منظمة الأغذية والزراعة للأمم المتحدة | 联合国粮食及农业组织 | Food and Agriculture Organization of the United Nations | Organisation des Nations Unies pour l'alimentation et l'agriculture | Organización de las Naciones Unidas para la Agricultura y la Alimentación

EXPERT CONSULTATION ON IMPROVING INFORMATION ON STATUS AND TRENDS OF AQUACULTURE

20 – 23 January 2004, Rome, FAO, Rome, Italy

CURRENT FAO PROCEDURES FOR MONITORING AND REPORTING PRODUCTION AND STATUS OF AQUACULTURE

SUMMARY

The Fisheries Information, Data and Statistics Unit (FIDI) of the Food and Agricultural Organization of the United Nations (FAO) has been systematically collecting and disseminating statistics on global aquaculture production by weight and value since 1984. The Fisheries Department has also been reporting regularly on status and trends of the aquaculture sector to alert regional fishery organizations, national policy makers and advisors, industry, NGOs and the public to the global aquaculture situation and global issues which can and do have effects at the regional and national levels. Several databases of non-statistical information have also been developed and are drawn upon in global reporting. Efforts are underway to harmonize and integrate internal databases for easier access and more comprehensive presentations. This document briefly describes the content and present process for the compilation and dissemination of statistical and non-statistical information, and the reporting on status and trends of aquaculture.

BACKGROUND

1. FAO is the only source of comprehensive global fishery statistics and most reviews of the state of world fisheries and aquaculture, past trends and future prospects rely on FAO statistics. FAO 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, fishing fleets, and employment in fisheries. On the basis of these analyses, FAO reviews trends and outlines prospects of the contribution of fish to food security. The contribution of fish to national food supply (particularly to protein supply) is monitored for all countries of the world and this necessitates collating information

on production, disposition of catches to food and non-food uses, and production and trade of fishery commodities.[1]

2. FIDI, the FAO Fishery Information, Data and Statistics Unit, is responsible for the collection of global fishery statistics.

PROCUREMENT OF AQUACULTURE STATISTICS

3. FAO/FIDI collects, collates, evaluates, analyses and disseminates annual statistics on world aquaculture production. The statistical database on aquaculture is a key vehicle for monitoring and strategic analysis of global, regional and national developments in aquaculture, which constitutes one of the three long term objectives of the FAO Fisheries Department -- *the promotion of responsible fisheries and aquaculture sector management at the global, regional and national levels; promotion of increased contribution of responsible fisheries and aquaculture to world food supplies and food security; and global monitoring and strategic analysis of fisheries and aquaculture.*

4. The aquaculture statistics database system is of a relatively recent origin and is still under development, lagging behind systems for fisheries and agriculture. Systematic collection of aquaculture statistics by FIDI started only in 1984. Before then, one questionnaire was used to collect fish production from capture fisheries and aquaculture combined. A separate questionnaire, FISHSTAT *AQ*, designed in consultation with regional experts (Annex I) under the remit of the Coordinating Working Party on Fishery Statistics (CWP) was introduced in 1984 to identify the aquaculture component in the total fish production statistics reported at the national level. Nominal catches for marine and inland capture fisheries were then inferred by subtracting the country returns from FISHSTAT *AQ* from the national summary of total fish production (FISHSTAT NS 1). Questionnaires for collection of separate statistics for capture fisheries and aquaculture were eventually introduced in 1997.

5. Through this reporting mechanism, countries inform FAO of aquaculture production, in terms of quantity and value, in marine, brackish and freshwater environments, as well as provide information on rearing systems and stocking to the wild (Annex I). Even though some structural information on culture systems and production from hatcheries is collected at present, FAO has not so far disseminated this information due to problems with quality and completeness. The same species classification, coding scheme and record format used for nominal catches and landings are being used by FAO to store these data in order to ensure full comparability with capture fisheries. The current FAO aquaculture production database shows annual figures from 1950 and is organized by country, three aquatic environments and more than 350 species/items of commercial importance.

6. The total separation of the FAO aquaculture and capture fisheries databases along with the separate collection of statistics for capture fisheries and aquaculture facilitates access to marine and inland capture fisheries data in the Catches and Landings Yearbook, permits analysis of trends over a longer period of time for both capture fisheries and aquaculture, and improves the quality of nationally reported data.

[1] FAO. 1997. FAO fishery statistics programme. Paper prepared for the FAO-SEAFDEC Regional Workshop on Fishery Statistics, 19-21 August 1997. Bangkok, Thailand. FAO/SEAFDEC/97/4. 9p.

7. Aquaculture statistics are usually obtained from national reporting offices, notably: Departments of Fisheries, Ministries of Agriculture and, at times, research institutions. Annually all countries receive:

- **FISHSTAT *AQ*** questionnaire (Annex I), which is designed for reporting data for one year. It is sent to all countries for reporting production by weight and value from aquaculture in marine, brackish and freshwater environments, as well as information on rearing facilities. Where inland (fresh water) aquaculture and marine and brackishwater aquaculture are the responsibility of different agencies, both agencies receive the questionnaire and report independently to FAO. An explanatory sheet is sent with FISHSTAT *AQ*. This provides a definition of what constitutes aquaculture activities (definition of aquaculture for statistical purposes) and the terms used in the questionnaire. To ensure clarity of the definition, a table, entitled *Classification Proposed for Various Aquaculture and Capture Fisheries Practices* is regularly published in the *FAO Yearbook of Fishery Statistics: Aquaculture Production* together with the explanatory sheet (Annex I).

- ***AQUASTAT NS AQ***. a new questionnaire, equivalent to the NSI form for capture fisheries statistics, was introduced to allow countries to update the time series for total aquaculture production tonnage and value for the previous seven years.

QUALITY CONTROLOF STATISTICAL DATA

8. The quality of aquaculture data varies depending on each country's ability to collect and compile such statistics. FIDI uses all the verification information at its disposal to evaluate data accuracy and completeness, and corresponds with the countries when data are questionable. Often the reliability of national fishery statistics can be assessed by comparison with information from other sources, i.e., industry reports and by checking for internal consistency amongst the national data sets (e.g. production and foreign trade for the same commodity) or consumption statistics. FIDI constructs supply utilization accounts in order to calculate the per capita fish consumption and these often show discrepancies which can be used to identify erroneous production of trade statistics. Such checking, of course, requires that both production and trade statistics are reported but this is often not the case.

9. In cases where data are not reported or are considered unreliable, FIDI makes estimates using the best available information which, in the worst situation, can be a repeated value from an earlier year. Such estimated values are identified as such with footnotes "F" or "R", in the FAO Yearbooks of Fishery Statistics. Thus, the proportion of the total production which is accounted for by estimated data, provides a general indicator of the quality of the FAO statistical data. It must be stressed that this is not a definitive measure of the quality of the statistics. Undoubtedly, some reported statistics which are adopted by FIDI are erroneous, but it is a useful indicator of the general quality of the data in comparison with other data sets.

10. The mechanisms for collecting data and the coverage and quality of data on production from aquaculture provided by countries to FAO have been constantly under review with the aim of improving their quality and relevance to future national and global needs.

DISSEMINATION OF AQUACULTURE STATISTCAL DATA AND OTHER INFORMATION

FAO Fishery Statistics Database Systems

11. Aquaculture statistics collated by FAO are stored in a database which is disseminated once a year through an annual publication -- *FAO Yearbook of Fishery Statistics: Aquaculture production*. The database is also downloadable from the Internet and is made available upon request in CD-ROM form. At present, the total national production (aquaculture and capture) categorized by country, major fishing area and species items, are disseminated electronically as FISHSTAT PLUS for years from 1950 onwards. Fishery databases, including aquaculture, presently maintained by FIDI are described in Annex II.

12. Initially, aquaculture production statistics were combined with those of capture fisheries and published in the *FAO Yearbook. Fishery Statistics. Catches and Landings*, until Volume 80 (1997). Since 1989, they have been also published as *FAO Fisheries Circular No. 815: Aquaculture production statistics*. This circular, reporting production as tonnes, and value ($US), was upgraded to a yearbook in the year 2000 (*FAO yearbook. Fishery Statistics. Aquaculture production*). This has improved dissemination of the statistics and increased its visibility since, as a yearbook, it was distributed to member governments according to country quota, whereas the Circular was not.

Non-Statistical FAO Database Systems

13. In addition, the Fisheries Department is taking advantage of technical advances in hardware, software and communications technology to develop, through the Fisheries Global Information System (FIGIS) project, new ways of capturing data from States. The *FAO World Fisheries and Aquaculture Atlas*, the *UN Oceans Atlas* and *OneFish* provide additional new tools for capturing and disseminating information. The FAO maintains other non-statistical data bases of relevance to status and trends reporting; these databases are described briefly in Annex III.

COORDINATION AND INTEGRATION AQUACULTURE STATISTICAL AND NON-STATISTICAL INFORMATION

Coordination

The Coordinating Working Party on Fishery Statistics[2] (CWP)

14. The CWP comprises representatives of inter-governmental organizations which have a competence in fishery statistics. FAO provides the Secretariat. CWP has as its purpose to (a) keep under continuous review the requirements for fishery statistics for research, policy-making and management, (b) agree on standard concepts, definitions, classifications and methodologies for the collection and collation of fishery statistics, and (c) make proposals for the coordination and streamlining of statistical activities amongst relevant intergovernmental organizations. The CWP considers and debates matters related to aquaculture statistics, but member organizations are mainly concerned with management of natural resources of

[2] The participating organizations of the CWP are: Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR); Commission for the Conservation of Southern Bluefin Tuna (CCSBT); Food and Agriculture Organization of the United Nations (FAO), also on behalf of FAO regional fishery bodies; Indian Ocean Tuna Commission; International Commission for the Conservation of Atlantic Tunas (ICCAT); International Council for the Exploration of the Sea (ICES); International Whaling Commission (IWC); North Atlantic Salmon Conservation Organization (NASCO); Northwest Atlantic Fisheries Organization (NAFO); Organisation for Economic Co-operation and Development (OECD); Secretariat of the Pacific Community (SPC); Statistical Office of the European Communities (Eurostat).

commercially important fish. Some have no mandate for the collection of aquaculture statistics, or for reporting on aquaculture.

15. The CWP, supported by the participating organizations, has served since 1960 as the premier international and inter-organization forum for recommending common definitions, classifications and standards for the collection of fishery statistics. It has developed common procedures for statistics collection which have streamlined the collation process and reduced the burden on national fishery statistical offices. It has provided technical advice on fishery statistical matters to participating organizations and has facilitated the preparation of methodological and reference documents. In the process it has shaped the statistical programmes of all participating organizations to some extent, and those of FAO in particular, while leaving organizations complete autonomy in their areas of responsibility. By integrating and coordinating the statistical programmes among organizations, CWP made possible the standardization and streamlining of reporting through procedures and concepts which have served as models throughout the world.

FAO regional fishery bodies

16. Some of the FAO fishery regional bodies have subsidiary working parties (WPs) which periodically address issues of fishery statistics on a regional basis and make recommendations for appropriate action to improve the quality and reliability of the data (e.g. APFIC, GFCM, CECAF, CARPAS[3]). Others sometimes deal with fishery statistics in the context working parties on economics. The recommendations of these bodies are discussed in the meetings of the CWP for final advice and guidance. These bodies play an important role in improving national capacities for several reasons, including providing economies of scale, co-ordination of information requirements, standards and standardization, and training. Because of limited resources and the relatively recent history of aquaculture statistics, working parties of most of the regional bodies are largely focused on statistics of capture fisheries. The APFIC Joint Working Party on Fishery Statistics and Economics is a notable exception. Due to resource limitations at FAO, many of these regional WPs now meet on an ad hoc basis rather than according to periodic meetings with continuity of expert members.

Collaboration/coordination with other FAO departments and non-FAO regional organizations

- FAO Statistical Division, Economic and Social Department, FAO-Rome
- FAO Asia Pacific Commission on Agricultural Statistics (APCAS)
- Southeast Asian Fisheries Development Center (SEAFDEC)
- Network of Asia Pacific Aquaculture Centres (NACA)
- Research Institute for Fisheries, Aquaculture and Irrigation (HAKI), Szarvas, Hungary

17. Recognizing the similarity between agriculture and inland aquaculture, in terms of animal husbandry and a common dependence on natural resources, as well as the need to use existing mechanisms for collection of aquaculture statistics to defray costs, matters relating to aquaculture statistics are incorporated in the agenda of FAO/APCAS sessions whenever possible. Collaboration is also established with the FAO Statistical Department, which eventually lead to the development and publication of *Guidelines for the Collection of*

[3] Asia-Pacific Fishery Commission (APFIC); General Fisheries Commission for the Mediterranean (GFCM), Fishery Commission for the East Central Atlantic (CECAF), Regional Fisheries Advisory Commission for the Southwest Atlantic (CARPAS)

Structural Aquaculture Statistics[4] to encourage countries to incorporate aquaculture into the World Census of Agriculture 2000. This was intended to improve national surveys of aquaculture and provide a framework for those countries intending to develop databases on aquaculture. It also served to encourage integration of agriculture and aquaculture statistics where possible and appropriate.

18. Close liaison has existed for a long time with SEAFDEC, which also collects aquaculture statistics from its Southeast Asian country members (10 countries) and consists of periodic meetings, workshops and consultations on aquaculture, the most recent of which (for aquaculture statistics) was in 1999. In factm the FAO definition of aquaculture was based on a definition elaborated by SEAFDEC. The Fisheries Department also collaborates closely with NACA on a number of initiatives including the development of the AAPQIS-Asia database mentioned above.

19. Some other organizations, including regional and inter-regional organizations (OECD[5], EU[6], SPC[7], etc.), regional and national producers associations (e.g. FEAP[8]), national agencies (USDA[9;] Fisheries Department, Thailand; China P.R., etc.) and commercial concerns (e.g. Shrimp News; INFOFISH International, etc.) collect and publish aquaculture statistical and non-statistical information. Such reports are often consulted to check and supplement country statistics submitted to the FAO as necessary, and in global reporting on aquaculture status and trends.

20. The FAO also collaborates, though not systematically, with other regional organizations and national institutions (e.g. NACA, HAKI[10], SEAFDEC) in the preparation of national and regional overviews of aquaculture, and reviews of specific development issues, which contribute to the global information base on aquaculture, and analysis of the state of global aquaculture.

Integration

21. It is increasingly accepted that managers must take a wider range of issues into account in decision-making. Thus, information on resource utilization, the environment and socio-economics plays an enormous part in the multifaceted research required for modern management. This greatly increases the need for more reliable, more integrated and more accessible information. The need is underlined further, by the growing interaction of aquaculture with other sectors, particularly fisheries and agriculture, in terms of resources and markets, and the anticipated future application of the ecosystem-based approach to management.

22. The FAO Fisheries Department is in process of integrating its various data and information bases on fisheries and aquaculture, and improving the way information is

[4] Rana, K.J. Guidelines for the collection of aquaculture statistics. Supplement to the programme for World Census of Agriculture 2000. *FAO Statistical Development series* No. 5b. Rome, FAO. 1997. Rome, FAO. 56p
[5] Organization for Economic Cooperation and Development
[6] European Union
[7] South Pacific Commission
[8] Federation of European Aquaculture Producers
[9] United States Department of Agriculture
[10] Research Institute for Fisheries, Aquaculture and Irrigation, Szarvas, Hungary

collectedm authenticated and analyzed (see examples below). In addition, efforts are underway to integrate all FAO statistical data bases (agriculture, fisheries and forestry).

The Fisheries Global Information System (FIGIS)

23. The FIGIS project is aimed to provide useful, compiled and analyzed information at the global scale, available to all and subject to rigorous authentication. The intention is that it becomes the internationally-accepted standard (at specified, higher levels of detail) on all the world's fisheries and aquaculture. It seeks to provide information to both international agencies and institutions and higher audiences, including the general public. But, in so doing it also provides national governments, in most cases the originators of the data, with access to information on a wider geographic scope. Bilateral and regional issues and concerns will thus benefit from access to data of international origin. FIGIS, therefore, needs to investigate not just what information needs to be generated, analyzed and shared, but how to do it in ways that meet the needs of all levels of clients.

World Fisheries and Aquaculture Atlas CD-ROM

24. The first edition of this atlas was launched at the Conference on Responsible Fisheries in the Marine Ecosystem (Reykjavik, Iceland) in October 2001. The Atlas presents a comprehensive and global view of capture fisheries and aquaculture. It touches on all aspects of fisheries - from technology and trade to research and resources - and addresses a broad range of policy issues such as ecosystem management, safety at sea and biotechnology. The CD-ROM will be published at least every two years for distribution at the biennial meeting of the FAO Committee on Fisheries (COFI) as a companion to the FAO publication

Integration at the regional level

25. Collation of aquaculture information, and other related information, is underway at the regional level for the Mediterranean region through SIPAM[11] (see Annex III). A sister system (SIPAL)[12] was designed earlier (1995) for Latin America through a FAO/Italy regional aquaculture project, but is not operational as yet. A start was also made in 1998 to establish a regional system for Asia[13] through a cooperative effort with regional institutions (NACA, AIT[14], SEAFDEC, etc.). The intention was to eventually link these regional information systems as an inter-regional network with similar architecture and standards to enable exchange of information. Though the FAO can assist in the establishment of such a system, it will be sustainable only if it is need-driven and consequently hosted and supported by countries of the region. This is the case in the Mediterranean, where the regional HQ of SIPAM is hosted and supported by the Government of Tunis.

GLOBAL ANALYSIS OF AQUACULTURE STATUS AND TRENDS

26. The Code of Conduct for Responsible Fisheries provides a framework for the conduct of sustainable capture fisheries and aquaculture against which FAO appraises global fishery and aquaculture status and trends, and reports on these through periodic publications. These reports are intended to describe the general status in all regions of the world, rather than design and implement specific management measures, which is the purpose of regional

[11] Information System for the Promotion of Aquaculture in the Mediterranean
[12] Information System to Assist Aquaculture Planning in Latin America and the Caribbean
[13] FAO/NACA. 1998. Workshop on Aquaculture Information Systems. Bangkok, Thailand, 17-20 July 1998.
[14] Asia Institute of Technology

fishery organizations and national authorities. FAO's reviews are important in alerting regional fishery organizations, national policy makers and advisors, industry, NGOs and the public to the global aquaculture situation and global issues which can and do have effects at the regional and national levels. FAO reports, which cover aquaculture status and trends, exclusively or as part of wider coverage, are listed below.

Review of the State of World Aquaculture (*FAO Fisheries Circular 886*)

27. The state of the world's fish stocks and aquaculture are reviewed by the Fishery Resources Division for COFI. The review formerly included all capture fisheries, but for the Twentieth Session of COFI (1993) it was separated into two parts: the world's marine resources, and inland fisheries and aquaculture, identified respectively as Part I and Part 2 of the *FAO Fisheries Circular No. 710*. Due to the increased importance of aquaculture production, the review was produced in three parts for the Twenty first Session of COFI, March 1995, each part as a separate document under the same title: *Review of the State of World Fishery Resources*. The document dealing with aquaculture was issued in 1995 as *FAO Fisheries Circular No. 886*, entitled *Review of the State of World Fishery Resources: Aquaculture*. In 1997, Revision 1 of Circular 886 was published under a new title: *Review of the State of World Aquaculture*, and prepared in a new format.

28. The purpose of the Circular 886 is to provide policy makers, aquaculture planners and managers, producers and other stakeholders, as well as the public at large, a comprehensive, objective and global overview of aquaculture, including major development trends issues and outlook. In view of its narrower focus, the Circular provides much more detailed coverage of the aquaculture sector than the FAO State of Fisheries and Aquaculture (SOFIA; see below), where coverage of capture fisheries usually is more extensive than that of aquaculture. The Circular is intended to be issued every five years, with biannual updating through SOFIA and "Fact Sheets" posted on the Fisheries Department home page.

29. Circular 886 Revision 1 (1997) provides a highly comprehensive view of aquaculture. The review is prepared in three parts:

- *A global perspective of production trends*, including the contribution of the sector to food fish supplies, based on FAO statistical databases; major strategic issues facing aquaculture development and projected production by the year 2000;
- *Review of developments and trends in selected fields*, including environmental interactions, biodiversity and genetics, feed resources, fish health and quarantine, regulatory frameworks, product safety, international trade, and international aid to research and development; and
- *Review of production and production trends, including main development issues and outlook on a regional basis* (PR China separately), for each of seven regions: Asia, Africa, Europe, Former USSR Area, North America, Latin America and the Caribbean, and Oceania.

Each of the articles and regional reviews has its own reference list. No general statistical tables of production are included, although the trends analyses offered in all sections are graphed clearly and appropriately.

30. Circular 886 Revision 2 covers the basic topics as Revision 1 (global and regional production analysis, outlook and main issues and developments in selected fields) and adds sections on some special themes. Countries previously reported under the Former USSR Area are now incorporated in the European and Asian regions. Statistical tables used for graphic

illustrations in the global analysis section are annexed. The Circular is organized in the following sections:

- *Global aquaculture production trends analysis* , based on aquaculture statistics compiled by FAO, including regional profiles,
- *Development outlook section: major issues, opportunities and challenges* at the regional and global level
- *Inland fisheries – aquaculture interactions*, with summary comparison of FAO inland capture fisheries and aquaculture statistics 1970-1999, and challenges and prospects
- *The role of aquaculture in rural development*,
- *Recent technological innovations in aquaculture, and*
- *Producer associations and farmer societies.*

31. Circular 886 is prepared mainly by staff of the Inland Water Resources and Aquaculture Service (FIRI), supported at times by staff of other services of the Fisheries Department and FAO Legal Office, and a few external experts. There are no internal or external advisory committees. Contributions from outside the service and the organization are decided on an *ad hoc* basis, while selection of development issues to be covered is decided by the FIRI project team. The section on production and production trends is based exclusively on the FAO aquaculture statistics database. Other sections draw upon and cite information from other FAO publications, unpublished FAO information, and non-FAO information from conference proceedings, reviews, journals and books.

32. The Circular is still under development in all respects. Efforts are underway since 1997 to increase transparency and participation in its preparation. The quality of aquaculture statistics is being commented on and information sources are cited. Information from both FAO and non-FAO sources are used and, in some instances, professionals from outside FAO, with specialized expertise in selected subject matter covered in the review, have been invited to participate in preparing certain segments of the document. External participation has increased since Revision 1 and is much more extensive and evident in all sections of Revision 2. Regional reviews of status, trends and outlook were prepared by regional organizations, national centers of excellence, or individual experts in collaboration with FIRI staff. The reviews were discussed and amended by a working group consisting of those involved in preparation of the reviews.

33. The reliability of the statistical database, collated, checked and disseminated by FAO, which forms the basis of reporting on production and production trends, has been raised on some occasions. The quality of country data submissions is highly variable and there are problems with some of the data. Issues related to aquaculture statistics submitted to FAO are discussed in detail elsewhere (EC:STA/2004/4).

The State of World Fisheries and Aquaculture (SOFIA)

34. The biennial Committee on Fisheries (COFI) receives a comprehensive report on *The State of World Fisheries and Aquaculture* (SOFIA), prepared by staff of the Fisheries Department. The purpose of the publication is to provide policy makers, civil society and those who derive their livelihoods from the sector a comprehensive, objective and global view of capture fisheries and aquaculture, including related policy issues. Four issues have been prepared to date, in 1996, 1998, 2000 and 2002. The 2002 issue attaches the *FAO World Fisheries and Aquaculture Atlas*. The document has a standardized content consisting of five parts:

- Part 1. *World Review of Fisheries and Aquaculture,* a global review of the status of resources, production from capture fisheries and aquaculture, utilization and trade
- Part 2. *Selected Issues Facing Fishers and Aquaculturists,* complemented by reports on national and international activities undertaken to address them.
- Part 3. *Highlights of Special FAO Studies*
- Part 4. *Outlook*
- Part 5. *Fisheries Activities of Country Groupings* (e.g. ASEAN[15], EU, etc.).

There are no internal or external advisory committees for SOFIA, and the choice of issues beyond the 'standard' world review section rests with the project team.

Fishery Country Profiles[16]

35. FAO's Fisheries Department prepares and publishes Fishery Country Profiles (FCP). Each FCP summarizes the Department's assessment of activities and trends in fisheries and aquaculture for the country concerned. The profiles have a standard layout. Economic and demographic data are based on UN or World Bank sources; data on fisheries are generally those published by the FAO Fisheries Department. Contents are organized in the following sections:

- General economic data
- Fisheries data,
- Structure and characteristics of the fishing industry (including aquaculture)
- Development prospects
- Research
- Aid
- Internet links

National Aquaculture Sector Overviews (NASO)

36. The Inland Water Resources and Aquaculture Service (FIRI), FAO Fisheries Department, has recently (2002) initiated the preparation of national aquaculture sectors overviews according to a standard outline developed by FIRI. The intention is to provide a general overview of aquaculture and culture-based fisheries and to link this information to the FCPs to provide more extensive information on aquaculture.

37. The NASO is tentatively arranged in the following sections:

- *Characteristics, structure and resources of the sector* -- history and general overview, human resources, farming systems -- characteristics and distribution, and cultured species.
- *Sector performance* – production, marketing and markets, contribution to the economy, impact on poverty, environmental interactions and use of resources.
- *Promotion and management of the sector* – institutional framework; regulations; research, education & training
- *Trends, issues and development* – main development trends (10 years) in various aspects of development.
- *References* – bibliographic; internet links; illustrations and photographs.

Progress Report on the Implementation of the Code of Conduct for Responsible Fisheries (CCRF)

[15] Association of Southeast Asian Nations
[16] http://www.fao.org/fi/fcp/fcp.asp

38. Monitoring and reporting on the implementation of the CCRF is part 6 of the Resolution that adopted it. Article 4 of the Code requires the FAO COFI to monitor its application and implementation. A questionnaire is forwarded to all FAO Members for this purpose. The returns are used to report to COFI and to the UN General Assembly on national measures taken towards implementation. This reporting gives national and international forums an indication of how far their pledge to collaborate in conducting fisheries responsibly is being achieved.

39. The report is prepared and presented to COFI biannually. States have been surveyed three times to date for this purpose, and a report on the *Implementation of the Code of Conduct for Responsible Fisheries* presented to COFI in 1999, 2001 and 2003. The document summarizes the main activities undertaken by FAO at global and regional levels to promote the implementation of the Code, activities and applications at national level by FAO Members, and initiatives by non-FAO regional fishery bodies.

The State of Food and Agriculture (SOFA)

40. The State of Food and Agriculture is FAO's annual report on current developments affecting world agriculture. It reviews policy factors underlying recent agricultural performances at the world and regional levels. It also discusses issues of current or emerging interest, and presents each year an in-depth analysis of a selected topic of importance to world food and agriculture. The review includes a brief section entitled "Fisheries: production and trade", which includes aquaculture, in Part I of the document *Current Agricultural Situation – Facts and Figures*. There is also occasional coverage of aquaculture-related issues in Part IV *Selected Issues*, such as *Integrating Fisheries and Aquaculture to Enhance Fish Production and Food Security* (SOFA, 1998 issue).

Other Relevant FAO Initiatives

Conference on Aquaculture in the Third Millennium

41. The Conference, convened in 2002, in Bangkok, Thailand, was jointly organized by NACA[17], FAO and the Thailand Department of Fisheries, with support from a number of other organizations. The intensive preparatory work included organization of expert consultations, national studies and workshops; regional workshops; and an international expert meeting that refined the draft regional reviews and initiated the preparation of the global synthesis on trends in aquaculture development.

42. The Conference produced three major publications: (a) *Report of the Conference on Aquaculture in the Third Millennium*[18], (b) Technical Proceedings of the Conference on Aquaculture in the Third Millennium[19], and (c) the Bangkok Declaration and Strategy for Aquaculture Development Beyond 2000[20]. The three publications provide a useful reference

[17] Network of Aquaculture Centres in Asia-Pacific

[18] NACA/FAO. 2000. Report of the Conference on Aquaculture in the Third Millenium, 20-25 February 200, Bangkok, Thailand. NACA, Bangkok and FAO, Rome.120p.

[19] NACA/FAO.2000. Aquaculture in the Third Millennium. Subasinghe, R.P. Bueno, P.B., Hough, C., McGladdery & Arthur, J.E. (Eds.) NACA, Bangkok and FAO, Rome. 471pp.

[20] NACA/FAO. 20010. Aquaculture Development Beyond 2000: the Bangkok Declaration and Strategy. Conference on Aquaculture in the Third Millennium, 20-25 February 200, Bangkok, Thailand. NACA, Bangkok and FAO, Rome. 27p.

for anyone with an interest or stake in aquaculture development. The Technical Proceedings represent one of the most comprehensive reviews of the current state of aquaculture development in the world assembled to date.

43. The Bangkok Declaration addresses the role of aquaculture in alleviating rural poverty, improving livelihoods and food security, and maintaining the integrity of natural and biological resources and the environment. The Strategy comprises 17 elements that focus on measures government, the private sector and concerned organizations can incorporate into their aquaculture development programs. It also highlights the need for regional and inter-regional cooperation to assist in its implementation.

The First Session of the COFI Sub-Committee on Aquaculture(COFI/SCA)

44. The COFI Sub-Committee on Aquaculture was established in 2001 to provide a forum for consultation and discussion on aquaculture and to advise COFI on technical and policy matters related to aquaculture and on the work to be performed by the Organization in the field of aquaculture. Its terms of reference include provisions to identify and discuss major issues and trends in global aquaculture development and determine those issues and trends of international importance requiring action to increase the sustainable contribution of aquaculture to food security, economic development and poverty alleviation. The decisions of the Sub-Committee, if approved by COFI, define some elements of the FAO intercessional programme of work on aquaculture.

45. During its first session, in Beijing, China (18 to 22 April 2002), the Sub-Committee reviewed, *inter alia*, aquaculture information, statistics and reporting and designated improvement of the quality of aquaculture statistics and development of a strategy to improve global status and trends reporting on aquaculture as one of four priority areas of work for FAO.

Committee on Fisheries (COFI)

46. Beside the Circulars on the state of fishery resources and aquaculture, special reviews on current issues are often prepared as information or working papers for COFI sessions (e.g. *Future Challenges in World Fisheries and Aquaculture*; *Integrated Resource Management for Sustainable Inland Fish Production;* etc.)

Atlases

45. The publication of fishery status and trends is being enhanced by further developments within FAO. These include:

- *World Fisheries and Aquaculture Atlas CD-ROM*: The first edition of this atlas was launched at the Conference on Responsible Fisheries in the Marine Ecosystem (Reykjavik, Iceland) in October 2001. The Atlas presents a comprehensive and global view of capture fisheries and aquaculture. It touches on all aspects of fisheries - from technology and trade to research and resources - and addresses a broad range of policy issues such as ecosystem management, safety at sea and biotechnology. The CD-ROM will be published at least every two years for distribution at the biennial meeting of the FAO COFI as a companion to the FAO publication *The State of World Fisheries and Aquaculture.*
- *The UN Atlas of the Oceans* [21:] This is an Internet portal providing information relevant to the sustainable development of the oceans. It is designed for policy-makers who need to become familiar with ocean issues and for scientists, students and resource managers who need access to databases and approaches to sustainability. Material contained in the UN

[21] http://www.oceansatlas.org/index.jsp

Atlas is copyrighted but can be freely used for any personal and non-commercial purpose provided that the source is cited.

- *OneFish*: This is an online database and directory of fisheries and aquatic research and development information. Its development has been facilitated by the Support Unit for International Fisheries Research (SIFAR) and supported by major donor agencies and FAO.

46. Status and trends reporting on aquaculture is also undertaken by other international organizations (e.g. ICLARM, World Resources Institute, World Wide Fund, OECD, GAA22, etc.), FAO regional fishery bodies and other regional organizations (NACA, SEAFDEC, CEC[23], INFOFISH International, etc.) national agencies and the private sector. FAO draws on these reports and on peer-reviewed publications, in the preparation of its global reviews.

ACTION BY THE CONSULTATION

47. The Working Party is invited to take note of current content and procedures for the procurement, processing and distribution of statistical and non-statistical information, and the preparation of global overviews of the state of aquaculture, with a view to suggesting improvements in quality, scope, participation and transparency, for consideration in the drafting of an international strategy to improve global status and trend reporting of aquaculture.

[22] Global Aquaculture Association
[23] Committee of the European Committee

ANNEX I

FISHSTAT *AQ* QUESTIONNAIRE AND INSTRUCTION SHEET

FISHSTAT AQ

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
ORGANISATION DES NATIONS UNIES POUR L'ALIMENTATION ET L'AGRICULTURE
ORGANIZACION DE LAS NACIONES UNIDAS PARA LA AGRICULTURA Y LA ALIMENTACION

FORM FOR REPORTING STATISTICS ON AQUACULTURE

After completion please return this form

before 31 August 2002 to:

The Senior Fishery Statistician
Fishery Information, Data and Statistics Unit
Fisheries Department, FAO
00100 Rome, Italy

Cables: FOODAGRI Rome Italy
Telex: 610181 FAO I
Tel: 0039-06-5705-6454
Fax: 0039-06-5705-2476
E-mail: FIDI-e-Forms@FAO.ORG

EU Member States and EU Candidate Countries should send a copy to Eurostat (E-mail: david.cross@cec.eu.int):

Directorate for Agriculture, Environment and Energy Statistics, Eurostat
BP 1907
Luxembourg (Grand Duchy)

E-mail:david.cross@cec.eu.int
Tel: 352 4301 37249
Fax: 352 4301 37318

Please retain one copy for reference

INSTRUCTIONS FOR THE COMPLETION OF FISHSTAT AQ

1. **Aquaculture** is the **farming** of aquatic organisms, including fish, molluscs, crustaceans and aquatic plants. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc. Farming also implies individual or corporate ownership of the **stock** being cultivated. For statistical purposes, aquatic organisms which are harvested by an individual or corporate body which has owned them throughout their rearing period contribute to **aquaculture**, while aquatic organisms which are exploitable by the public as a common property resource, with or without appropriate licences, are the harvest of **fisheries**.

2. By **freshwater culture** is understood the cultivation of aquatic organisms where the end product is raised in freshwater; earlier stages of the life cycle of these species may be spent in brackish or marine waters.

3. By **mariculture** is understood that the cultivation of the end product takes place in sea water; earlier stages in the life cycle of these aquatic organisms may be spent in brackishwater or freshwater.

FORMULAIRE POUR LA DECLARATION DES STATISTIQUES DE L'AQUACULTURE

Une fois rempli renvoyer le formulaire ci-joint

avant le 31 Août 2002 au:

Statisticien principal des pêches
Unité de l'information, des données et des statistiques sur la pêche
Département des pêches, FAO
00100 Rome, Italie

Télég: FOODAGRI Rome Italy
Telex: 610181 FAO I
Tél: 0039-06-5705-6454
Télécopie: 0039-06-5705-2476
Courrier Electronique: FIDI-e-Forms@FAO.ORG

Les Etats Membres et les Pays candidats de l'Union européenne sont priés d'envoyer une copie à l'Eurostat (mél: david.cross@cec.eu.int):

Direction des Statistiques de l'Agriculture, de l'Environnement et de l'Energie, Eurostat
BP 1907
Luxembourg (Grand-Duché)

Mél: david.cross@cec.eu.int
Tél: 352 4301 37249
Fax: 352 4301 37318

Prière de conserver une copie aux fins de référence

INSTRUCTIONS SUR LA MANIERE DE REMPLIR LE FORMULAIRE FISHSTAT AQ

1. L'**aquaculture** consiste dans l'**élevage** d'organismes aquatiques, y compris poissons, mollusques, crustacés et plantes aquatiques. Elevage implique une quelconque forme d'intervention dans les processus d'augmentation de la production, telle que la mise en charge régulière, l'alimentation, la protection contre les prédateurs, etc. Elevage implique également la propriété individuelle ou juridique du **stock** en élevage. Du point de vue des statistiques, les organismes aquatiques récoltés par un individu ou une personne juridique les ayant eus en propriété tout au long de leur période d'élevage sont donc des produits de l'**aquaculture**. Par contre, les organismes aquatiques exploitables publiquement en tant que ressource de propriété commune, avec ou sans licences appropriées, sont à considérer comme des produits de la **pêche**.

2. L'expression **élevage en eau douce** s'applique aux organismes aquatiques qui sont élevés en eau douce au stade final; les stades antérieures du cycle biologique de ces espèces peuvent s'être déroulés en eau saumâtre ou en eau de mer.

3. L'expression **mariculture** s'applique aux organismes aquatiques qui sont élevés en eau de mer au stade final; les stades antérieures du cycle biologique de ces organismes peuvent s'être déroulés en eau saumâtre ou en eau douce.

FORMULARIO PARA INFORMACION ESTADISTICA SOBRE ACUICULTURA

Después de haber rellenado el presente formulario sírvase devolverlo

antes del 31 de Agosto de 2002 a:

Estadístico Superior de Pesca
Dependencia de Información, Datos y Estadísticas de Pesca
Departamento de Pesca, FAO
00100 Roma, Italia

Cables: FOODAGRI Rome Italy
Telex: 610181 FAO I
Tel: 0039-06-5705-6454
Fax: 0039-06-5705-2476
Correo electrónico: FIDI-e-Forms@FAO.ORG

Los estados miembros y los países candidatos de las Comunidades Europeas habrán de enviar una copia a Eurostat (correo electrónico: david.cross@cec.eu.int):

Dirección de Estadísticas de l'Agricultura, de l'Environnement et de l'Energía, Eurostat
BP 1907
Luxembourg (Gran-Ducado)

Correo electr.: david.cross@cec.eu.int
Tel: 352 4301 37249
Fax: 352 4301 37318

Sírvase conservar una copia para referencia

INSTRUCCIONES PARA RELLENAR EL FORMULARIO FISHSTAT AQ

1. La **acuicultura** es el **cultivo** de organismos acuáticos, incluyendo peces, moluscos, crustáceos y plantas acuáticas. La actividad de cultivo implica la intervención del hombre en el proceso de cría para aumentar la producción, en operaciones como la siembra, la alimentación, la protección de los depredadores, etc. La actividad de cultivo también presupone que los individuos o asociaciones que la ejercen son propietarios de la **población** bajo cultivo. Para propósitos estadísticos, se admite que una determinada producción de organismos acuáticos constituye una contribución a la **acuicultura**, cuando estos son cosechados por individuos o asociaciones que han sido sus propietarios durante el período de cría. Se dice, por otra parte, que una cosecha es el resultado de la actividad **pesquera** cuando los organismos acuáticos, en su condición de bién común, pueden ser explotados por cualquiera con o sin la respectiva licencia.

2. Por **cultivo en agua dulce** se entiende el cultivo de organismos acuáticos cuyo producto final se cría en agua dulce; durante las fases iniciales de su ciclo vital estas especies pueden vivir en agua salobre o marina.

3. Por **mariculture** se entiende que el cultivo del producto final se lleva a cabo en aguas marinas; durante las fases iniciales de su ciclo vital estos organismos acuáticos pueden vivir en agua salobre o dulce.

EC:STA/2004/3

4. By **brackishwater culture** is understood the cultivation of aquatic organisms where the end product is raised in brackishwater; earlier stages of the life cycle of these species may be spent in fresh or marine waters. Brackishwaters are characterized by large seasonal fluctuations in salinity. If these conditions do not exist or have no effect on cultural practices, please record production under either "Freshwater culture" or "Mariculture".

5. By **units** is intended ponds, cages, and other capital equipment for aquacultural production. Please record actual **number** of ponds, cages, etc., situated in your country.

   i) By **ponds and tanks** is meant: artificial units constructed above or below ground level capable of holding and interchanging water. Rate of exchange of water is usually low, i.e. not exceeding 10 changes per day.

   ii) By **enclosures and pens** is meant: water area confined by net, mesh and other barriers allowing uncontrolled water interchange and distinguished by the fact that enclosures occupy the full water column between substrate and surface; pens and enclosures will generally enclose a relatively large volume of water.

   iii) By **cages** is meant: open or covered enclosed structures constructed with net, mesh or any porous material allowing natural water interchange. These structures may be floating, suspended, or fixed to the substrate but still permitting water interchange from below.

   iv) By **raceways and silos** is meant: artificial units constructed above or below ground level capable of high rates of water interchange in excess of 20 changes per day.

   v) By **barrages** is meant: semi-permanent or seasonal enclosures formed by impervious man-made barriers and appropriate natural features.

6. By releases to a controlled environment is intended releases to further aquacultural practices.

7. By releases to the wild is intended releases to capture by fishing operations.

8. Data should record nominal production, i.e. the live weight equivalent of harvesting. Where data are not in live weight, please indicate such exceptions, e.g. gutted weight.

9. Quantities should be given in **metric tons**, except for ICES Member States which should report in units of 0.1 tonne.

10. Price/Kg. Please give average price at first sale in national currency.

11. Please indicate in your reporting any national exceptions to the concepts listed above.

4. L'expression **élevage en eau saumâtre** s'applique aux organismes aquatiques qui sont élevés en eau saumâtre au stade final; les stades antérieurs du cycle biologique de ces espèces peuvent s'être déroulés en eau douce ou en eau de mer. Les eaux saumâtres sont caractérisées par de fortes variations de salinité saisonnières. Si tel n'est pas les cas, ou si les variations n'influent pas sur les méthodes de culture, enregistrer la production dans les colonnes "Elevages en eau douce" ou "Mariculture".

5. Par **unités**, on entend les étangs, les viviers et tout l'équipement nécessaire à la production aquacole. Inscrire le **nombre** effectif d'étangs, de viviers, etc., existant dans le pays.

   i) Par **étangs et bassins**, on entend: des unités artificielles construites au-dessus ou au-dessous du niveau du sol et pouvant retenir et laisser circuler l'eau. Le rythme de renouvellement de l'eau est généralement lent et n'excède pas dix changements d'eau par jour.

   ii) Par **enclos et viviers**, on entend: un volume d'eau délimité par un filet, un maillage ou toute autre barrière permettant la circulation non contrôlée de l'eau, avec cette distinction que les enclos occupent la totalité de la hauteur d'eau comprise entre le substrat et la surface; les viviers et les enclos correspondent à un volume d'eau généralement important.

   iii) Par **cages** on entend: des ouvrages fermés, à ciel ouvert ou recouverts, constitués d'un filet, d'un maillage ou de tout matériau poreux permettant une circulation naturelle de l'eau. Ces ouvrages peuvent être flottants, suspendus, ou fixés au substrat mais sans empêcher l'eau de se renouveler également par le bas.

   iv) Par **raceways et silos**, on entend: des unités artificielles, construites au-dessus ou au-dessous du niveau du sol, permettant un renouvellement rapide de l'eau dépassant 20 changements d'eau par jour.

   v) Par **barrages (bordigues)**, on entend: des clôtures semi-permanentes ou saisonnières constituées d'éléments artificiels imperméables naturels appropriés.

6. Par individus produits pour un milieu contrôlé, on entend la production de juvéniles destinés à des opérations ultérieures d'aquaculture.

7. Par individus produits pour un milieu naturel, on entend des empoissonnements destinés à la capture ultérieure par des opérations de pêche.

8. Les données doivent indiquer la production nominale, c'est-à-dire l'équivalent en poids vif des quantités produites. Prière d'indiquer les exceptions (par exemple: poids éviscéré).

9. Noter que les quantités doivent être indiquées en **tonnes métriques**, à l'exception des Etats Membres du CIEM qui sont invités à indiquer les quantités en unités de 0,1 tonne.

10. Prix/kg.: indiquer le prix moyen à la première vente, dans la monnaie nationale.

11. Veuillez indiquer dans votre déclaration toutes exceptions nationales aux définitions ci-dessus.

4. Por **cultivo en aguas salobre** se entiende el cultivo de organismos acuáticos cuyo producto final se cría en agua salobre; durante las fases iniciales de su ciclo vital estas especies pueden vivir en agua dulce o marina. Las aguas salobres se caracterizan por grandes fluctuaciones estacionales de salinidad. Si ello no ocurre o no tiene efectos en las prácticas acuícolas, indique la producción en la columna "Cultivo en agua dulce" o "Maricultura".

5. Por **unidades** se entienden estanques, jaulas y otro tipo de equipo esencial para la producción acuícola. Indique el **número** efectivo de estanques, jaulas, etc., que haya en su país.

   i) Por **estanques y depósitos** se entiende: unidades artificiales construidas por encima o por debajo del nivel del suelo y capaces de retener e intercambiar el agua. La frecuencia de la renovación del agua es normalmente baja, es decir, no superior a los diez cambios diarios.

   ii) Por **recintos y corrales** se entiende: una masa de agua limitada por una red, tela metálica u otro tipo de barrera, que permite el intercambio completo del agua; se distinguen porque los recintos ocupan toda la columna de agua que hay entre el fondo y la superficie; tanto éstos como los corrales abarcan por lo general un volumen relativamente grande de agua.

   iii) Por **jaulas** se entiende: estructuras cercadas, cubiertas o descubiertas, construidas con red, tela metálica, u otros material poroso que permite el intercambio natural del agua. Estas estructuras pueden ser flotantes, suspendidas o estar fijadas al sustrato, permitiendo siempre el intercambio del agua desde abajo.

   iv) Por **canales y silos** se entiende: unidades artificiales construidas por encima o por debajo del nivel del suelo, que permiten una gran frecuencia de renovación del agua, superior a los 20 cambios diarios.

   v) Por **presas** se entiende: recintos semipermanentes o estacionales, formados por barreras artificiales impermeables y características naturales propias.

6. Por liberaciones de individuos a un medio ambiente controlado se entienden las que se hacen para promover actividades acuícolas.

7. Por liberaciones de individuos al ambiente natural se entienden las que se hacen para su captura posterior en operaciones de pesca.

8. Los datos deberán reflejar las capturas nominales, es decir, el equivalente en peso en vivo de los productos, expresado en toneladas métricas. Si ello no fuera posible, rogamos se indique la preparación (por ejemplo: peso eviscerado).

9. Sírvase indicar las cantidades en **toneladas métricas**, con exclusión de los estados miembros del CIEM que deberán indicar las cantidades en unidades de 0,1 toneladas.

10. En la columna "Precio/kg", indicar el precio medio en la primera venta, expresado en la moneda nacional.

11. Al consignar los datos sírvase indicar las eventuales excepciones del país respecto de los conceptos antes mencionados.

	FAO/CWP FORM FOR REPORTING STATISTICS ON AQUACULTURE						FISHSTAT **AQ**			
YEAR 20_ _	COUNTRY or AREA _ _ _ _ _ _	Form for reporting details of type of culture. Do not record quantity produced on this form					For culture in brackish or marine waters specify FAO fishing area			SHEET Nº 1
	METHOD OF CULTURE (by main categories of aquatic organisms)	Freshwater culture			Brackishwater culture *			Mariculture		
		Nº of units**	m3 in '000	Hectares	Nº of units**	m3 in '000	Hectares	Nº of units**	m3 in '000	Hectares
	FISHES									
	Ponds and tanks									
	Enclosures and pens									
	Cages									
	Raceways and silos									
	Barrages									
	Others:									
	CRUSTACEANS									
	Ponds and tanks									
	Enclosures and pens									
	Others:									

	MOLLUSCS									
	On bottom									
	Off bottom									
	Others:									
	SEAWEEDS									

	HATCHERY/NURSERY OUTPUT		Number of larvae, fingerlings, juveniles, etc. released, i.e. used for stocking		
			Number released		
	Local Name	Scientific name	To a controlled environment	To the wild	Total
	SPECIES				

Note: shaded areas represent concepts of no technical validity and consequently figure should not be inserted into those spaces.
* See section 4 of the Instructions.
** See section 5 of the Instructions.

FAO/CWP FORM FOR REPORTING STATISTICS ON AQUACULTURE							FISHSTAT AQ	
YEAR 20_ _	COUNTRY or AREA _ _ _ _ _ _	Record here output for final consumption, including aquatic plants for industrial purposes. Do not include hatchery output or fish which will continue to be subject to aquaculture practices.			For culture in brackish or marine waters specify FAO fishing area			SHEET Nº 2&3
3-alpha identifier	SPECIES CULTURED		Freshwater culture		Brackishwater culture *		Mariculture	
	Local name	Scientific name	Metric tons	Price/Kg	Metric tons	Price/Kg	Metric tons	Price/Kg
	FISHES (live weight)							
	Ponds and tanks							
	Enclosures and pens							
	Cages							
	Raceways and silos							
	Barrages							
	Others:							
	CRUSTACEANS (whole)							
	Ponds and tanks							

	Enclosures and pens							
	Others:							
	MOLLUSCS (with shell)							
	On bottom							
	Off bottom							
	Others:							
	SEAWEEDS (wet weight)							

* See section 4 of the Instructions.

Classification proposed for various aquaculture and capture fisheries practices

PRODUCTION FROM:	DESIGNATION		
	AQUACULTURE	CAPTURE FISHERIES	
		Enhanced	Traditional
Hatcheries	●		
Managed grow-out sites for organisms reared from fry, spat and juveniles:			
- Ponds	●		
- Tanks	●		
- Raceways	●		
- Cages	●		
- Pens	●		
- Barrages	●		
- Integrated vallicoltura production	●		
- Private, tidal ponds (tambaks)	●		
- Poles, ropes and net bags for molluscs	●		
- Aquatic plants from planted or suspended facilities	●		
Managed sites for on-growing or fattening of organisms of marketable size (e.g. tuna, cod) captured in the wild	[●] Only incremental growth in captivity		●
Stocked lakes, dams, reservoirs and rivers:			
- with additional enhancement (predator control, engineering and/or fertilization, etc.)		●	
- modifications, with exploitation rights		●	
- no other intervention, without exploitation rights		●	
Unstocked lakes, dams, reservoirs and rivers:			
- with enhancement (fertilization and/or predator control habitat modification), exploitation with or without rights		●	
Rice–fish practice:			
- from stocked rice–paddy	●		
- from unstocked rice–paddy			●
Brush parks:			
- managed over time and with other enhancement rights		●	
- harvested on an install-and-harvest basis			●
Fish aggregating devices			●
Holding facilities for live captured organisms of marketable size held for a few months (e.g. lobsters, crabs)			●
Ranching		●	
Artificial reefs with or without exploitation rights		●	
Recreational fisheries:			
- privately owned recreational riverine fisheries			●
- public water bodies			●
Open access waters with or without exploitation rights			●

ANNEX II

FAO FISHERY DATABASES

The following databases are maintained by the FAO Fisheries Information, Data and Statistics Unit (FIDI):

1. Nominal Catches and Landings

This database contains the volume of fish catches landed by country of capture, by species or a higher taxonomic level (ISSCAAP groups), and by FAO major fishing areas. Volume is measured in tons for all items except aquatic mammals, alligators and crocodiles, which are measured by number of animals, and pearls, shells, corals and sponges which are measured in kilograms. Weights are of the whole animal (live weight); a diagram with the catch concepts is given as Annex 2. Coverage includes harvest by commercial, artisanal and subsistence fisheries, including aquaculture.

2. Aquaculture Production of Fish

This database system is still under development. One problem is obtaining a universally acceptable and permanent definition of aquaculture for data collection. An important objective for the aquaculture database is to include the collection of data on aquaculture production units (surface area of growing waters, number of cages, number of pens, etc) and type of culture in addition to the existing statistics on production quantity (in live weight) and price per kilogram by species, country and environment (fresh/brackish/seawater). The same coding scheme and record format used for nominal catches and landings is being used to store these data.

3. Fishery Commodities

This database contains statistics on the annual production of fishery commodities and imports and exports (including re-exports) of fishery commodities by country and commodity description (including processing method) in terms of volume and value. The data are coded using the FAO International Standard Statistical Classification of Fishery Commodities (ISSCFC) which is derived from the United Nations Standard International Trade Classification (revision 3) and linked to the Harmonized Commodity Description and Coding System (HS) of the World Customs Organization (WCO).

4. Fleet Statistics

FIDI collects annual statistics by country on the number and total tonnage of fish catching, processing, and support vessels utilized in commercial, subsistence and artisanal fisheries by size of vessel measured in gross registered tons (GRT) and by type of vessel according to some 50 types of vessel defined in the International Statistical Classification of Fishery Vessels (ISCFV). Data for calendar years 1970 to 1995 constitute the series that have been collected, compiled and edited. Data for the years 1970, 1975, and 1977 to 1991 have been published.

5. Employment Statistics

This database contains statistics on the number of commercial and subsistence fishers for the period 1970-1995. It is collected on an annual basis by means of a questionnaire which requests separation of the number of workers according to the time devoted to fishing as an occupation (full-time, part-time, and occasional). Based on the revision of the International

Standard Classification of Occupations, information is also collected since 1990 on the number of people engaging in commercial aquaculture and on the disaggregation of employment data by gender.

6. Apparent Consumption of Fish and Fishery Products

FIDI is responsible for supplying annual statistics of supply/utilization accounts for eight groups of primary fishery commodities and nine groups of processed products. The per caput supply are derived from food balance sheets which state import, export, production and other uses of fishery products. In FAO's work, these data are required to meet the requests of its statutory bodies to keep the world's food and nutrition situation under constant review, to update FAO's analytical work in the field of food security, and to provide the statistical base for the projections of demand, supply and other assessment studies. The derived consumption statistics are as good as the basic catch, utilization, trade and production data on which they are based; therefore trends in some cases may reflect improved primary data rather, than real changes to food intake.

ANNEX III
FAO NON-STATISTICAL FISHERY AND AGRICULTURE DATABASES
(Relevant to aquaculture status and trend reporting)

1. AAPQIS[24] - Information System on Aquatic Animal Health Management in Aquaculture

AAPQIS aims to provide a mechanism for the comprehensive tracking and reporting of diseases and parasites on a regional basis. Since this information is derived from the scientific literature, as well as a team of established experts in different fields of aquatic animal health, it can be adapted for use by national governments for establishing national systems for disease reporting and tracking, as well as for reference information for aquatic animal health diagnosticians and academia.

The foundation for the Asia component (AAPQIS-Asia) is now fully functional. AAPQIS-Asia, is a joint venture between FAO and the Network of Aquaculture Centres in Asia-Pacific (NACA). AAPQIS-Asia currently contains limited information from Asia, but it is hoped this will stimulate addition and development of more information, on health management, certification, and quarantine protocols. Disease descriptions and pathogens, together with their regional distribution records, will be added on a regular basis. The Latin American chapter of AAPQIS, AAPQIS-Latin America and the African Chapter -- AAPQIS-Africa, are being developed through collaborations with CIAD[25], Mazatlan, Mexico and ICLARM[26] - the World Fish Centre respectively.

2. DIAS[27] - Database on Introductions of Aquatic Species

The database includes records of species introduced or transferred from one country to another but not movements of species inside the same country (see the Glossary for more explanations about these terms). Coverage of accidental introductions of organisms (e.g., through ship ballast waters) is not complete and records on this topic have been generally entered only when important impacts on fisheries or on the environment have been caused. The database, which contains now about 3,150 records, can be queried through a Search Form. Users aware of other introductions of aquatic species not already included in the database or that have additional information on the records in the database are requested to fill in the Input Form. Links are provided to related web sites.

3. SIPAM[28]- Information System for the Promotion of Aquaculture in the Mediterranean

SIPAM was conceived by FAO to improve aquaculture information flow, to assist aquaculture development in the region. It supports and serves as a tool for the aquaculture research and development networks under the umbrella of GFCM. It incorporates aquaculture statistics, roster of experts, bibliographies, country reports on aquaculture, publications of the aquaculture research and development networks and links to FAO databases and other relevant sites. SIPAM operates under the aegis of the Committee on Aquaculture (CAQ) of the General Fisheries Commission for the Mediterranean (GFCM).

[24] http://www.enaca.org/aapqis/
[25] Centro de Investigación en Alimentación y Desarrollo., A.C. ; http://www.ciad.mx/mazatlan/ciadmazi.htm
[26] http://www.iclarm.org/
[27] http://www.fao.org/fi/statist/fisoft/dias/index.htm
[28] http://www.fao.org/fi/statist/fisoft/sipam/default.htm

4. Geonetwork[29]

GeoNetwork is an integral part of the spatial information infrastructure being developed by FAO which aims to improve access to, and integrated use of spatial information to aid decision making for sustainable development. GeoNetwork allows individuals and organizations to work interactively and visually with FAO's vast wealth of map and related information, making the earth's geography a starting point for finding, retrieving and using information. This includes population density, infrastructure, administrative boundaries, land cover/use, soils, crop zones, water, aquaculture, fisheries and forest resources, livestock distribution, nutrition profiles and early warning information. The database also provides links to relevant publications and meetings.

5. GISFISH[30]

This database is under development by the Inland Water Resources and Aquaculture Service, FAO Fisheries Department. It is to comprise a database characterizing all known applications of GIS in aquaculture, in depth case studies, links to current projects, and links to data, technologies and techniques of direct relevance to GIS in aquaculture including innovative application in other fields. This will complement GeoNetwork.

6. ASFA[31] - Aquatic Sciences and Fisheries Abstracts

ASFA is an abstracting and indexing service covering the world's literature on the science, technology, management, and conservation of marine, brackish water, and freshwater resources and environments, including their socio-economic and legal aspects. The ASFA bibliographic database contains over 820,000 references, with coverage since 1971 (some 800,000 are computer searchable from 1973 onwards). About 3,500 new bibliographic references are added each month to the database. Each bibliographic reference includes: the title of the document in its original language (all non-English titles are also translated into English), an English language and/or non-English language abstract and subject, taxonomic and geographic index entries as relevant.

ASFIS species[32] - List of species for Fishery Statistics Purposes

FIDI collates world capture and aquaculture production statistics at either the species, genus, family or higher taxonomic levels in 1,375 statistical categories (2000 data) referred to as species items. Three types of codes are assigned to each species item: 1) ISSCAAP code; 2) taxonomic code; and 3) 3-alpha code. The ISSCAAP code is assigned according to the FAO 'International Standard Statistical Classification for Aquatic Animals and Plants' (ISSCAAP) which divides commercial species into 50 groups on the basis of their taxonomic, ecological and economic characteristics. The taxonomic code is used by FAO for a more detailed classification of the species items and for sorting them out within each ISSCAAP group. The 3-alpha identifier is a unique code made of three letters that is widely used for the exchange of data with national correspondents and among fishery agencies. The list is a part

[29] http://www.fao.org/geonetwork/srv/en/main.search
[30] Kapetsky, J.M. and J. Aguilar-Manjarrez. 2002. GIS for the development and management of coastal aquaculture: Present applications and new opportunities. Paper prepared for Aquaculture Europe 2002, Trieste, Italy, October 16-19, 2002.
[31] http://www.fao.org/fi/asfa/ASFA.asp
[32] http://www.fao.org/fi/statist/fisoft/asfis/asfis.asp

of the *Aquatic Sciences and Fisheries Information System (ASFIS)* which presently includes 10,381 species items.

7. SPECIESDAB[33] - Global Species Database for Fishery Purposes

The information compiled by FAO's Species Identification and Data Programme were computerized in a database that forms a global inventory of commercially important species. SPECIESDAB is the name given to this database and the associated computer software that manipulates the data. SPECIESDAB was created to offer quick and easy access to the fisheries and biological information in the FAO Species Identification Sheets and World Catalogues. SPECIESDAB represents FAO's standard authority on nomenclature and identity of aquatic species used by man. It constitutes a global framework for continuous storage and updating of information and for the exchange of data between FAO and fisheries institutions of Member Countries.

8. AQUASTAT[34] – FAO information system on water and agriculture

The purpose of the program is to help support continental and regional analyses by providing systematic, up-to-date and reliable information on water for agriculture and rural development, and to serve as a tool for large-scale planning and forecasting. The database includes, country profiles - standardized text by country and summary tables; regional overviews - standardized text by region and summary tables: maps and GIS - spatial data on water resources and irrigation; institutions - online database of national and regional institutions; water resources - by country ; documents - online publications and links to document databases; and links - interesting links on water and agriculture.

9. AFRIS[35] - Animal Feed Resources Information System

Provides descriptions and chemical data on plants and other feed materials with 650 references and abstracts

10. TERRASTAT[36] - Land resource potential and constraints statistics at country and regional level

Contains country statistics of soil, terrain, climatic and agricultural land use limitations, and potential extent.

11. FAOLEX[37]

FAOLEX is a comprehensive and up-to-date computerized legislative database, the world's largest electronic collection of national laws and regulations, as well as treaties, on food, agriculture and renewable natural resources. It is a tool of great value to governments, practitioners, non-governmental organizations and scholars. Selected texts of major significance pertaining to FAO's mandate, including legislation on agriculture, animals, environment, fisheries, food, forestry, land, plants, water and wildlife, are summarized and indexed in English, French or Spanish. Direct access to the summary, index and full text of each piece of legislation is provided.

[33] http://www.fao.org/fi/statist/fisoft/SPECIES.asp
[34] http://www.fao.org/ag/agl/aglw/aquastat/main/index.stm
[35] http://www.fao.org/ag/AGA/AGAP/FRG/AFRIS/default.htm
[36] http://www.fao.org/ag/agl/agll/terrastat/
[37] http://www.fao.org/Legal/default.htm