Draft strategy and outline plan for improving information on status and trends of aquaculture

This document presents a strategy for improving information on aquaculture status and trends based on that developed for capture fisheries through an FAO Technical Consultation convened in March 2002 and approved by the FAO Council in 2003. The basic structure and guiding principles of the fisheries strategy are retained and selected revisions made in contents as necessary to meet the specific needs of aquaculture. The draft strategy for aquaculture was reviewed and approved with amendments by the FAO Expert Consultation on Improving Information on Status and Trends of Aquaculture in January 2004. The present document represents the final draft of the strategy for aquaculture, which incorporates amendments suggested by the Expert Consultation.

1 INTRODUCTION AND RATIONALE

The need for aquaculture data and information collection is embedded in the Code of Conduct for Responsible Fisheries, and some data needs are further elaborated in the associated FAO Technical Guidelines. The Code recognizes that reliable and timely data are required for the competent authorities of national governments to effectively discharge their general responsibility in the promotion of sustainable aquaculture practices that are well integrated into rural, agricultural and coastal development.

The collection, analysis and presentation of reliable evidence of current achievements at the local and national levels are the basis for monitoring the structure, production and performance of the aquaculture sector, and for analysing trends over time. These practices also contribute to the calculation of indicators that provide evidence of meaningful and sustainable impact of good policies.

In recent years the demand for reliable data and information and for reporting on aquaculture has greatly increased, driven not only by the need to formulate and monitor sound policies and development plans, but also by new information and reporting requirements of international agreements and initiatives, and by the increasing public demand for transparency and accountability.

Changing perspectives in fisheries and aquaculture management are also changing the requirements for information. Now, managers must take a wider range of issues into account in decision-making, including consideration of aquaculture within the full scope of the environment; approaching sustainability through application of the Precautionary Principle, as embodied in the CCRF; and considering information from and between all sectors to ensure transparency and the likelihood that compliance can be understood, accepted and implemented.

Though aquaculture has been practiced for centuries in some countries, management of the sector is a fairly new concern. In fact, aquaculture was recognized only recently (March 2001) as an independent economic activity by the United Nations Statistical

Commission. Accordingly, the collection of statistical data and other information on aquaculture separately from fisheries data is a recent endeavor at the national regional and global levels and lags well behind systems for agriculture and capture fisheries.

However, the growing interest in aquaculture and the implications of its expansion, together with strategic concerns for sustainable development and trade, and for social and economic development, have created a need for a better array of numerical data of reliable quality and for other information that measures and describes trends of the sector. In many countries, the sector is developing rapidly, or is expected to do so, adding to the need for close and regular monitoring.

Information on the status and trends of aquaculture is also either needed for, or consistent with, international instruments with relevance to aquaculture, including:

- *Code of Conduct for Responsible Fisheries* which calls for use of the best scientific evidence available, bilateral and multilateral cooperation in research and data collection (Article 6.4), regional mechanisms for cooperation to compile and exchange data (including information on socio-economic factors, Article 7.4), and publication and dissemination of results (Article 12);
- *The Declaration and Plan of Action of the FAO Kyoto Conference on the Sustainable Contribution of Fisheries to Food Security* which calls for monitoring and assessing production of fishery products, supply and demand, and their effects on food security, employment, income and trade; promoting standardized methods for study of social, cultural and economic attributes of fisheries and aquaculture, and developing verifiable indicators of the importance of these attributes and their compatibility with management objectives;
- *Commission for Sustainable Development*, as called for by UNCED in Chapter 40 of Agenda 21, which requires states to report on sustainability indicators, which are likely to be partially based on fisheries and aquaculture status and trends information;
- International Conventions and Agreements, such as the *Convention on Trade in Endangered Species (CITES)* (1973) and the *Convention on Biological Diversity* (1992), which call for the collection and exchange of information on the status of biota; *Agreement on Sanitary and Phytosanitary Measures (SPS Agreement)* which calls for international reporting on incidence and risk of selected aquatic diseases; World Trade Organization (*WTO) Agreement on Technical Barriers to Trade (TBT)* which may call for eco-labelling for sustainability and safety purposes; and
- International Programmes, including the (a) *United Nations Environmental Programme (UNEP)*, (b) specific projects sponsored by the *Global Environmental Facility*, and (c) *Inter-Agency Committee on Sustainable Development*, which call for, or need, fisheries and aquaculture information.

FAO is a provider of global assessments and analyses to the world community. The challenge is to respond to the increasing and more diversified demand for these services, while adapting to Members' changing needs. The communications revolution has created an ever more quality-conscious external environment, requiring greater attention to the improvement of information products. As the quality of FAO's information is closely correlated to the capacity of member countries to provide reliable and complete data, there is a need to support and/or improve their capacity for data collection and analysis.

Promoting sustainable aquaculture at the national level requires improved status and trends information. Article 9 (Aquaculture Development) of the Code of Conduct for Responsible Fisheries (Articles 9.2.4. and 9.1.3) requests states to enhance their capabilities of data collection and dissemination, and in the application of such data to rational use of resources and aquaculture development planning.

Since 1984, FAO has made considerable progress in establishing a global database on aquaculture statistics, but much more needs to be done to improve knowledge of

the sector and to adapt to current demands for management information. Aquaculture statistics of many countries presently do not meet the information demands of management for sustainability, and there are a number of technical constraints in the compilation of regional and global aquaculture statistics related to standardization, completeness and reliability of data reported by some countries, and by institutional problems at the national and global levels. The need to resolve these constraints is made more urgent by the increasing demand for information at all levels by a variety of data users.

The Working Party on Status and Trends of Fisheries of the FAO Advisory Committee on Fisheries Research (ACFR:STF), on the request of the ACFR, prepared a draft International Plan of Action (IPOA) for improving the Fishery Department's data collection and assessments of status and trends of capture fisheries, which was presented to the twenty fourth session of the Committee on Fisheries (COFI) in March 2001. The IPOA was subsequently reviewed and amended to a Strategy by a Technical Consultation convened in March 2002, on the request of COFI. The Strategy and related project profile for Improving Collection and Processing of Data and Information on the Status and Trends of Capture Fisheries were adopted by COFI during its Twenty-fifth Session, February 2003.

The COFI Sub-Committee on Aquaculture (COFI-AQ), during its First Session in April 2002, identified data collection and reporting (to improve knowledge and management of the sector) as a key priority area for future work The Sub-Committee considered information needs for aquaculture at the global level and recommended that FAO develop an approach (strategy) for improving reporting on aquaculture status and trends similar to that developed for capture fisheries, with special attention to the quality of the information on which it is based.

In follow-up to this recommendation, the FAO convened, in January 2004, an Expert Consultation on Improving Information on Status and Trends of Aquaculture, which reviewed and approved, with amendments, a draft strategy for aquaculture prepared by FAO. This document represents the final draft of the strategy which incorporates the recommendations and suggestions of the Consultation and those of the Working Group of Experts on the FAO Aquaculture Questionnaire, "FISHSTAT AQ", which immediately followed the Expert Consultation.

2 NATURE AND SCOPE

2.1 Nature of the Strategy

This Strategy has been elaborated within the framework of the Code of Conduct for Responsible Fisheries (the Code), as envisaged by Article 2 (e), and as it relates to national and regional mechanisms for cooperation to compile and exchange data (Article 7.4.7 and Article 9.2.4), and the publication and dissemination of results, as it relates to aquaculture (Article 12.3, 12.4). It is also within the remits of the Strategic Framework for FAO 2000-2015 (Chapter II. Corporate Strategies, Section E - Improving Decision-making through the Provision of Information and Assessments and Fostering of Knowledge Management for Food and Agriculture).

The provisions of Article 3 of the Code apply to the interpretation and application of this document and its relationship with other instruments. All concerned Members and non-members of FAO and aquaculture entities are encouraged to support its implementation.

This Strategy applies to the assembly and dissemination of information on the status and trends of aquaculture. Data collection needs for monitoring the status and trends of aquaculture are established by existing obligations of states to report fisheries statistics to FAO under Article XI of the FAO Constitution. The Strategy proposes to significantly improve data collection and related research and provide impetus for

fulfilling those that already exist. This impetus should include additional support from relevant international organizations, whether governmental or non-governmental, and financial institutions (development partner agencies) for capacity building in developing countries.

In this Strategy, the reference to states includes the European Community in matters within its competence.

2.2 Scope of the Strategy

The Strategy is global in scope and is designed to cover all aquaculture in fresh, brackish and marine waters, including all commercial and subsistence aquaculture. It addresses issues concerning national capacity for the collection, processing, analysis and dissemination of data and information; quality, completeness and scope of data and information; timeliness of data and information collection and dissemination; national and international institutional frameworks for coordination of data and information collection; and participation and transparency in the preparation of global status and trends reports.

The main focus of the Strategy is on information concerning the primary food-producing sector (as opposed to supporting industries) and its contribution to national food security, including socio-economic information.

3 OBJECTIVE

The overall objective of the Strategy is to provide a framework for the improvement of knowledge and understanding of aquaculture status and trends as a basis for policy-making and management, and for sector development that is compatible with good stewardship of resources and the environment.

The Strategy will be implemented through arrangements between states, directly or through their participation of regional fishery organizations, and FAO. These arrangements should be established at various geographic scales, ranging from local, to national, to regional, and they should be linked to form a global system under the auspices of FAO. Wherever, and whenever, possible, existing organizations should be used as the basis of the arrangements.

FAO efforts to assemble and disseminate comprehensive information on the global status and trends of aquaculture (through its annual statistical yearbooks, periodic *FAO Fisheries Circulars* and the FAO Fisheries Global Information System (FIGIS)) are hindered by a number of institutional and technical constraints at the national, regional and global levels. The Strategy seeks to provide a framework for addressing these key constraints.

Consistent with Article 5 of the Code, the capacity of developing countries will be duly taken into account in implementing the Strategy. The Strategy will seek to enhance the capacity of states whose data collection systems are in a critical condition, so that they can improve sector management at the national level and fulfil existing commitments to collect aquaculture statistics, thus allowing them to more fully participate in the Strategy.

4 GUIDING PRINCIPLES

The arrangements for implementation of this Strategy should be based on the six guiding principles highlighted in the paragraphs that follow.

4.1 Sustainability of information systems

Arrangements for assembling and disseminating information on the status and trends of aquaculture should be viable in the long term. As a consequence: (a) adequate funding should be provided at the national, regional and global levels, taking into account the

resources available to countries, regional aquaculture/fishery organizations/mechanisms and FAO; and (b) the programme should consider the particular needs of developing countries which may require large investments in training and capacity building, to facilitate the formulation of appropriate national programmes or strategies.

4.2 Best scientific evidence

Arrangements for assembling and disseminating information on the status and trends of aquaculture should contribute to the best scientific evidence available. Protocols for assuring the quality of scientific information should be applied wherever and whenever practicable and appropriate. Such protocols should take account of the need to consider knowledge of participants in the sector, as well as traditional knowledge.

4.3 Participation and cooperation

Arrangements for assembling and disseminating information on the status and trends of aquaculture should adopt mechanisms for inclusion of all relevant participants in the preparation, analysis and presentation of aquaculture information. Relevant participants may include, *inter alia*, government experts, producers, industry representatives and non-governmental organizations. States should, in accordance with international law, cooperate with other states in developing and maintaining such aquaculture information, as appropriate, either directly, or through appropriate intergovernmental organizations, including regional fishery organizations/mechanisms. States should provide feedback on the status and trends of aquaculture to all relevant participants.

4.4 Objectivity and transparency

Arrangements for assembling and disseminating information on the status and trends of aquaculture should contribute to providing the best scientific evidence available (paragraph 26), and to transparency, in support of Article 6.13 of the Code of Conduct, while respecting any confidentiality requirements. Uncertainty associated with status and trends information should be expressed.

4.5 Timeliness

Arrangements for assembling and disseminating information on the status and trends of aquaculture should result in information being provided in a timely manner. Specific tools should be adopted or developed to ensure this outcome.

4.6 Flexibility

Arrangements for assembling and disseminating information on the status and trends of aquaculture should be flexible enough to permit adjustments as necessary to ensure that they effectively support aquaculture policy-making and management through the provision of appropriate information.

5 REQUIRED ACTIONS

5.1 Capacity-building in developing countries

States, relevant intergovernmental and non-governmental organizations, and financial institutions, should address developing country needs for financial and technical assistance, technology transfer, training and scientific cooperation, in order to build capacity to implement cost-effective and sustainable aquaculture data collection, data processing, analysis and reporting, and exchange information. Capacity building is critical to fulfil national needs, the needs of regional aquaculture/fishery organizations, existing obligations for reporting aquaculture data to FAO, and to ensure that developing countries can more fully participate in, and benefit from, the Strategy.

States, particularly major aquaculture producers, should incorporate the collection of aquaculture statistics as an integral part of the policy-making and sector management process, both at the local and central levels.

States should, with support from development partner agencies and assistance from FAO, where necessary, enhance their capacities to collect data (including the capacity to determine data needs of target users, identify the data to be collected, and clearly define the expected output), to ensure that the coverage of aquaculture information is as complete as possible and encompasses all sectors.

States should improve national inter-agency communications and coordination to make best use of all data collection schemes to obtain aquaculture data and reduce costs, particularly with regard to socio-economic data on small scale and subsistence aquaculture, employment and similar information that is often collected by government agencies unrelated to fisheries or aquaculture. The establishment of working groups comprising aquaculture and other statisticians should be promoted.

States should cooperate through their regional fishery organizations and regional programmes, with the cooperation of FAO if necessary, to develop and adopt effective and pragmatic standards and systems for collection of aquaculture statistical data, which should be compatible with FAO systems in order to enable reliable compilation of data on aquaculture at the regional and global levels.

5.2 Global methodologies and standards

5.2.1 Addressing gaps and constraints in the FAO statistical database on aquaculture

States, particularly major aquaculture producers, with assistance from FAO and relevant regional aquaculture/fishery organizations/mechanisms, should place special emphasis on the periodic collection of information on structural aquaculture statistics to enable the design of appropriate frame surveys, in the interest of more reliable and representative statistics, and for calculating resource use indicators as needed.

States should make greater efforts to specify aquaculture production by species and not aggregate them into species groups. In some instances, preparation of local taxonomic field guides for enumerators might help improve species details in aquaculture statistics.

States should seek to reduce delays in the collection, processing, analysis and reporting of statistical data by adopting information technology tools and investing in computers. Prolonged delays reduce data benefits in the decision-making process and may lead to poor decisions (due to dated information) and attendant loss of confidence and support for statistical systems.

FAO, in cooperation with states, regional fishery/aquaculture organizations/ mechanisms and development partner agencies, should develop a standard software package for the compilation, processing and analysis of aquaculture statistics, and promote its adoption and application at the national and regional levels to ensure timely delivery of information to users. FAO should further expedite the processing and reporting of global aquaculture statistics by developing and adopting electronic tools and procedures for the collection of statistics from states.

FAO should review and revise the FAO aquaculture questionnaires as necessary to meet information needs and should improve the accompanying instructions. FAO should also seek to improve harmonization of priority terms and definitions where confusion may result in submission of incorrect information by states.

5.2.2 Data collection systems for aquaculture in rural development

States, relevant intergovernmental and non-governmental organizations, and financial institutions should recognize that many small-scale and subsistence aquaculture holdings, particularly in developing countries, are not well monitored and awareness

needs to be raised on the importance of monitoring these activities. They are probably under-estimated and therefore under-represented in current aquaculture status and trends information. Consequently they are not adequately considered in the development of plans and policies for aquaculture, particularly for improving rural food security and livelihoods.

States should participate in and support the development of cost-effective methods for acquiring and validating data on small-scale and subsistence aquaculture, including rapid appraisal methodologies and other approaches for data-poor situations and participatory processes that closely associate the farmers and their organizations to the data collection schemes. Where possible and appropriate, these surveys should be integrated with agricultural surveys and surveys of small-scale fisheries.

FAO, with support from member states and development partner agencies, should address the special data collection and assessment needs for small-scale and subsistence aquaculture, including the use of meetings of experts to develop innovative approaches and guidelines.

5.2.3 Expanding the scope of information on status and trends of aquaculture

States should approach the implementation of the Code of Conduct, in particular as this relates to Article 9 (Aquaculture Development), and other articles applicable to aquaculture [e.g. Article 7.4.4 and 7.4.5 (Data Gathering and Management Advice) and Article 12.9 (Fisheries Research)], by considering ways to expand the scope of status and trends reporting to meet the responsibilities recommended therein.

States, directly or through participation in regional fisheries organizations, should consider broadening the collection of information on the status and trends of aquaculture to support further development of aquaculture management, by incorporating, *inter alia,* socio-economic, environmental and resource use considerations.

FAO should seek to include the following data in its annual questionnaire (FISHSTAT AQ): (a) Volume of production by species by method of culture, (b) aquatic environment and area, (c) production in volume, (d) production in value, (e) area under culture, (f) volume of water, (g) hatchery production released to the wild, (h) hatchery production put in controlled environment, (i) number of farms/hatcheries, (j) employment in full time equivalent, (k) production by intensity level, (l) environmental indicators , (m) input of fry/juveniles from the wild.

FAO, with support of Members, and with full participation of regional organizations should further address the issue of indicators of sustainable aquaculture development (ecological, social, economic and institutional), including cost-effective methods for their derivation, to facilitate management of aquaculture, resources and the environment.

Any increase in the scope of collected statistics, to be practicable, must be considered in the context of national needs and priorities, data collection costs and national capacity, as well as the trade-off between the scope of coverage and data accuracy.

5.3 Improving institutional mechanisms and procedures for aquaculture statistics and status and trends reporting

5.3.1 Coordination and scientific advice

FAO, with support of its Members, either directly or through regional aquaculture/fishery organizations/mechanisms and arrangements, should consider establishing an inter-regional Coordinating Working Party on Aquaculture Statistics (CWP-AS) with the same terms of reference as the Coordinating Working Party on Fishery Statistics (CWP-FS), i.e. to (a) keep under continuous review the requirements for aquaculture statistics for research, policy-making and management, (b) agree on standard concepts, definitions, classifications and methodologies for the collection and collation of

aquaculture statistics, and (c) make proposals for the coordination and stream-lining of aquaculture statistical activities amongst relevant intergovernmental organizations.

5.3.2 Participation

FAO should consider establishing an appropriate participatory mechanism for the involvement of national experts, centres of excellence and regional aquaculture/fishery organizations/mechanisms in the preparation and analysis of information on status and trends in aquaculture. Relevant participants may include, *inter alia*, government experts, producers, industry representatives and non-governmental organizations. The mechanism would provide greater transparency, consensus building at the national, regional and global levels.

5.3.3 Oversight

FAO, with support from its Members, either directly or through regional fishery organizations, should also consider establishing a process for scientific oversight of the global reviews of aquaculture status and trends, including those prepared for the biennial State of World Fisheries and Aquaculture (SOFIA).

5.3.4 FIGIS participation, structuring and capacity building

States should support, both directly or through participation in regional fisheries organizations, the development of Fisheries Global Information System (FIGIS) by:

- providing national user requirements for outputs from and inputs to the system;
- participating in national, regional and international processes to define the protocols for information exchange, quality assurance or quality rating, and transparency provisions to be specified in partnership agreements;
- contributing timely information to FIGIS;
- facilitating a systematic synthesis of information on aquaculture status and trends from national to regional and global levels;
- participating in complementary information and communication technology initiatives aimed at improving the generation and dissemination of research-based knowledge relevant to sustainable development;
- providing FIGIS with the best scientific information available where the assurance of information quality could be established by review processes at the national or regional level;
- supporting FAO and other FIGIS partners, as appropriate, in the organization of and participation in pilot projects and workshops, to further develop and implement FIGIS, to develop training materials, and to conduct training; and
- FAO's continued development of FIGIS, using modern information and communication technology, as a partnership between FAO, regional fisheries organizations and national organizations, and other organizations that can make a positive contribution to the system.

5.3.5 Criteria and methods for ensuring information quality and security

States should participate in the development and application of criteria and methods to ensure information quality and security for the purposes of best scientific evidence, in accordance with internationally agreed standards and practices, through mechanisms for data verification, and in a manner consistent with applicable confidentiality requirements.

FAO, with support of, and participation by Members should facilitate the development of practical guidelines for quality assurance, transparency and security of aquaculture information.

5.3.6 Arrangements for the provision and exchange of information

States, directly or through their participation in regional fisheries organizations, should seek and agree on arrangements to facilitate the provision and exchange of information on the status and trends of aquaculture with FAO, as appropriate. These arrangements should address the roles and entitlements of the partners, including in relation to information quality, transparency and confidentiality.

Working groups composed of aquaculture experts and set up by countries or regional fishery organizations that meet to assess the status and trends of aquaculture and which conduct their work according to terms of reference which specify the scope of their activities, are an important mechanism for enhancing the quality and transparency of scientific information. They can also provide important opportunities for capacity building.

States, directly or through participation in regional fishery organizations, in their respective jurisdictions and regional programmes, should formalize arrangements for working groups to analyse aquaculture data and information towards the evaluation of their status and trends. The periodicity of these working group meetings would depend on available human and financial resources and the characteristics of the aquaculture sector.

States should seek to make use of all national information systems by improving coordination and sharing of information among government agencies and integration of information collection where possible (e.g. with agricultural and artisanal fisheries surveys, agriculture census, etc.).

States and development partner agencies should work with FAO to ensure the participation of fishery experts from around the world in working groups, particularly where these working groups contribute to capacity building in developing countries. The TCDC and other FAO programmes could be used for this purpose.

5.3.7 Sustaining data collection, information on the status and trends of aquaculture

States should monitor their systems for data collection, analysis and reporting to ensure the sustainability of these systems to meet the needs of aquaculture policy-making and management and the agreed requirements of regional fishery organizations and FAO, and take corrective actions as appropriate.

FAO and development partner agencies should assist states identify minimum data requirements and frequency of collection to meet management and reporting needs, and to elaborate cost-effective methods, tools and institutional arrangements for this purpose.

6 PROMOTION AND IMPLEMENTATION MECHANISMS

6.1 General call for improving information on the status and trends of aquaculture

States, regional aquaculture/fishery organizations and international institutions should develop and implement mechanisms for the improvement of aquaculture information, the application of research to enhance the availability of best scientific evidence, and the adoption of a continuing process for the enrichment of aquaculture status and trends information to support sustainable development and management at local, regional and global levels.

6.2. The role of states

States should evaluate the actions they need to take to improve information on the status and trends of aquaculture, address these needs on a priority basis, and report on the improvements they make, as part of their biennial report to FAO on the Code of Conduct.

States should allocate adequate resources in order to ensure sustainable and timely collection, processing and dissemination of information needed to enable rational management of national resources and responsible aquaculture development. Sound national information systems are the basis of a sound global information system.

6.3 The role of regional fishery organizations

Regional fishery organizations/mechanisms, within the limits defined by their conventions and to the extent mandated by their members, should participate in the implementation of this Strategy, by providing support to their members, participating in global programmes and decisions on the development and adoption of standards and guidelines for information on the status and trends aquaculture.

6.4 The role of FAO

FAO will, to the extent directed by its Conference, and as part of its Regular and Field Programme activities, support states and regional aquaculture/fishery organizations in the implementation of this Strategy.

FAO will, to the extent directed by its Conference, support member states' implementation of this Strategy, through in-country technical assistance projects using Regular Programme funds and by use of extra-budgetary funds made available to the Organization for this purpose. For more sustainable management of aquaculture development and conservation of resources and the environment, FAO should prepare a specific programme for establishing effective and sustainable systems for data collection, processing and analysis in developing countries, including in particular the least developed among them. A draft project outline prepared by the consultation for this purpose is given in Annex 1.

FAO will report biennially, through COFI-AQ and COFI on the state of progress in the implementation of the Strategy.

6.5 Role of development partner agencies and non-governmental organizations

International and national development partner agencies should give priority to the provision of financial and technical assistance to developing countries, in particular the least-developed among them and small-island developing states, and countries whose data collection systems are in a critical condition, for capacity building and information system development, as necessary for implementation of this Strategy.

Non-governmental organizations (national, regional and international) concerned with aquaculture, fish-farmers and the aquatic environment and research into these, should encourage implementation of the Strategy through appropriate support, information methods development and capacity building and participation.

Annex 1

DRAFT PROJECT OUTLINE: IMPROVING COLLECTION AND PROCESSING OF DATA AND INFORMATION ON THE STATUS AND TRENDS OF AQUACULTURE

1 BACKGROUND

The novelty of aquaculture as a recorded economic activity and the lack of easy access to adequate objective information has often resulted in its exclusion from development planning and the management of resources, and hampered investment in the sector. In some instances, it has lead to societal and environmental problems, failure to provide development support, loss of market opportunities, and conflicts with other traditional sectors.

The growing importance of aquaculture, its rapid expansion, increasing interactions with other sectors and competition for natural resources calls for closer attention to the collection of data and information for sustainable management. Data and information on aquaculture in many countries are often of such poor quality that it is difficult to draw reliable conclusions from them. Therefore, it is necessary to improve statistical and other data collection and status and trends reporting systems throughout the world in order to empower policy makers and managers in each country.

The overall objective of the Draft Strategy is to provide a framework for such improvement to facilitate aquaculture policy making and management for development in the context of good stewardship of natural resources and the environment. The required actions are listed in Part V. The Project Outline is based on the required actions, and its outputs are contributions to solve the problems.

2 DRAFT PROJECT OUTLINE

The Project addresses the improvement of collection, processing and use of data and information on the status and trends of capture fisheries. It is part of the FishCode Programme "Assistance to Developing Countries for the Implementation of the Code of Conduct for Responsible Fisheries", the overall objective of which is to increase economic, social and nutritional benefits obtained from fisheries and aquaculture, through the adoption of responsible management and resource conservation policies and practices. The suggested project duration is five years.

It is a pre-requisite that the data and information to be improved are those that have been identified by countries as a necessary basis for advice generation and effective policy-making and fisheries management.

The immediate objectives of the Project are as follows.

- **Objective 1:** Improved collection and processing of data and information on aquaculture (freshwater, brackishwater and marine) to provide a reliable basis for sustainable development, economic analyses and management.
- **Objective 2:** Aquaculture data collection and processing according to the latest global standards executed by competent staff.

Project activities will be delivered through the implementation of two overlapping components.

2.1 Component 1: Development of inventories, methodologies and operational guidelines

This component (about 3 years) covers the creation of methodological descriptions of aquaculture statistical and data collection systems used by all countries and regional aquaculture/fisheries organizations/mechanisms. The exercise is intended to obtain a complete picture of all systems in use so as to identify gaps in monitoring and, crucially, to assess the quality of the systems used. It will also identify the improvements and training required in developing countries that are to be addressed under Component 2. The inventory will cover data systems on all aspects of aquaculture, including data on aquaculture holdings, employment, consumption, processing and trade and all economic and sociological aspects. Component 1 will also address methodological needs at the global level.

Component 1 activities will be normative and global in nature, involving desk studies, questionnaires and expert consultations as well as data collection and verification missions by consultants over a three-year period. It is foreseen that FAO Regular Programme staff will be deeply involved in overseeing these activities, which should lead to a number of publications, computer programs and training materials.

Elements of Component 1

Inventory preparation:

- assessment of locally available capabilities;
- preparation of methodological descriptions of existing national and regional statistical and data collection systems for aquaculture;
- identification of gaps in monitoring;
- assessment of the need for indicators at the national and regional levels;
- preparation of a glossary of terms and definitions used in the collection of statistics and data on aquaculture;
- review of available criteria for quality assessment and assurance; and
- elaboration of weighting factors for the quality of statistical data.

Assessment of training needs:

- identification of (i) training needs and (ii) training materials; and
- preparation of training material specific to aquaculture and to specific production systems as necessary.

Development of global methodologies and standards:

- development of software programmes to facilitate collection and processing of national aquaculture statistics;
- preparation of a standardized global glossary of terms and definitions for statistical purposes;
- development of protocols for the provision and exchange of information, including protocols for inputs into FIGIS;
- development/adaptation of rapid appraisal methods for use in data-poor situations, with focus on semi-commercial and subsistence aquaculture;
- development of low-cost (Web-based) information systems for national, regional and global information systems;
- expansion of the scope of information on status and trends of aquaculture, including socio-economic and sustainability aspects;
- elaboration of indicators focusing on practical applications at national and regional levels, including consideration of data requirements and practical solutions for indicators on sustainability aspects;

- elaboration of guidelines for creating appropriate linkage between information needs and management (policy, planning and management), including procedures or the use of data for management purposes; and
- developing methods and criteria for ensuring and assessing information quality and security.

Establishment of institutional arrangements:

- establishment of an inter-regional mechanism for coordination of and scientific advice on aquaculture statistics;
- establishment of mechanisms for cooperation in the preparation of status and trends reports on aquaculture and of protocols for the provision and exchange of information; and
- establishment of a process for oversight of status and trends reports.

2.2 Component 2: Field training and implementation

Component 2 (4 years) aims at substantial improvement in collection and processing of aquaculture statistics and other data and information on aquaculture for selected developing countries. The main purpose is to obtain better data for policy-making and aquaculture management at national level, and at regional level in cases of transboundary concerns. Improvements in reporting to FAO and other agencies would be an important secondary benefit.

Component 2 covers capacity building at all levels, and implementation of improved or new statistical and other data collection and processing systems in a number of selected countries. There is also a need for improved interaction between aquaculture statisticians, sector analysts and socio-economists, as well as for new interactions with experts of other sectors, particularly in the agriculture and fisheries sectors. The Project should facilitate this interaction.

Beneficiary states will be selected from developing countries with substantial aquaculture sectors that have a potential of becoming an example for other countries in similar situations. Training will initially be based on existing material (guidelines, manuals, computer programs), but gradually this lecture material may be modified, building on knowledge gained through the execution of Component 1. The basic approach will be first to train regional teams of trainers by language group, and then to provide Project support at national and/or sub-regional level for courses to larger numbers of national staff.

Elements of Component 2

Improvement of national and regional data collection systems for aquaculture with special focus on small-scale aquaculture and the environment:

- support to national and regional data collection and information systems, including guidelines to assist planning and implementation of such systems, and to establish appropriate linkages between management and information gathering and utilization;
- assistance to improve inter-agency communications and co-ordination for more cost-effective and compatible data gathering and information systems;
- capacity-building (technical assistance, training and systems development) in developing countries, including the collection of statistics on subsistence and semi-commercial aquaculture;
- national and regional capacity building for inputting to the Fisheries Global Information System (FIGIS); and
- expansion of the scope of information on status and trends of aquaculture to cover socio-economic and sustainability data, through improved information sharing and coordination at the national level, development of rapid assessment methods

for data-poor situations, integration with agricultural and artisanal fisheries household surveys, and other appropriate means.

Improvement of arrangements for the provision and exchange of information at regional and global levels:

- support to and active participation in the Fisheries Global Information System (FIGIS);
- mobilization of support to regional aquaculture information systems;
- organization of and participation in working groups in assessing the status and trends of aquaculture;
- assistance for improving communication and coordination among agencies involved in the collection of aquaculture and related statistics and data, at the national and regional level, to make best use of available data and capacity; and
- continued improvement/strengthening of FAO's aquaculture information dissemination system, including on-line systems and publications (e.g. FIGIS, NASO, *FAO Fisheries Circular* 886, etc.).

2.3 Institutional arrangements

FAO will work primarily with national administrations in implementing the Project, in particular the departments and institutes responsible for aquaculture statistics and information and for the maintenance of registries important for aquaculture policymaking and management. Where appropriate, FAO will seek partnerships with regional organizations in connection with setting up an institutional framework for global status and trends reporting, and as a means of facilitating prompt and efficient implementation of the Project, particularly in situations where more states are involved.

Considering the magnitude of the problem, the Project should be seen as a driving force that may pass its programme on to other organizations and projects for execution of training and other activities. Close coordination is also envisaged with other elements of the FishCode Programme and other aquaculture/fisheries projects executed by FAO (e.g. FIGIS, National Aquaculture Sector Overviews (NASO), etc.) or other agencies.

2.4 Government inputs

All Member states of FAO will be expected to complete questionnaires issued by the Project on behalf of FAO.

Beneficiary states will be expected to provide various commitments ranging from support to Project staff to the provision of personnel to assist in carrying out studies, the collection of information and data required for studies, office accommodation, transportation and other logistical support, etc.