1.6 Is this frame well developed: #---1---2---3---4---5

E.1.2 Indicate related articles of fisheries and statistical laws that specify reporting responsibilities

The Fisheries Act 1985 provides legal support for data collection. There are particular sections in the Act that can ensure that all fishing vessels must provide data and information

E.2 Non fishery information and non statistical information

Data sets required for fisheries management are already available in the present data collection system. However for fisheries planning, development and other integrated type of activities where other sectors and agencies are involved, further data and information are required. Sometimes these data are collected by the various agencies and sectors. Networking with other agencies on such information is very necessary. On such level there are needs to standardized and harmonized metadata.

E.2.1 Is there statistical non-fishery information available, if any, please list

E2.1.1 Is non fisheries information available: #---1---2---3---4---5
E2.1.2 Is it used: Yes---No---Don't know

E.2.2 Is there any non-statistical information that can be used to supplement the statistical data

E.2.2.1 Is there useful non statistical information**:** #---1---2---3---4---5
E.2.2.2 If available is it used: Yes---No---Don't know

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2.5 COUNTRY REPORT: MYANMAR

2.5.1 Summary

Why is Information Needed and Who is Collecting it

The fishery development policy of Myanmar focuses on 1) increase of the inland fisheries production; 2) prevention of fish extinction; 3) safeguard of fresh water and marine habitats; and 4) development of eco-friendly shrimp farming.

The Department of Fisheries (DoF) is implementing collection of fisheries data for the Central Statistical Organization (CSO) and the Directorate of Livestock and Fisheries.

What would be Needed

The following information is needed in the formulation of fishery policies and management plans:

- catch and effort by sector, including species composition
- economic data: fish prices, export and status of employment
- livelihood information
- infrastructures

Regional and international organisations and private sector are identified as users of fisheries data.

What And How Data Are Collected

Data collection differs slightly for different sub-sectors (Freshwater and marine fisheries), but targets the same type of information: catch and effort, fish price and exportation, employment and infrastructures.

Freshwater fisheries data concerning aquaculture and open fisheries are collected through reports from license holders.

Fleet registration, census, logbook (for off-shore fisheries), port sampling and other indirect surveys are used to compile data on a monthly base.

How is Data Processed and Analysed

Data collected at local level (township) are forwarded to the district, and from the district to the state and division level, to be finally compiled by DOF Headquarters where statistical summary reports are prepared annually and disseminated to the users.

Major Constraints And Improvements

Budget, manpower and equipment, coordination and technical supports are the main constraints identified. Periodical evaluation of census / surveys and the implementation of a computer based information system would be the major sources of improvement.

2.5.2 Edited Country Questionnaire

The returned country questionnaires were analysed in a systematic way in order to allow comparison of the different systems used. For this a Check list was made. Below the answers of the questionnaire are presented in the different "Text boxes" after which the results of the checklists are provided. For the checklist, the answers from the questionnaire were used in combination of existing information obtained from various FAO and SEAFDEC reports. Not all of the topics could be covered and during the workshop it will be attempted to fill in the gaps

PART 1: WHY

A WHY FISHERY DATA AND INFORMATION ARE NEEDED

A.0 Check if a national policy and/or management objectives are formulated for the country

Myanmar has adopted its fishery development policy in accordance with national and international conditions.

National Fisheries Development Plans

- *In 2002 , the Government reorganized the Department of Fisheries to extend the aquaculture unit*
- *The Department of Fisheries is making progress in environment-friendly schemes in intensive shrimp farming, and is encouraging the private sector*
- *Provide financial assistance and loans from "Livestock and Fisheries Development Bank"*
- *Implementation on rice-fish culture program for development of rural area*
- *The 3 years' shrimp culture development plan (2^{nd} phrase)*

Natural Resource Management Policies

- *Set up strategy to increase fish production by replenishing seeds into dams, reservoirs and natural water areas*
- *In the leasable fisheries, lease holders may hold fish in pens for stocking, and then they are released again by lease holders at the start period or the next flood. In this way, there is an increase on fish production by culture based capture fisheries for sustainable fisheries in Myanmar*
- *Introduction program on fish cum paddy simulations cultivation for the increases of fish production*

Related Marine Research

- *Data collecting on shark fisheries*
- *Marine fisheries resources survey with the assistant of SEAFDEC*
- *Ayeyarwaddy Dolphin Surveys collaborated with DOF and WCS*

Others

- *Implementation of HACCP system in seafood industries*
- *Training for shrimp culture*
- *Planning for aquaculture development*

Although the above mentioned plans have already been worked out and underway, there are still specific plans to be done by DOF to improve the current information as stated below :-

- *A regular performance on fishery census and surveys activities*
- *The necessity of a functional computer based information system*

A.0.1 Country policy available Yes---No---Not traceable
A.0.2 Year when latest policy established: 2002
A.0.3 List major topics of national fisheries policy:
A.0.3.1 Increase inland fish production
A.0.3.2 Prevent extinction of fish
A.0.3.3 Safeguard freshwater and marine habitats
A.0.3.4 Development of eco friendly shrimp farming

A.2 Describe the existing national policy and management objectives for which fishery information is required:

(a) National Policy on Fisheries Sector

- *To promote all round development in the livestock and fisheries sector;*
- *To increase meat and fish production for domestic consumption and share the surplus with neighbouring country;*
- *To encourage the expansion of marine and freshwater aquaculture;*
- *To upgrade the socio-economic status of livestock and fishery communities*

(b) Management Objectives

- *Conservation of fishery resources;*
- *To facilitate research activities on fisheries;*
- *Collecting and compilation of fishery statistics;*
- *Providing extension services;*
- *Monitoring of fishery activities;*
- *To keep the fishery sector under sustainability*

A.1 What data/information do you need or wish to have for policy and management

In the formulation of fishery policies and management plans and in other decision making process, the following data and information are needed:-

- *Catch assessment data on catch and effort, species composition;*
- *Economic data in which cover information on fish prices, export and status of employment in the sector;*
- *Livelihood information on fish consumption including data on employments, income generation, habitat used and importance of fishery related activities for livelihood;*
- *Structural data on number of fishing gears, landing sites, markets, cold-storages, ice plants, fish meal plants, etc*

A.1.1 Indicate if the answers on information requirements are belonging to one of the following groups:

- A.1.1.1 Resource
- A.1.1.2 Catch assessment
- A.1.1.3 Trade/export
- A.1.1.4 Production/fleet capacity
- A.1.1.5 Labour
- A.1.1.6 Economics
- A.1.1.7 Environment
- A.1.1.8 Fish utilization/processing
- A.1.1.9 Biological
- A.1.1.10 Fish price
- A.1.1.11 Socio economics
- A.1.1.12 Aquaculture

A.3 List other needs of information

- *Collaboration and coordination with the international/ regional organization in relation to fishery sector.*
- *Taking responsibilities to report concerning the fisheries to national GDP, and*
- *information for development planning including management of fisheries.*
- *Information services to private sector*
- *Information for other users in the country as well as international bodies and institutions.*

A.3.1 Other users' needs identified: Yes – No

A.3.2 If Yes, then requirements are related to:

- A.3.2.1 Inter/regional agreements
- A.3.2.2 Needed for other sector planning
- A.3.2.3 For private sector

A.3.2.4 Other agencies
A.3.2.5 NGOs & Universities

A.4 Describe objectives of fishery data collection

Description on objectives of fishery data collection are given below :

- *To fulfil the requirements of information users in relation to fishery sector;*
- *To asses and focus fishery resources potential and productivity;*
- *Predicting and planning sustainable fisheries management;*
- *Making policy and decision on fishery sector;*
- *Formulating and developing essential processes for long-term monitoring and management*

A.5 Description on how objectives of data collection are implemented through major data collection systems

The major data collection fishery statistics in Myanmar are composed three main sources of statistics, namely censuses, surveys, and administrative records. Moreover, the statistical system in Myanmar is a decentralized system. Each ministry has its own statistical unit to meet its own needs.

- *The Central Statistical Organization (CSO) is the only authoritative organization in Myanmar that has the mandate to collect, process, organize and supply data for the use of planner, policy makers and other users in the country and international bodies.*
- *The Directorate of Livestock and Fisheries under the Ministry of Livestock and Fisheries is conducting the data collection, compilation, analysis and dissemination for fisheries and livestock sector. Data collection is implemented by the Department of Fisheries (DoF)*

A.5.2 Are there specialised systems/functions in A5: Yes---No---Don't know

A.6 Indicate whether intended users of fisheries information receive required information

With the use of fishery information, fishery statistics can serve in many trends, especially for safeguarding the fishery resources for a long-term, including data and information that describe the current and past status of the fisheries, monitoring the status and trends of the fisheries. Moreover, they can also provide the basis for management in the fishery sector. Such that, it renders a great help towards the required information through the intended and end users of fishery information. The fishery statistics of Myanmar can be utilized based on all the given fishery information to such an extent, but not in full, especially on the information of livelihood data

A.6.1 Is the way information produced from data collection systems submitted to intended users fulfil their needs: #---1---2---3---4---5

A.6.2 Are the dissemination channels diverse enough to assume that users are satisfied: #---1---2---3---4---5

PART 2--- WHAT

PART 2-1: INDICATORS AND DATA VARIABLES

B WHAT SHOULD BE COLLECTED

Data on fisheries in Myanmar are classified into two parts, Freshwater Fisheries and Marine Fisheries. Freshwater Fisheries consists of (a) fish culture, (b) leasable fisheries, and (c) open fisheries. Marine Fisheries include (a) in-shore fisheries and (b) off-shore fisheries.

a) Aquaculture

- *Production Statistics*
  Quantity and Value, production of fish and shrimp seed (by DOF / by Private) and records of grow out production (fish and shrimp)
- *Socio-economics Statistics*
  No. of owner, no. of labour, export quantity and value, required fish/ shrimp seed and records of fish and shrimp disease
- *Structural Statistics*
  No. of owner, No. of fish/shrimp pond and cultured system, area of fish/ shrimp pond and type of aquaculture method
- *Livelihood Statistics*
  No. of labour (full time/ part time/ family)

b) Leasable Fisheries(Inland capture fisheries)

- *Production Statistics*
  Quantity and Value, and no. and type of fishing gear
- *Socio-economics Statistics*
  Value of tender lease (Auctioned fee) and commercial species
- *Structural Statistics*
  No. of lease owner (Large- scale commercial fisheries and small to middle scale commercial fisheries); number, area, type of leasable fisheries; number, type, size of fishing gear; fishing methods by fishing gear, by culture and by seed stocking; and fishing period
- *Livelihood Statistics*
  No. of labour (full time/ part time/ family) and no. of fishing village

b) Open Fisheries (Inland capture fisheries)

- *Production Statistics*
  Quantity and Value and number and type of fishing gear
- *Socio-economics Statistics*
  No. of labour and commercial species

- *Structural Statistics*
  Fishery Tender (number), fishing gears (number, type) and fishing methods (by fishing gear, by seed stocking, etc..)
- *Livelihood Statistics*
  No. of labour (full time/ part time/ family) and no. of fishing village

a) Marine Fisheries

(In-shore fisheries)

- *Production Statistics*
  Quantity and Value, no. and type of fishing gear
- *Socio-economics Statistics*
  No. of Fishers, No. of fishing boat and Commercial species
- *Infrastructural Statistics:*
  No. of cold storage/ ice plant/ fish meal plant/ etc…
- *Livelihood Statistics*
  No. of labour (full time/ part time/ family) and No. of fishing village.

(Off-shore Fisheries)

- *Production Statistics*
  Quantity and Value, No. of fishing vessels and gear and Records of fishing trip
- *Socio-economics Statistics*
  Landing statistics, Export statistics, Companies list/ owner/ yearly export amounts and Fish supply in Yangon
- *Infrastructural Statistics*
  No. of cold storage/ ice plant/ fish meal plant/ etc. and No. of building fishing vessel
- *Livelihood Statistics*
  No.of labour (full time/ part time/ family) and No. of fishing village

B.1 What are the data items (indicators and variables) that are currently collected

B.1.2 Identify the gap between “wanted” and “have”. How large is the gap calculates as “number do”/”number wanted”: score from table: 77 %

	Wanted	*Actual do regularly*
1	*Catch, species, gear, vessel*	*Catch reporting*
2	*Value of catch*	*quantity and value*
3	*Fish price*	*State owned auction*
4	*Export trade*	*Export and trade reporting*
5	*Employment*	*Employment reporting*
6	*Socio economics*	
7	*No gears/vessels*	*Fishing units, frame for vessels, gears and fishing lots, License details*
8	*Structural data/Ice plants/processing*	*Structural statistics reporting*
9	*Effort data*	

B.2 Indicate whether different sets of data items are collected for different subject areas of fisheries

No

B.2.1 Can we identify the list of subject areas covered by each collection system: Yes---No

B.2.2 How many subject areas indicated: 5

B.2.3 Name them:

B.2.3.1: Marine fisheries-inshore

B.2.3.2: Marine fisheries-offshore

B.2.3.3: Inland fisheries-open access

B.2.3.4: Inland fisheries- leased lots

B.2.3.5: Aquaculture

B.2.4 Are indicators provided specifically for different subject areas: Yes---No

B.2.5 Is there an overlap in indicators between the subject areas: Yes----No---Don't know

B.3. Provide definitions for classification terms used in the data collected

B.3.1 Are definitions provided for subject areas and fisheries segments identified above: Yes--No

B.3.2 Do definitions exist at national level: Yes---No

B.3.3 Are definitions compatible with regional/international defined classifications: #---1—2—3—4--5

PART 2-2: INSTITUTIONAL ARRANGEMENTS FOR DATA COLLECTION, PROCESSING AND REPORTING.

C. HOW ARE DATA COLLECTED AND MANAGED

C.1 INSTITUTIONAL ARRANGEMENTS

C.1.1 Indicate the national structure for fishery data collection, compilation, analysis and dissemination

The Central Statistical Organization (CSO) is the only authoritative organization in Myanmar that has the mandate to collect, process, organize and supply data for the use of planner, policy makers and other users in the country and international bodies.

The Directorate of Livestock and Fisheries under the Ministry of Livestock and Fisheries is conducting the data collection, compilation, analysis and dissemination for fisheries and livestock sector.

Department of Fisheries is basic responsible for fishery data collection, processing and dissemination and the existing system runs as follows:

(a) <u>Basic Unit</u>

In Myanmar, there are 370 townships in the whole country but DOF township officers are totally (110) persons. Some township fisheries officers cover more than one township, and all township fisheries officers have to provide and support in collecting the fishery data. That is why we can say that all township fisheries officers are as the basic data collecting officers who are, at the same time, having their own duties to perform the work on fisheries.

(b) <u>Data collection, processing and dissemination</u>

Reporting of the statistical data and collection from Township level to District and then to State and Division where the data is edited and collected, before being sent to statistical office, DOF in Yangon. All organized data in DOF are processed step by step before presenting final results. Data processing is done either manually or using computers.

(c) <u>Collaboration with the other Departments for fishery statistics</u>

Department of fisheries of Myanmar has been collaborating with the Central Statistical Organization (CSO), and National Planning and Economic Department as well as Directorate of Livestock and Fisheries.

C.1.1.1 Institutional arrangements: How many institutes involved: 6
(DoF, CSO, Dep. of Planning and Economics, Dir. Livestock and fisheries)

C.1.1.2 Is there coherence between the institutes involved and the subject areas / major data collection systems as defined in B2/B3: #---1---2---3---4---5

C.1.1.3 Does the organigram reflect a specialisation of the functions vertically / horizontally: #---1---2---3---4---5

C.1.1.4 Is there a vertical distribution of responsibilities for data collection and data management at different levels: #---1--2---3--4--5

C.1.2 Describe the coordination mechanisms among agencies/institutions concerned

Department of Fisheries has been coordinating with the Myanmar Fisheries Federation (MFF) which is one of the highest NGOs commercial organizations to encourage and promote fishery industries of Myanmar.

In Myanmar, the Central Statistical Organization (CSO) is the key contributor to the collection, compilation, analysis, evaluation, organization, interpretation and dissemination of official statistics. CSO is in touch with applying knowledge of statistics of high integrity and quality.

The Directorate of Livestock and Fisheries is directly responsible to the Minister for Livestock and Fisheries, and formulate plans, coordinates, supervises, monitor and evaluates the performance of the livestock and fisheries sector of the Union of Myanmar. It has own statistical unit for livestock and fisheries with the skilful personnel.

C.1.2.1 Are there communication mechanisms between these institutions:
Yes---No---Don't know

C.1.2.2 Is there a coordinating body: Yes---No---Don't know

C.1.2.3 Are responsibilities identified: #---1---2---3---4---5

C.1.2.4 Are partners for different responsibilities identified: #---1---2---3---4---5

C.1.2.5 Is the structure complex: #---1---2---3---4---5

C.1.3 Describe operational resources allocated for data collection for both central and local levels

In the DOF, there are approximately 150 staff from among the 30 district officers, and 180 staff among 12 State and Division officers. Based on the township and district officers on the collection covering aquaculture, inland and marine fisheries, the compilation and analysis are made by the state and division officers including in the using of various collecting forms and methods, fishing licenses, log books, and questionnaires. DOF headquarter takes the responsibility in collecting data and information and sends the summary reports to the Directorate of Livestock and Fisheries and CSO as well as to the National Planning Department. Planning and Statistics Division of DOF totally consists of 27 staff.

C.1.3.1 Is there a budget problem: Yes---No---Don't know

C.1.3.2 Is there a staffing problem: Yes---No---Don't know

C.1.3.3 Is there an equipment problem: Yes---No---Don't know

C.1.3.4 Is there a coordination problem: Yes---No---Don't know

C.1.3.5 Organisation at central level (1= simple... 5= complex):
#---1---2---3---4---5

C.1.3.6 Organisation at local level (1=simple.... 5= complex):
#---1---2---3---4---5

PART 2-3: TECHNICAL ASPECTS OF DATA COLLECTION, PROCESSING AND REPORTING

C.2 DATA COLLECTION

C.2.1 Describe methodologies for data collection for each subject area or fishery

Type of Fisheries in Myanmar is determined by nature of catch. It is divided into freshwater fisheries and marine fisheries. Freshwater fisheries consist of three sub-categories; aquaculture, leasable fisheries and open fisheries whereas marine fisheries are divided into in-shore fisheries and off-shore fisheries.

(1) Freshwater Fisheries

The data collection is conducted through register, records and licensing. Production figures are estimated based on reporting by license holder. It is done by the DOF officers every two weeks before the monthly compilation.

(2) Marine Fisheries

Operation of all the fishing vessels and gears officially requires a license. The data collection on marine fisheries is usually conducted through questionnaires, log-books, registers, records, catch reports, landing statistics, surveys and the reports of researches.

C.2.1.1 Is there evidence of a description by major data collection system and/or subject area: Yes---No

C.2.1.2 Are we able to understand the provided procedures for elaborating indicators by group of indicators / subject area: Yes---No

C.2.1.3 The methods encompass:

- C.2.1.3.1 Indirect surveying marine fisheries
- C.2.1.3.2 Indirect surveying of inland fisheries
- C.2.1.3.3 Registration/License
- C.2.1.3.4 Census rice-fish
- C.2.1.3.5 Logbooks

C.2.1.4 Are stratification procedures explained: #--1---2---3---4---5

C.2.2 How often are the data collected on what time basis. Provide a time line indicating the approximate schedule of data collection

The time line of the data collection flow is based on weekly and monthly compilation. However, in some cases the collection is done everyday, for example, the landing statistics. On the whole, the time line of compilation is done through the monthly basis

C.2.2.1 Are time, space and other criteria (i.e. species, gear types, etc…) defined, are their level of precision / resolution defined, and are these levels highly aggregated or allowing detailed reporting:

- C.2.2.1.1 Time: #---1---2---3---4---5
- C.2.2.1.2 Space: #---1---2---3---4---5

C.2.2.1.3 Species: #---1---2---3---4---5
C.2.2.1.4 Gears/Vessels: #---1---2---3---4---5
(This is for Inland fisheries data collection only)

C.2.2.2 Are there existing standards for statistical units and approaches and at which level (national, regional, international):
National #---1---2---3---4---5
Regional #---1---2---3---4---5
International #---1---2---3---4---5

C.3 DATA PROCESSING

C.3.1 Are there different methods of estimation for different subject areas or fisheries, if so please list

- Nil -

C.3.1.1 Are there different processing methods for different subject areas:
Yes---No---Don't know
C.3.1.2 List the different methods
C.3.1.2.1:
C.3.1.2.2:

C.3.2 Describe the processes of data compilation and storage including hardware and software used

All organized data in DOF are processed step by step before presenting final results. Data processing is done either manually or using computers. So far, It is practically difficult to use specialized fishery statistics software for data processing process in DOF. The Central Statistical Organization (CSO) is doing the processing of the data compilation and storage with hardware and software used.

Reporting of the statistical data and collection from Township level to District and then to State and Division where the data is edited and collected, before being sent to statistical office, DOF in Yangon.

Data entry sheets (Inland only):

C.3.2.1 Includes some sort of quality control procedures
Yes----No---Don't know
C.3.2.2 Standardized entry forms: Yes---No---Don't know
C.3.2.3 made by data collectors: Yes---No
C.3.2.4 using a specialized database: Yes---No---Don't know
C.3.2.5 Simple software like word, excel, access: Yes---No---Don't know
C.3.2.6 Directly in the central system: Yes ---No---Not provided
C.3.2.6.1: Remote---Direct
C.3.2.7 Include data validation / quality control procedures:
Yes---No---Don't know

C.3.2.8 Data review at local level: Yes---No---Don't know
C.3.2.9 Data review at regional level: Yes---No---Don't know
C.3.2.10 Data review at national level: Yes---No---Don't know

Central System:

C.3.2.11 Specialized software: Yes---No---Don't know
C.3.2.12 Automated procedure to import data from decentralized entry points: Yes---No---Don't know
C.3.2.13 Includes data validation procedures: Yes---No---Don't know
C.3.2.14 Merged data coming from different data collection systems: Yes---No---Don't know
C.3.2.15 Stores raw data: Yes---No---Don't know
C.3.2.16 Stores aggregated data: Yes---No---Don't know
C.3.2.17 Does the system facilitate integration of data from different sources: Yes---No---Don't know

Timeliness:

C.3.2.18 Time between data collection and entry (or import) in the central system in month: 1 month---Don't know

C.3.3 How is the analysis of statistical data conducted and by whom. Is information from other sectors/institutions outside fisheries sector used to provide a more holistic approach

In Myanmar, the Central Statistical Organization (CSO) is the key contributor to the collection, compilation, analysis, evaluation, organization, interpretation and dissemination of official statistics.

C.3.3.1 Analysis is: Centralized---Decentralized---Both
C.3.3.2 Are the raising procedures well described: Yes---No---Don't know
(It is a full enumeration through reporting)
C.3.3.3 Are the procedures following a standardized method: Yes---No---Don't know
C.3.3.4 Are statistical procedures applied: Yes---No---Don't know
C.3.3.5 Statistical procedures encompass:
C.3.1.5.1
C.3.1.5.2
C.3.3.6 Is there an independent review procedure: Yes---No---Don't know

C.4 REPORTING

These are the data items included in the fishery statistics bulletin.

- *Per capita fish supply by years;*
- *Production in quantity by sub-sectors;*
- *Area of cultured ponds by state and division and its production;*
- *Seed production from fish hatcheries of DOF;*
- *Number of fish and prawn hatcheries of DOF;*
- *Number of fishing vessel and kind of gears;*
- *Number of cold storage and ice plant(State and Division);*
- *Fishery exports by Myanmar;*
- *Fish supply in Yangon;*
- *The list of companies exported fishery products;*
- *The top ten countries imported fishery products from Myanmar;*
- *Rice-fish culture area and production;*
- *Stock enhancement in open water bodies(dams/ reservoirs/ ponds)*

C.4.1 In what form are the data/information packaged, presented and disseminated

C.4.1 Reporting format: Paper ---Digital---Website

C.4.2 Are there statistical reports routinely prepared for information users, how often are they made available

Yes, there are statistical reports routinely prepared for information users. They are made available yearly. Moreover, the selected monthly economic indicator with the help of the Department of Fisheries and the other data owners is also published for circulation by CSO

C4.2.1 Reporting schedule: Monthly---Quarterly---Annually
C4.2.2 Timeliness (Last published report): 2003

PART 2-4 IMPROVEMENT OF SYSTEM

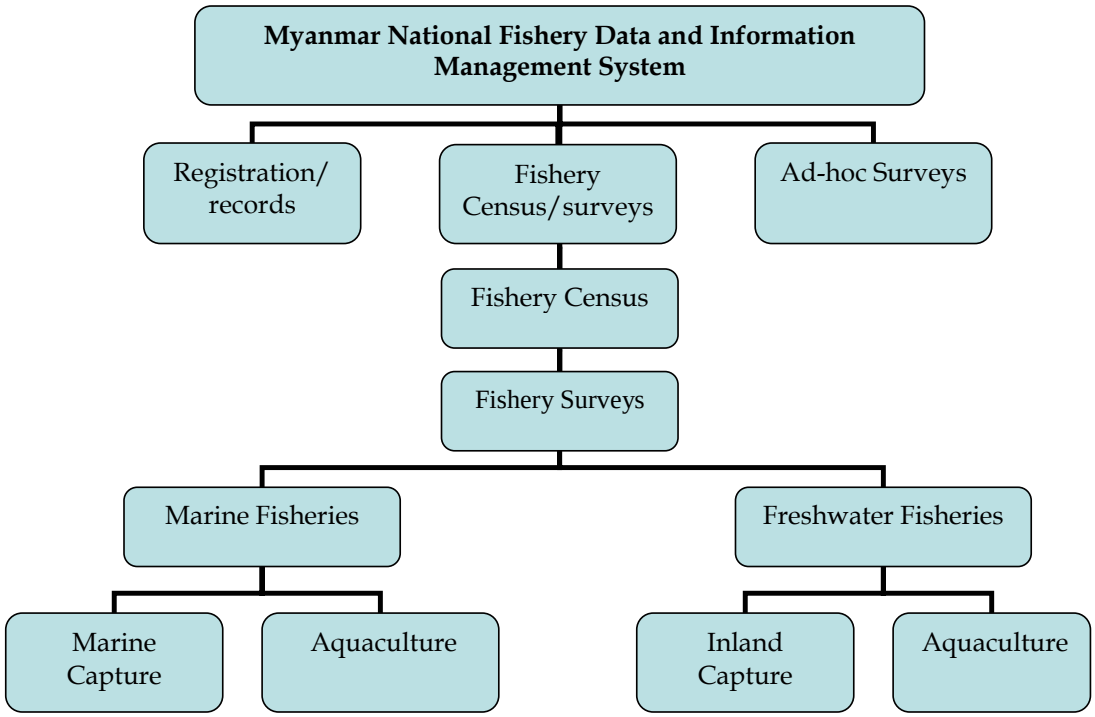
D HOW CAN THE SYSTEM BE IMPROVED

D.1 System design

D.1.1 Describe the designing process of the data collection system and major historical changes in the design or implementation of the system

The designing process of the data collection system is shown in the chart 1.

As shown in the chart, the DOF has systematically planned for the implementation, and is now still underway. Due to limited of funds, there are some disadvantage to do a regular performance on the fishery census and surveys. In the "Myanmar Census of Agriculture" in 2003, some simple questions about rice-fish culture were included. This census of agriculture will be able to provide the users with a wide range of information on fisheries



D.1.1.1 When the system was originally designed: 2003
D.1.1.2 Changes in the past: Yes --- No---Don't know
D.1.1.3 How many times it changed: Don't know
D.1.1.4 When was the last change: 2003
D.1.1.5 Why changes:
- D.1.1.5.1 Shift in policy
- D.1.1.5.2 Technical improvement
- D.1.1.5.3 Budget constraints
- D.1.1.5.4 Statistical improvement

D.1.1.5.5 Institutional improvement
D.1.1.5.6 International requirements

D.1.2 Indicate whether the information users were consulted in the planning and reviewing process in order to meet their needs

In the planning and reviewing process, the fishery statistics are used to draw national plan and in the consideration for food security as well as on predicting and planning sustainable fisheries management. In doing so, the information provided through this system meets some of their needs in the consulting process.

D.1.2.1 Are stakeholders formally involved in the formulation process: Yes---No---Don't know
D.1.2.2 How many stakeholder groups: Yangon Institute of Economics, Ministry of National Planning and Economics, CSO, and Myanmar Fisheries Federation

D.1.3. Is there any metadata available

No

D.1.3.1	Methodology notes available	Yes---No---Don't know
D.1.3.2	Manuals available	Yes---No---Don't know
D.1.3.3	Statistical procedures described	Yes---No---Don't know
D.1.3.4	Metadata available	Yes---No---Don't know

D.2 Data quality and improvements

D.2.1. What are the perceived weaknesses and problems with the current data collection system

In the current fishery data collection system, the weakness and problems are as follows:

- *To get more complete information on livelihood data;*
- *To get more complete registrations of marine capture fisheries (families);*
- *To collect the more detail data through activities of micro-surveys, surveys, ad-hoc surveys and fisheries census;*
- *It needs a functional computer based information system.*

D.2.1.1 Does system meets requirements: Yes---No---No opinion
D.2.1.2 Produces information timely: Yes---No---No opinion
D.2.1.3 Is the system static or evolving: #---1---2---3---4---5

D.2.2 What are the constraints and opportunities in improving quality aspects of information

The constraints and opportunities in improving quality aspects of information are as follows:

- *Budget;*
- *Manpower and equipments;*
- *Coordination and co-operation between line agencies and related agencies;*
- *Technical assistances.*

D.2.2.1 Constraints in improving quality: Yes---No---Don't know
D.2.2.2 Constraints are:
- D.2.2.2.1 Financial
- D.2.2.2.2 Capacity
- D.2.2.2.3 Institutional
- D.2.2.2.4 Coordination
- D.2.2.2.5 Methods
- D.2.2.2.6 Awareness of importance of statistics

D.2.2.3 Opportunities

D.2.3 Describe plans and actions necessary to improve current information

The specific plans and action necessary to improve current information system are as follows:

- *A regular performance on fishery census and surveys activities;*
- *The necessity of a functional computer based information system.*

D.2.3.1 Is there a plan for improvement: Yes---No---Don't know
D.2.3.2 Improvement encompasses:
- D.2.3.2.1 data collection
- D.2.3.2.2 processing
- D.2.3.2.3 statistical procedures
- D.2.3.2.4 dissemination
- D.2.3.2.5 training
- D.2.3.2.6 cooperation
- D.2.3.2.6 specialisation of functions
- D.2.3.2.7 data exchange mechanisms
- D.2.3.2.8 Verification and validation

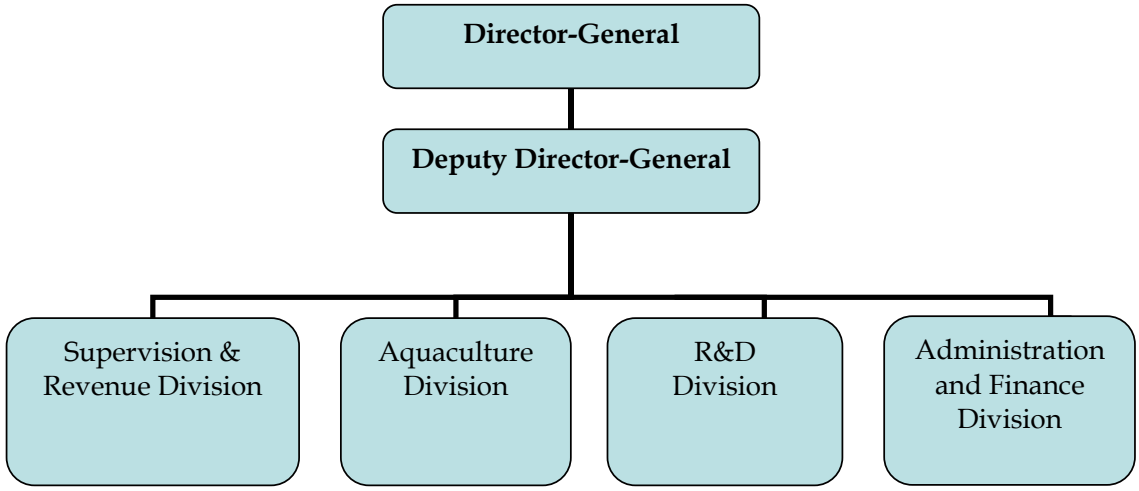
D.2.3.3 Financial and institutional support is secured for improvement: Yes---No---Don't know

E SUPPLEMENTARY INFORMATION

E.1 Institutional arrangements of the fisheries administration

E.1.1 Indicate the administrative structures responsible for fisheries management, development and monitoring for each administrative division (if any) Describe the roles of each institution involved

The administrative structures responsible for fisheries management of Department of Fisheries, Myanmar Organization is given as Chart .2



As mentioned above, there are four divisions under the supervision of the Director-General and Deputy Director-General for fishery management, development, monitoring and administrative respectively

E.1.1.1 Different administrative divisions responsible: Yes---No---Don't know
E.1.1.2 How many units: 1
E.1.1.3 Are local communities involved: #---1---2---3---4---5
E.1.1.4 Are there activities for CCRF: Yes---No---Don't know
E.1.1.5 Is there frame for CCRF: Yes---No---Don't know
E.1.1.6 Is this frame well developed: #---1---2---3---4---5

E.1.2 Indicate related articles of fisheries and statistical laws that specify reporting responsibilities

There are four fisheries laws promulgated by the Government of Myanmar as follows:

- *Law relating to the fishing rights of foreign fishing vessels. (1989)*
- *Aquaculture Law(1989)*
- *Myanmar Marine Fisheries Law(1900)*
- *Freshwater Fisheries Law (1901)*

After enacted these four laws, the Government of Myanmar try to improve and enacted the two amending laws, which are stated as below:-

- *Law Amending the Myanmar Marine Fisheries Law (1993)*
- *Law Amending the Law Relating to the Fishing Rights of Foreign Fishing Vessels (1993)*

Before enacting these laws, Department of Fisheries runs its own proceeding in accordant with the "Fisheries Act (1905)".

Objectives of the Fisheries Laws

The objectives of the fisheries laws of Myanmar are as below:-

- *To further develop the fisheries;*
- *To prevent the extinction of fish;*
- *To safeguard and prevent the destruction of freshwater and marine fisheries water;*
- *To obtain duties and fees payable to the State;*
- *To manage the fisheries and to take action in accordance with the law.*

E.2 Non fishery information and non statistical information

E.2.1 Is there statistical non-fishery information available, if any, please list

Yes, there is non-fishery information available on the list as given below:-

(1) Population census;
(2) Agriculture census;
(3) Household income/expenditure or consumption surveys;
(4) Survey of price.
(5) Rice-fish data obtained from the Agriculture census

E.2.1.1 Is non fisheries information available: #---1---2---3---4---5
E.2.1.2 Is it used: Yes---No---Don't know

E.2.2 Is there any non-statistical information that can be used to supplement the statistical data

E.2.2.1 Is there useful non statistical information**:** #---1---2---3---4---5
E.2.2.2 If available is it used: Yes---No---Don't know

E 2-3 Describe specific plans and actions necessary to improve current information.

There are still specific plans to be done by DOF to improve the current information as stated below:-

- *A regular performance on fishery census and surveys activities;*
- *The necessity of a functional computer based information system.*

ACKNOWLEDGEMENTS

The country report was developed with assistance of U Tint Swe (Deputy Director, Planning and Statistics Division, Department of Fisheries), U Yan Linn (Assistance Staff Officer, Planning and Statistics Division, Department of Fisheries) and the inputs of the FAO consultants Dr. Purwito Martosubroto and Mr. Theo Visser.

2.6 COUNTRY REPORT: PHILIPPINES

2.6.1 Summary

Why is Information Needed and Who is Collecting it

The latest fisheries policy of the Philippines emphasizes the archipelagic structure of the Philippines, includes Integrated Coastal Management, stresses the importance of the protection marine ecology, wants to reduce fishing effort by 50%, indicates the introduction of community based fisheries management, and stipulates sustainable resource management, food security and the control of foreign access to the EEZ.

Data on fisheries to support policy making are collected by the following institutions:

1. Bureau of Agriculture Statistics (BAS),
2. National Fisheries Research and Development Institute (NFRDI)

What would be Needed

For appropriate policy formulation, the following information would be preferred;

- Number of fishing establishment by type & size of management;
- Number of fishing boat by type and by tonnage;
- Number of fishermen by working status;
- Number of fishing units by size of boat and fishing gear type;
- Catch of marine fishery by gear type by species;
- Inland fishery production by water bodies and by species;
- Number of fish farms by type of culture and cultural areas;
- Statistics on disposition of catch;
- Statistics on fish processing;
- Fishing effort statistics;
- Per capita consumption of fish;
- Cost & returns of fish culture

What and How is Data Collected

About 50-60% of this information is actually collected at present through;

- BAS collects volume and value of production of top thirty marine species by province. For aquaculture, volume of production, value and area by type of environment and by type of aqua farm by species are collected by province.

- NFRDI collects production data on catch and effort by fishing ground, by species and by gear through random sampling as well as biological data (e.g. sex and maturity, length and weight, etc)

How is Data Processed and Analysed

- The NFRDI sets the sampling methodology, while the BFAR Regional Stock Assessment Team collects the catch, effort and biological data. The data are collated or encoded to a database and analyzed in the respective BFAR Regional Offices, with technical support of NFRDI. Dissemination of information is by the Regional

Offices. The final technical result of the project is presented in a national technical paper review and evaluation prior to its publication.

- The BAS collects, compiles, analyzes and disseminates fisheries information through a system that involves data collection starting at the provincial level, decentralized data processing, report compilation and analysis at the Central Office (CO). Data review is conducted at the Provincial Operation Center (POC), then at Regional Operation Center (ROC) and finalized during the National Data Review at the CO where estimates are analyzed, consolidated into statistical output tables, reports and handbook and disseminated to users

Major Constraints and Improvements of the System

The major constraints are insufficient sample size and scope due to insufficiency of budget. Sampling frames could get outmoded quickly and cannot be updated regularly. There is little capacity at the moment to make needed improvements.

2.6.2 Edited Country Questionnaire

The returned country questionnaires were analysed in a systematic way in order to allow comparison of the different systems used. For this a Check list was made. Below the answers of the questionnaire are presented in the different "Text boxes" after which the results of the checklists are provided. For the checklist, the answers from the questionnaire were used in combination of existing information obtained from various FAO and SEAFDEC reports. Not all of the topics could be covered and during the workshop it will be attempted to fill in the gaps

PART 1: WHY

A WHY FISHERY DATA AND INFORMATION ARE NEEDED

A.0 Check if a national policy and/or management objectives are formulated for the country

A.0.1 Country policy available Yes—No

Fishery policies were to:

- *emphasize the archipelagic nature of the Philippines in development planning;*
- *view coastal management in terms of integrated management;*
- *implement UNCLOS 1982 within the framework of the National Marine Policy;*
- *address the extent of National Territory, protection of marine ecology, management of marine economy and technology, maritime security; and*
- *reduce coastal fishing pressures from the estimated level in 1993 by half in order to reach the maximum sustainable levels*

The Philippine Government's most significant policy shift in the past 10 years has been the commencement of joint management mechanisms of the fisheries sector between both the central government and the municipalities, and the government and the fishers (FARMCs)

A.0.2 Year when latest policy established: 1990

A.0.3 List major topics of national fisheries policy:

- A.0.3.1 Emphasis archipelagic structure
- A.0.3.2 ICZM
- A.0.3.3 Protection marine ecology
- A.0.3.4 Reduce fishing effort by 50%
- A.0.3.5 Introduce community based fisheries management
- A.0.3.6 Manage fisheries in a sustainable way
- A.0.3.7 Food security
- A.0.3.8 Control foreign access to EEZ

A.2 Describe the existing national policy and management objectives for which fishery information is required:

The existing national policy and management objectives are embodied in the Philippine Fisheries Code of 1998 or Republic Act No. 8550 An Act Providing for the Development, Management and Conservation of the Fisheries and Aquatic Resources, Integrating all Laws Pertinent thereto and for other Purposes.

Rule 7.2 – Comprehensive Fisheries Information System – Establish a comprehensive information network system at the national, regional and local levels, in cooperation with other concerned agencies, for collection, storage, and retrieval of fisheries data;

Rule 7.3 Coordination with Concerned Agencies – Coordinate with the Bureau of Agricultural Statistics (BAS), Philippine Fisheries Development Authority (PFDA), LGU and other Agencies to ensure that the catch and effort statistics collected by the said agencies shall be in accordance with the data requirement of BFAR;

A.1 What data/information do you need or wish to have for policy and management

Catch, number fishing boats and types of gear use, production statistics by fishing vessel, gear, fishing ground and species. More specifically :

- *Number of fishing establishment by type & size of management.*
- *Number of fishing boat by type and by tonnage.*
- *Number of fishermen by working status.*
- *Number of fishing units by size of boat and fishing gear type.*
- *Catch of marine fishery by gear type by species*
- *Inland fishery production by water bodies and by species.*
- *Number of fish farms by type of culture and cultural areas*
- *Statistics on disposition of catch*
- *Statistics on fish processing.*
- *Fishing effort statistics*
- *Per capita consumption of fish*
- *Cost & returns of fish culture*
- *Stock assessment*
- *Trade*

A.1.1 Indicate if the answers on information requirements are belonging to one of the following groups:

A.1.1.1 Resource
A.1.1.2 Catch assessment
A.1.1.3 Trade/export
A.1.1.4 Production/fleet capacity
A.1.1.5 Labour
A.1.1.6 Economics
A.1.1.7 Environment
A.1.1.8 Fish utilization/processing
A.1.1.9 Biological
A.1.1.10 Fish price
A.1.1.11 Socio economics
A.1.1.12 Aquaculture

A.3 List other needs of information

A.3.1 Other users' needs identified: Yes – No

A.3.2 If yes, then requirements are related to:

A.3.2.1 Inter/regional agreements
A.3.2.2 Needed for other sector planning
A.3.2.3 For private sector
A.3.2.4 Other agencies
A.3.2.5 NGOs & Universities

A.4 Describe objectives of fishery data collection

BAS: To come up with estimate of volume and value of fish production by region by province and other relevant information for policy formulation and planning

NFRDI: To support fisheries management

A.5 Description on how objectives of data collection are implemented through major data collection systems

Probability surveys which employ contractual data collectors to conduct interview of sample respondents

Non-probability surveys or monitoring activities which involve interview of key informants on indications of production and price of fish

The question was most likely not completely understood as the correct answer is provided in B1. There are 5 systems:

- Bureau of Agriculture Statistics (BAS)
- National Fisheries Research and Development Institute (NFRDI)

- National Statistic Office (NSO) for census
- National Statistic Office (NSO) for trade
- Port Fisheries Development Authority (PFDA) for infra structure development

A.5.2 Are there specialised systems/functions in A5: Yes---No

A.6 Indicate whether intended users of fisheries information receive required information

Other needs of fishery information (A3) could not be provided due to insufficiency of funds to collect the needed information.

A.6.1 Is the way information produced from data collection systems submitted to intended users fulfil their needs: #---1---2---3---4---5

A.6.2 Are the dissemination channels diverse enough to assume that users are satisfied: #---1---2---3---4---5

PART 2--- WHAT

PART 2-1: INDICATORS AND DATA VARIABLES

B WHAT SHOULD BE COLLECTED

B.1 What are the data items (indicators and variables) that are currently collected

BAS collects volume and value of production of top thirty marine species by province. For aquaculture, volume of production, value and area by type of environment and by type of aqua farm by species are collected by province.

NFRDI collects production data on catch and effort by fishing ground, by species and by gear through random sampling as well as biological data (e.g. sex and maturity, length and weight, etc)

B.1.1 Identify the gap between "wanted" and "have". How large is the gap calculates as "number of do"/"number of wanted": score from table: 53%

	Wanted	*Actual do regularly*
1	*Frame*	*yes*
2	*CPUE*	*yes*
3	*Daily fishing effort*	*yes*
4	*CPUE species wise*	*yes*
5	*CPUE gear wise*	*yes*
6	*Spatial distribution*	*yes*
7	*Seasonal distribution*	*yes*
8	*No fishermen and working status*	*yes*
9	*Inland fisheries*	*yes*
10	*Fish processing*	
11	*Fish consumption*	*yes*
12	*Disposition of catch/pricing*	*yes*

B.2 Indicate whether different sets of data items are collected for different subject areas of fisheries

NFRDI collects data for stock assessment purposes both for the commercial and municipal fisheries sector of the country.
BAS collects data for national account purposes for the commercial, municipal and aquaculture sectors
NSO implements fisheries censuses (1.7 million fisheries operators)
PFDA collects the information on infrastructure facilities and processing

B.2.1 Can we identify the list of subject areas covered by each collection system: Yes---No
B.2.2 How many subject areas indicated: 4
B.2.3 Name them:
B.2.3.1: Municipal fisheries (Inshore)
B.2.3.2: Commercial fisheries (Offshore)
B.2.3.3: Aquaculture
B.2.3.4: Biological studies
B.2.4 Are indicators provided specifically for different subject areas: Yes---No
B.2.5 Is there an overlap in indicators between the subject areas: Yes----No---Don't know

B.3. Provide definitions for classification terms used in the data collection

See attached sheet

B.3.1 Are definitions provided for subject areas and fisheries segments identified above: Yes--No

B.3.2 Do definitions exist at national level: Yes---No
B.3.3 Are definitions compatible with regional/international defined classifications #---1—2—3—4--5

PART 2-2: INSTITUTIONAL ARRANGEMENTS FOR DATA COLLECTION, PROCESSING AND REPORTING.

C. HOW ARE DATA COLLECTED AND MANAGED

C.1 INSTITUTIONAL ARRANGEMENTS

C.1.1 Indicate the national structure for fishery data collection, compilation, analysis and dissemination

- *The NFRDI sets the sampling methodology, while the BFAR Regional Stock Assessment Team collects the catch, effort and biological data. The data are collated or encoded to a database and analyzed in the respective BFAR Regional Offices. Dissemination of information is by the Regional Offices but on a case-to-case basis as not all Regional Offices utilize the data in the region. The final technical result of the project is presented in a national technical paper review and evaluation prior to its publication.*
- *The BAS collects, compiles, analyzes and disseminates fisheries information through a system that involves data collection starting at the provincial level, decentralized data processing, report compilation and analysis at the Central Office (CO). Data review is conducted at the Provincial Operation Center (POC), then at Regional Operation Center (ROC) and finalized during the National Data Review at the CO where estimates are analyzed, consolidated into statistical output tables, reports and handbook and disseminated to users*

C.1.1.1 Institutional arrangements: How many institutes involved: 4
BAS, NFRDI and National Statistics Office (NS0), Port Fisheries Development Authority (PFDA)
C.1.1.2 Is there coherence between the institutes involved and the subject areas / major data collection systems as defined in B2/B3: #---1---2---3---4---5
C.1.1.3 Does the organigram reflect a specialisation of the functions vertically / horizontally: #---1---2---3---4---5
C.1.1.4 Is there a vertical distribution of responsibilities for data collection and management at different levels: #--1--2---3--4--5

C.1.2 Describe the coordination mechanisms among agencies/institutions concerned

An Inter-agency committee/Technical Working Group on Fisheries Statistics was formed represented by coordinating agencies concerned and members.

C.1.2.1 Are there communication mechanisms between these institutions:
Yes---No
C.1.2.2 Is there a coordinating body: Yes---No---Don't know
C.1.2.3 Are responsibilities identified: #---1---2---3---4---5
C.1.2.4 Are partners for different responsibilities identified:
#---1---2---3---4---5
C.1.2.5 Is the structure complex: #---1---2---3---4---5

C.1.3 Describe operational resources allocated for data collection for both central and local levels

NSAP – 2 enumerators per landing site. A total of 200 enumerators nationwide.
BAS – 1 enumerator per sample landing site

C.1.3.1 Is there a budget problem Yes---No---Don't know
C.1.3.2 Is there a staffing problem Yes---No---Don't know
C.1.3.3 Is there an equipment problem Yes---No---Don't know
C.1.3.4 Is there a coordination problem Yes---No---Don't know
C.1.3.5 Organisation at central level (1= simple... 5= complex):
#---1---2---3---4---5
C.1.3.6 Organisation at local level (1=simple.... 5= complex):
#---1---2---3---4---5

PART 2-3: TECHNICAL ASPECTS OF DATA COLLECTION, PROCESSING AND REPORTING

.2 DATA COLLECTION

C.2.1 Describe methodologies for data collection for each subject area or fishery

For catch assessment purposes, the collection is every other two days regardless of Saturdays, Sundays or Holidays for a total of 20 or 21 sampling days per month, ten days for commercial fishery survey and another ten days for the municipal fishery survey. The scheme is that if the commercial fishery is surveyed on the first day and on the second day the municipal is surveyed and rest on the third day. This is again repeated on the third day and so on for the whole month.

BFAR provides funds to the Bureau of Agricultural Statistics (BAS) to conduct probability surveys. In the event that BFAR could not provide funds the BAS employs the non-probability survey to come-up with the national fisheries statistics.

BAS conducts the following surveys as regular statistical activities:

- *Wholesale price monitoring at fish landing market*
- *Commercial Fisheries Survey*
- *Municipal Fisheries Survey*
- *Aquaculture Survey*

Fishing vessel statistics is compiled from the administrative forms used in the licensing and registration of fishing boats, which contains the data items such as type, tonnage class, fishing gears used and number of operators.

Commercial fishery statistics is generated through the Log Book System to be prepared by vessel captains and submitted to the BFAR on a monthly basis

Conducted every ten years, Census of Agriculture and Fisheries (CAF) is a large-scale government operation that gathers data and generates the latest statistics on agriculture and fisheries. Census-taking for CAF 2002 is being administered in two batches, with the Census of Agriculture conducted earlier from March 3 to April 5, 2003.

Census of Fisheries aims to find out the number and distribution of households and enterprises engaged in fishing and aquaculture. Likewise, it seeks to determine the structure and characteristics of fishing and aquaculture operations. Information derived from the CF serve as bases for sampling frame for other statistical undertakings and supply basic data for development planning.

C.2.1.1 Is there evidence of a description by major data collection system and/or subject area: Yes---No

C.2.1.2 Are we able to understand the provided procedures for elaborating indicators by group of indicators / subject area: Yes---No

C.2.1.3 The methods encompass:

- C.2.1.3.1 Frame survey
- C.2.1.3.2 Effort survey
- C.2.1.3.3 Catch survey
- C.2.1.3.4 Quality check survey
- C.2.1.3.5 Logbook survey
- C.2.1.3.6 Census methods
- C.2.1.3.7 Nutritional/consumption survey
- C.2.1.3.8 Others
- C.2.1.3.9 Registration/License

C.2.1.5 Are stratification procedures explained: #--1---2---3---4---5

C.2.2 How often are the data collected on what time basis. Provide a time line indicating the approximate schedule of data collection

For BAS, monthly data collection for marine fisheries is done on an every other day frequency, for aquaculture and inland municipal fisheries; surveys are conducted on a quarterly basis. In case of insufficiency of funds, the non-probability method is employed by interview of key informants done on a quarterly basis.

C.2.2.1 Are time, space and other criteria (i.e. species, gear types, etc) defined, are their level of precision / resolution defined, and are these levels highly aggregated or allowing detailed reporting:

C.2.2.1.1 Time #---1---2---3---4---5
C.2.2.1.2 Space #---1---2---3---4---5
C.2.2.1.3 Species #---1---2---3---4---5
C.2.2.1.4 Gears/Vessels #---1---2---3---4---5
(This is for Routine data collection only)

C.2.2.2 Are there existing standards for statistical units and approaches and at which level (national, regional, international):

National #---1---2---3---4---5
Regional #---1---2---3---4---5
International #---1---2---3---4---5

C.3 DATA PROCESSING

C.3.1 Are there different methods of estimation for different subject areas or fisheries, if so please list

Data processing for BAS data is decentralized at the Provincial Operation Centers (POCs). Data processing system for the fishery surveys is prepared at the Central Office (CO). Prior to the survey operations, trainings/briefings on the use of the system are conducted among Provincial Processing Officers (PPOs). After the data inputting at the POC, summary sheets are prepared/reviewed/validated by the POC staff and then forwarded to the Regional Operation Centers (ROC) where regional summaries are generated/reviewed and validated. The Regional Agricultural Statistics Officers (RASOs) send the summary sheets to the C.O

For the NFRDI the data are collated or encoded to a database and analyzed in the respective BFAR Regional Offices. Dissemination of information is by the Regional Offices. The final technical result of the project is presented in a national technical paper review and evaluation prior to its publication.

C.3.1.1 Are there different processing methods for different subject areas:
Yes---No---Don't know

C.3.1.2 List the different methods

C.3.1.2.1: BAS data sent to the Central Office for aggregation
C.3.1.2.2: NFRDI/BFAR data remain at Regional Office

C.3.2 Describe the processes of data compilation and storage including hardware and software used

For BAS, a data processing system using the IMPS is developed at the CO. Data entry activities are done at the POCs and compilation and storage of data are done at the CO.

Data entry sheets (BAS only):

C.3.2.1 Includes some sort of quality control procedures: Yes----No---Don't know
C.3.2.2 Standardized entry forms: Yes---No---Don't know
(Data entry in a computerized system)
C.3.2.3 made by data collectors: Yes---No
C.3.2.4 using a specialized database: Yes---No---Don't know
C.3.2.5 Simple software like word, excel, access: Yes---No---Don't know
C.3.2.6 Directly in the central system: Yes---No---Not provided
C.3.2.6.1 Remote---Direct
C.3.2.7 include data validation / quality control procedures: Yes---No---Don't know
C.3.2.8 Data review at local level: Yes---No---Don't know
C.3.2.9 Data review at regional level: Yes---No---Don't know
C.3.2.10 Data review at national level: Yes---No---Don't know

Central System:

C.3.2.11 Specialized software: Yes---No---Don't know
C.3.2.12 Automated procedure to import data from decentralized entry points: Yes---No---Don't know
C.3.2.13 Includes data validation procedures: Yes---No---Don't know
C.3.2.14 Merged data coming from different data collection systems: Yes---No---Don't know
C.3.2.15 Stores raw data: Yes---No---Don't know
C.3.2.16 Stores aggregated data: Yes---No---Don't know
C.3.2.17 Does the system facilitate integration of data from different sources: Yes---No---Don't know

Timeliness:

C.3.2.18 Time between data collection and entry (or import) in the central system in month: xxx---Don't know

C.3.3 How is the analysis of statistical data conducted and by whom. Is information from other sectors/institutions outside fisheries sector used to provide a more holistic approach

Provided above

C.3.3.1 Analysis is: Centralized----Decentralized---Both
C.3.3.2 Are the raising procedures well described: Yes---No---Don't know
C.3.3.3 Are the procedures following a standardized method: Yes---No---Don't know
C.3.3.4 Are statistical procedures applied: Yes---No---Don't know
C.3.3.5 Statistical procedures encompass:
C.3.3.5.1 No procedures
C.3.3.5.2 Sample size check
C.3.3.5.3 Stratification of PSU
C.3.3.5.4 adaptation and check of raising factors
C.3.3.6 Is there an independent review procedure Yes---No---Don't know

C.4 REPORTING

Information are loaded in the BAS Website, reports on performance of agriculture and fisheries and statistical outputs, handbooks are published

C.4.1 In what form are the data/information packaged, presented and disseminated

C.4.1 Reporting format: Paper ---Digital---Website

C.4.2 Are there statistical reports routinely prepared for information users, how often are they made available

C.4.2.1 Reporting schedule: Quarterly---Annually
C.4.2.2 Timeliness (Last published report): 2003

PART 2-4 IMPROVEMENT OF SYSTEM

D HOW CAN THE SYSTEM BE IMPROVED

D.1 System design

D.1.1 Describe the designing process of the data collection system and major historical changes in the design or implementation of the system

Survey instruments are updated as the need arises or when new fishing information is made available.

D.1.1.1 When the system was originally designed: 1980
D.1.1.2 Changes in the past: Yes --- No---Don't know
D.1.1.3 How many times it changed: Don't know
D.1.1.4 When was the last change: 1995
D.1.1.5 Why changes:

- D.1.1.5.1 Shift in policy
- D.1.1.5.2 Technical improvement
- D.1.1.5.3 Budget constraints
- D.1.1.5.4 Statistical improvement
- D.1.1.5.5 Institutional improvement
- D.1.1.5.6 International requirements

D.1.2 Indicate whether the information users were consulted in the planning and reviewing process in order to meet their needs

A user consultation mechanism is incorporated in the designing/reviewing process of fishery data and information collection system as BAS conducts User's Forum where Technical Working Group members are consulted.

D.1.2.1 Are stakeholders formally involved in the formulation process
Yes---No---Don't know
D.1.2.2 How many stakeholder groups: Not known

D.1.3. Is there any metadata available

Only for the National Stock Assessment Program (NSAP)

D.1.3.1	Methodology notes available	Yes---No---Don't know
D.1.3.2	Manuals available	Yes---No---Don't know
D.1.3.3	Statistical procedures described	Yes---No---Don't know
D.1.3.4	Metadata available	Yes---No---Don't know

D.2 Data quality and improvements

D.2.1. What are the perceived weaknesses and problems with the current data collection system

- *Insufficient sample size and scope due to insufficiency of budget.*
- *Sampling frames get outmoded quickly and cannot be updated regularly*

D.2.1.1 Does system meets requirements: Yes---No---No opinion
D.2.1.2 Produces information timely: Yes---No---No opinion
D.2.1.3 Is the system static or evolving: #---1---2---3---4---5

D.2.2 What are the constraints and opportunities in improving quality aspects of information

Budget Constraints and lack of Technical Personnel in BAS

D.2.2.1 Constraints in improving quality Yes---No---Don't know
D.2.2.2 Constraints are:
- D.2.2.2.1 Financial
- D.2.2.2.2 Capacity
- D.2.2.2.3 Institutional
- D.2.2.2.4 Coordination
- D.2.2.2.5 Methods

D.2.2.2.6 Awareness of importance of statistics

D.2.2.4 Opportunities

D.2.3 Describe plans and actions necessary to improve current information

Request for regular funding for generation of fisheries information. At present BAS does not have regular operating expenses to generate fisheries information, only personnel services are available.

D.2.3.1 Is there a plan for improvement: Yes---No---Don't know

D.2.3.2 Improvement encompasses:

- D.2.3.2.1 data collection
- D.2.3.2.2 processing
- D.2.3.2.3 statistical procedures
- D.2.3.2.4 dissemination
- D.2.3.2.5 training
- D.2.3.2.6 cooperation
- D.2.3.2.6 specialisation of functions
- D.2.3.2.7 data exchange mechanisms

D.2.3.3 Financial and institutional support is secured for improvement: Yes---No---Don't know

E SUPPLEMENTARY INFORMATION

E.1 Institutional arrangements of the fisheries administration

BFAR is the National Agency mandated to implement fisheries management, development and monitoring. However, collection and publication of the national fisheries statistics is the mandate of another National Agency such as the BAS

E.1.1 Indicate the administrative structures responsible for fisheries management, development and monitoring for each administrative division (if any) Describe the roles of each institution involved

E.1.1.1 Different administrative units responsible: Yes---No---Don't know

E.1.1.2 How many units: (4) *BFAR, FARMCs, Municipalities and NGOs*

E.1.1.3 Are local communities involved: #---1---2---3---4---5

E.1.1.4 Are there activities for CCRF: Yes---No---Don't know

E.1.1.5 Is there frame for CCRF Yes---No---Don't know

E.1.1.6 Is this frame well developed: #---1---2---3---4---5

E.1.2 Indicate related articles of fisheries and statistical laws that specify reporting responsibilities

Executive Order 116 dated January 30, 1987, Section 16 – The functions of BAS are defined as follows: a) to collect, compile and release official agricultural statistics; b) to exercise technical supervision over data collection centers; and c) to coordinate all agricultural statistics and economic research activities of all bureaus, corporations & offices under the Department of Agriculture.

Implementing Rules & Regulations Pursuant to Republic Act 8435, Sec. 44 – The BAS will serve as the central information server of the National Information Network (NIN); and will provide technical assistance to end users in accessing and analyzing product and market information and technology

The fishery Code obligates compulsory registration of municipal fisherfolk and fishing vessels. The LGUs shall maintain registries of municipal fisherfolk and fishing vessels for the purposes of monitoring their fishing activities and fish catch

E.2 Non fishery information and non statistical information

E.2.1 Is there statistical non-fishery information available, if any, please list

Census data

E.2.1.1 Is non fisheries information available : #---1---2---3---4---5
E.2.1.2 Is it used Yes---No---Don't know

E.2.2 Is there any non-statistical information that can be used to supplement the statistical data

E.2.2.1 Is there useful non statistical information**:** #---1---2---3---4---5
E.2.2.2 If available is it used: Yes---No---Don't know

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2.7 COUNTRY REPORT: SINGAPORE

2.7.1 Summary

Why is Information Needed and Who is Collecting it

Protection and conservation of fisheries, food security, control of fishing and support to trade and exports are the main issues addressed in the Fisheries policy of Singapore.

The Agri-food & Veterinary Authority Singapore (AVA) is in charge of fisheries data collection and management.

What would be Needed

Fish Import/Export statistics, catch and effort data, information on fishing boats and processing are the data items requested for fisheries management purposes

What and How is Data Collected

Trade statistics are obtained electronically through inwards and outwards declaration. Fishing effort data are obtained through a licensing system. Farming and processing production data are from surveys.

Data are stored, processed and analysed using spreadsheet software to produce estimates. Results of analysis are presented in reports (monthly and annually) and management papers.

Major Constraints and Improvements of the System

The main constraint of the system is the accuracy of information and data obtained by surveys, which rely on the cooperation of stakeholders.

2.7.2 Edited Country Questionnaire

The returned country questionnaires were analysed in a systematic way in order to allow comparison of the different systems used. For this a Check list was made. Below the answers of the questionnaire are presented in the different "Text boxes" after which the results of the checklists are provided. For the checklist, the answers from the questionnaire were used in combination of existing information obtained from various FAO and SEAFDEC reports. Not all of the topics could be covered and during the workshop it will be attempted to fill in the gaps

PART 1: WHY

A WHY FISHERY DATA AND INFORMATION ARE NEEDED

A.0 Check if a national policy and/or management objectives are formulated for the country

Fisheries act (chapter 111)

An act for the protection and conservation of fisheries, and to make provision for the control of fishing, the control of the marketing and distribution of fish and the use and control of fishing ports and harbours, for measures pertaining to the general welfare and improvement of the fishing industry in Singapore and for purposes incidental thereto.

It is to ensure resilient supply of fish and fishery products for consumption, and to support and facilitate import and export fish trade.

A.0.1 Country policy available Yes[2]---No---Not traceable
A.0.2 Year when latest policy established:
A.0.3 List major topics of national fisheries policy:
- A.0.3.1 Protection and conservation of fisheries
- A.0.3.2 Food security
- A.0.3.3 Control of fishing
- A.0.3.4 Support of trade & export

A.2 Describe the existing national policy and management objectives for which fishery information is required:

Some fishery information are declared by the stakeholders as a condition of their license which is compulsory, eg. Import trade statistic, and others are obtained through surveys.

[2] Part of food security and export security policy

A.1 What data/information do you need or wish to have for policy and management

Fishery data and information on catch, farming, manufacturing and trade

A.1.1 Indicate if the answers on information requirements are belonging to one of the following groups:

- A.1.1.1 Resource
- A.1.1.2 Catch assessment
- A.1.1.3 Trade/export
- A.1.1.4 Production/fleet capacity
- A.1.1.5 Labour
- A.1.1.6 Economics
- A.1.1.7 Environment
- A.1.1.8 Fish utilization/processing
- A.1.1.9 Biological
- A.1.1.10 Fish price
- A.1.1.11 Socio economics
- A.1.1.12 Aquaculture

A.3 List other needs of information

Other than national data, information concerning regional and international fisheries will be useful

A.3.1 Other users' needs identified Yes – No

A.3.2 If yes, then requirements are related to:

- A.3.2.1 Inter/regional agreements
- A.3.2.2 Needed for other sector planning
- A.3.2.3 For private sector
- A.3.2.4 Other agencies
- A.3.2.5 NGOs & Universities

A.4 Describe objectives of fishery data collection

Regulating all activities concerning fisheries such as catching, farming, manufacturing and trading to ensure resilient supply of fish and fishery products for consumption, and to support and facilitate import and export fish trade.

A.5 Description on how objectives of data collection are implemented through major data collection systems

Legislations are available for compulsory declaration of some fishery information.

A.5.2 Are there specialised systems/functions in A5: Yes---No---Don't know

A.6 Indicate whether intended users of fisheries information receive required information

Most of the useful fishery information are available for the intended users

A.6.1 Is the way information produced from data collection systems submitted to intended users fulfil their needs: #---1---2---3---4---5

A.6.2 Are the dissemination channels diverse enough to assume that users are satisfied: #---1---2---3---4---5

PART 2--- WHAT

PART 2-1: INDICATORS AND DATA VARIABLES

B WHAT SHOULD BE COLLECTED

B.1 What are the data items (indicators and variables) that are currently collected

Fish import/export statistics, fishing effort eg. boat size and gears, fisherman data, production/catch data, farming and processing production data

B.1.2 Identify the gap between "wanted" and "have". How large is the gap calculates as number of "do"/ "wanted": score from table: 100 %

	Wanted	***Actual do regularly***
1	*catch*	*effort, catch, species, gears, vessels*
2	*aquaculture*	*production*
3	*trade & export*	*Import/export*
4		*processing*

B.2 Indicate whether different sets of data items are collected for different subject areas of fisheries

No, the same data are collected nationwide.

B.2.1 Can we identify the list of subject areas covered by each collection system: Yes---No

B.2.2 How many subject areas indicated:

B.2.3 Name them:

B.2.3.1: Marine fisheries-inshore

B.2.3.2:

B.2.4 Are indicators provided specifically for different subject areas: Yes---No

B.2.5 Is there an overlap in indicators between the subject areas: Yes---No---Don't know

B.3. Provide definitions for classification terms used in the data collected

(No comment)

B.3.1 Are definitions provided for subject areas and fisheries segments identified above: Yes--No

B.3.2 Are definitions existing at national level: Yes---No

B.3.3 Are definitions compatible with regional/international defined classifications: #---1—2—3—4--5

PART 2-2: INSTITUTIONAL ARRANGEMENTS FOR DATA COLLECTION, PROCESSING AND REPORTING.

C. HOW ARE DATA COLLECTED AND MANAGED

C.1 INSTITUTIONAL ARRANGEMENTS

C.1.1 Indicate the national structure for fishery data collection, compilation, analysis and dissemination

Agri- Food & Veterinary Authority Singapore (AVA) is in charge of the fishery data for collection and management. The AVA was established on 1 April 2000 to carry out the responsibilities of the Primary Production Department (PPD). As a statutory board, the AVA has a more autonomous framework that allows it to respond effectively to the challenges ahead.

C.1.1.1 Institutional arrangements: How many institutes involved: 1

C.1.1.2 Is there coherence between the institutes involved and the subject areas / major data collection systems as defined in B2/B3: #---1---2---3---4---5

C.1.1.3 Does the organigram reflect a specialisation of the functions vertically / horizontally: #---1---2---3---4---5

C.1.1.4 Is there a vertical distribution of responsibilities for data collection and data management at different levels: #---1--2---3--4--5

C.1.2 Describe the coordination mechanisms among agencies/institutions concerned

AVA will liaise with other agencies e.g. International Enterprise Singapore (formerly known as the Singapore Trade Development Board), if necessary for the trade statistics.

C.1.2.1 Are there communication mechanisms between these institutions: Yes---No---Don't know

C.1.2.2 Is there a coordinating body: Yes---No---Don't know

C.1.2.3 Are responsibilities identified: #---1---2---3---4---5

C.1.2.4 Are partners for different responsibilities identified: #---1---2---3---4---5

C.1.2.5 Is the structure complex: #---1---2---3---4---5

C.1.3 Describe operational resources allocated for data collection for both central and local levels

The data collection are carried out by staff at the AVA managed fishing ports, as well as its headquarters

C.1.3.1 Is there a budget problem: Yes---No---Don't know

C.1.3.2 Is there a staffing problem: Yes---No---Don't know

C.1.3.3 Is there an equipment problem: Yes---No---Don't know

C.1.3.4 Is there a coordination problem: Yes---No---Don't know

C.1.3.5 Organisation at central level (1= simple... 5= complex): #---1---2---3---4---5

C.1.3.6 Organisation at local level (1=simple.... 5= complex): #---1---2---3---4---5

PART 2-3: TECHNICAL ASPECTS OF DATA COLLECTION, PROCESSING AND REPORTING

C.2 DATA COLLECTION

C.2.1 Describe methodologies for data collection for each subject area or fishery

Trade statistics are obtained electronically through inwards and outwards declaration. Fishing effort data are obtained through licensing system. Farming and processing production data are from surveys.

C.2.1.1 Is there evidence of a description by major data collection system and/or subject area: Yes---No

C.2.1.2 Are we able to understand the provided procedures for elaborating indicators by group of indicators / subject area: Yes---No

C.2.1.3 The methods encompass:

C.2.1.3.1 License/Registration for effort

C.2.1.3.2 Direct surveys for aquaculture and processing

C.2.1.3.3 Trade from declaration

C.2.1.4 Our perception of the used systems: #---1---2---3---4---5

C.2.1.5 Are stratification procedures explained: #--1---2---3---4[3]---5

C.2.2 How often are the data collected on what time basis. Provide a time line indicating the approximate schedule of data collection

Trade statistics are collected on daily basis. Fishing effort data are collected on yearly basis. Farming data are on monthly basis

C.2.2.1 Are time, space and other criteria (e.g. species, gear types, etc) defined, are their level of precision / resolution defined, and are these levels highly aggregated or allowing detailed reporting:

C.2.2.1.1 Time: #---1---2---3---4---5

C.2.2.1.2 Space: #---1---2---3---4---5

C.2.2.1.3 Species: #---1---2---3---4---5

C.2.2.1.4 Gears/Vessels: #---1---2---3---4---5

C.2.2.2 Are there existing standards for statistical units and approaches and at which level (national, regional, international):

C.2.2.2.1 National: #---1---2---3---4---5

C.2.2.2.2 Regional: #---1---2---3---4---5

C.2.2.2.4 International: #---1---2---3---4---5

C.3 DATA PROCESSING

C.3.1 Are there different methods of estimation for different subject areas or fisheries, if so please list

No

C.3.1.1 Are there different processing methods for different subject areas: Yes---No---Don't know

C.3.1.2 List the different methods

C.3.1.2.1:

C.3.1.2.2:

[3] Full enumeration

C.3.2 Describe the processes of data compilation and storage including hardware and software used

Data are abstracted from sources and compiled using Microsoft Excel. Information are stored in hard disk or cut in CDs.

Data entry sheets:

C.3.2.1 Includes some sort of quality control procedures: Yes----No---Don't know
C.3.2.2 Standardized entry forms: Yes---No---Don't know

Data entry in a computerized system:

C.3.2.3 made by data collectors: Yes---No----Don't know
C.3.2.4 using a specialized database: Yes---No---Don't know
C.3.2.5 Simple software like word, excel, access: Yes---No---Don't know
C.3.2.6 Directly in the central system: Yes---No---Not provided
C.3.2.6.1 Remote---Direct
C.3.2.7 Include data validation / quality control procedures: Yes---No---Don't know
C.3.2.8 Data review at local level: Yes---No---Don't know
C.3.2.9 Data review at sub national level: Yes---No---Don't know
C.3.2.10 Data review at national level: Yes---No---Don't know

Central System:

C.3.2.11 Specialized software: Yes---No---Don't know
C.3.2.12 Automated procedure to import data from decentralized entry points: Yes---No---Don't know
C.3.2.13 Includes data validation procedures: Yes---No---Don't know
C.3.2.14 Merged data coming from different data collection systems: Yes---No---Don't know
C.3.2.15 Stores raw data: Yes---No---Don't know
C.3.2.16 Stores aggregated data: Yes---No---Don't know
C.3.2.17 Does the system facilitate integration of data from different sources: Yes---No---Don't know

Timeliness:

C.3.2.18 Time between data collection and entry (or import) in the central system: ---Don't know

C.3.3 How is the analysis of statistical data conducted and by whom. Is information from other sectors/institutions outside fisheries sector used to provide a more holistic approach

Data are analyzed by Senor Officer for drafting of report and management paper. Yes, other information with regard to food supply are also used.

C.3.3.1 Analysis is: Centralized---Decentralized---Both

C.3.3.2 Are the raising procedures well described: It is a full enumeration through reporting: Yes---No---Don't know

C.3.3.3 Are the procedures following a standardized method: Yes---No---Don't know

C.3.3.4 Are statistical procedures applied: Yes---No---Don't know

C.3.3.5 Statistical procedures encompass:

C.3.3.5.1 Sample size check

C.3.3.5.2 Stratification of PSU

C.3.3.5.3 Adaptation and check of raising factors

C.3.3.6 Is there an independent review procedure: Yes---No---Don't know

C.4 REPORTING

Data are presented in monthly and annual reports, and management papers.

C.4.1 In what form are the data/information packaged, presented and disseminated

C.4.1 Reporting format: Paper ---Digital---Website

C.4.2 Are there statistical reports routinely prepared for information users, how often are they made available

No

C4.2.1 Reporting schedule: Monthly---Quarterly---Annually

C4.2.2 Timeliness (Last published report): 2004

PART 2-4 IMPROVEMENT OF SYSTEM

D HOW CAN THE SYSTEM BE IMPROVED

D.1 System design

D.1.1 Describe the designing process of the data collection system and major historical changes in the design or implementation of the system

The data collection system is carried out with the supports of the IT technology. In particular, the collection of trade statistics is done through the implementation of the Trade Net which is the electronic declaration of inwards/outwards declaration by the stakeholders.

D.1.1.1 When the system was originally designed: 10-20 years ago
D.1.1.2 Changes in the past: Yes --- No---Don't know
D.1.1.3 How many times it changed: not known
D.1.1.4 When was the last change:
D.1.1.5 Why changes:
- D.1.1.5.1 Shift in policy
- D.1.1.5.2 Technical improvement
- D.1.1.5.3 Budget constraints
- D.1.1.5.4 Statistical improvement
- D.1.1.5.5 Institutional improvement
- D.1.1.5.6 International requirements

D.1.2 Indicate whether the information users were consulted in the planning and reviewing process in order to meet their needs

Yes

D.1.2.1 Are stakeholders formally involved in the formulation process: Yes---No---Don't know
D.1.2.2 How many stakeholder groups: Not known

D.1.3. Is there any metadata available

No comment

D.1.3.1 Methodology notes available: Yes---No---Don't know
D.1.3.2 Manuals available: Yes---No---Don't know
D.1.3.3 Statistical procedures described: Yes---No---Don't know
D.1.3.4 Metadata available: Yes---No---Don't know

D.2 Data quality and improvements

D.2.1. What are the perceived weaknesses and problems with the current data collection system

The data collected are fairly liable and updated

D.2.1.1 Does system meet requirements: Yes---No---No opinion
D.2.1.2 Produces information timely: Yes---No---No opinion
D.2.1.5 Is the system static or evolving: #---1---2---3---4---5

D.2.2 What are the constraints and opportunities in improving quality aspects of information

For information and data obtained from surveys, their accuracy depends much on the cooperation of the stakeholders.

D.2.2.1 Constraints in improving quality Yes---No---Don't know
D.2.2.2 Constraints are:
- D.2.2.2.1 Financial
- D.2.2.2.2 Capacity
- D.2.2.2.3 Institutional
- D.2.2.2.4 Coordination
- D.2.2.2.5 Methods
- D.2.2.2.6 Awareness of importance of statistics

D.2.2.3 Opportunities

D.2.3 Describe plans and actions necessary to improve current information

Nil

D.2.3.1 Is there a plan for improvement: Yes---No---Don't know
D.2.3.2 Improvement encompasses:
- D.2.3.2.1 data collection
- D.2.3.2.2 processing
- D.2.3.2.3 statistical procedures
- D.2.3.2.4 dissemination
- D.2.3.2.5 training
- D.2.3.2.6 cooperation
- D.2.3.2.7 specialisation of functions
- D.2.3.2.8 data exchange mechanisms
- D.2.3.2.9 Verification and validation

D.2.3.3 Financial and institutional support is secured for improvement Yes---No---Don't know

E SUPPLEMENTARY INFORMATION

E.1 Institutional arrangements of the fisheries administration

E.1.1 Indicate the administrative structures responsible for fisheries management, development and monitoring for each administrative division (if any) Describe the roles of each institution involved

AVA is the sole agency responsible for fisheries management in Singapore

E.1.1.1 Different administrative divisions responsible: Yes---No---Don't know
E.1.1.2 How many divisions:
E.1.1.3 Are local communities involved: #---1---2---3---4---5
E.1.1.4 Are there activities for CCRF: Yes---No---Don't know
E.1.1.5 Is there frame for CCRF: Yes---No---Don't know
E.1.1.6 Is this frame well developed: #---1---2---3---4---5

E.1.2 Indicate related articles of fisheries and statistical laws that specify reporting responsibilities

Various Rules under the Fisheries Act which is administered by AVA

E.2 Non fishery information and non statistical information

E.2.1 Is there statistical non-fishery information available, if any, please list

Food supply situation in Singapore

E2.1.1 Is non fisheries information available: #---1---2---3---4---5
E2.1.2 Is it used: Yes---No---Don't know

E.2.2 Is there any non-statistical information that can be used to supplement the statistical data

AVA Annual report

E.2.2.1 Is there useful non statistical information**:** #---1---2---3---4---5
E.2.2.2 If available is it used: Yes---No---Don't know

E 2-3 Describe specific plans and actions necessary to improve current information.

No comment as the existing system of information collection is satisfactory

ACKNOWLEDGEMENTS

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2.8 COUNTRY REPORT: THAILAND

2.8.1 Summary

Why is Information Needed and Who is Collecting it

The latest fisheries policy of Thailand was formulated in 2002 and encompasses: 1) manage fisheries inside Thai waters; 2) attain catch at 1.58 million mt/year; 3) rehabilitation of marine resources and environment; 4) reduction of by catch with 100,000 mt/year; 5) manage fisheries outside Thai waters; 6) implement regulation to govern conduct of Thai fleet in waters outside Thailand; 7) increase fleet with 3500 vessels for outside EEZ fishing aiming at a catch of about 1.8 million mt/yr; 8) increase aquaculture production by 5.5% year; 9) improve quality assurance for export with 1million mt/year.

Data on fisheries to support this policy are collected by:

1. National Statistical Office)NSO(, in the Office of the Ministry of Information, Communication and Technology has responsibility to co-ordinate and to set standards for all statistical activities in the country .The Statistical Act authorizes NSO to review and to approve of statistical projects being proposed to be undertaken in other statistical units in the government agencies .This office also has the responsibility for conducting all censuses covering population, agriculture, fishery, industry, etc .
2. Department of Fisheries)DOF(, Ministry of Agriculture and Cooperatives is responsible for the development of statistical collection system and implementation of fisheries statistical surveys and the compilation of fisheries statistical yearbook.

What would be Needed

To support appropriate formulation of a fisheries policy and fisheries management plans, the following information would be required:

1. Fishing structure
   - Number of Fishing communities, fishing household and fishermen
   - Number of fishing vessel and fishing gear
2. Fishing ground and fishing zone
3. The status of fisheries resources
   - Catch and landing
   - Value of catch
   - Fishing effort
4. Fisheries resources indicators
   - Catch per unit effort (CPUE)
   - Catch composition
   - Maximum sustainable yield (MSY)
   - Biomass
5. By catch and fish utilization
6. Social and economic information
   - Costs and earnings of fishing operation
   - Income distribution
   - Fisheries conflict
   - Employment opportunities

- Occupational and geographical mobility

What and How is Data Collected

Most of this data (90%) is actually collected at present through

- Fishery Census
- Marine capture fishery survey
- Inland capture fishery survey
- A-hoc surveys/research programmes

How is Data Processed and Analysed

Fishery Statistics Analysis and Research Group (FSARG) of DOF is responsible for planning, data input and processing and reporting on Thai fisheries statistics in collaborate with Provincial Fisheries Offices. In each field of marine fisheries, inland fisheries, the Statisticians of FSARG design and plan surveys and enumerator at Provincial Fisheries Offices implement data collection for each survey. They send back completed survey forms to FSARG where all of the data are process with computers.

Major Constraints and Improvements of the System

A major constraint of the system is timeliness as it takes about 2 years to get the data published. The system will be improved through decentralization of processing whereby the raw data will be partially compiled/processed at district level.

2.8.2 Edited Country Questionnaire

The returned country questionnaires were analysed in a systematic way in order to allow comparison of the different systems used. For this a Check list was made. Below the answers of the questionnaire are presented in the different "Text boxes" after which the results of the checklists are provided. For the checklist, the answers from the questionnaire were used in combination of existing information obtained from various FAO and SEAFDEC reports. Not all of the topics could be covered and during the workshop it will be attempted to fill in the gaps

PART 1: WHY

A WHY FISHERY DATA AND INFORMATION ARE NEEDED

A.0 Check if a national policy and/or management objectives are formulated for the country

A.0.1 Country policy available: Yes—No
A.0.2 Year when latest policy established: 2001
A.0.3 List major topics of national fisheries policy: *Targets and policies of ninth National Economic and Social Development Plan (2002-2006)*

A.0.3.1: Fisheries management inside/outside Thai waters

A.0.3.2: Rehabilitation of marine resources and environment
A.0.3.3: Food supply (attain catch at 1.58 million mt/year, increase aquaculture production by 5.5%)
A.0.3.4: Fishing capacity (increase fleet with 3500 vessels for outside EEZ fishing)
A.0.3.5: MSC (regulation to govern Thai fleet in waters outside Thailand)
A.0.3.6: Reduction of by catch (100 000 mt/year)
A.0.3.7: Post harvest (Improve quality assurance for export)

A.2 Describe the existing national policy and management objectives for which fishery information is required:

Objectives

To maintain fisheries resources in harmonize with sustainable utilization and without negative impact to environment, under joint administration and management by Thai people, community, local organization and government.

Strategy

1. Improve fisheries and environmental administration and management.
- *Amend rules/regulations and measures concerned with fisheries administration and management in compliance with the constitution law of the country and with the current situation of fisheries resources and environment.*
- *Set up data- base on fisheries resources, environment and bio-diversity as well as improve statistics collection system.*
- *Improve the MCS system*

2. Rehabilitate the degraded resources and environment.
- *Zoning*
- *Fishing control/limited entry/effort reduction*
- *Ban on destructive fishing methods*
- *Protected area*
- *Artificial reefs installation/restocking*

3. Encourage technology and personnel development that related to fisheries and environmental management.

4. Build awareness to people of all groups in realizing the value of fisheries resources and environment as well as to encourage their participation in management.
- *Build up knowledge and awareness to the youth and people of all groups for sustainable use of resources.*
- *Establish the efficient participatory procedure for fisheries and environmental management.*

5. Encourage protection and conservation of bio-diversity, genetics, species variety and fish habitat.

A.1 What data/information do you need or wish to have for policy and management

The Information Requirements (Capture Fisheries)

1. *Fishing structure*
   - *Number of Fishing communities, fishing household and fishermen*
   - *Number of fishing vessel and fishing gear*
2. *Fishing ground and fishing zone*
3. *The status of fisheries resources*
   - *Catch and landing*
   - *Value of catch*
   - *Fishing effort*
4. *Fisheries resources indicators*
   - *Catch per unit effort (CPUE)*
   - *Catch composition*
   - *Maximum sustainable yield (MSY)*
   - *Biomass*
5. *By catch and fish utilization*
6. *Social and economic information*
   - *Costs and earnings of fishing operation*
   - *Income distribution*
   - *Fisheries conflict*
   - *Employment opportunities*
   - *Occupational and geographical mobility*

A.1.1 Indicate if the answers on information requirements are belonging to one of the following groups:

A.1.1.1 Resource
A.1.1.2 Catch assessment
A.1.1.3 Trade/export
A.1.1.4 Production/fleet capacity
A.1.1.5 Labour
A.1.1.6 Economics
A.1.1.7 Environment
A.1.1.8 Fish utilization/processing
A.1.1.9 Biological
A.1.1.10 Fish price

A.3 List other needs of information

The Commitment and International Convention

- *The 1995 Code of Conduct for Responsible Fisheries*
- *The 1999 International Plan of Action for management of Fishing Capacity*
- *The 1992 Convention on Bio-diversity*
- *UNCLOS*

Private sectors

- *Trade and marketing information*

Other Government agency

- *Vessel registration*
- *Fish import and export*
- *Fish price and consumer price index*
- *Labour employment*
- *GDP and National income*

A.3.1 Other users' needs identified: Yes – No

A.3.2 If yes, then requirements are related to:

A.3.2.1 Inter/regional agreements

A.3.2.2 Needed for other sector planning

A.3.2.3 For private sector

A.3.2.4 Other agencies

A.4 Describe objectives of fishery data collection

The objectives are;

- *To monitor changes in the structure of the fisheries sector*
- *To monitor the situation of fisheries resources*
- *To track progress toward sustainable development*
- *To predict or warning about potential problem in the future*
- *To monitor the socio-economic situation and fisheries conflict*

A.5 Description on how objectives of data collection are implemented through major data collection systems

Fishery Census

The marine fishery census was conducted by NSO and DOF . The objectives of the census were)a (to collect data on basic economic structure of marine capture fishery and coastal aquaculture,)b (to collect data on socio-economic characteristics of fishery establishment, fishery employees' households and demographic characteristics of fishermen, and)c (to provide data to be used as a sampling frame for related survey. The Marine Fishery Census covers all marine capture fishery and coastal aquaculture establishments and fishery employees' households which were located in 24 *coastal provinces in the central and the southern parts of the country*.

Marine capture fisheries survey

The Survey is classified into four sections, namely, production from major fishing methods of fishing gear, production from fishing gear used by fishing communities other than the major fishing methods, and production from particular fishing methods.

The main objective of the Survey is to secure the data necessary for fishery administration and fish stock assessment by providing catch data by species and fishing efforts for each type of fishing gear.

Marine fishery in Thailand are broadly classified into large scale or off-shore fishery where the number of fishing units is relatively limited by productivity per fishing unit is quite high, small-scale or coastal fishery which are scattered along
Three types of survey are being implemented, namely, log Book Survey which covers 11 major fishing gears; fishing community Survey which covers all types of fishing methods which are not covered by the Log Book Survey.

Inland capture fisheries survey
This survey is undertaken in order to estimate the annual production of each type and size of water bodies, e.g .reservoir, lake, swamp and communities pond.

Ad-hoc survey/research

- *Costs and earnings of fishing operation*
- *Occupational and geographical mobility*
- *Fisheries conflict*

A.5.2 Are there specialised systems/functions in A5: Yes---No

A.6 Indicate whether intended users of fisheries information receive required information

Yes monthly reports and upon request

A.6.1 Is the way information produced from data collection systems submitted to intended users fulfil their needs #---1---2---3---4---5

A.6.2 Are the dissemination channels diverse enough to assume that users are satisfied: #---1---2---3---4---5

PART 2--- WHAT

PART 2-1: INDICATORS AND DATA VARIABLES

B WHAT SHOULD BE COLLECTED

B.1 What are the data items (indicators and variables) that are currently collected

The fishery data items (Capture Fisheries) are currently collected through Marine surveys consisting of log book Survey (for large scale fisheries) and fishing commodity surveys (for small scale fisheries), and freshwater capture surveys.

All the data items collected on a routine basis are.

- *Number of Fishing communities, fishing household and fishermen (collected by the agriculture and fishery census every 10 years)*
- *Number of fishing vessel and fishing gear*
- *Production quantities by species and by zone or by province (collected by DOF)*
- *Species composition (collected by DOF)*
- *Value of catch*
- *Fishing effort (Marine Survey)*

B.1.1 List of indicators should be coherent with data wished to be collected in A1. Is the list coherent with A1: Yes---No

B.1.2 Identify the gap between "wanted" and "have". How large is the gap calculates as number of "do"/ "wanted": score from table: 90-100%

	Wanted	***Actual do regularly***
1	*no of fishing communities*	*Yes- census*
2	*no fishing vessels and gears*	*Yes- census*
3	*catch and landing*	*Yes - Mar. Capt. Fish. Surv*
4	*value of catch*	*Yes- from an outside source*
5	*fishing effort*	*Yes - Mar.Capt. Fish.Surv.-Fish. Com. Surv*
6	*CPUE*	*Yes - Mar.Capt. Fish.Surv.-Fish. Com. Surv*
7	*Catch composition*	*Yes- Mar.Capt. Fish.Surv.-Fish. Com. Surv*
8	*Biomass*	*Yes - Scientific surveys*
9	*By catch & fish utilization*	*Yes- Marine production survey*
10	*Cost & earnings fisheries*	*Yes - Ad hoc*
11	*Income distribution*	*Yes - Ad hoc and Census*
12	*fisheries conflict*	*Yes - Ad hoc*
13	*employment opportunities*	*Yes- Ad hoc and Census*
14	*occupational and geographic mobility*	*Yes- Ad hoc and Census*

B.2 Indicate whether different sets of data items are collected for different subject areas of fisheries

Thailand collects species detailed production data by type of fishing gear for marine fisheries but only those of larger grouping of species for inland fisheries.

A detailed survey on tuna landings by foreign vessels is conducted by Andaman Sea Fisheries Research and Development Center (AFRDEC)

B.2.1 Can we identify the list of subject areas covered by each collection system: Yes---No

B.2.2 How many subject areas indicated: 5

B.2.3 Name them:

- B.2.3.1 Marine fisheries
- B.2.3.2 Inland Fisheries
- B.2.3.3 Aquaculture
- B.2.3.4 Industrial fisheries
- B.2.3.5 Artisanal Fisheries
- B.2.3.6 Socio Economics
- B.2.3.7 Biodiversity
- B.2.3.8 Trade

B.2.4 Are indicators provided specifically for different subject areas: Yes---No

B.2.5 Is there an overlap in indicators between the subject areas: Yes----No---Do not know

B.3. Provide definitions for classification terms used in the data collection

The definitions used in the data and information collection system are clear on e.g. "part-time fishers" and "trash fish", but there were some confusion on e.g. "Mariculture and Brackish water"

B.3.1 Are definitions provided for subject areas and fisheries segments identified above: Yes--No

B.3.2 Do definitions exist at national level: Yes---No---Don't know

B.3.3 Are definitions compatible with regional/international defined classifications: #---1—2—3—4--5

PART 2-2: INSTITUTIONAL ARRANGEMENTS FOR DATA COLLECTION, PROCESSING AND REPORTING

C. HOW ARE DATA COLLECTED AND MANAGED

C.1 INSTITUTIONAL ARRANGEMENTS

C.1.1 Indicate the national structure for fishery data collection, compilation, analysis and dissemination

1. *National Statistical Office)NSO (in the Office of the Ministry of Information, Communication and Technology has responsibility to co-ordinate and to set standards for all statistical activities in the country .The Statistical Act authorizes NSO to review and to approve of statistical projects being proposed to be undertaken in other statistical units in the government agencies .This office also has the responsibility for conducting all censuses covering population, agriculture, fishery, industry, etc, and household income and expenditure* survey .
2. *Department of Fisheries)DOF(, Ministry of Agriculture and Cooperatives is responsible for the development of statistical collection system and implementation of fisheries statistical surveys and the compilation of fisheries statistical yearbook*
3. *Andaman Sea Fisheries Research and Development Center (AFRDEC) in Phuket is conducting landing statistics along the coast of Andaman Sea and sampling program on only tuna landing by foreign vessels*
3. *Harbour Department takes care of the fishing boat registration*
4. *Fish Marketing Organisation collects data on fish price at landing sites*
5. *Ministry of natural resources and environment is in charge of environmental monitoring coastal marine resources*

C.1.1.1 Institutional arrangements: How many institutes involved: 6
C.1.1.2 Is there coherence between the institutes involved and the subject areas / major data collection systems as defined in B2/B3: #---1—2—3—4—5
C.1.1.3 Does the organigram reflect a specialisation of the functions vertically / horizontally: #---1—2—3—4—5
C.1.1.4 Is there a vertical distribution of responsibilities for data collection and management at different levels: #---1---2---3---4---5

C.1.2 Describe the coordination mechanisms among agencies/institutions concerned

C.1.2.1 Are there communication mechanisms between these institutions: Yes---No
C.1.2.2 Is there a coordinating body: Yes---No---Don't know
C.1.2.3 Are responsibilities identified: #---1—2—3—4—5
C.1.2.4 Are partners for different responsibilities identified: #---1—2—3—4—5
C.1.2.5 Is the structure complex: #---1---2---3---4---5

C.1.3 Describe operational resources allocated for data collection for both central and local levels

I*n the past, Fisheries Statistics Analysis and Research Group (FSARG) have problems with human resource (including enumerators), lacking of awareness and understanding in collecting data, lack of budget and difficulties in collecting data because the fishermen are not aware of the purposes of collecting data. Thus it make difficult to achieve timely and accurate collection of statistics. Since September 2003, DOF tries to set up the up-to-date database of all the data involving fishermen by register. This is supported by the Policy of Decentralization aiming at one stop service at local level. This may enable to process fundamental data at sub district, district, or at least province level. Now we are in the phase of training enumerators how to collect data in appropriate manner and FSARG sets a package program in each province for processing fundamental data.*

C.1.3.1 Is there a budget problem: Yes---No---Don't know
C.1.3.2 Is there a staffing problem: Yes---No--- Don't know
C.1.3.3 Is there an equipment problem: Yes---No--- Don't know
C.1.3.4 Is there a coordination problem: Yes---No
C.1.3.5 Organisation at central level (1= simple... 5= complex):
#---1—2—3—4—5
C.1.3.6 Organisation at local level (1=simple.... 5= complex):
#---1—2—3—4--5

PART 2-3: TECHNICAL ASPECTS OF DATA COLLECTION, PROCESSING AND REPORTING

C.2 DATA COLLECTION

C.2.1 Describe methodologies for data collection for each subject area or fishery

Data Collection System
The main objective of the fishery surveys is to obtain the data necessary for fishery administration and fish stock assessment.

Marine capture fisheries survey
The production from capture fisheries has been estimated based on the results of the fishery production surveys. The Marine survey is classified into two sections, namely production from major fishing methods (large scale) and production from small scale fishing gear used by fishing communities. The operator of a sample unit is requested to keep a record of catch and fishing efforts for each trip by means of a Log Book. Such record is verified by an enumerator with the invoice of the fish transaction kept by the operator. A sample operator is asked by the enumerator on the number of fishing days and average catch per day in the previous month. The catch is then estimated from this information.

Inland capture fisheries survey

This survey is undertaken in order to estimate the annual production of freshwater capture fisheries by type and size of water bodies such as natural reservoirs, lakes, swamps Trap ponds.

A sample fishing operator is asked by the enumerator on the number of fishing days and average catch per day, how many days per month and how many month in a year that the fishermen can get fish with each gear in the previous year, then estimated the catch from these data.

C.2.1.1 Is there evidence of a description by major data collection system and/or subject area: Yes---No

C.2.1.2 Are we able to understand the provided procedures for elaborating indicators by group of indicators / subject area: Yes---No

C.2.1.3 The methods encompass:

- C.2.1.3.1 Frame survey
- C.2.1.3.2 Effort survey
- C.2.1.3.3 Catch survey
- C.2.1.3.4 Quality check survey
- C.2.1.3.5 Logbook survey
- C.2.1.3.6 Census methods
- C.2.1.3.7 Nutritional/consumption survey
- C.2.1.3.8 Others
- C.2.1.3.9 Registration

C.2.1.4 Are stratification procedures explained: #--1---2---3---4---5

C.2.2 How often are the data collected on what time basis. Provide a time line indicating the approximate schedule of data collection

C.2.2.1 Are time, space and other criteria (i.e. species, gear types,) defined, are their level of precision / resolution defined, and are these levels highly aggregated or allowing detailed reporting:

- C.2.2.1.1 Time: #---1---2---3---4---5
- C.2.2.1.2 Space: #---1---2---3---4---5
- C.2.2.1.3 Species #---1---2---3---4---5
- C.2.2.1.4 Gears: #---1---2---3---4---5
- C.2.2.1.5 Others: #---1---2---3---4---5

C.2.2.2 Are there existing standards for statistical units and approaches and at which level (regional, national, international):

- Regional #---1---2---3---4---5
- National #---1---2---3---4---5
- International #---1---2---3---4---5

C.3 DATA PROCESSING

C.3.1 Are there different methods of estimation for different subject areas or fisheries, if so please list

SFRAG is processing all the data with one method

C.3.1.1 Are there different processing methods for different subject areas:
Yes---No---Don't know

C.3.1.2 List the different methods

C.3.1.2.1

C.3.1.2.2

C.3.1.2.3

C.3.2 Describe the processes of data compilation and storage including hardware and software used

The Statisticians of SFRAG (office center in BKK) design and plan all of the surveys. Field enumerators at Provincial Fisheries Offices collect data and send them back to SFRAG. SFRAG will process all the data with mini computers. In the future Provincial Fisheries Offices are expected to process the data with a package program prepared by SFRAG.

C.3.2 Questions to address are again "Quality" of the data processing system i.e.:

Data entry sheets:

C.3.2.1 Includes some sort of quality control procedures: Yes----No---Don't know

C.3.2.2 Standardized entry forms: Yes---No---Don't know

Data entry in a computerized system:

C.3.2.3 Made by data collectors: Yes---No

C.3.2.4 Using a specialized database: Yes---No---Don't know

C.3.2.5 Simple software like word, excel, access: Yes---No---Don't know

C.3.2.6 Directly in the central system: Yes ---No---Don't know

C.3.2.7 Include data validation / quality control procedures:
Yes---No---Don't know

C.3.2.8 Data review at local level: Yes---No---Don't know

C.3.2.9 Data review at regional level: Yes---No---Don't know

C.3.2.10 Data review at national level: Yes---No---Don't know

Central System:

C.3.2.11 Specialized software: Yes---No---Don't know

C.3.2.12 Automated procedure to import data from decentralized entry points:
Yes---No---Don't know

C.3.2.13 Includes data validation procedures: Yes---No---Don't know

C.3.2.14 Merged data coming from different data collection systems:
Yes---No---Don't know

C.3.2.15 Stores raw data: Yes---No---Don't know

C.3.2.16 Stores aggregated data: Yes---No---Don't know

C.3.2.17 Does the system facilitate integration of data from different sources:
Yes---No---Don't know

Timeliness:

C.3.2.18 Time between data collection and entry (or import) in the central system in month: 1 month

C.3.3 How is the analysis of statistical data conducted and by whom. Is information from other sectors/institutions outside fisheries sector used to provide a more holistic approach

The analysis of statistical data is conducted by SFRAG. DOF is expected to introduce a decentralized processing system whereby the raw data collected are partly compiled/ process at province or district level, and also use external sources of information in processing.

C.3.3.1 Analysis is: Centralized----Decentralized---Both
C.3.3.2 Are the raising procedures well described: Yes---No---Don't know
C.3.3.3 Are the procedures following a standardized method:
Yes---No---Don't know
C.3.1.4 Are statistical procedures applied: Yes---No---Don't know
C.3.1.5 Statistical procedures encompass:
C.3.1.5.1
C.3.1.5.2
C.3.1.5.3
C.3.1.6 Is there an independent review procedure: Yes---No---Don't know

C.4 REPORTING

C.4.1 In what form are the data/information packaged, presented and disseminated

The forms that FSARG presented and disseminated contain the information on:

- *Catch by species, by fishing gear and by fishing ground*
- *Fishing effort (No. of trips, fishing days, fishing hours, and/or fishing hauls)*
- *Production and value by species and by fishing gear*
- *Quantity and price of fish landing by species*

FSARG are responsible for yearbook dissemination

C.4.1 Reporting format: Paper ---Digital---Website

C.4.2 Are there statistical reports routinely prepared for information users, how often are they made available

The Statistical reports are regularly prepared for information users, which include 13 annual publications:

1. *Fisheries Statistics of Thailand*
2. *Thai Fishing Vessels Statistics*
3. *Marine Fisheries Statistics Base on The Sample Survey*
4. *Fishing Community Production Survey*
5. *Landing Place survey*
6. *Statistics of Shrimp Culture Survey*
7. *Statistics of Marine Fish Farms Survey*
8. *Statistics of Marine Shellfish Culture Survey*
9. *Freshwater Fish Farm Production*
10. *Freshwater Landing Place survey*
11. *Statistics of Freshwater Fisheries Product from Pond Trap*
12. *Freshwater Fisheries Product from Natural Reservoirs*
13. *1Statistics of Fisheries Factory*

C4.2.1 Reporting schedule: Quarterly----Annually
C4.2.2 Timeliness (Last published report): 2002

PART 2-4 IMPROVEMENT OF SYSTEM

D HOW CAN THE SYSTEM BE IMPROVED

D.1 System design

D.1.1 Describe the designing process of the data collection system and major historical changes in the design or implementation of the system

The Statisticians of FSARG were involved in the process of current data collection system. FSARG prepares data sheet and sample size for respective province. When there has been any change in fisheries situation, we can change the design or implementation of the system.

D.1.1.1 When the system was originally designed: 1980s
D.1.1.2 Changes in the past: Yes --- No---Don't know
D.1.1.3 How many times it changed: little changes
D.1.1.4 When was the last change: 2000
D.1.1.5 Why changes:
- D.1.1.5.1 Shift in policy
- D.1.1.5.2 Technical improvement
- D.1.1.5.3 Budget constraints
- D.1.1.5.4 Statistical improvement

D.1.1.5.5 Institutional improvement

D.1.2 Indicate whether the information users were consulted in the planning and reviewing process in order to meet their needs

Sometimes users were consulted in the planning and reviewing process in order to meet their needs.

D.1.2.1 Are stakeholders formally involved in the formulation process: Yes---No---Don't know
D.1.2.2 How many stakeholder groups: Sometimes

D.1.3. Is there any metadata available

SFRAG has made the following information available to guide the enumerator and/or users, especially students:

- *Methodology notes*
- *Data collection manuals*
- *Other sources of data*
- *Import export data from Custom Department*
- *Marine Fishery Census from NSO*
- *Agriculture Census from NSO (for Freshwater.)*

D.1.3.1	Methodology notes available	Yes---No---Don't know
D.1.3.2	Manuals available	Yes---No--- Don't know
D.1.3.3	Statistical procedures described	Yes---No--- Don't know
D.1.3.4	Metadata available	Yes---No--- Don't know

D.2 Data quality and improvements

D.2.1. What are the perceived weaknesses and problems with the current data collection system

The perceived weaknesses and problems with the current data collection system are critically delayed compilation and dissemination of fishery statistics for 2 years. With this delay, even though the information is accurate, its usefulness is very much reduced. Recently FSARG is in the process of improving the system.

D.2.1.1	Does system meets requirements:	Yes---No---No opinion
D.2.1.2	Produces information timely:	Yes---No---No opinion
D.2.1.3	Is the system static or evolving:	#---1---2----3---4---5

D.2.2 What are the constraints and opportunities in improving quality aspects of information

Thailand is also suffered from classic problems of statistical systems, namely lack of budget, technical know-how, and man power. At the field level, there are some enumerators who are not qualified for the job.

D.2.2.1 Constraints in improving quality: Yes---No---Don't know
D.2.2.2 Constraints are:
- D.2.2.2.1 Financial
- D.2.2.2.2 Capacity
- D.2.2.2.3 Institutional
- D.2.2.2.4 Coordination
- D.2.2.2.5 Methods

D.2.3 Describe plans and actions necessary to improve current information

The specific plans to improve current information are:

- *Improving methodologies to achieve required accuracy of data/information*
- *Streamlining procedures for statistical data collection, processing, analysis, and reporting to improve the timeliness of information dissemination.*
- *Providing more training for field staff and enumerators.*
- *Improving coordination with other national agencies.*

DOF has plans and actions to improve current information through the registration scheme for fishers, decentralization of fishery administration to the Provincial Fisheries Offices.

D.2.3.1 Is there a plan for improvement: Yes---No---Don't know
D.2.3.2 Improvement encompasses:
- D.2.3.2.1 data collection
- D.2.3.2.2 processing
- D.2.3.2.3 statistical procedures
- D.2.3.2.4 dissemination
- D.2.3.2.5 training
- D.2.3.2.6 cooperation
- D.2.3.2.7 specialisation of functions
- D.2.3.2.8 data exchange mechanisms

D.2.3.3 Financial and institutional support is secured for improvement: Yes---No---Don't know

E SUPPLEMENTARY INFORMATION

E.1 Institutional arrangements of the fisheries administration

E.1.1 Indicate the administrative structures responsible for fisheries management, development and monitoring for each administrative division (if any) Describe the roles of each institution involved

E.1.1.1 Different administrative units responsible: Yes---No---Don't know
E.1.1.2 How many units: 2
E.1.1.3 Are local communities involved: #---1---2---3---4---5
E.1.1.4 Are there activities for CCRF: Yes---No---Don't know
E.1.1.5 Is there a legal frame for CCRF: Yes---No---Don't know
E.1.1.6 Is this frame well developed: #---1---2---3---4---5

E.1.2 Indicate related articles of fisheries and statistical laws that specify reporting responsibilities

E.1.2.1 Are the laws provided: Yes---No
E.1.2.2 Are there specific laws for reporting responsibilities
Yes---No---Don't know

E.2 Non fishery information and non statistical information

E.2.1 Is there statistical non-fishery information available, if any, please list

Non-fishery information available are.

- *Population census*
- *Agriculture census*
- *Household income/expenditure or consumption surveys*
- *Village profiling surveys*
- *Labour force surveys*

E2.1.1 Is non fisheries information available: #---1—2—3—4—5
E2.1.2 Is it used Yes---No---Don't know

E.2.2 Is there any non-statistical information that can be used to supplement the statistical data

Non-statistical information that can be used to supplement the statistical data are.

- *National development plans*
- *Natural resource management policies*
- *Interactions with the environment and other sectors (integrated coastal zone management*
- *Related marine research or markets and consumer preferences.*
- *Costs and earnings of fishing operation*
- *Income distribution*
- *Fisheries conflict*
- *Employment opportunities*

E.2.2.1 Is there useful non statistical information**:** #---1---2---3---4---5
E.2.2.2 If available is it used: Yes---No---Don't know

ACKNOWLEDGEMENTS

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2.9 COUNTRY REPORT: VIETNAM

2.9.1 Summary

Why is Information Needed and Who is Collecting it

The national socio-economic development strategy provides outlines of fisheries policies and objectives that encompass: protection of the resource base; division of effort from inshore to offshore; and maintenance of capture levels at 2002 mark.

At present, regular statistic data on fisheries are being collected by two parallel systems, namely the statistic system of the General Statistics Office and that of the Ministry of Fisheries.

What would be Needed

For appropriate policy formulation and the development of management plans, data on fisheries should encompass: production quantity by province and by species groups, processing and export value by product and by market, number of vessel by horse power group, number of labour in the different sectors and infrastructure investment.

What and How is Data Collected

A large part of the data, especially for marine fisheries is actually collected through:

- Catch and Effort monitoring programme based on a frame obtained from vessel registration scheme, logbooks, estimation of volume and value of production made by commune level through district/ DOFI/ MOFI)
- Annual sample/special surveys or census programmes
- Monitoring of trade and export data
- Scientific research on stock assessment

For inland fisheries there is no regular programme and rough estimates are made based on household surveys.

How is Data Processed and Analysed

At each administrative level, statistical officers compile, analyze, and prepare six monthly and annual reports. The processes of data compilation and storage are mainly manually conducted or with the use of spreadsheets.

In many provinces, fishing production is divided into 5 main groups: fish, shrimp, cephalopod, bivalve and other; fish age classes (seeds, fry, fingerlings, adult fish group weight) and type of culture in order to enable production of consistent reports combining capacity registry and production survey. Based on number of fishing vessel and average

productivity of catch, information on season, fishing ground and enumerators' experience to estimate catch quantity

Major Constraints and Improvements of the System

Major constraints are:

- Lack of the operational resources for collection and data processing, and qualifications of staff do not meet the actual requirement.
- Lack of standardized set of statistic items. Data collection forms are not systematically established.
- Weakness in collaboration between routine and non-routine statistics units.
- Stakeholders (fishers, factories, wholesale…) are not willing to provide information to enumerators.

Plans to improve the system include:

- Clarify roles and responsibilities of concerned agencies at the provincial level for the collection and reporting of fishery statistics;
- Standardization of fishery statistics items, classification, forms, and data collecting methods including clear reporting mechanism and frequency of reporting (monthly, quarterly and annually);
- Promote capacity building of statistical personnel both statisticians and enumerators particularly on the aspect of data collection methodologies;
- Apply information technique to statistical activities to improve the use of fisheries data and information in monitoring fisheries
- Disseminate fisheries statistical information products using printed material and via Internet
- Provision of sufficient facilities for statistics;
- Reinforce communication and coordination mechanism including network of statistical officers for the provincial, district and municipality;
- Cooperation with regional/international organizations

2.9.2 Edited Country Questionnaire

The returned country questionnaires were analysed in a systematic way in order to allow comparison of the different systems used. For this a Check list was made. Below the answers of the questionnaire are presented in the different "Text boxes" after which the results of the checklists are provided. For the checklist, the answers from the questionnaire were used in combination of existing information obtained from various FAO and SEAFDEC reports.

PART 1

A WHY FISHERY DATA AND INFORMATION ARE NEEDED

A.0 Check if a national policy and/or management objectives are formulated for the country

OBJECTIVES:

- *Diversion of a substantial amount of current fishing effort from the inshore areas into (under-exploited) offshore fishing zones;*
- *Freezing total marine capture levels at the 2002 mark (under consideration)*

A.0.1 Country policy available Yes—No
A.0.2 Year when latest policy established: Don't know
A.0.3 List major topics of national policy: part off overall policy
A.0.3.1 Social benefit, cohesion
A.0.3.2 Economic growth, stability and security
A.0.3.3 Health
A.0.3.4 Balance of payments, international competition
A.0.3.5 Protection of resource base, Monitoring and control (fisheries)
A.0.3.6 Management

A.2 Describe the existing national policy and management objectives for which fishery information is required: They provided the master-plans

- *National Socio-economic development strategy, Five-Year Socio-Economic Development Plan and Annual Socio-economic development plan*
- *Master plans for the socio-economic development in fisheries for the period till 2010 and the orientation to 2020*
- *Five-Year and Annual socio-economic development plans in fisheries sector*

A.1 What data/information do you need or wish to have for policy and management

1. Result data:

- *Total production (including capture and aquaculture production)*
- *Exported fisheries production (by value, quantity and product)*
- *Used area for aquaculture activities.*
- *Effect and result of projects (production, growth rate, number of labour, net income)*

2. Potential data:

- *Potential area available for aquaculture*
- *Capacity of fisheries processing factories (yield capacity, quality, product)*
- *Capture capacity (number, size of vessels, fishing methods, kind of captured product, labour force engaging in fishing marine products)*
- *Demand for investment capital in capture, aquaculture and processing)*

A.1.1 Indicate if the answers on information requirements are belonging to one of the following groups:

A.1.1.1 Resource
A.1.1.2 Catch assessment
A.1.1.3 Trade/export
A.1.1.4 Production/fleet capacity
A.1.1.5 Labour
A.1.1.6 Economics
A.1.1.7 Environment
A.1.1.8 Fish utilization/processing
A.1.1.9 Biological
A.1.1.10 Fish price

A.3 List other needs of information

A.3.1 Other users' needs identified: Yes – No
A.3.2 If yes, then requirements are related to:
A.3.2.1 Inter/regional agreements
A.3.2.2 Needed for planning
A.3.2.3 For private sector
A.3.2.4 Other: commercial sector
A.3.3 Coherent with the formulated policy: 0---1—2—3—4—5

A.4 Describe objectives of fishery data collection

- *To develop policies to ensure that potentials of the natural resources are effectively used to support economic development and sustainable growth of the fisheries in a sustainable manner for the given goals of the Ministry and future generations in Vietnam; and to create more job and increase higher income for the poor fishing communities in coastal areas.*
- *To assess the effect of policies and to reject timely the obsolete policies that are neither linked with actual development in fisheries sector nor connected closely to the national development goals and the international integrate process of fisheries sector in Vietnam.*

A.5 Description on how objectives of data collection are implemented through major data collection systems

- *Monthly reports from Provincial Department of Fisheries and Rural Agricultural and Development Department.*
- *Reports of exported fisheries value from General Customs Office.*
- *Reports from projects and programs in the fisheries sector*

A.5.2 Are there specialised systems/functions in A5: Yes---No
(*e.g. Customs survey collects specialised data for their purpose only)*

A.6 Indicate whether intended users of fisheries information receive required information

The Ministry of Fisheries are now paying more attention to the development of the fishery statistical system and the effective use of reliable and meaningful information from the fishery statistical system for the management and monitoring of fisheries. Fishery data and information provided to users need to meet the international standard and be consistent with Vietnamese Statistical Law.

A.6.1 Is the way information produced from data collection systems submitted to intended users fulfil their needs: #---1---2---3---4---5

A.6.2 Are the dissemination channels diverse enough to assume that users are satisfied: #---1---2---3---4---5

(*Vietnam has only one national publication of fisheries statistics)*

PART 2--- WHAT

PART 2-1: INDICATORS AND DATA VARIABLES

B WHAT SHOULD BE COLLECTED

B.1 What are the data items (indicators and variables) that are currently collected

Data items currently collected are:

- *Production quantity by province and by species groups, i.e. fish, shrimp, mollusc and others.*
- *Processing and export value by product, by market and by exporter*
- *Seed production capacity*
- *Number of vessels by horse power group*
- *Aquaculture area by environment and by species group*
- *Number of labour working in logistics: aquaculture, fishing, shipbuilding and maintenance, processing and service.*
- *Infrastructure investment*

B.1.2 Identify the gap between "wanted" and "have". How large is the gap calculates as "number do"/"number wanted": score from table: 100%

	Wanted	***Actual do regularly***
1	*Catch assessment*	*Landings by groups of species*
2	*Processing*	*Processing and export value*
3	*Fleet capacity*	*Number vessel by HP group*
4	*Labour*	*Labour engagement in fisheries*
5	*Economics*	*Infrastructure investment*

B.2 Indicate whether different sets of data items are collected for different subject areas of fisheries

There are different sets of data items collected for different subject areas or fisheries. For example, the data items collected for marine fisheries are 1) production by provinces (29 coastal provinces) and by species groups, i.e. fish, shrimp, squids, shells and others; 2) the number of fishing vessels by provinces and by horse power groups (<20Hp, 20-<45, 45-<90, 90-<150 and >=150Hp). In inland fisheries, related data are collected in a less detailed manner, i.e. production by species groups (fish, shrimp and others) and the number of fishing vessels.

B.2.1 Can we identify the list of subject areas covered by each collection system: Yes---No

B.2.2 How many subject areas indicated: 3

B.2.3 Name them:

B.2.3.1 Marine fisheries

B.2.3.2 Inland Fisheries
B.2.3.3 Aquaculture
B.2.3.4 Industrial fisheries
B.2.3.5 Artisanal Fisheries
B.2.3.6 Socio Economics
B.2.3.7 Biodiversity
B.2.3.8 Other

B.2.4 Are indicators provided specifically for different subject areas:
Yes---No

B.2.5 Is there an overlap in indicators between the subject areas:
Yes----No---Don't know
(Different systems are covering the same area i.e. MARD/MOFI covering same subject area)

B.3. Provide definitions for classification terms used in the data collection

Each fisheries statistics indicators have both quantitative and qualitative definitions to facilitate provincial statistical officials' collection. Some general definitions are compiled by the General Statistics Office. The more detailed ones are in building progress by Fisheries Informatics Center. Some examples of definitions are:

- *Marine fishing: economic activities to catch aquatic objects including fish, crustacean, mollusc and others from natural marine water bodies.*
- *Inland fishing: economic activities to catch aquatic objects including fish, crustacean, mollusc and others from natural fresh water bodies (rivers, lakes, reservoir…)*
- *Inshore fishing and offshore fishing: Offshore fishing is the marine capture action taken in the fishing grounds with the depth of 30m or deeper in the Tonkin Gulf, Gulf of Thailand, South-east and South-west area; and the depth of 50m or deeper in the Central area.*
- *Powered boat and Non-powered fishing boat: Powered boats are classified by 3 standards: horse power of main engine, tonnage and length of boat. Powered boats are classified by Horse power groups: <20Hp, 20 - <45, 45 - <90, 90 - <150, >=150Hp.*

B.3.1 Are definitions provided for subject areas and fisheries segments identified above Yes--No

B.3.2 Do definitions exist at national level Yes---No

B.3.3 Are definitions compatible with regional/international defined classifications
#---1—2—3—4--5

PART 2-2: INSTITUTIONAL ARRANGEMENTS FOR DATA COLLECTION, PROCESSING AND REPORTING.

C. HOW ARE DATA COLLECTED AND MANAGED

C.1 INSTITUTIONAL ARRANGEMENTS

C.1.1 Indicate the national structure for fishery data collection, compilation, analysis and dissemination

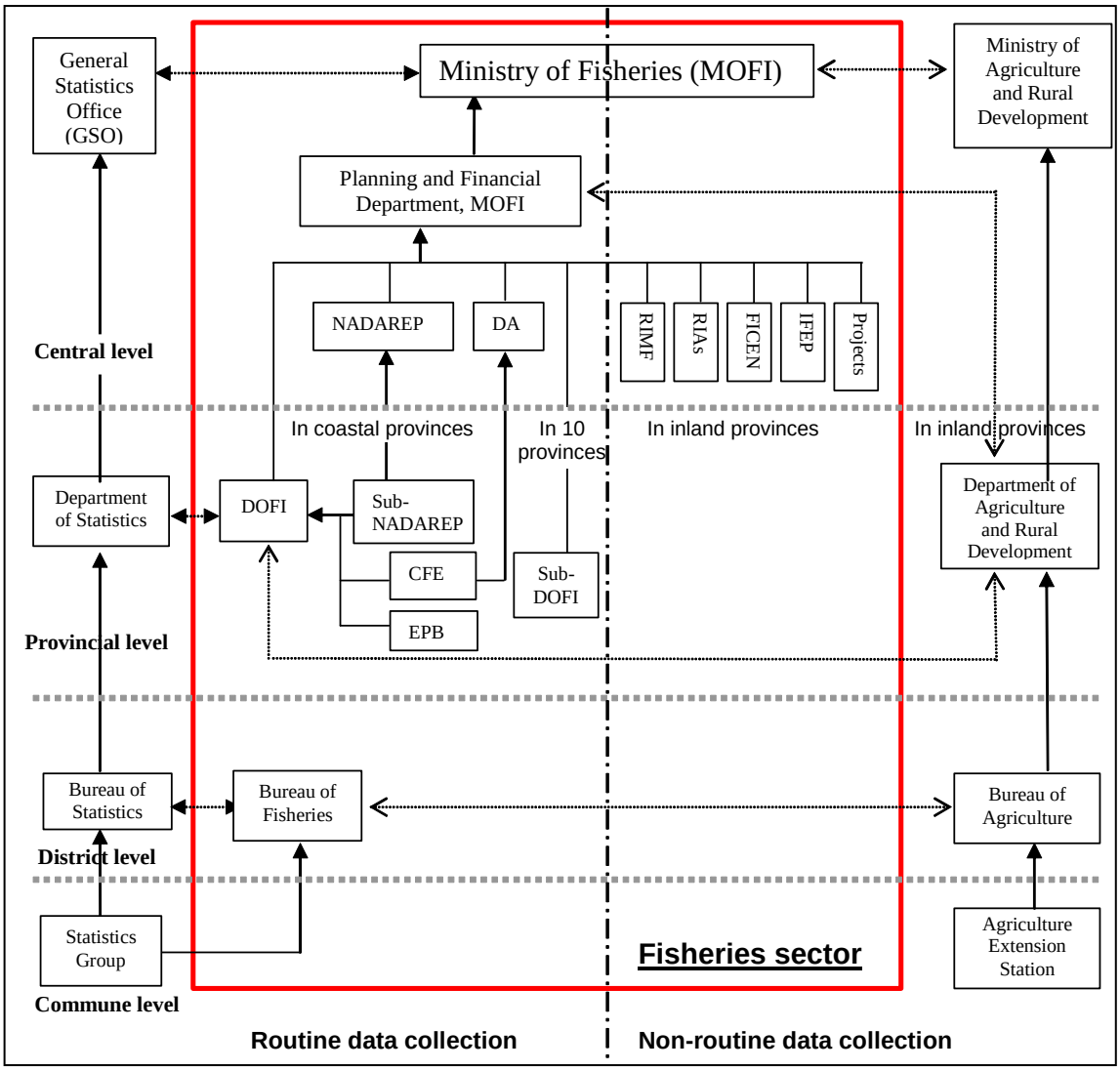
At present, regular statistic data on fisheries are being collected parallel by two systems, namely the statistic system of the General Statistics Office and that of the Ministry of Fisheries.

The General Statistics Office (GSO), with a network of Departments of Statistics (DSO) in provinces and Bureau of Statistics in districts as well as officials in charge of the statistical work at commune level, implement the State duties of recording statistics including fishery data. The policy orientation is to leave the responsibilities over general national indicators with GSO, while the sector-ministries collect the data on relevant indicators to manage their respective sectors.

Within the Ministry of Fisheries (MOFI), the Planning and Financial Department (PFD) carries overall responsibilities for fishery statistics. Among technical departments of MOFI, the National Directorate of Aquatic Resources Exploitation and Protection (NADAREP) is responsible to manage and control fishing vessel registration and fishing activities of these fleets and the Department of Aquaculture manages aquaculture activities in the country. The Research Institute of Marine Fisheries (RIMF) conducts scientific research on stock assessment, environment monitoring and fishing ground development. There are some other agencies that also collect fishery data and information upon request by PFD. For example, Fisheries Informatics Center (FICEN) gathers raw data on fish import/export from the General Customs Directorate every 10 days and analyses them to report/disseminate the information. (Research Institutes of Aquaculture (RIAs) also conduct information generation activities on difference subjects.

At the province level, provincial Department of Fisheries (DOFI) plays the key role in collecting fishery statistics in coastal provinces. In inland provinces, there are ten provinces where inland fisheries are being expanded and hence sub-DOFIs have been newly created to manage inland fisheries including statistical related duties. In remaining inland provinces, this work is being done by the Department of Agriculture and Rural Development (DARDs). However, the fisheries data in these provinces are sparely collected because fishery is their small controlled field. Fishing vessel related data are enumerated by Sub-NADAREP and Aquaculture sector is handled by the Centre for Fisheries Extension (CFE).

Fig. 1: the national structure for fishery data collection and compilation



Note: ⟶ Reported relationship ⟷ Collaboration ⟺ Coordination

DA:	*Department for Aquaculture, the Ministry of Fisheries*
NADAREP:	*National Directorate of Aquatic Resources Exploitation*
Sub-NADAREP:	*Sub-National Directorate of Aquatic Resources Exploitation*
RIMF:	*Research Institute of Marine Fisheries*
RIAs:	*Research Institute of Aquaculture*
FICEN:	*Fisheries Informatics Centre*
IFEP:	*Institute of Fisheries Economics and Planning*
DOFI:	*Department of Fisheries (under provincial government))*
CFE:	*Center for Fisheries Extension*
EPB:	*Economics & Planning Bureau*

C.1.1.1 Institutional arrangements: How many institutes involved: 4

C.1.1.2 Is there coherence between the institutes involved and the subject areas / major data collection systems as defined in B2/B3:#---1—2—3—4—5

C.1.1.3 Does the organigram reflect a specialisation of the functions vertically / horizontally: #---1—2—3—4—5

C.1.1.4 Is there a vertical distribution of responsibilities for data collection and management at different levels: #---1---2---3---4---5

C.1.2 Describe the coordination mechanisms among agencies/institutions concerned

The meeting between the Ministry of Fisheries and the General Statistics Office is held quarterly to make comparison and analysis of collected data.

At the provincial level, the officials of the Department of Fisheries and Department of Agriculture and Rural Development who are in charge of statistics holds a monthly meeting with the Department of Statistics to make comparison and analysis of the compiled data, a report will then be prepared and sent to the provincial People's Committee as well as to the General Statistics Office and the Ministry of Fisheries. These provincial departments together conduct the annual joint surveys in order to assure the accuracy of fishery data.

At the district level, because of the absence of fisheries offices, the fishery data collection has to depend on the Statistics Groups of GSO or the Agriculture Extension Stations. For this reason, fisheries officials must closely cooperate with enumerators of these agencies to control fisheries activities at the commune level.

Ministry of Fisheries and Ministry of Agriculture and Rural Development as well as their agencies and provincial counterparts have coordinated on ad hoc basis. Thanks to this coordination mechanism, the national statistics data and MOFI's data are harmonised and do not duplicate and contradict each other.

C.1.2.1 Are there communication mechanisms between these institutions:
Yes---No

C.1.2.2 Is there a coordinating body: Yes---No---Don't know

C.1.2.3 Are responsibilities identified: #---1—2—3—4—5

C.1.2.4 Are partners for different responsibilities identified: #---1—2—3—4—5

C.1.2.5 Is the structure complex: #---1---2---3---4---5

C.1.3 Describe operational resources allocated for data collection for both central and local levels

At the central level, human resources and budget come from the Ministry of Fisheries; there are 4 statistical officers in the Planning and Financial Department, who are completely equipped with computers connected to the ministry's local area network and internet.

At the local level, related activities are supported by provinces and districts. In each provincial DOFI, there are one to four officers in charge of analyzing and processing fishery data. These officers often share computers without internet access, but they have some computer skills and use Excel for data entry and reporting. At district level, human resources and logistics for statistical data collection are tailored according to the level of importance of fisheries in the area. Most of work there are on a part time basis.

C.1.3.1 Is there a budget problem: Yes---No---Don't know

C.1.3.2 Is there a staffing problem: Yes---No--- Don't know

C.1.3.3 Is there an equipment problem: Yes---No--- Don't know
C.1.3.4 Is there a coordination problem: Yes---No--- Don't know
C.1.3.5 Organisation at central level (1= simple... 5= complex):
#---1—2—3—4—5
C.1.3.6 Organisation at local level (1=simple.... 5= complex):
#---1—2—3—4--5

PART 2-3: TECHNICAL ASPECTS OF DATA COLLECTION, PROCESSING AND REPORTING

C.2 DATA COLLECTION

C.2.1 Describe methodologies for data collection for each subject area or fishery

The collection of fishery statistics in Viet Nam is conducted through:

- *Registration for fishing vessels and land area used for aquaculture*
- *Log books (newly applied) for some fishing activities*
- *System of regular reporting based on estimation made by commune level through district/ DOFI/ MOFI(production volume and value)*
- *Sample/special surveys or census: 1) DOFI/DARD conduct fishery surveys per year (i.e. once every quarter) in close collaboration with the Department of Statistics. A census was implemented in October 2001.*
- *Scientific research on stock assessment made by Research Institute for Marine Fisheries (RIMF)*

Standards applied:

- *Capture production: it is divided into five main groups: fish, shrimp, cephalopod, bivalve and others*
- *Aquaculture production: there are fish age classes (seeds, fry, fingerlings and adult fish group weight) and types of culture are defined at provincial level in order to enable production of consistent reports combining capacity registry and production survey.*

Apart from these standards statistical standards and definitions have not been established at national level. Efforts have been made to coordinate and share these standards with neighbouring provinces.

C.2.1.1 Is there evidence of a description by major data collection system and/or subject area: Yes---No
C.2.1.2 Are we able to understand the provided procedures for elaborating indicators by group of indicators / subject area: Yes---No
C.2.1.3 The methods encompass:

C.2.1.3.1 Frame survey
C.2.1.3.2 Effort survey
C.2.1.3.3 Catch survey (reporting)
C.2.1.3.4 Quality check survey
C.2.1.3.5 Logbook survey
C.2.1.3.6 Census methods
C.2.1.3.7 Nutritional/consumption survey
C.2.1.3.8 Others
C.2.1.3.9 Registration

C.2.1.5 Are stratification procedures explained: #--1---2---3---4---5

C.2.2 How often are the data collected on what time basis. Provide a time line indicating the approximate schedule of data collection

The staff at local level collects raw data every week and sends them to Fisheries Bureau/Department for process and analysis. On the 15th of each month Department of Fisheries reports the processed data to MOFI. The compiled fishery data from provinces are processed and analyzed before submitted to the Government on the 20th. Department of Agriculture and Rural Development submits related statistic data to Ministry of Fisheries on every six-month or annual basis.

C.2.2.1 Are time, space and other criteria (i.e. species, gear types, …) defined, are their level of precision / resolution defined, and are these levels highly aggregated or allowing detailed reporting:
C.2.2.1.1 Time #---1---2---3---4---5
C.2.2.1.2 Space #---1---2---3---4---5
C.2.2.1.3 Species #---1---2---3---4---5
C.2.2.1.4 Gears #---1---2---3---4---5
C.2.2.1.5 Others #---1---2---3---4---5
C.2.2.2 Are there existing standards and at which level (regional, national, international): #---1---3---4---5

C.3 DATA PROCESSING

C.3.1 Are there different methods of estimation for different subject areas or fisheries, if so please list

The information provided by the communes and the districts is compiled at provincial level, but this work may also be taken place at districts where there is a fishery bureau.

Some typical methods of estimation are:

- *The application of conversion factors in order to convert fishery commodities reported by processing units into raw material quantity.*
- *Base on the rate of raw material from aquaculture and catch recorded by a few processing units extrapolated to all processing ones to estimate aquaculture quantity and catch quantity.*
- *Capture production is estimated based on 1) the number of fishing vessels, 2) average productivity of fishing vessels, 3) information on season and fishing ground and 4) enumerators' experience*
- *Capacity of culture production (number or volume of cages, number of ha) together with production by species and type of culture are estimated based on the results of sample surveys.*

C.3.1.1 Are there different processing methods for different subject areas:
Yes---No---Don't know

C.3.1.2 List the different methods

C.3.1.2.1

C.3.1.2.2

C.3.2 Describe the processes of data compilation and storage including hardware and software used

The processes of the data compilation and storage are basically conducted manually. Ms Excel is popularly used to process and synthesize the data, and then the statistical reports are presented with Ms Word. At present, the Fisheries Informatics Centre (FiCen) is also constructing software to manage the data.

C.3.2 Questions to address are again "Quality" of the data processing system i.e.:

Data entry sheets:

C.3.2.1 Includes some sort of quality control procedures: Yes----No---Don't know

C.3.2.2 Standardized forms: Yes---No---Don't know

Data entry in a computerized system:

C.3.2.3 Made by data collectors: Yes---No

C.3.2.4 Using a specialized database: Yes---No---Don't know

C.3.2.5 Simple software like word, excel, access: Yes---No---Don't know

C.3.2.6 Directly in the central system: Yes ---No---Don't know

C.3.2.7 include data validation / quality control procedures:
Yes---No---Don't know

C.3.2.8 Data review at local level: Yes---No---Don't know

C.3.2.9 Data review at regional level: Yes---No---Don't know

C.3.2.10 Data review at national level: Yes---No---Don't know

Central System:

C.3.2.11 Specialized software: Yes---No---Don't know
C.3.2.12 Automated procedure to import data from decentralized entry points: Yes---No---Don't know
C.3.2.13 Includes data validation procedures: Yes---No---Don't know
C.3.2.14 Merged data coming from different data collection systems: Yes---No---Don't know
C.3.2.15 Stores raw data: Yes---No---Don't know
C.3.2.16 Stores aggregated data: Yes---No---Don't know
C.3.2.17 Does the system facilitate integration of data from different sources: Yes---No---Don't know

Timeliness:

C.3.2.18 Time between data collection and entry (or import) in the central system in month: one month---Don't know

C.3.3 How is the analysis of statistical data conducted and by whom. Is information from other sectors/institutions outside fisheries sector used to provide a more holistic approach

At each administrative level, statistical officers compile, analyze, and prepare reports in two forms: i) regular monthly, quarterly, 6-monthly and annually; ii) special reports in response to the request from the fisheries planners, administrators and other information users. Recently, some indicators to show the trend of fisheries are used such as CPUEs and income. The information from other sectors and/or institutions outside of fisheries sector such as socio-economic, demographic and other information (weather, the fuel price movement…) is also sought to provide additional information in their reports.

C.3.3.1 Analysis is: Centralized----Decentralized---Both
C.3.3.2 Are the raising procedures well described: Yes---No---Don't know
C.3.3.3 Are the procedures following a standardized method: Yes---No---Don't know
C.3.3.4 Are statistical procedures applied: Yes---No---Don't know
C.3.3.5 Statistical procedures encompass:
C.3.3.5.2
C.3.3.5.3
C.3.3.5.4
C.3.3.6 Is there an independent review procedure: Yes---No---Don't know

C.4 REPORTING

C.4.1 In what form are the data/information packaged, presented and disseminated

The data/information are packaged and presented in report formats with graphs and diagrams. They are disseminated through fax, telephone, mail and Internet. At present the statistical yearbook is under the process of preparation for publication.

C.4.1 Reporting format: Paper ---Digital---Website

C.4.2 Are there statistical reports routinely prepared for information users, how often are they made available

Monthly, quarterly and annual performance reports on a set of indicators are prepared for information users (mainly administrators and public media). Standard reports are requested by MOFI and GSO at national level and the People's Committee at provincial level. Paper reports are prepared from tables produced through Excel sheets according to template requested by each destination institution. Reports requested by the People's Committee contain much more details than the other reports prepared for national agencies.

C4.2.1 Reporting schedule: Monthly - Quarterly----Annually
C4.2.2 Timeliness (Last published report): Don't know

PART 2-4 IMPROVEMENT OF SYSTEM

D HOW CAN THE SYSTEM BE IMPROVED

D.1 System design

D.1.1 Describe the designing process of the data collection system and major historical changes in the design or implementation of the system

Since, the national economy has shifted from the centrally planned mechanism to the market one in late 1980', many private establishments have participated in fisheries activities and resources for statistics collection have been dwarfed as a result. The data collection system has not been able to cover all the information needed for the management of fisheries.

Before 2000, the Planning & Investment Department of MOFI was the unit responsible for statistical duties but this duty was transferred to the FiCen in late 2000. FiCen was engaged in processing and analyzing fishery data to meet the information requirements for management of fisheries and formulation of policies by the MOFI and local authorities. In 2004, statistics duties were shifted back to the Planning and Finance Department.

At the provincial level, Sub-DOFIs were created in 10 inland provinces in 2004. Although Sub-DOFIs are administratively placed under the DARDs, they functionally depend on MOFI and this institutional reform has made fisheries management more and so as the data collection.

D.1.1.1 When the system was originally designed: Don't know
D.1.1.2 Changes in the past: Yes --- No---Don't know
D.1.1.3 How many times it changed: 1-2 times

D.1.1.4 When was the last change: 1 year ago
D.1.1.5 Why changes:
D.1.1.5.1 Shift in policy
D.1.1.5.2 Technical improvement
D.1.1.5.3 Budget constraints
D.1.1.5.4 Statistical improvement
D.1.1.5.5 Institutional improvement

D.1.2 Indicate whether the information users were consulted in the planning and reviewing process in order to meet their needs

Fishery statistic has provided information to planning and policy maker, administrators, economists, and scientists in order to make short terms, long terms plans, to give guidance in production. At the same time many workshops, trainings have been conducted to consult the policy-makers and managers awareness are use of statistic in their work.

D.1.2.1 Are stakeholders formally involved in the formulation process:
Yes---No---Don't know
D.1.2.2 How many stakeholder groups

D.1.3. Is there any metadata available

There are several metadata available such as metadata database of fishing fleet and of fisheries business.

D1.3.1 Methodology notes available: Yes---No---Don't know
D.1.3.2 Manuals available: Yes---No---Don't know
D.1.3.3 Statistical procedures described: Yes---No---Don't know
D.1.3.4 Metadata available: Yes---No---Don't know

D.2 Data quality and improvements

D.2.1. What are the perceived weaknesses and problems with the current data collection system

- *Lack of the operational resources for collection and data processing, and qualifications of staff do not meet the actual requirements.*
- *Lack of standardized set of statistic items. Data collection forms are not systematically established.*
- *Weakness in collaboration between routine and non-routine statistic bodies.*
- *Stakeholders (fishers, factories, wholesale…) are not willing to provide information to enumerators.*

D.2.1.1 Does system meets requirements: Yes---No---No opinion
D.2.1.2 Produces information timely: Yes---No---No opinion
D.2.1.5 Is the system static or evolving: #---1---2---3---4---5

D.2.2 What are the constraints and opportunities in improving quality aspects of information

- *Steadily development of fisheries needs more accurate fisheries information to manage resources.*
- *The fisheries statistics agencies involved have coordinated in their operations to fulfil their duties more effectively.*
- *The fisheries statistics have received the technical and financial support from regional and international organizations such as SEADEC, FAO and others donors.*
- *The administrators have been more interested in fisheries statistical activities*

D.2.2.1 Constraints in improving quality Yes---No---Don't know
D.2.2.2 Constraints are:
- D.2.2.2.1 Financial
- D.2.2.2.2 Capacity
- D.2.2.2.3 Institutional
- D.2.2.2.4 Coordination
- D.2.2.2.5 Methods

D.2.3 Describe plans and actions necessary to improve current information

- *Clarify roles and responsibilities of concerned agencies at the provincial level for the collection and reporting of fishery statistics;*
- *Standardization of fishery statistics items, classification, forms, and data collecting methods including clear reporting mechanism and frequency of reporting (monthly, quarterly and annually);*
- *Promote capacity building of statistical personnel both statisticians and enumerators particularly on the aspect of data collection methodologies;*
- *Apply information technique to statistical activities to improve the use of fisheries data and information in monitoring fisheries*
- *Disseminate fisheries statistical information products using printed material and via Internet*
- *Provision of sufficient facilities for statistics;*
- *Reinforce communication and coordination mechanism including network of statistical officers for the provincial, district and municipality; and*
- *Cooperation with regional/international organizations*

D.2.3.1 Is there a plan for improvement: Yes---No---Don't know
D.2.3.2 Improvement encompasses:
- D.2.3.2.1 data collection
- D.2.3.2.2 processing
- D.2.3.2.3 statistics

D.2.3.2.4 dissemination
D.2.3.2.5 training
D.2.3.2.6 cooperation
D.2.3.2.7 specialisation of functions
D.2.3.2.8 data exchange mechanisms

D.2.3.3 Financial and institutional support is secured for improvement:
yes institutionally

E SUPPLEMENTARY INFORMATION

E.1 Institutional arrangements of the fisheries administration

E.1.1 Indicate the administrative structures responsible for fisheries management, development and monitoring for each administrative division (if any) Describe the roles of each institution involved

		At central level	*At province level*
Ministry of fisheries	*Administration departments*	*Administration Department*	*Department of Fisheries (DOFI), Department of Agriculture and Rural Development (DARD) and Sub-Department of fisheries have professional units to administrate the provincial fisheries activities*
		Planning and Financial Department	
		Department for Science and Technology	
		Personnel and Labour Department	
		Inspection Bureau	
		International Cooperation Department	
		Legislation Department	
		Department for Aquaculture	
		Private and Collective Sectors Department	
		National Directorate of Fisheries Resources Exploitation and Protection (NADAREP)	*Sub-NADAREP in 35 provinces*
		The National Fisheries Quality Assurance and Veterinary Directorate (NAFIQUAVED)	*Sub-NAFIQUAVED*
	Institutions	*Research agencies: RIMF, RIAs, IFEP*	
		Training institutions: Fisheries University, Fisheries Technical Colleges	
		Information and the press agencies: FICEN, Fisheries review	

E.1.1.1 Different administrative divisions responsible: Yes---No---Don’t know
E.1.1.2 How many divisions: 14
E.1.1.3 Are local communities involved: #---1---2---3---4---5
E.1.1.4 Are there activities for CCRF: Yes---No---Don’t know

E..... Is there a frame for CCRF: Yes---No---Don't know
E.1.1.5 Is this frame well developed: #---1---2---3---4---5

E.1.2 Indicate related articles of fisheries and statistical laws that specify reporting responsibilities

The National Assembly and the Government of Vietnam has issued policies on statistic (Statistical Law of June 17, 2003 and The Government's Decree No 40/2004/ND-CP of February 13, 2004 detailing and guiding a number of articles of the Statistics Law) to improve statistical system in the whole country.

The Law of Fisheries approved by the 11-tenured national assembly in October 2003 became effective as of July 2004 and specifies reporting responsibilities as follows:

- *Article 19: The master of the type of fishing vessel shall be responsible for recording a logbook while fishing.*
- *Ministry of Fisheries shall issue the form and content of logbook and its management regime as well as the report regime and its content*
- *Article 26: The organizations and individuals engaged in aquaculture shall report on aquaculture statistics as laid down by legislation on statistics.*
- *Article 39: Fishing vessels shall be subject to inspection except for non-motorised fishing vessels with the length less than 15 meters or motorised fishing vessels with total capacity of less than 20HP.*
- *Article 51: Content of State management of fisheries activities: conduct of statistics and information on fisheries activities.*

E.1.2.1 Are the laws provided: Yes---No
E.1.2.2 Are there specific laws for reporting responsibilities
Yes---No---Don't know

E.2 Non fishery information and non statistical information

E.2.1 Is there statistical non-fishery information available, if any, please list

- *Rural, agricultural and fishery census carried by the General Statistics Office in 2001 have provided some information on the household working in catch and aquaculture, fisheries production capacity.*
- *Export and import data collected by the General Custom Office.*
- *The national nutrition program*

E2.1.1 Is non fisheries information available: #---1—2—3—4—5
E2.1.2 Is it used Yes---No---Don't know

E.2.2 Is there any non-statistical information that can be used to supplement the statistical data

- *Aquaculture development program*
- *The national nutrition program*
- *Subjects investigating on aquatic resources*

E.2.2.1 Is there useful non statistical information**:** #---1---2---3---4---5
E.2.2.2 If available is it used: Yes---No---Don’t know

ACKNOWLEDGEMENTS

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3 QUESTIONNAIRE ON NATIONAL FISHERY DATA AND INFORMATION COLLECTION SYSTEM

3.1 Questionnaire

Part 1

This section is to be filled by a senior officer

Respondent name:
Title:
E-mail: **fax:**

A. WHY fishery data and information are needed

A1) What data and information do you need (or wish to have) in the formulation of fishery policies and management plans and in other decision making process?

A2) Describe the existing national policy and management objectives, for which fishery information is required

A3) List other needs of fishery information

A4) Describe objectives of fishery data collection

A5) Describe how objectives of data collection are implemented through major data collection systems

A6) Indicate whether intended users of fishery information receive required information

Part 2

This section is to be filled by a technical officer

Respondent name:
Title:
e-mail: **fax:**

B. WHAT data should be collected

B1) What are the data items (indicators and variables) that are currently collected?

B2) Indicate whether different sets of data items are collected for different subject areas or fisheries

B3) Provide definitions for classification terms used in the data collection system

C. HOW data are collected and managed

C1 Institutional arrangements for data collection

C1-1) Indicate the national structure for fishery data collection, compilation, analysis and dissemination

C1-2) Describe the coordination mechanism among agencies/institutions concerned

C1-3) Describe operational resources allocated for data collection for both central and local levels

C2 Data collection

C2-1) Describe methodologies for data collection for each subject area or fishery

C2-2) How often are the data collected and on what time basis? Provide a time line indicating the approximate schedule of data collection

C3 Data processing

C3-1) Are there different methods of estimation for different subject areas or fisheries? If so please list

C3-2) Describe the processes of the data compilation and storage including hardware and software used

C3-3) How is the analysis of statistical data conducted and by whom? Is information from other sectors/institutions outside fisheries sector used to provide a more holistic reporting?

C4 **Reporting**

C4-1) In what forms are the data/information packaged, presented and disseminated?

C4-2) Are there statistical reports routinely prepared for information users? How often are they made available?

D. HOW can the system be improved?

D1 **System design**

D1-1) Describe the designing process of the data collection system and major historical changes in the design or the implementation of the system

D1-2) Indicate whether the information users were consulted in the planning and reviewing process in order to meet their needs?

D1-3) Is there any metadata available?

D2 **Data quality and planned improvements of the information**

D2-1) What are the perceived weaknesses and problems with the current data collection system?

D2-2) What are the constraints and opportunities in improving quality aspects of information?

D2-3) Describe specific plans and actions necessary to improve current information

E. Supplementary information

E1 Institutional arrangements of the fishery administration

E1-1) Indicate the administrative structures responsible for fisheries management, development and monitoring for each administrative division (if any). Describe the roles of each institution involved

E1-2) Indicate related articles of fishery and statistical laws that specify reporting responsibilities

E2 Non-fishery information and non-statistical information

E2-1) Is there any non-fishery information available? If any, please list

E2-2) Is there any non-statistical information that can be used to supplement the statistical data?

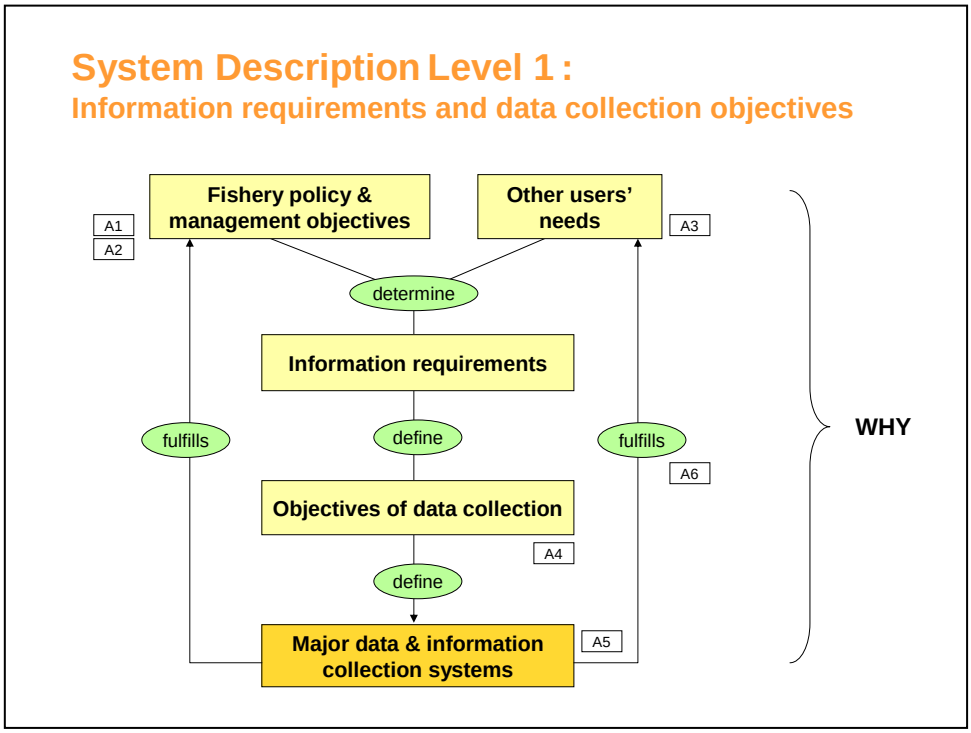
E2-3) Describe specific plans and actions necessary to improve current information

3.2 Explanatory Note

This explanatory notes was provided to the questionnaire respondents as guidance in filling up the questionnaire.

Part 1

A: WHY fishery data and information are needed



This section deals with the uses of fishery information; why do you need fishery data and information or for what purpose fishery information is required?

- Question A1 asks the information requirements in "decision making" process for fishery sector development and management.
- Question A2 asks the information requirements from the existing fishery policy and management plans and sees how the implementation of policy and management plans is supported by the data and information. For example, if one country has a policy of achieving sustainable management of coastal fishery resources, it needs the information to assess the status of fishery resources. If it has a management objective of resolving conflicts in coastal waters, it may need to have the information on types and no. of fishing operations in the conflict area, and causes of and nature of conflicts.
- The requirements for fishery data and information may not come only from the fishery line agency (e.g. fisheries department) but also from other external agencies. Questions A3 is concerned with those information needs that come from "other users". For example:
  - Reporting responsibilities for international/regional agreements
  - Reporting responsibilities for GDP estimation or national economic planning

- Information services for private sectors

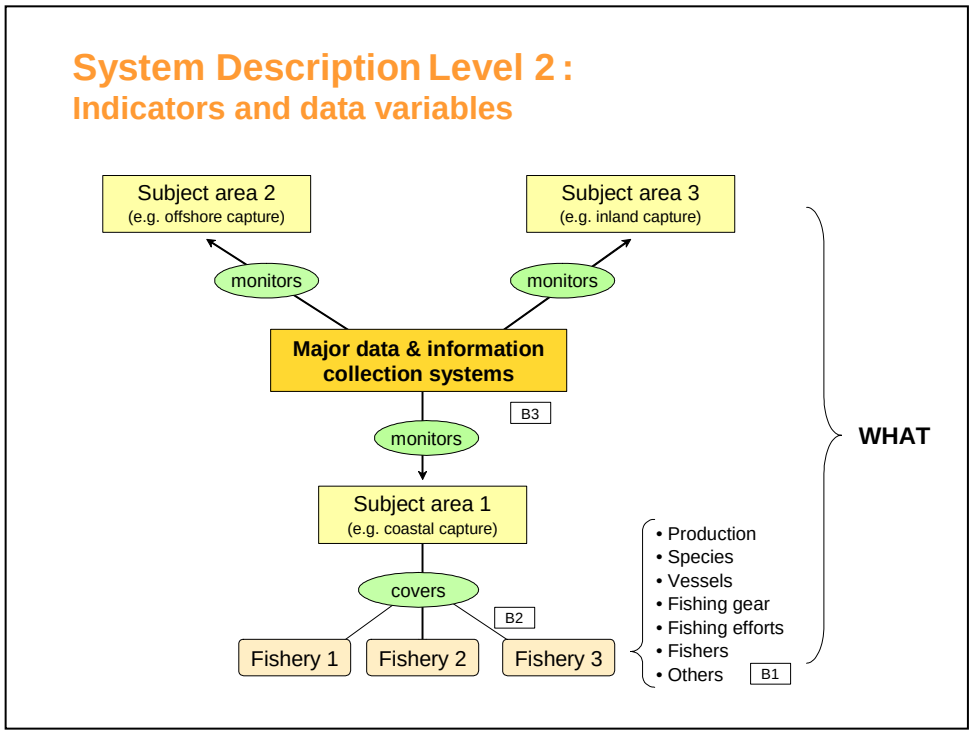
- Question A4 asks what specific objectives the national fishery data and information collection need to meet in order to fulfil the requirements of information users mentioned above. Some example of the objectives are 1) to monitor changes in the structure of the fishery sector for policy formulation purposes, and 2) to monitor production levels of each fishery sub-sector for the national account purpose.

- Objectives of data collection are often achieved through a combination of efforts such as routine collection of data by the fishery line agency, census of fisheries (or agriculture) by the central statistical office, and/or ad-hoc surveys by research institutions. Question A5 asks such overall framework of data collection.

- Question A6 asks whether policy makers and fishery managers (A1, 2) or other information users (A2) are adequately informed.

Part 2

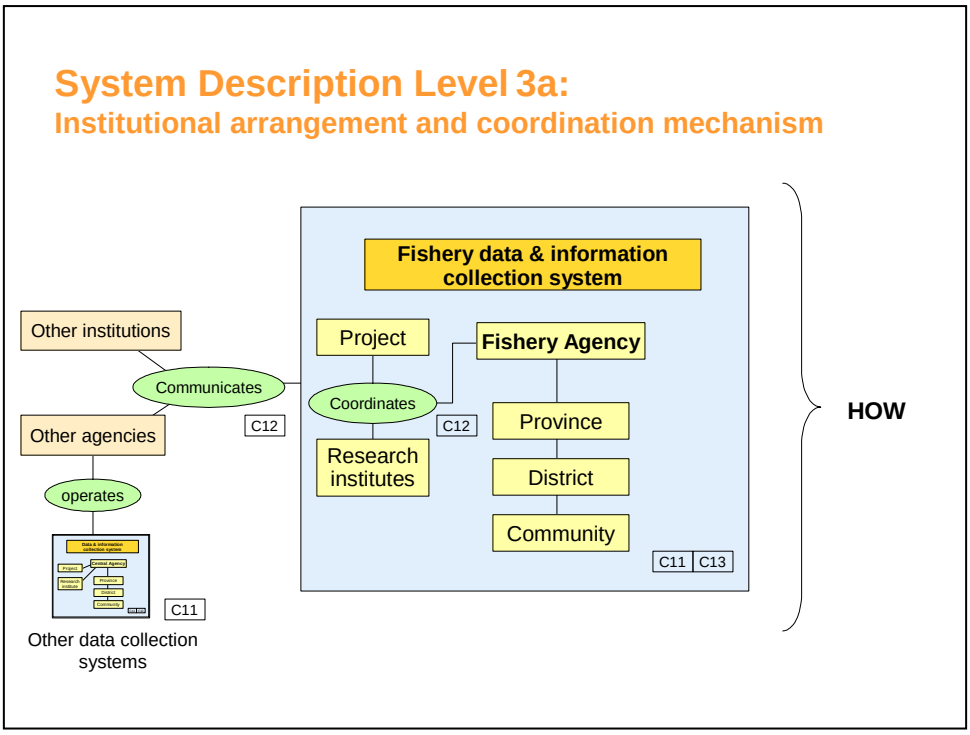
B: WHAT data should be collected



This section deals with the country's choice of indicators and data variables.

- Question B1 asks to list all the fishery related data items (indicators and variables) that are currently collected by the country for all the data collection systems (components) identified by the question A4. This should also include all the sub-sectors of fisheries (see the diagram above) and all the data items collected on a routine basis as well as on a periodic or ad hoc basis. For example:
  - Production quantities by species and by province (collected by the fisheries department)
  - No. of registered fishing vessels by tonnage group
  - No. of fishers (collected by the agriculture and fishery census)
  - Species composition of bottom trawl fishery (collected by a donor supported project)
- Question B2 asks whether the different sets of data items are collected for different subject areas. For example, one country may collect species detailed production data by type of fishing gear for marine fisheries but only those of larger groupings of species for inland fisheries. It may enumerate the number of fishing vessels for commercial fleet but not for small-scale fisheries. The subject area may not necessarily the component of the fisheries sector but can be an administrative activity (or purpose) driving the collection of data. For example a subject area may be "fish auction for coastal fisheries" where managing fish auction places is the purpose (or administrative activity) that result in collecting quantities and prices of fish sold by coastal fisheries
- Question B3 requests the information on potentially ambiguous definitions used in the data and information collection system such as "part-time fishers", "reef fish", "trash fish", or "brackish water", as well as those definitions that are unique to one country such as "inn fishery" or "leased fishery"

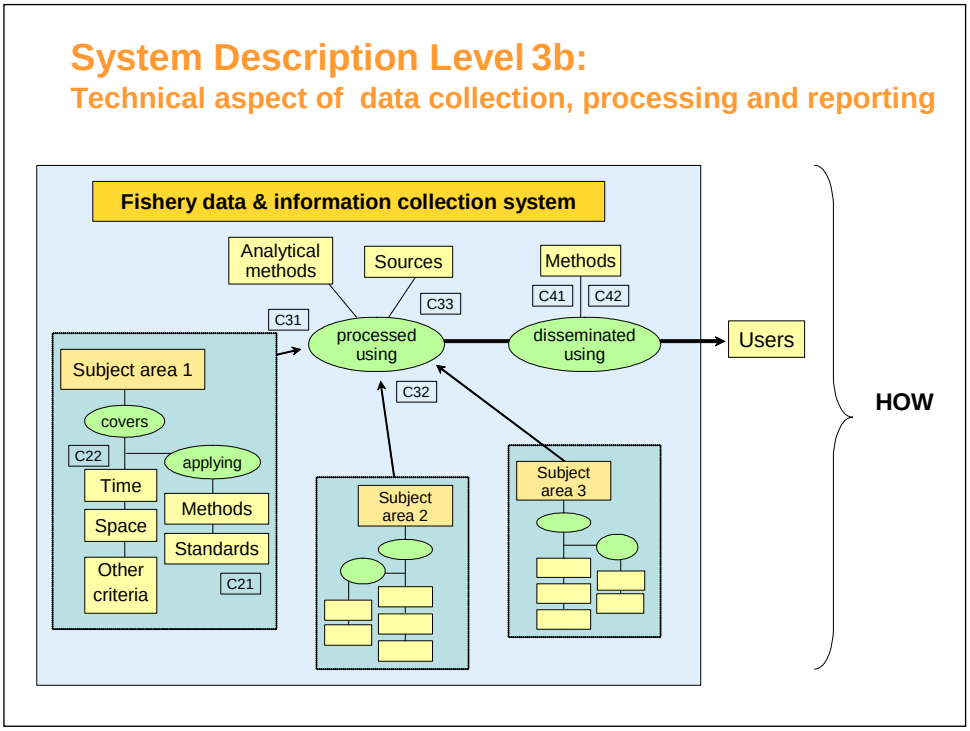
C: HOW data are collected and managed



The description of institutional arrangement can focus primarily on the major data & information collection system that is most relevant to the fisheries sector (here named Fishery data & information collection system). Other major data & information collection systems may be described likewise if it is of equal importance to the sector, or more simply through existing communication protocols if no focus on these secondary systems is required.

- Question C1-1 request to describe the institutional structure of the fishery data collection system at central, provincial, district and local level and their respective functions in the system.
- When more than one agency/institution are involved in data collection, it is often necessary to have a consultation or communication mechanism to coordinate their activities among agencies/institutions concerned. Question C1-2 requests the information on this mechanism.
- Question C1-3 requests the information on operational resources allocated for data collection for both central and local levels. For example:
  - No. of staff and their qualifications
  - Opportunities for training and other capacity development
  - Budget
  - Equipment and facilities

C2 to 4: Data collection, processing and reporting



- Question C2-1: If different scope and methodologies of data collection are applied for different subject area or fishery, please describe all of them. For example, sample-based surveys at landing sites may be applied for the estimation of capture production from coastal fisheries but logbook surveys are applied for offshore fisheries. Number and size of fishing vessels may be enumerated annually based on the record from nation vessel registration scheme but the number of fishers is enumerated decennially when national population census is conducted. (Please refer to the answers to the question B1, B2)
  Please also describe standards used. For example, is there a national or international standard list of species which the system uses; if data are collected at provincial level, are provinces coded according to a national standard coding system for administrative units?

- Question C2-2 asks the time line of the data collection flow from the initial data sources (e.g. fishing communities or landing sites) to, district, province and the central agency level. For example, raw data from weekly visits to landing sites are compiled at the district office and report to the provincial office monthly. They are subsequently reported to the central agency on a quarterly basis.
  Please also mention the spatial coverage and spatial resolution for data collected as well as other criteria used to compile data and their level of details.

- In accordance with subject areas or fisheries mentioned in the question B1 and C2-1, Question C3-1 asks whether there are different methods of estimation for different subject areas or fisheries.

- Question C3-2 is concerned with the processes of the data compilation and storage including hardware and software used. For example, some countries have a decentralised processing system whereby the raw data collected are partly compiled/processed at province or district level. Please also mention if external sources of information used for processing.

D. HOW can the system be improved?

D1 System design

- Question D1-1 asks, for example, 1) when the current data collection system was originally established and who (which stakeholders) were involved in the process, 2) whether there has been any change in design or implementation of the system and what was the reason for the change. Financial difficulties can lead to the reduction of field enumerators and shifts in policy could require additional data items to be collected.
- Question D1-3 requests the availability of such information as follows:
  - Methodological notes
  - Data collection manuals
  - Other sources of data used
  - Catalogue of commercially important species

D2 Data quality and planned improvements of the information

- Question D2-1 requests to look at such aspects of the systems as follows:
  - Does the system meet the information requirements?
  - Does the system produce the information timely?
  - Does the system produce the information with the quality users require?
  - Does the information produced actually used?
- For the Question D2-2, please refer to the diagram above
- Some example of plans and actions (Question D2-3) are
  - Improving methodologies to achieve required accuracy of data/information
  - Streamlining procedures for statistical data collection, processing, analysis, and reporting to improve timeliness of information dissemination
  - Providing more training to field staff and enumerators
  - Improving coordination with other national agencies

E. Supplementary information

- Question E1-1 asks whether different administrative units are responsible for marine and inland waters, and/or whether management authorities are delegated to local government units or communities.
- Some examples of Question E2-1 are:
  - Population census
  - Agriculture census
  - Household income/expenditure or consumption surveys
  - Village profiling surveys
  - Labour force surveys
- Some examples of Question E2-2 are:
  - National development plans
  - Natural resource management policies
  - Interactions with the environment and other sectors (integrated coastal zone management)
  - Related marine research or markets and consumer preferences