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The rising tide of fisheries instruments and the struggle to keep afloat

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Since agreement was reached in 1982 on the UN Convention on the Law of the Sea, and particularly since the conclusion of the 1992 UN Conference on Environment and Development, the rate of development of global instruments impacting on fisheries has escalated considerably and is apparently continuing to do so. A flood of global and regional instruments relevant to fisheries has been generated, including, for example, the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora which pre-dates the UN Convention, the 1992 Convention on Biological Diversity, 1992 Agenda 21: Programme of Action for Sustainable Development, the 1993 FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, the 1995 UN Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, the 1995 FAO Code of Conduct for Responsible Fisheries and its four international plans of action and strategy, and the 2001 FAO Reykjavík Declaration on Responsible Fisheries in the Marine Ecosystem reflecting the growing international interest in ecosystem approaches to fisheries. Most recent has been the 2002 World Summit on Sustainable Development's Plan of Implementation. These instruments have been motivated by real problems associated with environmental degradation and living resource depletion, in several cases specifically in connection with fisheries. They have attempted to address these problems, and each instrument is recognized as being a positive contribution towards the sustainable use of resources and ecosystems. However, taken collectively they form a large, often confusing and potentially overwhelming set of recommendations and requirements that is putting many fishery management agencies under severe pressure as they seek to implement them. This paper provides a brief overview of the range of recent instruments and their implications for sustainable fisheries management, considers the progress being made in implementing them, identifies general problems being encountered and how they might be ameliorated in the future. A key problem is a lack of political will, or political ability, to address effectively the problems facing fisheries and marine ecosystems. One consequence of this is that the agencies charged with fisheries management are not provided with adequate technical and financial capacity to implement the instruments in most, if not all, countries. The problem is especially acute in developing countries where they are strained by the full effects of 'instrument implementation fatigue'.

Keywords: Code of Conduct; WSSD; implementation; developing countries; future scenarios

1. INTRODUCTION

The problems being experienced in fisheries have been well studied and are well documented (e.g. McGoodwin 1990; Ludwig *et al.* 1993; Rosenberg *et al.* 1993; Crean & Symes 1996; Cochrane 2000). They are manifested through the widespread failure of fisheries management to achieve its biological, ecological, economic and social objectives. Those involved in fisheries and fisheries management have long been aware of the failures to achieve management objectives and the underlying problems that have led to these failures. Garcia (1992) described some of the international findings and recommendations on sustainable fishing immediately after World War II. At that time, the fish resources of the Northern Hemisphere had already been overfished, and in 1946 the London International Overfishing Conference stressed that many bottom fish resources were overfished. The problem of freedom of access to fish resources in the high seas (then any stocks occurring more than three nautical miles offshore) was apparent, but no agreement could be reached on the allocation of these resources. In 1945 an FAO Technical Committee report recommended, *inter alia:*

(i) improvements in the collection and dissemination of information;
(ii) research to improve the ability to achieve maximum sustainable production; and
(iii) establishment of Regional Councils to improve fisheries research and management.

The response to the problem of local overfishing was an increase in distant water fishing, led by Europe, Japan and the United States of America. At the same time, some attempts were made to reduce the negative impacts of fishing through technical measures such as regulation of mesh sizes,

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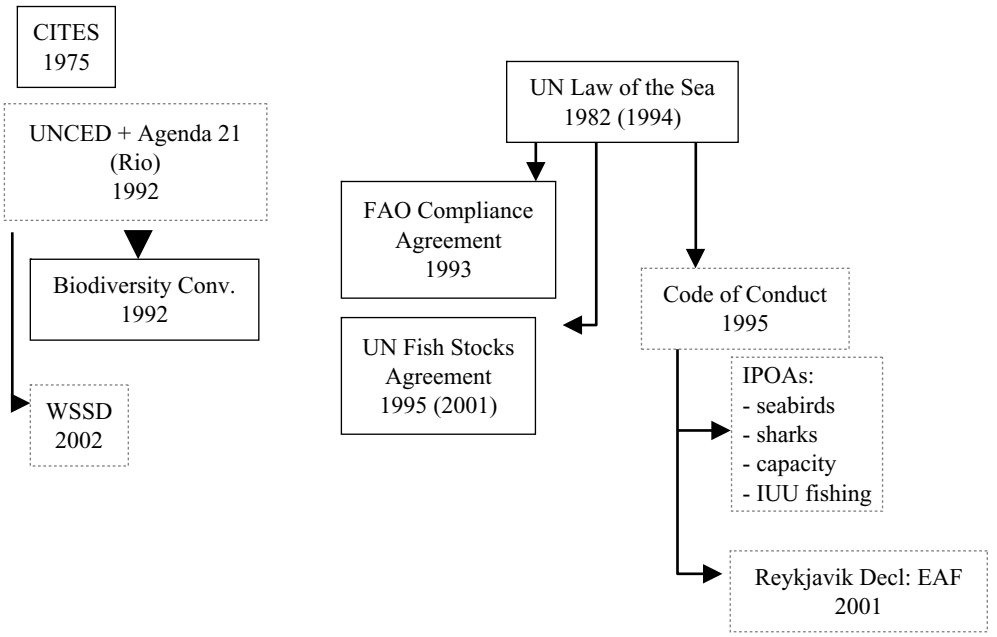

Figure 1. Outline of some of the major international agreements (voluntary, dotted outline; binding, solid outline) directly impacting upon national and regional fisheries.

minimum sizes for landed fish and closed areas and seasons, but these measures proved generally ineffective as investment in fleets resulted in the unchecked growth of fishing effort (Garcia 1992; Pearce 1994). The problem of overcapacity, together with the need to resolve the question of access to fishery resources, had been recognized as early as 1948 and was addressed in the FAO publication in that year on the State of Food and Agriculture (Garcia 1992).

2. THE INSTRUMENTS

Since these post-World War II beginnings, the international community has worked steadily to build a framework of international law and instruments that would, if effectively implemented, halt the overexploitation of living marine resources and the ecosystems in which they occur, allowing for their sustainable use to provide for optimal social and economic benefits for current and future generations. The pace of development of these voluntary and binding instruments has increased considerably in recent decades and especially since the early 1990s after the 1992 United Nations Conference on Environment and Development (UNCED) or Earth Summit (figure 1). Some of the instruments, in chronological order, include:

(i) 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). This instrument is a binding international agreement aimed at ensuring that international trade in specimens of wild animals and plants does not endanger their survival. The Convention text, agreed in March 1973, entered into force in July 1975. At present more than 30 000 species of animals and plants are listed on one of its three appendices although at present very few of these species are relevant to fisheries. Species considered to be under threat can be placed on one of the appendices. The three appendices involve different degrees of control of international trade, according to the estimated status of the population involved. International trade is generally prohibited for Appendix I species; controlled trade that is not detrimental to the survival of the species is permitted in Appendix II species, while Appendix III consists of species that have been placed there at the request of a State that requires the assistance of other countries to strengthen control. Several species of relevance to fisheries are currently listed on CITES Appendix II, including most of the sturgeon and paddlefish species (Acipenseriformes spp.), Caribbean queen conch (*Strombus gigas*), whale shark (*Rhincodon typus*) and basking shark (*Cetorhinus maximus*). The number of exploited aquatic species listed on CITES appears likely to grow as conservation concerns about marine fish species gain increasing international attention.

(ii) 1982 UN Convention on the Law of the Sea (1982 UN Convention). This Convention entered into force on 16 November 1994. It is the fundamental legal framework governing the use of the oceans and seas, including the legal basis for conservation, management and research of, and into, marine resources (Aqorau 2003). Regarded as the 'mother law' underlying the conservation and management of fisheries, the 1982 UN Convention is the point of reference for all international fisheries instruments that have been concluded subsequently.

(iii) Agenda 21: Programme of Action for Sustainable Development (Agenda 21). The UN Conference on Environment and Development (UNCED) was held in Rio de Janeiro in 1992. The Conference adopted Agenda 21, a programme of action for sustainable development, to be undertaken by governments, UN agencies and other relevant groups and organizations at global, national and local levels. Chapter 17 of Agenda 21 deals with the protection of the oceans, all seas, coastal areas and their living resources. Chapter 17 specifies, *inter alia*, the requirements for

implementation of the 1982 UN Convention and proposed that it must involve new, integrated approaches, including the adoption of the precautionary approach. Two binding agreements were also concluded at UNCED, the Convention on Climate Change and, directly relevant to fisheries, the Convention on Biological Diversity (CBD).

(iv) 1992 Convention on Biological Diversity (CBD). This instrument entered into force in December 1993. At the time of writing, over 175 countries had ratified the agreement. It has three main goals (CBD 2003):

- conservation of biodiversity;
- sustainable use of the components of biodiversity; and
- sharing the benefits arising from the commercial and other use of genetic resources in a fair and equitable way.

While the CBD does not refer explicitly to fisheries, it covers all biodiversity, including that of marine systems and therefore is relevant to, and affects, fisheries. At the Second Meeting of the Conference of Parties to the Convention, the Jakarta Mandate on Coastal and Marine Biodiversity was issued. A programme of work for the Mandate was adopted in 1998 and gives particular attention to integrated marine and coastal area management, the sustainable use of living resources, protected areas, mariculture and alien species (Aqorau 2003), all of which are directly pertinent to fisheries.

(v) 1993 FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (1993 FAO Compliance Agreement). The FAO Conference adopted the Agreement in November 1993. It is intended to provide an instrument for countries to take effective action, consistent with international law, to ensure compliance with applicable international conservation and management measures for living marine resources of the high seas. The Agreement stipulates the special responsibility of flag states to this end, in particular with respect to granting authorization to fish on the high seas. Flag states may do so only when satisfied that they are able to exercise effectively their responsibilities and they must comply with the detailed provisions of the Agreement concerning the granting of such authorization to vessels previously registered in the territory of another state. Such authorization should, as a result, enhance flag state control in high-seas fisheries, enable these fisheries to be more effectively managed and contribute to a reduction in the incidence of IUU fishing on the high seas. An important aspect of the Agreement is that it seeks to ensure a good exchange of information on all fishing operations on the high seas.

(vi) 1995 FAO Code of Conduct for Responsible Fisheries and its related four IPOAs and strategy. The Code of Conduct was adopted by the Twenty-eighth Session of the FAO Conference in October 1995. The Code of Conduct is a voluntary instrument, although parts of it are based on relevant sections of the 1982 UN Convention. The Code also includes provisions that are binding under other legal instruments such as the 1993 FAO Compliance Agreement. It is intended to be holistic in nature and to cover all aspects of fisheries, including aquaculture, from initial exploration and planning through to post-harvest practices and trade.

(vii) 1995 United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation of Straddling Fish Stocks and Highly Migratory Fish Stocks (1995 UN Fish Stocks Agreement). This Agreement entered into force in November 2001. It was developed partly in response to the failure of the 1982 UN Convention to prevent overexploitation of high-seas fish stocks, including highly migratory and straddling fish stocks. The Agreement's primary goal is to ensure the effective implementation of the relevant provisions of the 1982 UN Convention to achieve the long-term conservation of these stocks (Aqorau 2003). The Agreement prescribes a detailed framework for the management of the two types of stock but also broadens the objectives to include avoidance of negative impacts on the marine environment, preservation of marine diversity and maintenance of the integrity of the marine ecosystem (Edeson *et al.* 2001). The Agreement's implementation therefore requires a holistic ecosystem approach to fisheries (EAF).

(viii) 2001 Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem (2001 Reykjavik Declaration). The Reykjavik Conference on Responsible Fisheries in the Marine Ecosystem was held in October 2001. The Conference focused on the issue of introducing more ecosystem considerations into fisheries management, recognizing that fisheries impact on marine ecosystems and ecosystems impact on the status and productivity of fishery resources. At the conclusion of that Conference, the 2001 Reykjavik Declaration was issued. It declared the intentions of the signatory countries to work collectively towards incorporating ecosystem considerations into fisheries management (FAO 2001*a*). The Reykjavik Declaration also requested FAO to develop guidelines for the inclusion of ecosystem considerations. In 2003 FAO published a set of technical guidelines for the EAF within the context of the 1995 FAO Code of Conduct (FAO 2003*a*).

(ix) 2002 Plan of Implementation adopted by the World Summit of Sustainable Development (2002 WSSD Plan of Implementation). The Summit was held in Johannesburg in 2002, 10 years after UNCED. WSSD produced a political Declaration and a Plan of Implementation. The latter is considered most pertinent to this paper. WSSD addressed the whole field of sustainable development. In relation to fisheries, the Plan of Implementation did not propose new concepts or approaches. Rather it sought to consolidate and reinforce the implementation of existing instruments, setting deadlines for achieving important targets such as the application of the ecosystem approach (by 2010) and the maintenance or restoration of stocks to

levels that can produce the maximum sustainable yield (where possible not later than 2015).

This package of instruments provides an ambitious attempt by the international community to promote and secure long-term sustainable outcomes in fisheries and the ecosystem of which they are part. However, the full and effective implementation of these instruments poses a major challenge for all countries, and especially developing countries that lack the necessary technical, financial and institutional capacity to facilitate and sustain implementation. Indeed, it has been noted in international fora that many countries are experiencing 'instrument implementation fatigue'.

3. PROGRESS IN IMPLEMENTING THE INSTRUMENTS

The suite of instruments described above covers a very broad range of fishery issues some of which are relatively novel, at least in their application. These issues include biological concerns, conservation, improved transparency and stakeholder consultation in fisheries management, the application of the precautionary approach, the EAF and fisheries monitoring, control and surveillance (MCS). To gauge accurately the progress in implementation being made by countries it would be necessary to evaluate each country in terms of each specific requirement or recommendation contained in the instruments. This would be an enormous task and no attempt is made in this paper to undertake it. However, there is evidence from a variety of public sources that many, if not all, countries are encountering substantive problems in responding to the ambitious and far-reaching intentions of these international instruments, and especially the post-UNCED instruments. The general result appears to be that in marine capture fisheries, global policy and the good intentions reflected in the instruments are outstripping implementation by a wide margin.

This conclusion can be obtained from several perspectives and sources. An obvious indicator of the progress in implementing these instruments, which are designed to promote sustainable use, is the status of marine fish stocks. Many papers in recent years have portrayed gloomy scenarios of the status of fish stocks around the world (Rosenberg *et al.* 1993; FAO 1994; Christensen *et al.* 2003). The most recent FAO information indicates that for the main marine fish stocks for which assessment information is available, there has been a reduction in the number of underexploited and moderately exploited fisheries resources, while the number of overexploited, depleted and recovering stocks has shown some increase in recent years (FAO 2002). Using available information, FAO (2002) estimated that 25% of fish stocks or species groups are underexploited or moderately exploited, *ca*. 47% are fully exploited, 18% overexploited and 10% of stocks are substantially depleted or are recovering from depletion. Collectively, the information available gives a strong indication that countries have not made good progress in maintaining fish stocks at productive population biomasses as called for, for example, in the 1982 UN Convention, the 1995 Code of Conduct and 2002 WSSD Plan of Implementation.

The 1995 FAO Code of Conduct covers a broad spectrum of activities central to fisheries and aquaculture. The progress made by countries in implementing the Code of Conduct provides a sound indication of the general state of fisheries and fisheries management. Article 4 of the Code of Conduct urges FAO Members and non-members, fishing entities, regional fishery management organizations or arrangements (RFMOs) or arrangements and other stakeholders to report to FAO on their efforts to implement the Code. FAO reports to its Committee on Fisheries (COFI) every second year on progress achieved with the Code's implementation. FAO bases its analysis and reporting on information contained in self-assessment questionnaires provided to members, RFMOs and civil society. The most recent report was made to the Twenty-fifth Session of COFI in February 2003 (FAO 2003*b*). A total of 105 FAO members, comprising 57% of the FAO Membership, responded to the Code of Conduct questionnaire, as did 19 RFMOs and five NGOs.

An analysis of the responses received suggests that progress is being made in the implementation of the Code of Conduct, but with a lower level of achievement for the IPOAs (table 1). In most cases, the results obtained from the questionnaires suggest that over 50% of the respondents are complying with, or have made reasonable progress towards, implementing the Code of Conduct. The only areas where less than 50% of members responded positively were those relating to fisheries MCS, the regulation of bycatch and discards and the establishment of mechanisms to reduce conflict between coastal fisheries and aquaculture, even though in all questions under the section relating to fishing operations, a high percentage of members responded that they had made some progress in these areas.

In considering these results it should be noted that some questions may not be relevant, or very important, for some FAO members and a non-positive response may indicate that the question is not applicable to a given country, rather than indicating a failure to comply with necessary requirements of the Code of Conduct. For example, countries with only limited inland water bodies would have little need for VMSs. Of greater concern, however, is the 'all or nothing' nature of many of the questions that may give little information on the quality or adequacy of the steps that have been taken by members. For example, most countries (89%) indicated that they have catch and effort data for the development of fishery management plans. This encouraging response does not give any insight into the quality and resolution of those data or the level of detail of the plans. The high positive response to this question contrasts with the conclusions of the Twenty-fourth Session of COFI in 2001 that '... basic data of good quality were often lacking at the national level' and that '... adequate financial and other resources were often lacking for methodologically sound statistical activities' (FAO 2001*b*). The discrepancy between these two reports on the same theme might be attributed to the very broad nature of the questions in the Code of Conduct questionnaire and differing national interpretations of what data are necessary for the development of effective management plans.

The overly optimistic perception created by the responses on Fisheries Research and Data Gathering is almost certainly representative of the responses to other questions in the questionnaire (table 1). Although the Twenty-fifth Session of COFI acknowledged that there had been positive

Table 1. Number and percentage of countries responding positively to questions in the FAO questionnaire about progress in implementation of the 1995 FAO Code of Conduct for Responsible Fisheries.
(Percentages shown are of positive responses in relation to the total number of members returning questionnaires to FAO. Numbers in brackets refer to the number of members stating that they had made partial progress in relation to the question.)

	number of positive responses	percentage of total responses
policy and legislation in conformity with Code	98	93
fishing operations		
fishing properly authorized	51 (39)	49 (37)
measures taken to limit bycatch and discards	49 (22)	47 (21)
VMS been implemented	22 (43)	21 (41)
aquaculture development		
code or instrument developed for best practices for aquaculture	53	51
related to harmful effects of species introductions and genetic alterations in aquaculture		
undertake environmental assessments	73 (1)	70 (1)
monitor aquaculture operations	77 (2)	73 (2)
minimize harmful effects	72 (2)	69 (2)
fisheries and coastal and basin area management		
have mechanisms to resolve conflicts over use of coastal resources		
coastal and industrial fisheries	65	62
coastal fisheries and aquaculture	48	46
gear types in coastal areas	70	67
post-harvest practices and trade		
have effective food safety and quality assurance systems for fish and fish products	71	68
consumers can identify origin of fish and fisheries products	83	79
fisheries research and data gathering		
timely, complete and reliable statistics on catch and fishing effort	64	61
have qualified personnel to generate data for management	60	57
data available for input to fishery management plans		
catch and effort data	93 (1)	89 (1)
research vessel surveys	67	64
on-board sampling from commercial vessels	59 (2)	56 (2)
in-port sampling surveys	71 (1)	68 (1)
FAO IPOAs		
development of national plans of action for the FAO IPOAs		
capacity	9 (42)	9 (40)
sharks	6 (11)	6 (11)
seabirds	3 (3)	3 (3)
illegal, unregulated and unreported fishing	47 (23)	45 (22)

experiences in implementation of the Code of Conduct, the Committee also recognized that much work still needed to be done and that, particularly in developing countries, a lack of capacity was hindering implementation of the Code of Conduct. COFI therefore called upon FAO to continue with its efforts to provide technical assistance in implementation of the Code of Conduct (FAO 2003*c*). However, with limited resources and capacity itself, FAO can at best play only a catalytic role in promoting this implementation. Indeed, the onus for implementation rests firmly with the countries themselves to put in place policies and measures that will allow meaningful progress to be made.

The 1993 FAO Compliance Agreement is an integral component of the Code of Conduct. By 18 August 2003 the Agreement had 27 acceptances. Some of the countries that have accepted the Agreement have yet to provide information to FAO about their vessels operating on the high seas, as required under Article IV of the Agreement relating to records of fishing vessels authorized to fish on the high seas. To encourage the supply of this information, FAO has taken steps to remind Parties of their obligations in this regard. Parties would welcome wider participation in this Agreement as a means of facilitating a stronger framework for the management and control of fishing vessels that operate in high seas fisheries. Despite consistent encouragement in the United Nations General Assembly (UNGA) and other international fora, the 1993 FAO Compliance Agreement took nearly a decade to enter into force. This result, given the relatively low number of acceptances required for entry into force, tends to indicate that the Agreement was not a high priority for many countries. However, in their reporting in relation to the implementation of the Code of Conduct for the Twenty-fifth Session of COFI, 30 countries indicated that they would accept the Compliance Agreement in 2003 or 2004. Four of those countries have already done so.

Table 1 shows a bleaker picture for implementation of the IPOAs, with only the responses on the IPOA to prevent, deter and eliminate IUU fishing (IPOA-IUU) showing substantial national progress in implementation.

Forty-seven members reported that they had taken steps towards developing NPOAs for IUU fishing, 23 members indicated that they would finalize their NPOAs in the near future while a further 18 members reported that their NPOAs would be completed before the June 2004 deadline. Nevertheless, COFI found it necessary to express '... concern about the continuing high and growing incidence of IUU fishing and the lack of effective implementation of the IPOA-IUU...' (FAO 2003*b*). Similar criticism about the slow progress in the implementation of the IPOA on the conservation and management of sharks (IPOA-sharks) has been voiced by some conservation groups and some countries. In this regard the Twelfth Conference of the Parties of CITES agreed on the following decisions at its meeting in October 2002 (CITES 2003*a*):

> The Secretariat shall transmit to FAO the concerns of the Conference of the Parties regarding the lack of progress in implementing the IPOA-Sharks, and urge FAO to take steps to encourage the implementation of the IPOA-Sharks by States and regional fisheries management organizations (Decision 12.48).
>
> The Secretariat shall encourage CITES authorities of Parties to obtain information on IPOA-Sharks implementation from their national fisheries departments and report on progress at future meetings of the Animals Committee (Decision 12.49).

Problems are also being experienced in the implementation of instruments other than those developed within FAO. In the case of CITES, for example, all the Acipenseriformes (sturgeon and paddlefish) species are listed on Appendix I or II of CITES, with the commercially more important species, such as beluga (*Huso huso*), *Acipense persicus* and other Caspian Sea sturgeons, listed on Appendix II. Trade is still permitted in Appendix II species, subject to it not being detrimental to the survival of the species. Another commercially important aquatic species, the queen conch (*Strombus gigas*) found in the Caribbean Sea, is also listed on Appendix II of CITES. However, in both of these cases substantial problems are being encountered by the range states and by CITES in both setting appropriate export quotas and in enforcing them.

In the case of the Caspian Sea sturgeons, the CITES Standing Committee in 2002 recognized the good progress made by the range states in complying with CITES requirements for long-term improvements in the management of the sturgeon fisheries, but reported that there was still a high-priority need to improve the stock assessments and to validate the methods used for calculating export quotas from the assessments (CITES 2002*a*). Other issues requiring attention included collaboration to counter illegal fishing and trade, strengthening the relevant national legislation and harmonizing it among the range states, improved understanding on the role of stock enhancement programmes and their ecological and economic consequences, and others. In the case of queen conch, a rapidly developing commercial fishery in recent decades has led to depleted populations in many countries and in 1992 the species was placed on CITES Appendix II. Despite this measure, the International Queen Conch Workshop on Review of Trade in Queen Conch held in June 2003 in Montego Bay, Jamaica, reported that the status of the populations of queen conch in several countries is unknown or only poorly known, that most populations of the species have continued to decline since the species was listed on Appendix II, and that there is thought to be an increase in illegal harvesting and international trade (CITES 2003*b*).

A major achievement in the 1990s was the conclusion of the 1995 UN Fish Stocks Agreement. On 18 August 2003 it had 35 ratifications or accessions. With the imminent deposit of instruments of ratification from European Community members, the number of Parties to the Agreement will exceed 50. The 1982 UN Convention and the 1995 Fish Stocks Agreement, in combination, provide the framework for strengthening the management of straddling fish stocks and highly migratory fish stocks and, as required, for the establishment of new organizations to manage these stocks where none currently exists. Many RFMOs that are mandated to manage these stocks have, or are in the process of, adjusting their conventions and management practice to give effect to the Fish Stocks Agreement, while two new organizations have been spawned by the Agreement to address management where no organization previously existed. These are the South-East Atlantic Fisheries Organization and the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean. These developments are highly positive and indicate that concrete measures are being taken by RFMOs to implement the Agreement.

Significantly, Parts III and IV of the 1995 UN Fish Stocks Agreement address international cooperation among all States, either directly or through RFMOs, involved in fisheries for straddling fish stocks and highly migratory fish stocks (FAO and UN 1998). *Inter alia*, these Parts of the Agreement provide that:

(i) a state whose vessels fish for stocks managed by a RFMO should either become a member of the RFMO or otherwise apply the measures adopted by the RFMO;
(ii) RFMOs should be open to membership by all states with a real interest in the fishery or fisheries in question;
(iii) new members of RFMOs should receive consideration for access to the fishery or fisheries in question in accordance with certain criteria;
(iv) RFMOs should have transparent decision-making procedures and allow for participation by representatives of other inter-governmental and NGOs; and
(v) where RFMOs do not exist, States should cooperate to establish them.

Following requests from the UNGA relating to the implementation of the 1995 UN Fish Stocks Agreement, an evaluation was undertaken in early 2003 (UNGA 2003). The report, which was considered by the UNGA at its 2003 Annual Session, had the following points as its main conclusions.

(i) The Agreement has made an important impact on the conservation and management of international fisheries, representing a benchmark for many States as recognized by the WSSD Plan of Action. However, as a binding international instrument, the full effect of the

Agreement will only be achieved by wider acceptance and implementation of all its provisions by all States.

(ii) The current depleted state of stocks covered by the Agreement and the costs associated with effective implementation of the Agreement is likely to mean that the main short-term focus will be on distribution of actual fishing opportunities and full recovery of management costs, rather than major development of new fisheries.

An analysis of acceptances of the 1993 FAO Compliance Agreement and ratifications and accessions to the 1995 UN Fish Stocks Agreement shows that only 10 countries have accepted or ratified both agreements. In 2002, FAO wrote to its Members that had ratified or accepted the 1995 UN Fish Stocks Agreement and not accepted the 1993 FAO Compliance Agreement requesting that they consider doing so. FAO takes the view that the effective implementation of the Fish Stocks and Compliance Agreements, in tandem, will serve to strengthen and enhance the way in which fisheries, and in particular high-seas stocks, are used and managed.

4. PROBLEMS AND CONSTRAINTS TO IMPLEMENTATION

The reports and examples discussed in § 3 indicate that many countries are making only limited progress in implementing the requirements and obligations of the relevant international instruments. As a result, the objectives of the instruments are far from being met and the biological, ecological, economic and social problems that beset many fisheries and ecosystems around the world continue and, in many cases, are increasing.

(a) *Generic considerations*

The reasons for this lack of progress in implementation are a matter of concern for the international community and have been considered and discussed in many regional and global fora. Cochrane (2000) has suggested that the factors constraining progress in attaining sustainable and productive fisheries fall into four categories:

(i) the high levels of biological (and ecological) uncertainty that have frequently resulted in poor or inappropriate management decisions;
(ii) the general conflict between short-term economic and social objectives and the longer-term objectives of sustainability, with the former usually being given priority;
(iii) poorly defined objectives in fisheries leading to *ad hoc* decisions and, again, decisions based on immediate problems; and
(iv) institutional weaknesses, in particular the absence, or inappropriate systems, of user rights and the predominance of top-down management approaches in fisheries, with inadequate participation by stakeholders.

Doulman (2003*a*) has also proposed several reasons for the widespread failure to manage fisheries responsibly. These reasons are broadly consistent with those of Cochrane (2000) and include:

(i) the continued existence of open-access and quasi-open-access fisheries in many parts of the world;
(ii) a tendency for political decision-makers to avoid taking decisions that would be unpopular in the short-term;
(iii) the priority given to biologically oriented management of fisheries rather than to managing the behaviour of fishers;
(iv) inadequate capacity in national administrations responsible for management particularly, but not exclusively, in developing countries;
(v) conflicting objectives, especially where resources are shared between different countries; and
(vi) inadequate fisheries MCS and outdated and inadequate penalties for serious fisheries infringements.

Furthermore, the achievement of sustainability in fisheries at the international level has been constrained (i) by 'opting out' provisions in some RFMO conventions with respect to the acceptance and implementation of management measures by parties, and (ii) from a lack of compulsory dispute settlement provisions. Both of these constraints encourage weaknesses, if not loopholes, in fisheries management.

(b) *Illegal, unreported and unregulated fishing*

Efforts to achieve long-term sustainability in fisheries are also frustrated by the widespread and growing incidence of IUU fishing (Doulman 2003*b*; FAO 2003*d*; Upton & Vitalis 2003; Hayashi 2004). It is now considered by some to be an 'environmental crime' rather than simply a fishing offence of an administrative nature (Hayman & Brack 2002). There are also increasing claims by some States alleging strengthening ties between organized national and international crime, money laundering and IUU fishing operations. This indicates that IUU fishing is no longer simply a fisheries problem (Forum Fisheries Agency 2003).

There are no global data on the full extent and cost of IUU fishing. The nature of this type of fishing does not readily allow global estimation with any significant degree of confidence. Some RFMOs are working to assess the regional extent and impacts of IUU fishing. The OECD is also attempting to evaulate more precisely parameters on IUU fishing and some States have initiatied national assessments to determine the extent of the problem (e.g. Agnew *et al.* 2002).

IUU fishing flourishes because States are unwilling or unable to meet their international obligations with respect to the control of fishing vessels flying their flags. The problem is compounded by States issuing 'flags of convenience' primarily as a means of raising revenue. The Commission of the European Communities (2002) has pointed out that these flags '... represent a considerable threat to the survival of fisheries worldwide'. This sentiment has gained wide international acceptance and support, even though Swan (2002) found that 'flags of convenience' for fishing vessels do not yield substantial financial returns. However, IUU fishing is not only a 'flag of convenience' problem: such fishing is common among fleets from countries that recognize their flag State responsibilities but which fail to enforce national legislation that reflects their international obligations.

IUU fishing is not an isolated problem: rather such fishing should also be seen as a symptom of other problems facing the management of fisheries (Cripps *et al.* 2000;

Balton 2002; FAO 2003*d*). These problems, which must be ameliorated if the incidence of IUU fishing is to be reduced, include, *inter alia*, ineffective management that fails to regulate fishery inputs and outputs; excess fleet capacity and, as regulations tighten, the 'pushing out' and re-flagging of vessels from managed fisheries to other fisheries that are unmanaged or poorly managed; and the masking of the real costs of vessel construction and fishing operations through the payment of direct and disguised subsidies.

FAO has been at the forefront of international efforts to address IUU fishing. The UNGA, United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea, International Maritime Organization, OECD and fora of the Asia-Pacific Economic Cooperation, among others, have also focused on IUU fishing. To this end, the WSSD called on States to take steps to implement the 2001 FAO International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU; FAO 2001*c*), through the elaboration of national plans of action, before the June 2004 deadline, even though current indications are that few countries will meet this deadline.

Many RFMOs report that IUU fishing in their convention areas by both member and non-member flag vessels is widespread and handicaps their efforts to manage fisheries. If RFMOs are not able to fulfil their mandates because of IUU fishing, the outlook for the sustainable use of many of the world's commercially important fish stocks is bleak. Some RFMOs have made recommendations and passed resolutions as a means of condemning and combating such fishing. Doulman (2003*b*) has summarized the actions taken by these RFMOs. They include, *inter alia*, efforts to: encourage non-members to become parties to their organizations; implement new, and strengthen existing, policies, procedures and mandates; develop 'lists of vessels' with a view to gaining the greater cooperation of flag States; and implement catch certification and traceability controls on catch so that the marketing of fish taken by fishers who are known to have engaged in IUU fishing will be made more difficult, if not blocked completely.

RFMOs are not supra-national entities and their measures to combat IUU fishing are only as effective as their members permit. A failure by RFMOs to effectively address IUU fishing reflects, to some degree, a lack of political will by members to take action to implement agreed measures even when it is known by some States that their vessels are engaging in IUU fishing and undermining the work of RFMOs. There is also a tendency for some States to take refuge behind national policies and legislation as a means of avoiding or deferring action on regionally agreed commitments. This has led to a growing impatience by some States with diplomatic approaches to IUU fishing, encouraging more radical action by the members of some RFMOs including the adoption of 'name and shame' policies for vessels and flags that are perpetual IUU fishing offenders (Australian Minister for Fisheries 2003).

Industry groups are claiming that more action and less diplomacy by RFMOs is required to deal with IUU fishing. They are also naming companies and vessels engaged in IUU fishing and promoting international responsible tuna fisheries behaviour (e.g. Coalition of Legal Toothfish Operators 2003; Organization for the Promotion of Responsible Tuna Fisheries 2003). Similarly, the International Coalition of Fisheries Associations (IFCA) has urged the World Trade Organization to support the use of trade measures as a means of encouraging compliance with global and regional fisheries conservation and management measures. IFCA maintains that trade measures can be very effective in discouraging and eliminating 'flag of convenience' fishing operations and IUU fishing (ICFA 2003). This largely unprecedented action by industry groups is being taken because IUU fishing and its related activities seriously prejudice the interests of commercial fishers who abide by their national and regional authorizations to fish. IUU fishers do not face the same constraints in terms of operating costs, catch limits, etc., nor do they implement the same safety standards for fishing and support vessels and crews as is required by their counterparts who do not engage in IUU fishing.

(c) *National perspectives on implementation of the code of conduct*

Useful insight into the problems associated with developing sustainable and responsible fisheries can also be gained from examining the constraints to implementation of the 1995 FAO Code of Conduct for Responsible Fisheries (FAO 2003*e*). In addition to completing the questionnaire on implementation of the Code of Conduct and its IPOAs, FAO Members were asked to investigate and report on their experiences in the implementation of those instruments and on the constraints that they were encountering. Sixteen countries responded, of which two were developed countries (Canada and the United States of America) and the remaining 14 respondents were developing countries (Barbados, Benin, Brazil, Chile, Egypt, Guinea, India, Iran, Morocco, Philippines, South Africa, Thailand, Uganda and Vietnam).

The case studies were produced by fisheries experts from the countries. The studies were not necessarily consistent in terms of their methodology (terminology used, interpretation of causes and effects and criteria for identifying specific constraints). Nevertheless, an attempt has been made to summarize the results of the studies for this paper (table 2). The categories of issues listed were developed by the authors to facilitate identification of common themes and evaluation of relative importance. Table 2 should be interpreted broadly, but is considered by the authors to provide a useful overview of the constraints reported in the studies.

Among developing countries a lack of resources and general management capacity, limitations in funding, scientific knowledge, and the ability of the stakeholders and public to participate because of poor education, featured heavily in the responses. Political factors such as an inadequate policy or legal framework, prevalence of open access fisheries (an issue also linked to equity), a lack of political will, occurrences of political interference and a focus on short-term priorities were also important. Conflicts between users (table 2) could reflect either, or both, of poor institutional mechanisms or fundamental political issues such as equity, lack of suitable alternatives or inadequately defined objectives.

The developed country respondents tended to emphasize more specific difficulties than the developing countries identifying, for example, problems in consulting with

differing stakeholders in specific fisheries, problems in the legal and policy frameworks including in relation to access rights, natural variability in populations and, in one case, the problems caused by the highly migratory nature of many shark species. However, capacity and funding are clearly also problems in these countries.

Of particular relevance to the implementation of the Code of Conduct and global initiatives to implement an EAF is the 2002 report of the United States of America's National Marine Fisheries Service (NMFS) to Congress. The report states that '... While minor stocks may be important in an ecosystem context, they are not the primary target species of directed fisheries. Therefore, due to funding constraints and other management concerns, these stocks cannot be given the same level of priority that targeted fisheries must be given...' (NMFS 2002). This problem almost certainly confronts fisheries management in most if not all other countries. It is widely agreed, however, that serious, appropriately precautionary single-species management including a fundamental reduction in overall fishing mortality could go a long way towards achieving sustainable and productive fisheries (NRC 1999). The FAO guidelines on an EAF also recognize the problem of priorities raised in the NMFS (2002) report and suggest that 'EAF ... is likely to be adopted as an incremental extension of current fisheries management approaches' (FAO 2003*a*).

(**d**) *Social attitudes and political will*

Most of the constraints listed in table 2 can be split into two broad groups: insufficient capacity and political constraints (table 3). A high incidence of IUU fishing was placed in the category 'others' because it could be a result of either, or both, of insufficient capacity of the responsible agencies to perform the tasks required or political constraints, as discussed in § 4b. It is therefore a result of constraints rather than a constraint in itself. The categories grouped under 'insufficient resources' were generally ranked higher than those under 'political constraints' based on the total number of times a constraint was identified by the respondents (table 2). However, this could be misleading, as a major cause of the provision of insufficient resources is a political constraint: governments that are presumably unable or unwilling to provide the resources required for responsible management. Hence, it is argued that the underlying problem is political in that the long-term value of sustainable fisheries is not recognized or it is considered of lower priority than other pressing issues and activities. In this paper, 'political attitudes' refers not only to governments but also to the attitudes and priorities of society as a whole. The latter would typically be the driving force of government will.

The reality of inadequate financial and management resources, not least the resources needed to find suitable alternatives for those deprived of livelihoods by reductions in fishing effort, confronts all countries. In the technical guidelines for the EAF, FAO proposed that an anticipated lack of investment in the implementation of the EAF and conflicts between short-term political goals and long-term perspectives could threaten the effective implementation of EAF (FAO 2003*a*). Similarly, Costanza *et al.* (1997) maintained that ecosystem services (which they defined as including good and services) were frequently assigned too low a priority in policy decisions. They argued that this occurred because ecosystem services are not properly reflected in commercial markets. In the case of fisheries, the economic performance of the fisheries sector is measured largely in terms of costs and benefits, where the benefits refer to the value of the catch and related products. The failure to include fish capital (i.e. biomass) in economic evaluations means that, at least in the short-term, depletion of fish stocks is not perceived to be a real cost of fishing (FAO 2003*a*).

Balmford *et al.* (2002) also identify the failure to consider the value of ecosystem services as a primary reason for global failure to conserve natural resources. Because the user who gains the short-term benefits from natural resources rarely has to pay the long-term price of the lost services, these costs tend to accrue to society as a whole, although this may frequently not be recognized by society. This phenomenon underlies the tendency to focus on short-term social and economic benefits in fisheries, with little consideration for the longer-term biological consequences: the age-old tendency to prefer 'a bird in the hand to two in the bush' (Cochrane *et al.* 1998).

(**e**) *Subsidies*

Balmford *et al.* (2002) drew attention to the important role of perverse incentives, including many forms of government subsidies, that encourage short-term development but which over the longer-term lead to economic inefficiencies and further reductions in ecological services, including size and productivity of fishery resources. Despite the focus of international attention on fisheries subsidies in fora such as FAO, OECD, UNEP and WSSD, the full extent and detrimental impact of subsidies on fisheries is still not known nor fully appreciated by some governments and important sectors of industry because of the sensitive short-term economic considerations involved. The extensive work of Milazzo (1998) on subsidies in fisheries highlighted the problems. He stated, *inter alia*, that they clearly promoted excessive levels of effort and capacity; that developed countries accounted for the majority of subsidies; that they are highly non-transparent and they are environmentally harmful (less than 5% of subsidies are so called 'good' subsidies). Similarly, Porter (2000) reported that '...Subsidies to fisheries production may be the most environmentally destructive natural resource subsidies of all. Fisheries subsidies have been a major factor in the global fisheries crisis of the past two decades.... Ignoring the devastating effect of vastly increased fishing effort on fishing stocks, some major fishing states have been subsidizing their fishing industries for decades'. The debate on fisheries subsidies is far from over. Many hard decisions will need to be taken by governments to minimize the adverse effects of subsidies on the sustainable management of fisheries.

(**f**) *Capacity in developing countries*

The shortfalls in capacity and financial resources experienced by developing countries are recognized in many of the more recent international fisheries instruments. Article V of the Code of Conduct, which addresses the Special Requirements of Developing Countries, states: '... countries, relevant international organizations ... and financial institutions should give full recognition to the special

Table 2. Constraints identified by countries participating in the case studies on implementation of the 1995 FAO Code of Conduct for Responsible Fisheries (FAO 2003*d*).
(The number in brackets in the column headings indicates the number of respondents.)

	number of references	
	developing countries (14)	developed countries (2)
lack of capacity	7	
lack of funds	6	
problems with policy or legal framework	6	1
inadequate scientific knowledge	4	
open access fisheries	4	
poor education of fishers	4	
conflicts between users	3	
emphasis on short-term objectives	3	
institutional weaknesses and poor consultation	3	2
insufficient political will	2	
poverty and demography	2	
political interference	2	
low public awareness	1	
variability or complexity in resource dynamics	1	2
poor international cooperation	1	
resistance by fishers	1	
low national capacity as a result of dominance by foreign fleets	1	
a high incidence of IUU fishing	1	
equity issues	0	1
total	52	6

requirements of developing countries ...' (FAO 1995). The IPOAs on IUU, seabirds and fishing capacity all draw attention to the requirements of Article 5 of the Code of Conduct, while the IPOA-sharks calls on FAO to provide assistance to States but without specifying developing countries (FAO 1999). Part VII of the UN Fish Stocks Agreement, as noted above, similarly makes note of the 'Requirements of Developing States', as do Article 20 of the CBD and the WSSD Declaration on Sustainable Development and the Plan of Implementation. Importantly, in a demonstrative step forward to assist developing countries meet their obligations under the 1995 UN Fish Stocks Agreement, the UNGA agreed at its 2003 session to establish an assistance fund under Part VII of the Agreement. This fund, expected to become operational in 2004, will be administered by FAO in collaboration with the UN.

Unfortunately, delivery on assistance to developing countries as provided for in these instruments falls far short of the real needs. At the Twenty-fifth Session of COFI there was a strong call, particularly from developing countries, for greater technical and financial assistance and training (FAO 2003*c*). Reinforcing the results of the case studies on implementation of the Code of Conduct, developing country Members reported that lack of capacity was constraining implementation of the Code of Conduct and the IPOAs. Countries of Latin America and the Caribbean presented a Declaration to COFI that stated, *inter alia*, '...the support of the international community and of FAO was needed to assist in the development of sustainable fisheries and the generation of food...'. The Declaration also drew attention to areas in the region that required strong assistance from the international community and FAO to alleviate poverty and to meet food requirements for their human populations. Commenting at the Twelfth Meeting of the Conference of the Parties to CITES in 2002, FAO reported that a lack of funding had resulted in the slow progress in implementation of the IPOA-sharks (CITES 2002*b*).

CITES has encountered similar difficulties in implementing its regulations. Referring to the problems being encountered by Caspian Sea States in conforming with CITES requirements, it was reported that '... the Standing Committee or the Secretariat could not have foreseen that such limited success would have been achieved in obtaining external technical and financial support for improving aspects of fisheries management in the region. It is not appropriate to penalize the littoral States for failing to make complex and expensive technical improvements to modernize their management programmes on their own, when these improvements could only have been achieved through inputs that were not available to them ...' (CITES 2002*a*).

Recognizing the importance of aid and technical assistance to developing countries, the WSSD Plan of Implementation urged developed countries to work towards a target of providing 0.7% of their gross national product in development aid (WSSD 2002). Developed countries are still far from this target and, in fact, between 1990 and 2001, development assistance fell from an average of 0.33% to 0.22% of gross national income of donor countries. It is notable and possibly encouraging that there has been a slight increase in this percentage since 2001 (UNDP 2003).

Overall, high expectations concerning the long-term sustainable development of fisheries have been reflected in comprehensive, far-sighted and potentially effective global policies and visions. However, so far, it seems evident that

Table 3. Fundamental nature of the constraints identified in the FAO case studies.
(The entries under each column heading are the categories used in table 2.)

insufficient capacity	political constraints	others
lack of technical capacity	open access fisheries	variability or complexity in resource dynamics
lack of funds	conflicts between users	a high incidence of IUU fishing
problems with policy or legal framework	emphasis on short-term objectives	
inadequate scientific knowledge	insufficient political will	
poor education of fishers	poverty and demography	
institutional weaknesses and poor consultation	political interference	
low public awareness	poor international cooperation	
	resistance by fishers	
	low national capacity as a result of dominance by foreign fleets	
	equity issues	

society as a whole is unable or unwilling to pay the costs required to ensure that these expectations are realized.

5. COVERING THE COSTS

A key underlying constraint preventing satisfactory progress in implementing the global fisheries agreements and instruments is therefore simple: social and economic pressures favour the short-term benefits, all too frequently with long-term costs (Cochrane 2000). Given that the problem is driven by society's priorities, as reflected through approaches to governance, the solutions must logically lie in the same realm. Undoubtedly, much can be achieved by addressing the important constraints in improving the biological and ecological aspects of fisheries management. Overcoming some of the scientific problems facing fisheries would, in conjunction with good governance, contribute to improved management. The establishment of better systems of data collection and monitoring, improving the biological and ecological knowledge relevant to fisheries management, improved methods of stock assessment that take better account of uncertainties, especially in multi-species and data-poor fisheries, the development of fishing methods and gear that reduce or eliminate unwanted bycatch and damage to the substrate will all contribute within an appropriate governance environment to more responsible and productive fisheries. Ultimately, such improvements will be essential for effective management for sustainable use of fishery resources. However, unless the attitudes of society can be changed to place appropriate value on sustained ecosystem goods and services, leading to changes in political will and governance, the benefits of such scientific and technological improvements will be swept aside as society and the practices and policies of the governments that serve society continue to focus on the short-term.

The need to gain the support of society is well recognized by the CBD and is elaborated in Decision 6 from the Fifth Conference of the Parties, dealing with the ecosystem approach (CBD 2000). Principle 1 of the CBD interpretation of the ecosystem approach recognizes that the objectives of management of land, water and living resources are a matter of societal choice and that management needs to take this into account. Benefits from natural resources should be distributed in a fair and equitable manner. Principle 4 directly addresses the need to take the economic context into account when managing ecosystems and proposes three economic requirements for effective management. These CBD principles address similar underlying issues as those proposed by Balmford *et al.* (2002). To achieve the objectives of sustainable use, the first requirement is to remove all market distortions that negatively impact on biodiversity (or, in a fisheries context, the status and productivity of the fish resources and their ecosystem), while the second requirement is a positive complement to the first requiring the implementation of incentives to promote 'biodiversity, conservation and sustainable use'. Finally, addressing the problem of the user rarely paying the full costs, CBD (2000) recommends that as far as possible the costs and benefits from using the ecosystem should be internalized so that the beneficiaries also pay the costs. In the case of fisheries, internalizing the costs could include, for example, ensuring that all activities that impact on marine ecosystems cover the true costs of those activities. That would include fishing but also recreational use, transport, impacts of land-based activities and others. Clearly, the consumers of fish products and beneficiaries from other ecosystem services would then also need to pay the full costs of benefits that he or she receives.

Balmford *et al.* (2002) discussed the lack of information on the nature and value of ecosystem services and the need to ensure that policy-makers are better informed on the real costs and benefits of alternative options. FAO (2003*a*) extended this discussion and proposed that society as a whole needs to be better informed on the true costs and benefits of options in fisheries management, through a programme of provision of information, education and training. In this way, the societal choice referred to by the CBD may be influenced to take a longer-term view of the use of fishery resources.

The need to create positive incentives for responsible fisheries is well recognized. Existing MCS systems in fisheries are commonly stretched to their limits and massively underfunded. Even where IUU fishing is contained, existing systems have rarely been found to be highly effective against problems such as discarding of catch and high-grading of species. Over-reliance on top-down enforcement of centrally determined fisheries policies and regulations, a command and control or 'exclusive' approach, is well recognized as

one of the problems in modern fisheries management. Greater voluntary compliance by fishers is essential for the future of fisheries and such compliance can usually be achieved only through participatory or 'inclusive' approaches to management (Charles 1998; Pinkerton 2002). Nonetheless, the key issue that clearly must still be resolved is who should pay for management (FAO 2003*a*). The need for the commercial fishing industry to cover a greater proportion of the costs of fisheries management, including the costs of administration, observer programmes, research and MCS, and the impacts of fisheries on the ecosystem is now widely accepted and gaining momentum in practice. However, the benefits of responsible fisheries are enjoyed not only by the fishing industry but also by society as a whole, and the costs need to be shared between all the beneficiaries. The problem is even harder to resolve when addressing subsistence fishers and fishers living in poverty with limited or no alternative sources of livelihood.

The need for an appropriate system of long-term user rights is now a part of established fisheries doctrine, although much progress is still required to achieve global implementation. Long-term rights, operating within an effectively regulated social, economic and political environment, should give the individual or group rights-holders incentives to use the resources and ecosystem responsibly, and in a socially and economically optimal manner so that the value of their right is maintained or increased. User rights can be issued to companies, individuals or groups, such as local communities (FAO 2003*a*). The initial allocation of rights can be highly controversial as it deals with issues such as allocation of wealth and equity (Pearce 1994; Cochrane & Payne 1998). In the case of rights being allocated to local communities, the fishing community itself could take responsibility for allocation of benefits within the community. This could both facilitate equitable distribution of benefits and alleviate the negative impacts that would be generated by excluding some fishers or fishing units in an externally imposed reduction of fishing effort (Jentoft 1989; Doulman 1993).

Access rights do not address, and will not solve, all the problems and while facilitating sustainable use, they do not ensure it. A holder of secure rights, whether individual, community or corporation may still favour the short-term gains of over-exploitation if faced by immediate threats to their livelihood (Cochrane *et al.* 1998). The sustainable use of fishery and all natural resources will only be selected by society if their own futures are secure and the WSSD Plan of Implementation agreed that ' . . . Eradicating poverty is the greatest global challenge facing the world today and an indispensable requirement for sustainable development, particularly for developing countries . . .' (WSSD 2002). The Plan also recognized that each country is primarily responsible for ensuring its own sustainable development and poverty eradication, but that wider support and action is required to assist them to achieve this goal. WSSD set a goal of halving by 2015 the number of people who receive an income of less than US$1 a day, currently estimated at 1.2 billion, and of those who suffer from hunger and do not have access to safe drinking water.

Market forces can also play a role in creating positive incentives. The use of eco-labelling has grown in recent decades although it is still very much in its infancy in fisheries. The theory of eco-labelling is that environmentally conscious consumers will favour and possibly be willing to pay more for products that they know have been produced in a sustainable and responsible manner (Wessels *et al.* 2001). Nevertheless, eco-labelling has yet to demonstrate a widespread benefit to the promotion of sustainable fisheries. Some of the problems and concerns with eco-labelling include: complaints about a lack of transparency in the development of standards; anxiety that eco-labelling could provide opportunities for countries to establish barriers to international trade, thereby protecting their domestic industries; concern about the costs of complying with eco-labelling criteria; and others (Wessels *et al.* 2001). Nevertheless it appears that some progress in this direction is being made and, for example, at the time of writing the Marine Stewardship Council listed seven certified fisheries on its Web site, including New Zealand hoki, Western Australian rock lobster and Alaskan salmon (MSC 2003).

The issues discussed above are only some of the options available to society to promote long-term sustainability in fisheries. Ultimately, the options all come down to creating a willingness in society and their governments to forego some potential short-term benefits for the sake of attaining or maintaining longer-term goals. They will also require society to confront some of the short-term costs associated with a transition towards sustainable fisheries. For the more affluent sectors of society this will require a change in attitudes, for the poorest sectors the most urgent requirement is real progress in development and equity.

6. THE FUTURE?

The foregoing analysis demonstrates that improvements in sustainable use of fisheries require some fundamental changes in societal attitudes and behaviour reflected in improved governance choices. At present, there is limited global pressure to address this matter seriously and comprehensively, and the likelihood of achieving such changes within the next generation, or even in this century, must be considered to be low. However, history is rarely predictable and, for example, the possibility of a major environmental or political crisis forcing humankind into a drastic reappraisal of values cannot be discounted. It is not encouraging though that the crises that have already taken place in marine fisheries so far, for example in relation to the Canadian cod and the state of the resources of the European Community, have not yet provoked a widespread corrective reaction. It is more realistic, therefore, to consider a range of scenarios for the future of fisheries, rather than to make a single forecast. There are many possible scenarios but for the purpose of this paper, three broad ones are suggested.

(a) *Scenario 1*

Status quo: whereby the broad trends in social and economic development, political patterns and societal values and perceptions do not change markedly. This is considered the most likely scenario primarily because, notwithstanding sporadic global crises such as World War II, the collapse of communism and very rapid technological developments, the overall trends in societal values, certainly in the fisheries sector, have tended to be incremental rather than abrupt and steep.

(b) *Scenario 2*

Growing international divide: under this scenario it is assumed that the developed world, and affluent sectors of society generally, surrender hope of closing the social and economic divide and disengage to a large extent from the developing world and poverty eradication programmes. Priority is given to economic growth in developed countries, and developing countries are preoccupied with addressing urgent socio-economic problems, often on an *ad hoc* basis as crises occur. Interest in and support for environmental issues and concerns and for the agencies charged with addressing them is substantially reduced. Reflecting the disparities in wealth and power, developed countries rely more on top-down approaches in their dealings with developing countries rather than on negotiation, consensus building and technical and financial support. Developing countries respond negatively to this change and, preoccupied with immediate national problems, give global environmental concerns lower priority. In terms of fisheries, this scenario would include reduced emphasis on long-term goals of sustainability and restoration in favour of short-term economic performance, greater damage to marine habitats through increased and less responsible use of natural resources in pursuit of short-term economic growth, and reduced aid and assistance to fisheries in developing countries as the developed countries focus increasingly on domestic issues. This scenario is considered extreme but, in light of the current gap and the tensions between rich and poor, the second most likely scenario to evolve of the three scenarios examined in this paper.

(c) *Scenario 3*

Global responsibility: this scenario can be best described by reference to the WSSD Plan of Implementation. Globally, society recognizes a mutual urgency and responsibility for sustainable development and takes action to address seriously the problems of poverty, inequity and unsustainable resource-use practices. For fisheries, this will require, for example, maintaining or restoring stocks to levels capable of producing the maximum sustainable yield; implementing the Code of Conduct for Responsible Fisheries and its related IPOAs; giving due consideration to the rights, duties and interests of coastal States and the special requirements of developing States in the allocation of fishery resources for straddling stocks and highly migratory fish stocks; eliminating subsidies that contribute to IUU fishing and to over-capacity; and maintaining the productivity and biodiversity of important and vulnerable marine and coastal areas. Under this scenario national and regional action to address fisheries conservation and management issues would be greatly heightened. Greater appropriate financial and technical assistance would flow to developing countries and negative impacts such as export of surplus fishing capacity would be substantially reduced. International agencies and RFMOs, the vehicles for promoting international cooperation in fisheries, would be called upon to ensure that more assertive and robust measures were adopted and implemented. RFMOs would be at the operational forefront of such action as envisaged in, *inter alia*, Agenda 21, the UN Millennium Goals (UNGA 2000) and the WSSD Plan of Implementation. This scenario is considered to be the opposite extreme to the previous scenario and, given prevailing trends in environmental governance and development aid, arguably the least likely to happen.

Development assistance can be in the form of direct technical and financial support, debt relief, overseas market access and effective technology transfers. In proposing these scenarios and in considering their consequences for fisheries, it is assumed that for many developing countries, social and economic progress will be substantially slower in the absence of such assistance. Foreign aid to developing countries will not, on its own, overcome the enormous problems these countries face, and the developing countries must take the lead in improving governance in order to manage resources more effectively and in distributing the benefits more equitably. However, they cannot do this on their own. Real progress will require policy changes in developed countries, for example removing barriers to trade and providing debt relief, as well as the provision of large amounts of donor financing to developing countries to assist them to address fundamental needs (UNDP 2003). These issues, among others, formed the basis of negotiations and the adoption of the Monterrey Consensus by the UN International Conference on Financing for Development (UNGA 2000). The Conference focused on ways and means of financing policies and programmes to '... eradicate poverty, achieve sustained economic growth and promote sustainable development ...' and to radically change the lives of 1.2 billion people in the world who subsist on less than US$1 per day. The Conference was also a response to a long-expressed desire by developing countries to address financial resources necessary to achieve international development goals (Anonymous 2002).

It needs to be recognized that aid is not always effective and there have been cases where it has failed absolutely (World Bank 1998). However, there are also examples where aid has been an important contributor to development, for example in the 1960s in Botswana and the Republic of Korea, in Indonesia in the following decade, Bolivia and Ghana in the 1980s, and then in Uganda and Vietnam in the 1990s. Among other findings, a World Bank report concluded that a good policy environment is important for financial aid to be effective but that, under such circumstances, aid has the potential to have a large positive impact on development (World Bank 1998).

Our method of analysis has, out of necessity, been broad and coarse, based primarily on the following principles.

(i) Eradicating poverty is essential for sustainable development, especially in the case of developing countries (WSSD 2002).
(ii) There is a trade-off between striving for short-term economic growth and long-term sustainable use of resources. The two cannot be maximized simultaneously.
(iii) There will be little improvement in the current trends in fishery resources and fisheries without a high level of political will leading to improvements in governance of natural resources.
(iv) Even where there are favourable political will and sound polices in developing countries, increased donor assistance will be required to translate the goals into actions. This must be accompanied by other trade and financial

Table 4. Speculation on the future of fisheries.
(See text for explanation of the scenarios.)

	scenario		
time horizon	1. status quo	2. growing divide	3. global responsibility
5 years ahead	little change in status of stocks; total global catch more or less constant	as for status quo	as for status quo
	some reduction in negative subsidies, some progress in eco-labelling	as for status quo	pressure for greater reduction in negative subsidies, some progress in eco-labelling
	limited attrition in fishing effort in commercial fisheries but too small to make a noticeable impact on stock status	as for status quo	active reductions in fishing effort in some commercial fisheries, but too early for noticeable impact on stock status
	IUU fishing remains a major issue, undermining the work of many RFMOs; slight progress in implementing limited access where necessary	as for status quo	progress in reducing IUU fishing
	little progress in reducing global poverty, fisheries still occupation of last resort for many coastal communities in developing countries	no progress in reducing global poverty, fisheries still occupation of last resort for many coastal communities in developing countries; faced with growing socio-economic problems, some developing countries beginning to resist pressures to implement global instruments they see as having few short-term benefits	progress in developing plans to reduce global poverty, but too early for benefits to be demonstrated
	growth in external negative impacts (e.g. pollution, habitat destruction, coastal zone development), with impacts in particular on small-scale fishing communities	as for status quo	greater pressure to address external negative impacts (e.g. pollution, habitat destruction, coastal zone development) through improved coastal zone management
	some progress in implementing improved technical measures (e.g. protected areas, more responsible gear and fishing practices)	as for status quo	as a result of education and cooperation, greater progress in implementing effective technical measures
	continued tensions between fisheries and environmental concerns; little governmental attention to environmental education and general public divided on the issues	as for status quo	ongoing dialogue between fisheries and environmental agencies and stakeholders; government-backed plans for programmes to inform and involve general public
10 years ahead	measurable decline in overall status of stocks, global catch declining	preoccupation with economic growth leads to more rapid decline in status of stocks; total global catch declines	improved status of several species, global catches possibly declining but slight increase in diversity and value
	considerable reduction in negative subsidies, eco-labelling reached a plateau with some but limited benefits	same preoccupation as for 1; means many subsidies maintained, eco-labelling makes little progress	few negative subsidies remain, eco-labelling growing, some governments providing positive incentives; greater support to management bodies from governments
	ongoing slow reduction in fishing effort in commercial fisheries but still substantial over-capacity; further slow progress in limiting access	as for status quo	good progress in reducing fishing effort in commercial fisheries and implementing appropriate systems of access rights

(Continued.)

Table 4. (Continued.)

	scenario		
time horizon	1. status quo	2. growing divide	3. global responsibility
	IUU fishing starts to recede as instruments start to be implemented and alternative solutions sought and implemented	no progress in reducing global poverty, further deterioration in inshore resources and ecosystems; developing countries seeking own solutions and neglecting low-priority global instruments, although still participating in organizations	the incidence of IUU fishing greatly reduced
	little change in most developing countries, and opportunities for alternative employment remain limited; livelihoods of fishers and status of inshore stocks remain poor	further degradation of inshore habitats and associated resources	with good international cooperation, signs of improvements in human development indicators in several developing countries; plans to limit access and develop alternatives for displaced fishers in these countries
	pollution, habitat destruction, coastal zone development still growing problems	as for status quo	widespread measures to limit negative impacts from external sources.
	effective technical measures widely implemented in most developed countries and commercial fisheries, but benefits largely negated by excess effort	as for status quo	benefits of effective direct management measures, complemented by appropriate reductions in fishing effort, start to accrue in some fisheries
	general public still divided on conflict between short- and long-term goals	tensions between governments and private sector and environmental interest groups growing, but environmental concerns having declining influence; minimal government attention to environmental education and majority of general public largely apathetic	progress in reconciling conflicting objectives in many fisheries and developing agreed management plans; increasing acceptance by public of need to raise priority of long-term objectives
20 years ahead	further decline in overall status of stocks, and continued global decline in landings	significant declines in overall status of stocks and global landings; marine biodiversity substantially impacted, increasing incidence of species extirpations	good progress in status of stocks, global catches possibly lower than current, but improvements in many higher-value species
	negative subsidies largely removed, eco-labelling maintains plateau	some subsidies retained for economic productivity and political expedience	no negative subsidies remain, eco-labelling widespread; well-established positive incentives in most countries
	fishing effort in commercial fisheries stabilized, but still at levels above economic and biological optima	stable commercial fishing effort but still at sub-optimal levels	fishing effort generally commensurate with productivity of the resources; few truly open-access and 'last-resort' fisheries remain
	livelihoods of fishers and status of inshore stocks in developing countries remains poor, possibly deteriorating	poor, possibly deteriorating, livelihoods of fishers and status of inshore stocks in many developing countries	good progress in improving global human development and gap between rich and poor diminishing although still substantial
	declining populations in developed countries and greater concern for environmental issues may have led to stabilization in pollution etc., but risk that increased *per capita* consumption particularly among more affluent could negate this effect	emphasis on economic development leads to further environmental degradation; reliance on short-term technological solutions to mitigate impacts of environmental problems	further progress in limiting negative impacts from external sources
	growing concern among some members of public but largely ineffectual	general public interest in environmental issues declining with little attention being given to environmental education and raising awareness	good progress in achieving objectives of WSSD plan of implementation; widespread publi support for goals of sustainable development, especially in most recent generation

measures and policies designed to facilitate sustainable development in needy countries (UNDP 2003).

(v) Political will is largely driven by society in each country, but with an imbalance favouring the interests of capital (McGoodwin 1990; Symes 1996; Cochrane 2000). In practice, these driving forces favour short-term social and economic goals over sustainable use, as indicated by the failure of governments to make adequate progress towards sustainable use of natural resources.

(vi) Changing societal and governmental perspectives on the need for real change towards sustainable use will require education and awareness building (WSSD 2002).

Working from this base, the results contain no radical surprises (table 4). The most likely scenario, wherein there will be no substantial changes in environmental policies and their relative priority in most countries, is considered to be insufficient to avoid further degradation in natural resources, including fishery resources and their ecosystems. Implementation fatigue will continue and could grow within all countries. Under the second scenario, a growing international divide, the developed countries would have the potential to make progress towards sustainable use but give higher priority to short-term economic growth. For the Earth as a whole, a marked deterioration in the status of marine stocks and ecosystems would be expected. To achieve the third, desirable, strategy of global responsibility, the implementation of the global fisheries instruments, most recently reflected in the WSSD Plan of Implementation, will need to be addressed more rigorously and critically than has been the case so far. The negative impacts on resources and ecosystems come not only from fisheries but from a wide range of other human activities as well and they will need to be addressed as seriously. This paper cannot explore these topics but they are well covered in the Plan of Implementation of the World Summit on Sustainable Development. Overall, for substantive improvements in fisheries management, and resource management in general, major changes in societal priorities and behaviour, leading to improved governance, will be needed. This will have to be accompanied by the awareness of all countries of the global nature of the problems, including the problem of poverty, and of the global responsibilities to address them.

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GLOSSARY

CBD: Convention on Biological Diversity
CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora
COFI: FAO Committee on Fisheries
EAF: ecosystem approach to fisheries
FAO: Food and Agriculture Organization of the United Nations
ICFA: International Coalition of Fisheries Associations
IPOA: international plan of action
IUU: illegal, unreported and unregulated
MCS: monitoring, control and surveillance
NGO: non-governmental organization
NMFS: National Marine Fisheries Service
NPOA: national plan of action
OECD: Organisation for Economic Co-operation and Development
RFMO: regional fishery management organization
UN: United Nations
UNCED: United Nations Conference on Environment and Development
UNEP: United Nations Environment Programme
UNGA: United Nations General Assembly
VMS: vessel monitoring system
WSSD: World Summit on Sustainable Development