

A Moral Hazard

The recently formed Aquaculture Stewardship Council is unlikely to develop into a positive force for marine conservation or food security

The decline in production and trade from marine-capture fisheries, primarily due to overfishing, has raised serious concerns over the future of food security and the livelihoods of millions of people who rely on marine fisheries for income and employment. Yet this marine crisis is increasingly countered by optimism over the growth and potential of aquaculture.

According to the website of the World Wide Fund for Nature (WWF),

chemicals, and the escape of farmed fish into the natural environment. Farming of prawns and salmon has perhaps generated the most concern.

In the wake of various guidelines and principles developed by the aquaculture industry for its regulation, WWF, in partnership with the Dutch Sustainable Trade Initiative, has recently launched the Aquaculture Stewardship Council (ASC). It aims to become the world's leading certification body for responsible fish farming, and its goal is to work with the industry and retailers to use ecolabelling to transform aquaculture towards environmental and social sustainability. Clearly, the ASC is modeled on the Marine Stewardship Council (MSC), which was itself modelled on the Forest Stewardship Council (FSC), all three being developed by WWF.

Any initiative that seeks to improve the environmental impact of fish farming would seem worthwhile. Moreover, the ASC, unlike the MSC, contains standards on social criteria, and promotion of the rights of workers as well as the livelihoods of communities living in the vicinity of farms. The standards are, therefore, ambitious and it would seem they have been developed with a thorough understanding of the complex challenges confronting the industry.

Potential problems

However, the ASC faces a number of difficulties and potential criticism. A part of the problem lies with the approach the ASC is using to certify farms, which raises concerns about its reliability and impartiality.

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approximately half of the seafood we eat is wild-caught, the other half is from aquaculture. WWF argues that due to the strong demand for seafood, and the limits of wild-capture production, increasing the growth of aquaculture is a responsible path to choose. The director of the WWF's aquaculture programme says, when done well, aquaculture "protects the environment" and is "the most sustainable way to feed the world".

The growth in commercial aquaculture has generated concerns, primarily over its environmental impact. We need not dwell on the evidence here, other than noting that the list of ecological problems facing fish farming include: pollution, habitat destruction, excessive use of freshwater, contamination of ecosystems with antibiotics or harmful

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Furthermore, promoting aquaculture as a realistic answer to overfishing and global food shortages is contentious. While certain forms of fish farming seem important to encourage, many other forms of farming should probably be discouraged, and certainly not promoted through ecolabels. Unfortunately, the ASC does not make this distinction. Overall, we may wonder whether the ASC, as it has been designed so far, will make a meaningful contribution to marine conservation or food security.

It would appear that the ASC's approach to certifying fish farms is essentially the same as the one used by the MSC for certifying wild-caught fish. An expert committee, formed by the WWF, has developed a list of principles and criteria for a fish farm to be considered sustainable. Since environmental challenges differ according to the type of fish farming, separate standards have been developed for nine types of farmed fish, that is, a standard for salmon farming, one for prawn farming, one for tilapia, and so on. The ASC will now approve a list of private companies to act as certifying bodies. Companies wishing to gain the ASC logo will pay these certifying bodies to conduct an assessment of their farm, leading to a score indicating how well the farms do on the standards. Low scores will not mean companies will be denied the logo, but will mean the companies will have to meet certain 'corrective measures' over a specified time frame.

One of the difficulties confronting ecolabels such as those of the ASC, as well as the FSC and MSC, is the reliability and consistency of their scoring methods. All rely on generating a single score for the unit of certification, representing the degree to which they meet the underlying standards. For the MSC, the scoring system is sub-divided into three components; the sustainability of the fish stock, the ecosystem impacts, and the strength of the fisheries management. Each component is scored on a scale of one to 100, and the final decision to award the label is based on the unit

of certification scoring over 60 on all three components, and not less than 60 on any one. However, depicting the performance of different fisheries as a single-digit score is inherently inconsistent and it lacks statistical validity. This is partly because the measurements that influence the final score are subjective, but also because each unit of certification is quite different—if two fisheries score the same, we cannot infer that they are equally sustainable. Likewise, if one fishery scores three points more than another, it is not clear what this means in practice, yet a couple of points either side of 60 makes all the difference.

This problem of consistency and validity would seem to be pronounced for the ASC. The thorough and detailed standards the ASC has developed involve numerous scoring components, including not only environmental ones, but also social ones.

Different problems

Moreover, the ASC is trying to provide one ecolabel for various forms of fish farming that face very different problems, evident in the need to develop nine different standards, as opposed to just one, which is the case for both the FSC and the MSC. It is not clear how the ASC will weight scoring on different criteria to arrive at a single statistic, nor is it clear how scores for one type of fish farming, such as for prawns, should compare to scores for

The screenshot shows the ASC website with the following content:

- Header: WWW.ASCWORLDWIDE.ORG, Choose language: English
- Logo: Aquaculture Stewardship Council
- Navigation: Home | About the ASC | Species | Certification | Aquaculture Dialogues | Planning | Producer Capacity Building | Contact
- Mission Statement: The ASC's mission is to transform aquaculture towards environmental and social sustainability using efficient market mechanisms which create value across the chain.
- Image: A group of salmon swimming in water.
- Section: Sustainable aquaculture
- Footer:
 - Aquaculture Stewardship Council (ASC)
 - Mission and vision
 - What the ASC can do for you
 - Sustainable aquaculture
 - Aquaculture Dialogues
 - Certification
 - Help building the ASC
 - Support the ASC
 - Partners & Supporters

ASC is trying to provide one ecolabel for various forms of fish farming. It is trying to develop nine different standards

another, such as oyster farming. There may be extreme examples of best and worst practice that most people will agree should either pass or fail according to the ASC standards, but in between these extremes, there will be many farms where the decision is less obvious and the scoring system could be exposed as flawed or arbitrary.

There is also inherent 'vested interests' that may distort the certifying process further. Certifying bodies are vulnerable to being biased towards the companies they assess. This is because assessments are

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well paid and the clients, that is, the companies wanting to be certified, will choose which accredited company will do their assessment. Certifying bodies have a vested interest in passing companies, as that will lead to further business, not only in terms of annual assessments and reassessments, but also through positive referrals.

The ability for certifying bodies to be biased lies with the fact that standards and principles of any third-party ecolabelling system can be vague, allowing certifying bodies a great deal of leeway in how they are interpreted. For example, for prawn farms, the ASC states that all impacts on surrounding communities, ecosystem users, and landowners should be accounted for, and will be negotiated, in an open and accountable manner. How certifying bodies will form an opinion on this is not certain. It is easy for certifying bodies to simply tick boxes.

The potential for vested interests to undermine the certifying process should be countered by the ASC itself, in its oversight role. Yet the organization faces a difficult balancing act of ensuring the

credibility of decisions and, at the same time, growing market coverage of its logo. It may be easy to get the balance wrong. To insure integrity of the certification process, the ASC, following the approach of the MSC and the FSC, will probably use peer reviews of final assessment documents, and it will encourage comments and feedback from civil society. The reports of certifying bodies will, therefore, be made available on the Internet and anyone wishing to raise complaints should be able to do so.

However, assessment documents can be complicated and unclear—filled with technical jargon—and, most of the time, they are available only in English. Those people who may be best placed to challenge findings of assessments, such as fishermen and coastal people living near fish farms, may find assessment documents totally alien and inaccessible, particularly when they cannot read English or do not have access to the Internet.

For the MSC, peer reviewers have noted that it is hard to challenge decisions because reviewers do not have access to raw data or they are not able to corroborate findings; all they can do is comment on the internal logic of documents. There have also been conflicts of interests in the peer review mechanism of the MSC, where peer reviewers have been employed by certifying bodies as consultants on other projects. Given the specialized field of aquaculture, such problems may arise for the ASC, although proactive steps could be taken to mitigate this risk.

Reversed interpretation

The experience of the MSC and the FSC suggests that when complaints are made, or doubts are raised through peer reviews, final decisions are often based on a reversed interpretation of the precautionary approach, that is, the benefit of the doubt tends to favour the companies, not the environment. Certain decisions by the MSC and the FSC have been challenged, and these organizations have faced a loss

of credibility among a significant number of scientists and conservation non-governmental organizations (NGOs). The ASC, being based on the FSC and the MSC, may well find it encounters similar criticism.

The experience of the MSC also shows that using certifying companies is an expensive process. This means it is normally out of reach for small-scale firms, and it only makes sense for those with sufficient economies of scale. Since this generates criticism, philanthropic organizations and donors are encouraged to pay for the certification of smaller businesses. WWF provides funding and support for smaller firms, and it also has acted as the co-client for MSC pre-assessment in some cases (for example, in Tanzania's octopus fishery). Yet subsidizing a voluntary market-based initiative may not be sustainable, particularly where the economic benefits are ambiguous and the donor funding moves on.

Proponents of aquaculture encourage the view that it is an industry able to alleviate the food insecurity caused by overfishing, and it can safely meet growing demands for seafood. In fact, aquaculture is already doing this; apparently, half of the seafood we eat is from aquaculture and this proportion will certainly increase, if the claims are to be believed. However, this claim over the contribution of aquaculture to seafood consumption is easily misunderstood, and promoting aquaculture needs to be done carefully, otherwise it may have negative repercussions.

A point of confusion is that the term seafood is sometimes used generically to cover all fish products, including those from the sea, as well as those from inland or freshwater sources. Based on this definition of seafood, and using the latest data supplied by the Food and Agriculture Organization of the United Nations (FAO) in its latest, *The State of World Fisheries and Aquaculture 2010* (SOFIA) report, it is true that roughly 45 per cent (or 52 mn tonnes) of total global fish consumption comes from

aquaculture, while the rest comes from wild sources (63 mn tonnes). However, if we use a more literal interpretation of seafood—defined as fish from the sea—the proportion of seafood that we eat from farms is much less.

In 2008, global production of marine wild-caught fish was 80 mn tonnes, of which just over 27 mn tonnes is classified by the FAO as being for 'non-food' purposes, such as the production of fishmeal and fish oil. This leaves approximately 53 mn tonnes for direct human consumption. Mariculture produces roughly 20 mn tonnes of seafood, mainly comprising molluscs, followed by crustaceans (shrimps and prawns), and then, lastly, finfish, such as salmon. So in global terms, about 27 per cent of our total consumption of seafood comes from fish farms.

The majority of aquaculture is based in China. Of the 20 mn tonnes of seafood produced each year by farms, 12 mn tonnes are produced there, with 80 per cent being consumed within the country. China also accounts for most of the inland fish production—about 20 mn tonnes each year. So, looking at the SOFIA data on world fisheries and aquaculture production, excluding China, all forms of aquaculture—inland and marine—account for 26 per cent of total fish consumption, as opposed

FAO/ ROBERTO PAIDUTTI



Fisherman bringing in tilapia. It is believed that aquaculture can alleviate the food insecurity caused by overfishing, and it can safely meet growing demands for seafood

to 45 per cent. The proportion of farmed seafood to total consumption of seafood is lower still, at about 16 per cent. So, for the Chinese, far more than half of their seafood comes from aquaculture; for the rest of the world, the proportion is significantly less.

The statistics showing that mariculture comprises 27 per cent of global seafood consumption, or 16 per cent outside China, is almost certainly an overestimation. Whereas FAO's statistics for mariculture are

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probably quite accurate, its statistics for seafood production are not. The FAO only receives information on about 70 per cent of commercially exploited fish stocks. It only receives data from 40 per cent of countries in Africa. A study by the University of British Columbia, published early this year, claimed that catches from the Arctic are hugely under-reported and may be 75 times larger than previously estimated.

Most countries in the world also do a poor job in counting the amount of fish produced by small-scale fisheries or subsistence fishing. For example, a report on Mozambique, co-authored by WWF in 2009, showed that the actual catch of fish, when small-scale fisheries were properly included, was over six times greater than the official catch statistics reported by the Mozambique authorities to the FAO. The current Big Numbers project run by the WorldFish Centre in Malaysia has showed similar disparities between reported catches and actual catches by the small-scale sector. To this we can add widely published estimates that some 30 per cent of marine catch is illegal and unreported. When we combine all these missing data for catches of fish at sea, we can appreciate that the real contribution made by mariculture

to global seafood consumption is quite small.

The majority of mariculture products, particularly the expensive ones produced by commercial farming enterprises in the Far East, Latin America and Europe related to prawns and salmon, is sold to North America, the European Union (EU) and Japan. Very few people in Africa eat farmed seafood, as is the case in Latin America and the Pacific. So, it is probably the case that mariculture is disproportionately providing food to people who are otherwise food-secure; these are luxury food items eaten by those who over-consume seafood and other protein.

One of the well-established problems facing mariculture is the reliance on the capture of wild fish for breeding, which is important to keep the genetic stock of farmed fish healthy. So a proportion of farmed fish represents wild fish that have been captured, stripped of eggs, hatched and then fattened. It is also acknowledged that carnivorous species of farmed fish, including prawns and salmon, also require seafood in their diet, as does the intensive aquaculture of non-carnivorous fish, given the improved growth that fishmeal induces in these herbivorous creatures.

Fish farming

To produce one kg of prawns, about 1.4 kg of other sea fish is needed. The ratio for salmon is higher, at about 1:5. In total, aquaculture worldwide consumes about 16 mn tonnes of wild fish. Prawn and salmon farming alone consumes 9 per cent of all global marine production, as recorded by the FAO. There have been some advances in the use of non-fish products (such as soybean meal) to feed farmed marine fish and species, but for the time being, the practice of farming key species of carnivorous sea fish involves the use of more fish than is produced. As the marine ecologist Daniel Pauly points out, fish farming for carnivorous marine species remains a net drain on marine ecosystems.

The FAO differentiates between fish for human consumption and fish produced for 'non-food purposes', with the latter amounting to 27 mn tonnes. Yet the majority of wild-caught fish put into the category of 'non-food purposes' are actually being fed to farmed fish (or chickens) in order for humans to eat them. The distinction the FAO makes, therefore, seems odd and further obscures the relative importance to food security of wild-caught fish, compared to farmed fish. The FAO should re-classify fish production data into three categories: fish for direct human consumption, fish for indirect human consumption, and fish for non-food purposes (including that which is used in pharmaceutical industries or is fed to pets).

From a food-security perspective, it seems objectionable that certain forms of fish farming involve taking large quantities of fish with low market value to produce a smaller amount of fish with a higher market value. Those that see this as unproblematic point out that a large amount of fishmeal comes from small fish and 'trash fish'—so-called because of their relatively limited value for human consumption. However, there is a potential for much of the fish being used for fishmeal to be eaten directly by people, particularly fish such as sardines and anchovies. Indeed, with concerted effort, the amount of fish that could be redirected from the fishmeal industry (27 mn tonnes) to human consumption could exceed the total output of farmed marine species (20 mn tonnes). This would also result in more numerous and cheaper products being available to developing countries, as opposed to a smaller number of more expensive and less environmentally sustainable products being supplied to developed countries. This may reduce the availability of some fish species favoured by wealthier consumers, but it is also possible that consumer preference for seafood such as prawns and salmon, as opposed to smaller pelagic fish such as sardines, is caused as much by

marketing and product status as by superior flavour.

This dependence on wild fish for feeding farmed fish limits the expansion of certain forms of aquaculture. The supply of fishmeal and fish oils for aquaculture is already under strain, while the farming of carnivorous seafood has stagnated. In Europe and North America, the growth in mariculture has slowed to one per cent a year. Further increases in aquaculture will require technological breakthroughs in artificially enhanced feeds, greater use of non-fishmeal products, including animal products, or simply the purchase of more wild-caught fish. The third option would have negative consequences for the availability and price of cheap fish for poor consumers; the FAO reports that aquafeed manufactures are increasing their use of fishmeal and fish oil at the expense of all other uses, including human consumption. The first two options—feeding farmed fish with artificial or non-fish-based diets raises concerns about the quality and safety of products. Although the industry is reported to be investing in research for alternative feeds, so far reliance on fishmeal remains.

The supply of fishmeal and fish oils for aquaculture is already under strain...

Ecosystem impact

A further problem with using fishmeal for fish farming is that it removes large quantities of smaller fish from marine ecosystems, thereby having an impact on the health of larger predatory fish. This ecosystem impact of fishmeal production has been raised as a serious concern worldwide, including in North America where extensive fishing of menhaden (America's largest commercial fishery) for reduction purposes caused a major fall in the availability of a range of other marine species. In Peru, which produces around 30 per cent of the

global fishmeal supplies, fishmeal processing factories also have a major negative impact on coastal ecosystems and human health through the dumping of liquid wastes and as a result of air pollution.

These inter-related problems of fishmeal—referred to as the ‘fishmeal trap’—are less relevant for some species of freshwater herbivorous fish and for less intensive aquaculture practices, as well as the farming of certain shellfish such as oysters and clams. Such species do not need

Wild-caught fish from the sea far outstrip existing and potential production from the farming of seafood...

fishmeal in their diets. Indeed, the farming of certain shellfish is thought to have a positive impact on reducing pollution in seawater, although there are still concerns about farmed shellfish changing the genetic composition of wild shellfish. There is also evidence that intensive mariculture of exotic species may spread diseases to wild fish populations, against which they have little resistance.

An increase in the production of less intensive forms of aquaculture, including of shellfish and herbivorous freshwater fish, is undoubtedly the most important policy choice from a food-security perspective. Whether an increase in the production of these forms of aquaculture will take the strain off marine ecosystems is uncertain, and requires more empirical research and monitoring.

The ASC promotes all forms of responsible aquaculture, and statements made by the WWF can easily give the impression that the quantity of seafood we eat from farms is much higher than it actually is. This gives rise to a ‘moral hazard’. The idea that an increase in fish farming is able to provide the world with a sustainable and environmentally benign source of seafood may work to lessen the

urgency among policymakers to address overfishing in the seas; there may be a sense that although marine fisheries are being poorly conserved, the negative economic and food-supply consequences of this can be mitigated by increased support and economic investments to fish farming in general. Consider, for example, a report by Water Watch in 2010 that described how the Hawaii State government, concerned with overfishing in its seas, subsidized two private companies to create marine aquaculture ventures with over US\$3mn, and also provided the companies with lower tax obligations. It seems that these ventures remain unprofitable, have caused considerable negative impacts on the environment, and have generated few jobs, currently fewer than 40.

Wild-caught fish from the sea far outstrip existing and potential production from the farming of seafood, in its literal sense. With the notable exceptions cited above, farming of seafood, particularly carnivorous species such as prawns, salmon and tuna, is a commercial activity concentrated on supplying relatively wealthy consumers in developed countries. The most pressing concern, from both a food-security perspective and a conservation perspective, remains the sustainable and equitable use of the natural resources contained in the world’s oceans. Campaigns promoting the commercial interests of the mariculture industry can easily distract from this point.

False understanding

This moral hazard extends to consumers, who may sustain their level of consumption of wild-caught fish under the false understanding that the marine crisis is being compensated for, or solved, by mariculture. This becomes even more contentious where, first, farmed fish is mislabelled as wild fish, giving a false impression of seafood abundance, and second, where farmed fish is able to force the prices down of wild-caught fish,

when scarcity suggest prices should be increasing.

The ASC is presented as an organization that is in everybody's interest. By promoting responsible fish farming, it claims to be making a positive contribution to preserving ocean biodiversity. However, on the basis of the arguments put forward in this article, the ASC will not develop into a positive force for marine conservation while it still promotes the farming of carnivorous marine species. It may, in fact, have a contradictory impact, due to the moral hazard noted above. The ASC is also unlikely to have any bearing on food security, unless it provides exclusive focus to promoting small-scale farming of herbivorous species, which it currently does not. Indeed, the most likely contribution the ASC will make is with promoting the interests of certain aquaculture companies—those with the resources to pay for the ecolabel and those who sell the majority of their products in Europe and North America, where retailers are more likely to demand ecolabelled products.

While it may be too early to pass judgment on the integrity of the ASC, given the experiences of the MSC and the FSC, over time, the ASC may be accused of certifying fish farms that do not meet the highest environmental and social standards, and the ASC logo will be concentrated among products coming from larger commercial enterprises.

The inherent flaws and conflicts of interests in the certifying process make this likely. Indeed, WWF has recently shown that environmental campaigning can be undermined by trying too hard to develop support and partnerships with the industry. Vietnamese farmed pangasius catfish was taken off WWF's international 'Red List' (the 'to be avoided' list) because the Vietnamese authorities were concerned about the potential negative impact this would have on exports. Here we see that independent organizations working to provide consumers with reliable information on the sustainability of products can be

compromised by commercial and political considerations.

The logic of ecolabels needs to be revisited for both aquaculture and capture fisheries. The claim that they promote 'good' products at the expense of 'bad' ones, and that this has a positive overall effect on the environment needs empirical evidence. Unfortunately, most studies have shown that voluntary ecolabels that confer positive messages to consumers about the environmental impacts of a product have not been successful in bringing about major environmental gains.

At best, these initiatives make small improvements to the operations of certain companies who are willing to pay for the certification process. In many cases, it is commercial companies that worry about negative consumer campaigns that see ecolabels being necessary, or who see a niche market for themselves. Negative consumer campaigns, in contrast, seem to have more of an impact. The claims made by ecolabels, and the amount of financial support they receive, seem disproportionate. They are not providing radical solutions to what are profound problems. The way in which they have been designed seems to support the status quo, and they may actually work as an obstacle to more progressive policy ideas. 

For more

www.ascworldwide.org

Aquaculture Stewardship Council

www.worldwildlife.org/what/global/markets/aquaculture/council-faqs.html

WWF: Aquaculture Stewardship Council FAQs

www.panda.org/who_we_are/wwf_offices/mongolia/?uNewsID=197712

WWF putting 'tra' fish on consumer red list angers Vietnam

www.ifo.net/default.asp?contentID=636

International Fishmeal and Fish Oil Organization

www.farmedanddangerous.org

Farmed and Dangerous

www.gaaia.org

Global Alliance Against Industrial Aquaculture

www.fao.org/docrep/013/i1948e/i1948e00.htm

FAO: Private Standards and Certification in Fisheries and Aquaculture

www.fao.org/fishery/topic/16023/en

Selected Links on Aquaculture from FAO