

SEAFOOD CERTIFICATION AND ECOLABELLING: A NEW WRAPPING ON FISHERIES RESOURCE MANAGEMENT?

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ABSTRACT

With heightened media attention on the poor state of world fish stocks and the environmental impacts of aquaculture production methods, both governments and seafood industries are keen to demonstrate support for improved management measures. This paper includes results from a DFID funded project concerned with seafood certification, ecolabelling and developing economies. The focus is upon the potential implications of the shift in management power throughout the seafood value chain and the increased reliance upon market-based measures to encourage sustainable production. Certification of fishing and aquaculture operations gives consumers a cue to help distinguish between products on criteria such as sustainability, welfare, health and safety etc. The increased prevalence of certification schemes internationally can be seen as a shift in power, and potentially responsibility, from governments to consumers. It is suggested that this drift may widen as the traditional national regulators lose the power to determine international certification criteria and the public uses purchasing power to determine how their food is produced. Whilst there may be proclaimed benefits of certification and ecolabelling, the paper suggests there could also be adverse consequences for the future development of aquatic food sectors. The advent of certification as a prerequisite for international markets can impose costs, particularly in developing countries without corresponding benefits for all others along the value chain. Mixed fisheries and transboundary stocks present particular challenges to certification, whilst also being more demanding of conventional resource management measures. New species, and those new to markets, where consumers have yet to accurately signal their emergent value may encourage less stringent management measures. Improved understanding of these potential problems is vital if more effective management measures are to be delivered.

Keywords: Certification, Ecolabelling Marketing Management

INTRODUCTION

The global seafood trade stretches across continents, involving everyone from the smallest artisanal fisheries and fish farmers to factory ships and intensive transnational aquaculture organisations. Not surprisingly, there are huge differences in the quality and range of products and production methods. Health, safety, environmental and welfare issues are interlinked with the production and end product, so how does the conscientious seafood buyer decide which products to purchase? There is a whole range of mandatory standards and voluntary certification schemes which aim to ensure products meet minimum levels of stipulated criteria. Certification is the procedure through which recognised (or accredited) certification bodies provide written or equivalent assurance that a product conforms to certain principles, criteria or standards [1]. Mandatory standards, usually set by importing governments, tend to be those concerned with health and safety, such as prohibiting use of banned chemicals and setting maximum levels of contaminants and bacteria in food. Voluntary schemes include guidelines on environmental impacts, welfare and quality management issues, such as 'organic' seafood and other ecolabels. The different certification schemes will be covered in the next section.

The first ecolabel, "Blauer Engel" (Blue Angel) was established in Germany in 1977. Since the late 1980s a number of national labelling systems have been set up in different countries, to satisfy consumer demands to purchase greener products [2,3]. Examples include: Green Seal (US), Nordic Swan (Sweden), and Eco-mark (Japan). The concept of ecolabelling was internationally recognized in 1992, when participants at the UN environmental committee (UNCED) agreed to promote initiatives that allow informed consumer choice [4,5]. The majority of ecolabels have been created in developed countries, but there are some with developing country origins, such as Indocert (India), Shrimp Seal of Quality (Bangladesh) and Thai Quality Shrimp (Thailand).

The history of ecolabelling in the fisheries sector is short and actual experiences of ecolabelling are limited, with the 'dolphin-safe' label on canned tuna one of the best-known examples, along with the more recent 'turtle-safe' label put on shrimp and shrimp products [6]. These schemes guarantee consumers a reduction of the by-catch of dolphins and turtles respectively. The Marine Stewardship Council (MSC), set up in 1997 by the WWF and Unilever, the world's largest seafood buyer, has an ecolabel scheme for certification of wild-caught seafood products from sustainable sources. The MSC became independent from its founders in 1999. Currently, 40 fisheries worldwide are engaged in the MSC programme, representing over three million tonnes of seafood annually, and 14 of these fisheries have met the MSC standard. Worldwide there are now more than 300 seafood products bearing the MSC eco-label in 24 countries. The global retail value of MSC-labelled seafood in 2004/05 was \$133,609,933 [7].

The growing interest in organic and ethical production and trade has been both consumer driven and trade driven [8], and supported by many western governments. A 1997 report by the US Environmental Defence Fund (EDF) recommended that organic certification and other eco-certification programs should be established that empower consumers to choose aquaculture products grown in an environmentally sound manner and give aquaculturists incentives to produce products which can bring higher prices [9]. The establishment in 1998 of an Ethical Trading Initiative (ETI) by a group of large British companies, non-governmental organisations (NGOs) and trades unions, funded by the Department for International Development (DFID), marked a significant step in building dialogue between business and development organisations and in raising the profile of the ethical agenda [8]. Ecolabelling schemes can have differing benefits and costs, and are therefore not supported by everyone. One of the main concerns of developing country governments and producers is that the schemes can act as non-tariff trade barriers by setting criteria which are very costly or difficult to meet. This and the many other costs and benefits of ecolabelling are discussed later.

The subject of sustainable seafood production has received increasing amounts of coverage in the western media during the past year. As a result, public awareness of the issues involved has increased and consumers are demanding more information on the seafood products that are on offer, not only in retail outlets but also in restaurants. A recent poll of European consumer and industry attitudes towards seafood found that most respondents regard environmental impact as an important factor in purchasing choices. The vast majority, 86%, of consumers said that they would prefer to buy seafood labelled as environmentally friendly, with a similar response from industry professionals [10,11]. When asked whether they would pay a premium for sustainable seafood, 40% of consumers answered that they were willing to pay 5-10% more.

With growing awareness and pressure to choose sustainable seafood products over others, consumers need reliable ways to distinguish between products. Is private certification of fishing and aquaculture operations the way to do this? Should capture fisheries and aquaculture be considered separately or together, and what are the implications for resource management? What role should governments play with regards to resource management? Are we letting them off their duty to maintain our resources by accepting that they are failing and by supporting private certification as the remedy? Effective monitoring and managing fish stocks is notoriously difficult, as evident from the global state of fish stocks. Contributing factors are the limits to scientific knowledge of stocks, measurement, monitoring and controlling fishing effort, changing natural environmental conditions amongst other reasons. So how can certifying companies claim to guarantee certain fishing operations are sustainable? Mixed species fisheries and stocks that are shared between countries only complicate their management further. Is private certification the best treatment for the failure of conventional resource management measures? Who wins and who loses when seafood products become certified? This paper will discuss the possible directions for seafood certification and ecolabelling with regards to fisheries resource management and the implications of these.

CERTIFICATION SCHEMES

There are currently many certification schemes that can be used to certify fisheries and aquaculture activities, with the end product displaying a label or logo to inform consumers of the certification. In addition to these 'eco-labels', there are perhaps hundreds of additional guidelines, codes of conduct, and best practice guides which propose working practices for improving environmental, welfare, social and other issues involved with seafood production. These schemes do not have associated logos, and therefore the consumer is not normally aware of them and able to make consumption decisions based on them. This paper will only consider the certification schemes with logos visible to consumers. Most seafood certification schemes are voluntary, but a few are mandatory. Some international

agreements on trade aim to restrict the use of certification and labelling, arguing that they act as non-tariff trade barriers.

Voluntary certification schemes

The main voluntary certification schemes that are currently in use around the world can be divided into organic, environmental, ethical, quality management and other multifactorial schemes. Those covered here are by no means comprehensive, due to the sheer number of certification schemes that exist and that are changing all the time.

Organic schemes

Organic certification schemes were originally developed for terrestrial food production, and many are currently being extended to include seafood. Most of the schemes are only being applied to farmed seafood production since there is not enough control over the inputs into wild fisheries to enable all the standards involved in organic certification to be met. However, there is currently a debate going on in the USA as to whether wild fish should be allowed to be certified organic, and whether farmed fish can justifiably be produced organically since they are not produced in 'natural' conditions. Organic certification bodies include: Soil Association (UK); Naturland (Germany); Label AB (France); Krav (Sweden); Debio (Norway); Bio Suisse (Switzerland); USDA Organic Food Program (USA); NASAA (Australia); BioGro (New Zealand); OFDC (China); JAS (Japan); and Indocert (India).

Environmental schemes

These schemes are concerned with the environmental impacts related to production of goods, in some cases specifically seafood. With seafood, these schemes tend to mostly address capture fisheries rather than aquaculture, and are often known as 'eco-labels'. Other, non-specific schemes are more concerned with the general environmental performance of the organisation to be certified, e.g. ISO standards. Examples of environmental schemes include: Marine Stewardship Council (UK); Friend of the Sea; KRAV Sustainable Fisheries (Scandinavia); ISO 14001; EMAS (Europe); Svane (Nordic); Blaue Engel (German); Hong Kong Green Label; and China Environmental Labelling.

Ethical schemes

The ethics of production are the central theme of these schemes, and include welfare issues such as working conditions, fair trade and fair wages, and health and safety. Examples include: Fairtrade Labelling Organisations (FLO); Ethical Trading Initiative (ETI); International Federation for Alternative Trade (IFAT); Social Accountability International (SAI); Alter-Trade Japan (ATJ); and RSPCA Freedom Food.

Quality management schemes

These schemes are concerned with minimum levels of quality and health, and safety of products. Examples include: ISO 9001 & ISO 22000; Tartan Quality Mark (Scottish Quality Salmon); Safe Quality Food 1000 Code & 2000 Code; Protected Designation of Origin, and Protected Geographical Indication (Europe). Many countries and regions have a generic label for their produce as a marketing strategy, hoping for consumers to associate food from their area with a certain quality standard. For example, Chile recently unveiled a new branding campaign which aims to boost the image of the country's exports, tourism and investment opportunities. The new logo includes the phrase 'Chile – All ways surprising'. Chilean aquaculture and fish products will now be associated with the new brand [12]. Other examples include Alaskan seafood, and 'Norge' seafood from Norway.

Other schemes

Many schemes encompass a range of issues involved in seafood production, including environmental, ethical, quality, safety and other issues. Some others are single-issue schemes. Examples of both include: Shrimp Seal of

Quality (Bangladesh); Global Aquaculture Alliance Best Aquaculture Practices Standards; Thai Quality Shrimp; EurepGAP Aquaculture Assurance Standard (Europe); and Safe Harbor Low Mercury Seafood.

Supermarket brands

Since the mid-1990s, there has been much greater emphasis on premium-quality own labels, e.g. Tesco's 'Finest' and Sainsbury's 'Taste the Difference'. These make choosing a better quality product much easier for consumers since the same brand can be found on many different types of products within a store. Some supermarkets have environmental policies which cover all goods in a category that are sold in store. For example, Marks & Spencer only source sustainable fish and they have high animal welfare standards for the meat they source. This means consumers can associate certain supermarket brands with specific standards, allowing consumers to shop without having to worry about the production methods behind the food they are buying.

Mandatory standards

There are a few mandatory standards that affect production methods or labelling of seafood products

Health and safety standards

Hazard Analysis and Critical Control Points (HACCP) is a systematic process which Governments worldwide have legislated to compel adoption. HACCP systems ensure companies prove that food safety requirements have been met [13]. HACCP does not have a visible label on products since all products must comply with the standards.

Traceability labelling

Country of Origin Labelling (COOL) - enforced by the US Dept of Agriculture since April 2005 requires supermarkets nationwide to identify which country the fish they sell comes from and whether it is farm-raised or caught wild. The rule applies to most fresh and frozen fish and shellfish, including lobsters, crabs and oysters. Not covered by the label rules are processed foods, including canned tuna and fish sticks, along with seafood that is cured, smoked or combined with other foods or sauces [14]. Country of origin labelling for meat, originally proposed for 2004, has been blocked in the US., House-Senate negotiators agreed to postpone it until 2008 after meatpackers and supermarkets opposition claiming it to be a record-keeping nightmare [15].

EU origin and wild/farmed labelling - EU regulations from 2002 require that the United Nations Food and Agricultural Organisation (FAO) fishing area or country of production is stated on the box and that the fish are labelled 'wild' or 'farmed' [16].

Restrictions on certification and labeling

World Trade Organisation (WTO) rules prohibit mandatory ecolabelling by governments, but voluntary ecolabelling schemes are allowed. However, countries including Korea, the United States and China are claiming that ecolabelling damages their competitiveness and acts as a barrier to trade. A proposal to outlaw many types of labelling is currently up for discussion at the WTO's ongoing negotiations [17].

THE BENEFITS AND COSTS OF CERTIFICATION

Economic benefits and costs

Certification schemes may allow market access for responsibly produced products. Adding value to products through certification can potentially increase incomes throughout the supply chain. Certified products can command a premium and differentiate the product from others, and this have the potential to slow or reverse the trend of the commoditisation of seafood, which has happened with salmon and shrimp production. The premium naturally depends on the health, environmental or social awareness of consumers, the credibility of the relevant eco-label and the market for ecolabelled products [18].

There is likely to be reduced risk for seafood industry investors and insurers since processes are under greater regulation, must adhere to standards, and are likely to be more transparent and accountable [19]. Therefore developing country producers of certified seafood may find it easier to attract investors, either from their own country or foreign investment. This will only be beneficial if some of the invested money stays within the country, or if infrastructure and services are improved as a result of the investment. Some governments have expressed interest in using aquaculture certification systems as a basis for permitting and licensing producers [19].

Certification fees can be prohibitively expensive, particularly for small producers in developing countries. However, there are some grants available, such as the WWF small grants fund which provides up to \$15,000 for community fisheries certification [19]. Often the certification of a fishery is a very lengthy and costly process. For example, the Alaska pollock fishery took 3.5 years and cost an estimated \$500,000 to certify as sustainable under Marine Stewardship Council (MSC) criteria [12]. When choosing certifiers, fisheries seeking certification often opt for experience, putting heavy pressure on the most experienced certifiers and further delaying decisions on certification [12].

In addition to the fees, changing to better management practices, particularly when infrastructure changes are needed, might prove prohibitively expensive for small scale farmers who are not able to wait for possible long term economic benefits [1,5]. Value added revenue gained from certifying products may not be equally distributed throughout the supply chain, and poor producers may see little of the profits from certification. Producers must choose which of the many certification schemes would be best for them, taking into account their target market, since many of the schemes will not be recognised by consumers in all countries. If the market for a certified product dries up in the country in which the certification scheme is based, the certification may not be recognised in other countries and the product may have to be sold there as if uncertified and at a lower price.

Certification schemes may function as non-tariff barriers to trade and allow countries to effectively impose their standards on other countries or risk losing trade. When the dolphin-safe label came into widespread use it became almost impossible to find canned tuna which was not labelled as dolphin-safe, even when it originated from dolphin-free fisheries, illustrating how difficult it became to market tuna without the label. This shows that ecolabels have the potential to tune a market, making access difficult if not impossible without the label. For a developing nation, this should be of special concern [6].

Without first increasing awareness and capacity to accelerate their application, new certification schemes and standards may impede trade from developing countries and reduce smallholder competitiveness [1]. Institutional factors may preclude developing countries from being sufficiently organised to institute effective, independent management schemes and achieve certifiable status [20]. Ecolabelling is usually based on the domestic environmental priorities and technologies of the importing country (i.e. where the ecolabel was developed), and may overlook the relevant and acceptable methods of production in the exporting country. Ecolabelling criteria may be tailored around an existing stock of technology, which developing countries do not have easy access to; developing country producers may have to incur a disproportionately large cost burden to adjust to the ecolabelling requirements. Differentials in environmental infrastructure (e.g. water supplies or waste treatment plants) may also place a higher burden on developing countries in terms of environmental standards and compliance. Supplies of environmentally friendly (or less hazardous) input materials may be more difficult to source from within developing countries where the environmental concerns are different to those in developed countries [18].

Eco-labels can bring an unnecessary cost or barrier to countries whose governments already manage their stocks sustainably, or have a strong tradition in managing common resources, such as in the Nordic countries. The Nordic project group, representing the views of the Nordic Council of Ministers, had important reservations during the consultation period of the MSC certification scheme, including discomfort with the fact that a private initiative was taking over the role of management traditionally viewed as the responsibility of the government; the lack of openness, and a lack of confidence in the initiators [21]. An analogy to the Mob was used when describing the MSC initiative: the WWF tell you that you do not manage your fish resources well, then offer you the MSC as protection against the rage of public opinion for your bad behaviour [21].

Pressure groups may also have a different definition of what is 'sustainable', 'environmentally friendly' or 'socially just' and may discredit the certification process or a particular label. This could in turn affect the credibility of the

whole certified seafood industry. Changing the behaviour of a significant proportion of consumers requires an integrated campaign to increase awareness, understanding and provide incentives for those individuals to purchase ecolabelled seafood. It would not be cost effective for many of the smaller producers of certified goods to advertise and educate the public so they rely on environmental pressure groups and the media to inform consumers of the issues but do not have any control over what information is, and is not, relayed to the public.

Concerns have been raised by international institutions and many developing countries that ecolabelling may be used as a non-tariff trade barrier, preventing those countries and industries where ecolabels are not used from successfully penetrating certain markets [18]. However, it could also be argued that developing countries may hold a competitive advantage relative to developed country counterparts due to the absence of thorough environmental controls and environmentally-based resource pricing. Market access effects of ecolabels have been the subject of studies and discussions but no conclusive evidence has been established on the trade effects [22]. The World Trade Organisation (WTO) agreement on Technical Barriers to Trade prohibits mandatory ecolabelling by governments, but voluntary ecolabelling schemes are allowed. Standards and regulations applied in the name of environmental protection are permitted only as regards the actual physical properties of the good, not the good's processing and production methods (PPMs). The legality, therefore, of ecolabels on PPMs, such as environmental or welfare impacts of production, is contested under WTO law.

Without first increasing awareness and capacity to accelerate their application, new certification schemes and standards may impede trade from developing countries and reduce smallholder competitiveness [1]. Unscrupulous use of labels without sufficient standards or monitoring can allow some imported goods to out-compete domestic goods under false pretences due to lower costs of production. Guaranteeing the authenticity of products may be costly to buyers.

There is commonly a lack of data on catches and on the management available for developing country fisheries, and thus it is difficult and costly to achieve and implement certification. Often certification of a fishery is a very lengthy and costly process. Whilst funds might be raised to support the certification bodies; for example, the MSC receives funds from trusts, companies, individuals, the EU, agencies and events [23], it could be argued that this money could be better spent on other causes, including aid or projects in developing countries.

Social benefits and costs

Depending on the certification scheme, the minimum standards imposed for certified production can result in improved social conditions for producers and other workers,. For example, fair trade schemes guarantee minimum prices for producers, and ethical trade schemes address working conditions and wages. These improvements can spread to others not directly involved in certified seafood production as the awareness of social, health-related and environmental issues increases in the producing countries. Schemes which guarantee fewer impacts on the environment should benefit everyone in the long term by protecting and preserving resources for future generations.

As many schemes look at the whole picture when it comes to seafood resources and production, there is potential for improved relations between stakeholders of seafood resources as they come to understand all the issues involved. However, if one stakeholder feels they have not received fair treatment then relations between stakeholders may worsen. What kind of process is most likely to provide an open consultation? A process initiated by private companies with economic interests in the fisheries sector, even if done in co-operation with environmental organizations which have to rely on the public opinion for financial support? Or is it more likely to be a governmental initiative, which entails a scrutiny of its own management regime? The MSC initiative has met with scepticism from fisheries managers, the fisheries sector and environmental organizations. This is largely founded on the perception that the MSC was established without a sufficiently open consultation process involving all stakeholders [6].

Certification and labelling allow consumers, both the end consumers of the products and retail and foodservice buyers, to make more informed choices when purchasing seafood products. They can, if they wish, use consumer power to influence the way that seafood is produced by choosing some goods over others. A number of supermarket chains within the EU have altered their supply chains and communications with their customers in response to campaigns from different pressure groups [24]. In Europe, schemes provided by non-governmental organisations (NGOs) have been found to have much higher credibility in the eyes of the consumer than governments or industry

with regard to environmental issues [21]. However, in the USA, consumers trust the Food and Drug Administration (FDA) and the Department of Agriculture (USDA) the most with regards to information provided about the safety, quality or sustainability of food [25].

Certified seafood can offer reduced health risks for buyers and consumers due to minimum standards, traceability and greater information about the products. Schemes can also influence and improve hygiene and food safety practices in developing countries by introducing standards such as HACCP. This results in safer food products on both local and international markets. There is also the potential for certification criteria to influence the impact of the schemes on countries with differing environmental and socio-economic conditions and interests [20]. This is reinforced by the lack of opportunity for developing countries to participate in the development of product standards [20].

Long run costs may be incurred by society if the certification of seafood resources shifts management power from governments to NGOs, which are not publicly accountable bodies. Here fisheries are less likely to be managed in the interests of all stakeholders, including the fishermen, processors and consumers. If production becomes geared to export markets for certified products, seafood resources may become diverted away from local markets and towards the more lucrative international markets. Local consumers would then be affected due to reduced food security and lower nutrition for local populations.

Environmental benefits and costs

Certification schemes are a market-based incentive for sustainable fisheries management. The market is replacing our democratic institutions as a key societal determinant, and therefore it can be argued that market-based measures are needed to encourage sustainable production. When looking at who regulates resources, NGOs have much higher credibility in the eyes of the consumer than governments or industry with regard to environmental issues. Consumers are therefore more likely to trust NGO schemes than governmental management of resources [21]. The fisheries sector is generally sceptical of environmental organisations, and due to the difficult conditions for monitoring in fisheries certification initiatives NGOs will need the support of the fisheries sector to effectively implement any management regime [6].

Developing countries often have greater priorities than the sustainable management of fisheries resources, sometimes selling rights to fish their waters to foreign countries to raise cash. Demand for certified seafood products, accompanied by premiums for these products, could change the priorities of developing country governments and allow their fisheries resources to be better managed and valued. Social awareness of environmental issues is also likely to be improved. Schemes concerned with sustainable fishing, should help ensure that production can continue with a much lower risk of resources running out. Wider environmental schemes may also reduce the risk of self pollution problems through the implementation of best environmental practices as recommended through certification procedures and training [5]. The auditing procedure allows dissemination and sharing of breakthroughs and developments in environmental technology since it often involves a single organisation making site visits to large numbers of operatives [5].

The development of large price differentials between certified and uncertified products may actually encourage the persistence of markets for uncertified products, which are likely to be unsustainable either environmentally or socially. Some consumers will always choose unlabelled products, due to price or other considerations, so unsustainable fisheries are likely to persist. If the choice is removed by using government regulation of fisheries then theoretically all fisheries could become sustainable.

Current knowledge of fishery resources is not comprehensive and involves some uncertainty, so ecolabels cannot guarantee that the certified management regime will lead to optimal use of the resource [6,21]. This uncertainty will possibly, in the long run, undermine the credibility of ecolabelling schemes, as consumers begin to see no improvement in fish stocks even when a management regime in accordance with the scheme is in place [6]. Some fisheries resources, such as transboundary stocks, move around and are shared by various countries so certifying these resources requires good understanding of their behaviour plus cooperation between all participants.

THE ROLE OF CERTIFICATION IN THE SUSTAINABLE MANAGEMENT OF FISHERIES AND AQUACULTURE

State of world fisheries and aquaculture resources

In 2003, total world fisheries production was estimated to be 132.2 million tonnes, with 90.3 million tonnes from capture fisheries and 41.9 million tonnes from aquaculture production [26]. An estimated 50% of assessed world marine stocks are fully exploited, a further 25% is overexploited, depleted or recovering, and the remaining 25% is underexploited or moderately exploited [26]. This suggests that that the maximum fishing potential has been reached and that more cautious and restrictive management measures are needed [26].

Aquaculture activities have been linked to many environmental impacts, some of the worst including the destruction of tropical mangroves to create shrimp ponds, and over-harvesting of wild fry as inputs for shrimp and fish farms. In world aquaculture production, there is currently a shift to sustainable practices and development strategies which is ongoing and an increasingly common objective. Inadequate resources, the relatively low importance accorded to aquaculture compared with other priority areas in national development plans, conflicts between sustainable aquaculture development and efforts to improve food security and alleviate poverty, and the high cost of compliance for small enterprises number among the possible reasons for slow progress in the development of an enabling environment for responsible aquaculture in many developing countries [26]. However there are indicators of change such as the number of developing countries becoming involved in organic aquaculture production, including Chile, Ecuador, Peru, Colombia, Indonesia, Vietnam, Thailand, Taiwan and China [27].

Failure of governments to manage seafood resources

It is apparent from the evidence above that the majority of the world's seafood resources are currently not being managed sustainably. In the case of developed countries, much research has been done into the status of wild fish stocks, but no exact conclusions can be drawn. Recommendations from scientists to governments are largely ignored or compromised in talks with fishing industries and regional inter-governmental agreements such as the EU Common Fisheries Policy (CFP) due to the lack of 'hard facts' and adverse political implications. Political enthusiasm for resource management has at least sometimes been tempered by the fact that the time period required for fish stocks to recover is longer than the interval to the next election. Some aquaculture operations have been shown to pollute their surrounding environment with excess nutrient wastes, antibiotics and other chemicals, act as disease hotspots and transfer disease to wild populations, contribute to overfishing through using fishmeal and fish oil in feeds, or allow escapes of genetically altered fish into the wild, among other things. Standards and regulations vary between countries, and therefore the impacts of aquaculture systems on their environment vary significantly.

For developing countries, the sustainable management of fisheries and aquaculture resources is not usually a priority. They are often more concerned with short term poverty reduction measures, increasing national food security and attracting foreign investment to finance the development of their country. The cost of the research needed to support realistic fisheries management systems has been one of the major difficulties facing developing countries [28]. Where countries sell their fishing rights to foreign countries to raise capital they typically retain even less control over the management of their resources. Environmental standards for aquaculture operations are usually not as strict in developing countries as they are in western countries. As a result, their aquatic resources may become neglected, damaged and unsustainable.

Support for ecolabelling

It tends to be developed countries who are in favour of ecolabelling and developing countries who are against it [29]. Developed countries tend to set higher environmental and welfare standards and want to prevent goods from countries with lower standards competing with domestic goods on price. The EU and Canada, in particular, would like to see processing and production methods (PPMs) ecolabels made legal under WTO rules, and to hold further discussions on the possibility of creating or adopting a set of standards within the WTO for ecolabels. Developing countries tend to oppose ecolabelling on the grounds that they do not necessarily have the same environmental problems as developed countries, they cannot afford the cost implications of certification, and their interests are not generally represented during creation of the ecolabel standards. Three developing countries that do not oppose ecolabels, Belize, Colombia, and Madagascar, are considering using certification as a requirement for local

producers so that aquaculture production from the entire country could be differentiated in the global marketplace [30].

There are currently no international standards for the ecolabelling of seafood. However, in November 2005, the FAO Committee on Fisheries adopted international guidelines for the ecolabelling of fish and fishery products from marine capture fisheries. The guidelines are voluntary and addressed to any ecolabelling scheme both public and private that is designed to certify and promote labels for fish and fishery products from well-managed marine capture fisheries with a focus on issues related to the sustainable use of fisheries resources [31].

Non-governmental organisations tend to be in favour of the certification of fisheries products since the certification usually requires some improvements in environmental or social behaviour. However, sometimes specific certification schemes come under criticism. For example, Greenpeace supports the MSC ecolabel but argues that some of the currently certified stocks do not deserve certification since they are not sustainable. Greenpeace has recently staged protests against food retailers and seafood producers in Europe and the US, demanding that they only sell fish from sustainable sources. Their lobbying appears to be having the desired effect, with retailers changing their policies and suppliers [32]. Most recently, Wal-Mart, the world's largest retailer, pledged to sell only fresh and frozen, wild-caught seafood from fisheries certified sustainable by the Marine Stewardship Council within three years [33]. Last autumn Wal-Mart had announced that they would partner with Conservation International (CI) to begin certifying all of their imported farm-raised shrimp to ensure it is grown in a sustainable way, with minimal impacts on the environment, fair wages and proper working conditions for producers. Other retailers singled out by the Greenpeace campaign include Asda, who have now agreed to remove Dover sole, skate, ling and dogfish from stores, and McDonalds, whom Greenpeace accuse of selling illegally caught fish products produced by Danish seafood firm Espersen. Producer Findus was also targeted about the source of its fish products.

Where government-based efforts to manage fisheries sustainably are perceived to be insufficient, economists, seafood businesses as well as non-governmental organizations have pointed to the need for private, market-based measures to complement traditional government-based resource management regimes [34]. As a private-sector phenomenon, ecolabelling is part of an evolving trend of governance where private and public initiatives coexist, and private actors devise their own policy instruments (Boström 2003). The 'privatisation' of the management of the oceans and its resources [36], where the role of government in resource management and its effectiveness in this regard is questioned, are important elements of this trend in the realm of the management of the oceans and their resources [34]. The seafood industry has recognised that the issue of certification of seafood and the sustainability of their products are important issues that will not disappear and will need to be addressed. A recent conference, Seafood Summit 2006, underlined the emergent priority of the wider sustainable seafood movement [37].

CONCLUSIONS

Certification schemes are becoming more widespread as the public gains greater knowledge of the issues surrounding sustainable seafood and demands a change in world seafood production and trade. Some schemes are increasingly becoming a prerequisite for market entry, such as the HACCP health and safety standards. Other schemes occupy niche markets, but current trends show that sustainable seafood will become more important as retailers start to promise to source 100% of their seafood from sustainable sources. Such communications to the public must also be realistic and deliverable if the credibility of certification is to be maintained. The experience of food scares within other market segments has shown how consumer confidence can quickly be lost where product claims are reneged upon. Under these circumstances, certification then becomes simply another groove in the ratchet of distrust and consumer confusion.

It is the role of all governments to manage their countries' seafood resources sustainably as it their duty to maintain healthy productive stocks and other natural resources for their citizens. However, since many of the world's fish stocks are overexploited, current management regimes are obviously not sustainable and changes are needed. If the route of certification assumes a more central position in the toolkit of resource management, control is likely to shift from governments to the private organisations that set certification criteria. Since these organisations are not accountable to the public, questions must be asked about the longer term impact of their decision making on the management of global fish stocks. Of course governments need not necessarily continue with a more distant role in

certification. Governments have been responsible for the definition and regulation of organic farming, whilst the development of the principles and criteria for sustainable fisheries by the Marine Stewardship Council has been controlled by private organisations, Unilever and WWF [38]. If governments lose management power to NGOs, fisheries are less likely to be managed in the interests of all stakeholders, including fishermen, processors and consumers. This would suggest the need at least for some reconsideration of the balance of power in resource management, and implicitly certification, decision-making. Such a review might also incorporate the scope for multilateral agencies, like FAO, to provide wider cohesion and guidance on what measures might best serve the sectors' needs.

Developing country producers will increasingly need to be able to prove where seafood exports come from and the status of wild stocks or the aquaculture production methods used. They have the option of developing their own eco-labels, or their industries can focus on obtaining foreign eco-labels that are relevant in their current (or future) export markets [39]. Small-scale producers will find it difficult to become certified due to economies of scale and the costs involved with certification. Alternative models may be required to enable participation such as establishing co-operatives, or Community Based Organisations, with many farmers grouping together to gain certification for the whole group. Governments too might play some role in this, such as educating organisations about the certification schemes available and providing support and training to enable them to reach the required standards. More fundamental infrastructure improvements may also be necessary, such as roads and other transport elements, electricity for adequate chilled storage, traceability measures and suchlike. The transition is unlikely to be easy for developing country producers, but if current trends continue transformation will definitely be necessary. Despite the concerns expressed, and the scope for improvement, the prognosis for a sector remaining devoid of any certification labelling is much less favourable.

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