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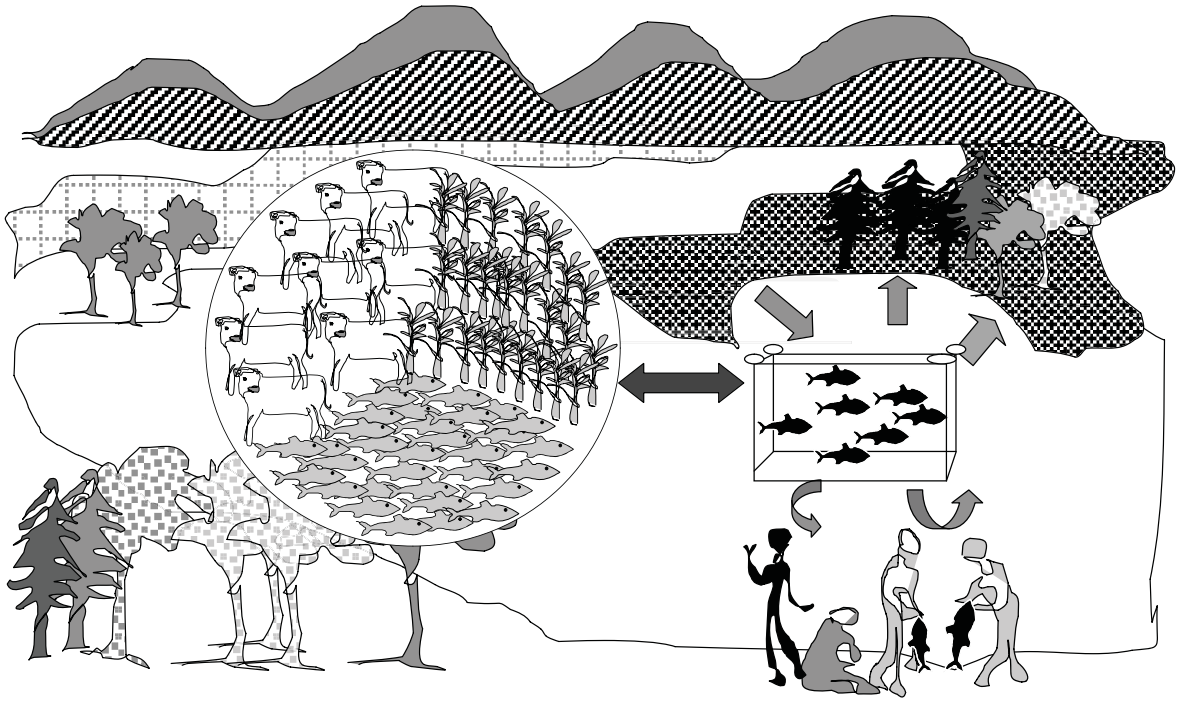
5

Suppl. 4

AQUACULTURE DEVELOPMENT

4. Ecosystem approach to aquaculture



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4. Ecosystem approach to aquaculture

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PREPARATION OF THIS DOCUMENT

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The initial discussions leading to the preparation of these guidelines took place in the FAO/Universitat de les Illes Balears *Expert Workshop on Building an Ecosystem Approach to Aquaculture* convened in Palma de Mallorca, Spain, from 7–11 May 2007. Another expert group discussed the initial draft content of the guidelines in the FAO *Expert Workshop on Guidelines for the Implementation of an Ecosystem Approach to Aquaculture (EAA)* that took place in Rome, Italy, from 24–26 November 2008. The experts participating in these workshops and contributing to the development of the guidelines were: José Aguilar-Manjarrez, Dror Angel, Conner Bailey, Uwe Barg, Kenny Black, Malcolm Beveridge, Alex Brown, Thierry Chopin, Barry Costa Pierce, Sena de Silva, Salud Deudero, Peter Edwards, Shirra Freeman, Nguyen Song Ha, John Hambrey, Nathanael Hishamunda, Nelly Isyagy, Yannis Karakassis, Duncan Knowler, Alessandro Lovatelli, Nuria Marba, Javier Martinez-Cordero, Syndhia Mathe, Miao Weimin, Reinaldo Morales, Ricardo Norambuena, Bill Silver, Francois Simard, Rohana Subasinghe, Phutchapol Suvanachai, Paul Tett, Max Troell and Alexandre Wainberg.

The initial drafts of the guidelines were prepared by Patrick White and Peter Edwards. Additional contributions and comments were provided by Gabriella Bianchi and James Muir. Cécile Brugère, José Aguilar-Manjarrez and Nathanael Hishamunda provided technical inputs throughout the process. Richard Arthur and Françoise Schatto provided editorial assistance.

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ABSTRACT

Social and biophysical dimensions of ecosystems are inextricably related such that a change in one dimension is highly likely to generate a change in the other. Although change is a natural consequence of complex interactions, it must be monitored and even managed if the rate and direction of change threatens to undermine system resilience.

> ***"An ecosystem approach to aquaculture (EAA) is a strategy for the integration of the activity within the wider ecosystem such that it promotes sustainable development, equity, and resilience of interlinked social-ecological systems."***

Being a strategy, the ecosystem approach to aquaculture (EAA) is not **what** is done but rather **how** it is done. The participation of stakeholders is at the base of the strategy.

The EAA requires an appropriate policy framework under which the strategy develops through several steps: (i) the scoping and definition of ecosystem boundaries and stakeholder identification; (ii) identification of the main issues; (iii) prioritization of the issues; (iv) definition of operational objectives; (v) elaboration of an implementation plan; (vi) the corresponding implementation process, which includes reinforcing, monitoring and evaluation; and (vii) a long-term policy review. All these are steps informed by the best available knowledge.

Implementing the EAA will require strengthening institutions and associated management systems so that an integrated approach to aquaculture development can be implemented and account fully for the needs and impacts of other sectors. The key will be to develop institutions capable of integration, especially in terms of agreed upon objectives and standards.

The widespread adoption of an EAA will require a much tighter coupling of science, policy and management. It will also require that governments include the EAA in their aquaculture development policies, strategies and development plans.

CONTENTS

Abbreviations and acronyms

APFIC	Asia-Pacific Fishery Commission
ASA	American Soybean Association
ASA-IM	American Soybean Association International Marketing (Program)
BMP	better management practice
CBA	capture-based aquaculture
CCRF	Code of Conduct for Responsible Fisheries (of the FAO)
COFI	Committee on Fisheries (of the FAO)
COP	codes of practice
EA	ecosystem approach
EAA	ecosystem approach to aquaculture
EAF	ecosystem approach to fisheries
EIA	environmental impact assessment
FAO	Food and Agriculture Organization of the United Nations
FCR	Feed conversion rate
GDP	gross domestic product
GIS	Geographic Information System
ICZM	integrated coastal zone management
ILO	International Labour Organization
IMTA	integrated multitrophic aquaculture
IWSM	integrated watershed management
LME	large marine ecosystem
MPA	marine protected area
NGO	non-governmental organization
OIE	World Organisation for Animal Health
PAS	partitioned aquaculture system
PCBs	polychlorinated biphenyls
SEA	strategic environmental assessment
SPS	sanitary and phytosanitary
TBT	technical barriers to trade
UNCBD	United Nations Convention on Biological Diversity
UNCED	United Nations Conference on Environment and Development
WHO	World Health Organization
WTO	World Trade Organization

BACKGROUND

1. From ancient times, fishing from oceans, lakes and rivers has been a major source of food, a provider of employment and other economic benefits for humanity. Ocean productivity seemed particularly unlimited. However, with increased knowledge and the dynamic development of fisheries and aquaculture, it was realized that living aquatic resources, although renewable, are not infinite and need to be properly managed, if their contribution to the nutritional, economic and social well-being of the growing world's population was to be sustained.

2. However, for nearly three decades, because of the dramatic increase of pollution, abusive fishing techniques worldwide, and illegal, unreported and unregulated fishing, catches and landings have been shrinking and fish stocks declining, often at alarming rates.

3. Stock depletion has negative implications for food security and economic development and reduces social welfare in countries around the world, especially those relying on fish as their main source of animal protein and income such as subsistence fishers in developing countries. Living aquatic resources need to be properly managed, if their benefits to society are to be sustainable.

4. Sustainability of societal benefits requires a recovery of depleted stocks and maintenance of the still-healthy ones, through sound management. In this regard, the adoption of the United Nations Convention on the Law of the Sea, in 1982 was instrumental. The law provides a new framework for the better management of marine resources. The new legal regime of the oceans gave coastal States rights and responsibilities for the management and use of fishery resources within the areas of their national jurisdiction, which embrace some 90 percent of the world's marine fisheries.

5. In recent years, world fisheries have become dynamically developing sectors of the food industry, and many States have striven to take advantage of their new opportunities by investing in modern fishing fleets and processing factories in response to growing international demand for fish and fishery products. It became clear, however, that many fisheries resources could not sustain an often uncontrolled increase of exploitation. Overexploitation of important fish stocks, modifications of ecosystems, significant economic losses, and international conflicts on management and fish trade still threaten the long-term sustainability of fisheries and the contribution of fisheries to food supply.

6. In light of this situation, while recognizing that the recovery of depleted stocks is still urgent and avoiding depleting still-healthy stocks as important, FAO Member States have expressed the need to further develop aquaculture as the only immediate way to bridge the gap between the dipping capture fisheries output and the increasing world demand for seafood.

7. Indeed, in the last three decades, aquaculture has recorded a significant and most rapid growth among the food-producing sectors and has developed into a globally robust and vital industry. However, aquaculture also has been shown at times to carry the potential to cause significant environmentally and socially adverse impacts.

8. Thus, the Nineteenth Session of the FAO Committee on Fisheries (COFI), held in March 1991, recommended that new approaches to fisheries and aquaculture management embracing conservation and environmental, as well as social and economic, considerations were urgently needed. FAO was asked to develop the concept of responsible fisheries and elaborate a Code of Conduct to foster its application.

9. Subsequently, the Government of Mexico, in collaboration with FAO, organized an International Conference on Responsible Fishing in Cancún in May 1992. The Declaration of Cancún, endorsed at that Conference, was brought to the attention of the United Nations Conference on Environment and Development Summit in Rio de Janeiro, Brazil, in June 1992, which supported the preparation of a Code of Conduct for Responsible Fisheries. The FAO Technical Consultation on High Seas Fishing, held in September 1992, further recommended the elaboration of a code to address the issues regarding high seas fisheries.

10. The One Hundred and Second Session of the FAO Council, held in November 1992, discussed the elaboration of the Code, recommending that priority be given to high seas issues and requested that proposals for the Code be presented to the 1993 session of the Committee on Fisheries.

11. The Twentieth Session of COFI, held in March 1993, examined in general the proposed framework and content for such a Code, including the elaboration of guidelines, and endorsed a time frame for the further elaboration of the Code. It also requested FAO to prepare, on a "fast track" basis, as part of the Code, proposals to prevent reflagging of fishing vessels which affect conservation and management measures on the high seas. This resulted in the FAO Conference, at its Twenty-seventh Session in November 1993, adopting the Agreement to Promote Compliance with International Conservation and Management

Measures by Fishing Vessels on the High Seas, which, according to FAO Conference Resolution 15/93, forms an integral part of the Code. It was also recognized and confirmed that issues of responsible aquaculture development and aquaculture sustainability should be addressed in the formulation process so that these be appropriately covered in the envisaged Code.

12. This implicit recognition of the importance of governance in aquaculture is underlined in Article 9.1.1 of the Code, which requires states to "establish, maintain and develop an appropriate legal and administrative framework to facilitate the development of responsible aquaculture". In addition, at the beginning of the new millennium, there is growing recognition of the significant potential for the use of ocean and coastal waters for mariculture expansion. The outstanding issue in this area is that, unlike in capture fisheries, the existing applicable principles of public international law and treaty provisions provide little guidance on the conduct of aquaculture operations in these waters. Yet, experts agree that most of the future aquaculture expansion will occur in the seas and oceans, certainly further offshore, perhaps even as far as the high seas. The regulatory vacuum for aquaculture in the high seas would have to be addressed should aquaculture operations expand there.

13. The Code was formulated so as to be interpreted and applied in conformity with the relevant rules of international law, as reflected in the 10 December 1982 United Nations Convention on the Law of the Sea. The Code is also in line with the Agreement for the Implementation of the Provisions of this Law, namely the 1995 Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks. It is equally in line with, *inter alia*, the 1992 Declaration of Cancún and the 1992 Rio Declaration on Environment and Development, in particular Chapter 17 of Agenda 21.

14. The development of the Code was carried out by FAO in consultation and collaboration with relevant United Nations agencies and other international organizations, including non-governmental organizations.

15. The Code of Conduct consists of five introductory articles: Nature and scope; Objectives; Relationship with other international instruments; Implementation, monitoring and updating; and Special requirements of developing countries. These introductory articles are followed by an article on General principles, which precedes the six thematic articles on Fisheries management, Fishing operations, Aquaculture development, Integration of fisheries into coastal area management, Post-harvest practices and trade, and Fisheries research. As already mentioned, the Agreement to Promote

Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas forms an integral part of the Code.

16. The Code is voluntary. However, certain parts of it are based on relevant rules of international law, as reflected in the United Nations Convention on the Law of the Sea of 10 December 1982. In capture fisheries, the Code also contains provisions that may be or have already been given binding effect by means of other obligatory legal instruments among the Parties, such as the Agreement to Promote Compliance with Conservation and Management Measures by Fishing Vessels on the High Seas, 1993. In aquaculture, the provisions of the Code implicitly encourage participatory governance of the sector, which extends from industry self-regulation, to co-management of the sector by industry representatives and government regulators and to community partnerships. Compliance is self or enforced by peer pressure, with industry organizations having the ability to exclude those who do not comply and governments only checking periodically.

17. The Twenty-eighth Session of the Conference in Resolution 4/95 adopted the Code of Conduct for Responsible Fisheries on 31 October 1995. The same Resolution requested FAO, *inter alia,* to elaborate appropriate technical guidelines in support of the implementation of the Code in collaboration with members and interested relevant organizations.

18. The expanding role and increasing contribution of aquaculture to economic growth, social welfare as well as global food security was recognized and reiterated at international levels such as the 1995 FAO/ Japan Conference on the Contribution of Fisheries and Aquaculture to Food Security, the 1996 World Food Summit, the 1999 Ministerial Meeting on Fisheries, the 2000 FAO/NACA (Network of Aquaculture Centres in Asia and the Pacific) Conference on Aquaculture in the Third Millennium and its Bangkok Declaration and Strategy, and most recently, the 2009 World Summit on Food Security.

19. The application of the ecosystem approach to fisheries and aquaculture as strategies for the development of the sector contributes to the implementation of the provisions of the Code, thereby enforcing the technical, ecological, economic and social sustainability of the industry.