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COMMITTEE ON FISHERIES

SUB-COMMITTEE ON AQUACULTURE

Second Session

Trondheim, Norway, 7-11 August 2003

IMPROVING THE STATUS AND TRENDS REPORTING ON AQUACULTURE

SUMMARY

After a brief summary of what aquaculture data are collected by FAO, this paper reviews actions taken by FAO and, to a lesser extent, by other international institutions, since the First Session of the Sub-Committee on Aquaculture. On the basis of experience gathered by FAO concerning the availability and reliability of national statistical systems, the paper proposes priority actions at the national, regional and international levels, as appropriate. Expected and proposed activities by the FAO Fisheries Department during the forthcoming inter-sessional period are described. In addition, Sub-Committee Members are invited to comment on activities undertaken in the last inter-sessional period and report and discuss what they intend to work on concerning improvements to status and trend reporting for aquaculture and where they would see opportunities for collaboration with FAO during the coming inter-sessional period until the next Session of the Sub-Committee.

RECOMMENDATIONS AND CONCLUSIONS OF THE FIRST SESSION OF THE COFI SUB-COMMITTEE ON AQUACULTURE

1. The First Session of the COFI Sub-Committee on Aquaculture (COFI:AQ/I), affirmed the importance of implementing the aquaculture-related provisions of the Code of Conduct for Responsible Fisheries. As part of this broad aim the Sub-Committee also considered needs for reporting status and trends of aquaculture at the global level¹ and gave recommendations of international, regional and national relevance to improve the quality of the information for the

¹ COFI AQ/I/2002/5. "Needs for Better Reporting on the Status and Trends of Aquaculture Development"

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sector and more specifically, to improve statistical data reliability. The Sub-Committee recommended in particular that FAO develop an approach for improving reporting on aquaculture status and trends, similar to what was developed for capture fisheries, with special attention to the quality of the information on which the reporting is based. The major recommendations from the first meeting of the COFI Sub-Committee on Aquaculture relating to status and trends reporting are summarized as follows. Later in the paper, progress on meeting these recommendations will be addressed.

2. In order to improve world statistics measuring the unfulfilled and fulfilled potential of aquaculture to increase the contribution to world food security, poverty alleviation and to social and economic goals, COFI:AQ/I recommended² that, as a minimum, the data to be collected at the national level should include production in quantity and value for farmed species of commercial importance, number and type of installations and information on their location, including appropriate estimates for the rural sector, and prices, employment, consumption and foreign trade of the produce of aquaculture.

3. COFI:AQ/I suggested that FAO assesses the quality of the data it receives and disseminates and reports to the next session of the Sub-Committee on how data reliability, where necessary, could be improved. COFI:AQ/I also emphasized the need for clear definitions on aquaculture-based fisheries and emerging technologies.

4. COFI:AQ/I recommended the incorporation of the collection of aquaculture data into relevant existing national data collection systems (e.g. agricultural census, consumption and labour surveys), in order to use the limited financial resources available efficiently and to capitalize on existing statistical capacity. It recognized that training and education in data collection, analysis, storage, management and dissemination are fundamental in securing the availability of good quality data. It requested that FAO continues assisting countries on these issues through the FAO Technical Cooperation Programme (TCP).

CURRENT DATA AND INFORMATION PROCESS

5. The FAO Fishery Information Data and Statistics Unit, FAO/FIDI, collates, evaluates, analyses, processes and disseminates annual statistics on world aquaculture production. Although the aquaculture statistics database system is of a relatively more recent origin than that for capture fisheries, FAO has been reporting and promoting the reporting of aquaculture production statistics, separately identified within the total fishery production, for nearly 20 years. According to FAO statistics, the aquaculture sector has grown significantly during this period, with profound consequences for food supply, livelihoods, trade, and resource utilization.

6. Since the First Session of the Sub-Committee on Aquaculture, FAO has continued to promote the collection of data for aquaculture, separately from those of capture fisheries, through statistically valid methods that permit the measurement of data reliability. However, based on replies to the FAO annual enquiry and assuming that the lack of response is largely due to non-availability of the data requested, no real progress can be reported. Many countries continued to report production at a level of species aggregation that is of limited use for global analysis. There are indications that governmental statistical programmes in some countries have regressed due to strained budgets and resources and lack of a high enough priority given to aquaculture data collection.

7. FAO is the only source of comprehensive global aquaculture production statistics. Most reviews of the state of world aquaculture, past trends and future prospects carried out by analysts rely on the statistics disseminated by FAO. FAO itself analyses these statistics in order to monitor many aspects of world fisheries such as fishery production from capture fisheries and aquaculture, fish production and trade of fishery commodities, fish consumption, and employment in fisheries.

² FAO, 2002. Committee on Fisheries. Report of the first session of the Sub-Committee on Aquaculture. Beijing, People's Republic of China, 18-22 April 2002. Fisheries Report No 674

On the basis of these analyses, FAO reviews trends and outlines prospects of the contribution of fish to food security. Since 1996 a biennial report³ (The State of World Fisheries and Aquaculture) has been produced including sector overviews and emerging policy and economic issues.

8. The statistical database on aquaculture is the key vehicle for monitoring and strategic analysis of global, regional and national developments in aquaculture. The database has served as an important means of describing the characteristics and dynamics of one of the most complex and rapidly evolving international food production sectors. It has in turn provided a valuable basis for public and private sector groups to assess resource use implications, define economic and nutritional impacts, and formulate market and development strategies.

9. At the national level, the main data users are the national administrations responsible for aquaculture, associations of producers, representatives of business, and other general users (financial institutions, consumer associations, economists, donors, civil society organizations, etc.). National approaches vary with institutional context, resources available and with the importance of the sector.

PROBLEMS WITH THE DATA

10. There are difficulties involved with the collection of global aquaculture data. These can occur at the international level where FAO compiles the worldwide statistics; at the national level where the countries compile and submit their aquaculture statistics; and in the field within the country where proper data collection procedures need to be available and be followed. Additionally, problems can occur if there is a lack of or poor communication between any of these steps.

11. At the international level the problems include issues of harmonization of terms, lack of timely reporting, non-reporting, and assessment of the reliability of reported data. Even finding a common definition for what is aquaculture has been troublesome and the subject of much international discussion as new methods and technologies emerge in the field. A need has been identified to produce a common glossary subject to international agreement. While much discussion⁴ has been held this product is not yet a reality.

12. In fulfilling its role as the compiler of the aquaculture data received from national reports, the most serious problems encountered by FAO have traditionally included for some countries a complete lack of reporting, a lack of timely reporting, a lack of complete reporting or a lack of accurate reporting. FAO works to encourage timely, accurate, and complete reporting from all countries, but primarily depends on countries to respond properly to the questionnaires and data requests. Statistics received are examined and suspicious estimates are submitted to further scrutiny and follow-up questioning with the national offices concerned. In cases where statistics are not reported or are considered unreliable and cannot be improved through consultation with the country concerned, FAO makes estimates based on the information that is available. Without better information, estimates may simply be a repetition of data from earlier years. In the near future, FAO plans to add additional automated data checks to help improve data quality and reliability.

13. At the national level, problems concern the inappropriate level of identification of species, lack of reporting for certain sectors, such as the rural and the semi-commercial ones, or of possible double reporting in production systems which cannot be clearly identified either as fisheries or as aquaculture. The problems associated with the international data sets are deeply rooted in national data constraints. Countries generally suffer from chronic resource shortages, particularly in most developing countries. The most frequent constraints indicated are:

³ FAO. 2003. The State of World Fisheries and Aquaculture 2002. FAO, Rome. 150 p.

⁴ SEAFDEC-FAO Ad hoc Expert Consultation on Variables and Terminology for Aquaculture Monitoring in Asia, Bangkok, Thailand, 13-16 September 1999.

- Data collection is often not based on a proper statistical methodology. The data provided are often estimates arrived at based on (possibly undocumented) assumptions.
 - Lack of proper licensing system for aquaculture establishments. This prevents controlled growth of the industry and impedes collection of information from the establishments.
 - Lack of quantitative assessment of small-scale rural and semi-commercial aquaculture.
 - No monitoring programme available to assess the feasibility of expanding experimental undertakings to commercial dimensions.
 - Primary data on aquaculture are scattered around various institutions and in both the government and private sectors.
 - No systematic efforts by institutional aquaculture authorities to develop programmes to collect such information from these institutions on a regular basis.
 - Inadequate budgets for the concerned provincial and central government institutions (including customs departments for relevant export commodities) in order to collect statistical information and to monitor the aquaculture industry.
 - Lack of human capacity or computer facilities for the processing, storage and analysis of data.
14. These problems compound the difficulty countries have in providing complete, accurate, and timely data for inclusion in the global database.

ACTIONS TAKEN OR PLANNED AS FOLLOW-UP TO THE FIRST SESSION

Aquaculture database extension

15. Based mostly on information available in its archives, FAO has recently completed the separation of capture fisheries and aquaculture production for the entire span of the global time series (from 1950). The current aquaculture production database holds annual records organized by country, aquatic environment and species/items of commercial importance. These data facilitate analysis of trends over a long period of time for both capture fisheries and aquaculture. The database is downloadable from the FAO website⁵ and also made available as a CD-ROM. Because this dis-aggregation required personal judgement and assumptions as well as extensive research, national aquaculture experts are asked to check the extended data for their area of expertise, and to report any anomalies or discrepancies so that FAO can continually improve this portion of the aquaculture database.

Preparation of aquacultural structural statistics

16. In preparation for the Expert Consultation on Land and Water Use in Aquaculture, in October 2002, the statistics on production by farming structure made available by selected countries representing a good geographical coverage by continent, have been consolidated for analysis. Annual data of aquaculture production practices for 1985-2000 for some 50 countries have been entered into electronic format and preliminary analyses have been conducted.

Expert Consultation on Land and Water Use in Aquaculture – Towards an improved information basis

17. In October 2002, FAO held the Expert Consultation on Land and Water Use in Aquaculture - Towards an improved information basis. The conclusions and recommendations relevant to aquaculture status and trends reporting are summarized:

- National institutions generally do not collect land and water use information.

⁵ <http://www.fao.org/fi/statist/FISOFT/FISHPLUS.asp>

- Projects, contracted reviews, and regional surveys can potentially fill the data gap. Examples are the Asian Institute of Technology (AIT) Outreach Program, the Asian Development Bank and Network of Aquaculture Centres in Asia-Pacific (ADB/NACA) joint survey, and location-specific baselines such as the Mekong River Commission Rural Extension Aquaculture Development Project in Southeast Asia.
- It is important in such studies to be clear about classification. Use of the terms ‘extensive’, ‘semi-intensive’ and ‘intensive’, based upon productivity and technical characteristics may be better replaced by classification on a range of structural indicators. (Use of a similar system such as the Land Use Types classification utilized by agricultural statisticians may be a useful way forward).
- Consideration should be given to repeating broad regional surveys such as the ADB/NACA study, which would supplement data available from national agricultural censuses (where these take place and include aquaculture).
- Regional institutions, such as NACA and/or AIT for Asia, can serve as a depository for this information for general access.

18. The Expert Consultation also reviewed the results based on time series of production by structure compiled by FAO/FIDI for selected reporting countries. The conclusion of the analysis was that for certain types of structures there were not enough national reports to make statistically valid comparisons. It was suggested that this type of reporting may benefit from less frequent enquiries (e.g. every third year).

Work of regional relevance

19. The General Fisheries Commission for the Mediterranean (GFCM) has investigated aquaculture information issues in the Mediterranean, particularly focusing on the harmonization of terminology for emerging technologies⁶. The General Fisheries Commission for the Mediterranean has been very active during the last 15 years in the establishment of a reliable and sustainable regional aquaculture information system to facilitate an exchange of information (regarding, *inter alia*, production, markets, regulations and technology) of interest to beneficiaries.⁷ FAO has worked with the Mekong River Commission on improvements to methodologies for the collection of inland fisheries and aquaculture statistics⁸. In addition there has been an initiative by the FAO Regional Office for Asia and the Pacific (RAP) to seek support through a Technical Cooperation Programme to improve data for the small scale and rural inland fisheries sectors, including those integrated with aquaculture activities⁹.

Expert Consultation on Improving Status and Trends Reporting on Aquaculture

20. Before the end of 2003 the Fisheries Department is planning to hold an Expert Consultation with the purpose of seeking national and international advice and guidance for improving global status and trends reporting on aquaculture, and to mobilize donor interest in supporting the required national capacity building. The Expert Consultation will bring together data providers and data users, in order to get a balanced approach between what is regarded as essential by the users group and what is feasible to achieve within the available resources and on-

⁶ Ad hoc Working Group on Sustainable Tuna Farming / Fattening Practices in the Mediterranean, Rome 12-14 May 2003

⁷ This Information System for the Promotion of Aquaculture in the Mediterranean (SIPAM), technically backstopped by the FAO Fisheries Department, is hosted in Tunisia with the support of the Tunisian Government and it can be accessed through its web page at: <http://www.faosipam.org>.

⁸ FAO/MRC/Government of Thailand/Government of the Netherlands. Ad hoc Expert Consultation on New Approaches for the Improvement of Inland Capture Fisheries Statistics in the Mekong Basin, Udon Thani, Thailand 2-5 September 2002.

⁹ FAO TCP Project Document. 2003. Addressing the Quality of Information on Inland Fisheries – Indonesia, Malaysia, Myanmar, Philippines, and Thailand.

going commitments. Excerpts from the prospectus for the Expert Consultation are provided as an information document, COFI:AQ/II/2003/Inf.7.

21. To provide guidance, the Expert Consultation will consider a number of interlinked institutional and technical issues. It will evaluate the current international information base and its adequacy for monitoring of trends in the light of changing management perspectives. It will also examine the procedures for global reporting and address the broader issues of quality assurance and participation in the collation and analysis of information in order to ensure transparency and a more systematic collation of information from the national to the regional and global levels. The overall objective of the Expert Consultation therefore will be to draft a strategy and plan for the sustainable improvement of status and trends reporting on aquaculture at the international level.

22. In addition, at the conclusion of the Expert Consultation, a working group of national data providers will discuss and suggest improvements to the current aquaculture questionnaire, based on their experiences, previous recommendations, and the conclusions of the Expert Consultation (see COFI:AQ/II/2003/Inf.7). The outcomes of the Expert Consultation and the Working Group will be reported to the next session of the Sub-Committee on Aquaculture.

Development of system for countries to use to improve the collection of aquaculture data

23. National statistical development is constrained by resources, and there is a need for cost-effective methods of quality data collection and processing. FAO-FIDI is planning the development of a computer-based aquaculture data collection module similar in concept to an already developed system for capture fisheries (ARTFISH), a system that has been successfully tested in many countries through the Technical Cooperation Programme. The goal of this new system ("ARTFISH-AQ") will be to build data collection and processing capacity in countries that desire such assistance. It is expected that this module would include elements of statistical sample selection procedures, data collection elements and forms, and data entry and processing capabilities. Methods for data collection best suited to each aquaculture typology (rural vs commercial, small-scale vs large-scale) will be developed. Some of the methods employed in small-scale fisheries data collections will be directly transferable, but also other methods specific to aquaculture will need to be included. Because of similarities to agricultural data collections, the first step planned is to investigate methodologies in agriculture and fisheries and consider these in the light of aquaculture data collection needs. It is expected that this module will be a valuable tool for countries to use to improve the quality of their national aquaculture statistics.

The Fisheries Global Information System (FIGIS)

24. The FIGIS project is intended to provide compiled and analysed information at the global level, available to all and subject to rigorous authentication. The intention is that it becomes the internationally-accepted standard (at specified, higher levels of detail) for world fisheries and aquaculture. It seeks to provide information to both international agencies and institutions and higher audiences, including the general public. In so doing, it provides national governments, in most cases the originators of the data, with access to information on the practices and production systems of other countries. Bilateral and regional issues and concerns will benefit from access to data of international origin. FIGIS investigates what information needs to be generated, analysed and shared, and seeks to assemble and provide it in ways that meet the needs of all levels of clients. Present and future work by FIGIS includes the development of an aquaculture module, establishment of the aquaculture information architecture within the system, dissemination of terminology and reference tables, and improved access to the statistical database.

World Fisheries and Aquaculture Atlas CD-ROM

25. After the launching of the first edition of the Atlas at the Reykjavik Conference on Responsible Fisheries in the Marine Ecosystem (Reykjavik, Iceland) in October 2001, a new edition was prepared in 2002 and distributed as a companion to the 2002 edition of the State of World Fisheries and Aquaculture. The Atlas includes a comprehensive and global view of aquaculture. It touches on all aspects from technology and trade to research and addresses a broad range of policy issues such as biotechnology and safety. The CD-ROM will be published at least every two years for distribution at the biennial meeting of the FAO Committee on Fisheries as a companion to the FAO publication the State of World Fisheries and Aquaculture.

Improvement of national aquaculture data

26. The quality of the regional and international data compiled by FAO ultimately depends on prevailing national statistical standards and attitudes in reporting. The usefulness of regional and international data bases on aquaculture depends on the accuracy and completeness of national statistics. It is clear that countries primarily need to collect aquaculture statistics for their own national interest, for policy-making, planning and management. The provision of statistics to FAO is necessarily a secondary concern. For this reason, requests from FAO and regional organizations should be aligned as closely as possible with what data are collected at national level in order to ensure high rates of response.

27. Some common problems with national data collections have been discussed. Such problems with data quality are common across the agriculture sector, including fisheries and aquaculture. In 2002, FAO, in evaluating its core statistical programme¹⁰ noted that there are problems with the quality of data in many countries and regions. Providing adequate data and assessments is most problematic especially for least-developed countries, which have inadequate financial and technical resources. Sizeable government funding was the exception rather than the rule, and shortages of funds were hampering the analysis of collected data such as large surveys and census data. This was often coupled with the lack of adequately trained staff.

28. The evaluation concluded that the reporting of countries on statistics is inadequate in many ways, with direct impact on the quality and value of FAO's databases of global statistics; that appropriate measures should be taken to ensure that the quality and credibility of the global databases are maintained, including greater coordination among FAO units as well as with other international organizations, both in collecting data from countries and supporting the development of national statistical systems; coordination and collaboration within the organization and between the data providers and users should be enhanced, including an improved mechanism for selection, prioritization, harmonization, monitoring and evaluation of statistical activities.

29. Substantially increased resources are needed to meet the information challenges described above. Present resources will only allow for some progress on normative activities, including the provision of general packages, adaptable to national circumstances, for planning and conducting surveys and for processing the collected data.

SUGGESTED ACTION BY THE SUB-COMMITTEE

30. The Sub-Committee is invited to comment on activities undertaken in the intersessional period and on activities planned, as described in the paper. In addition, the Sub-Committee is invited to report and discuss what they intend to work on concerning improvements to status and trend reporting at the national level during the forthcoming intersessional period and indicate where they would see opportunities for collaboration with FAO.

¹⁰ FAO. 2003. The Evaluation of Programme 2.2.2. (Food and Agriculture Information) – Activities Related to Agricultural Statistics in the Context of FAOSTAT – PC 89/5 (b).