

# Eco-labelling of Products in Context to Aquaculture

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## ABSTRACT

Ecolabelling of food and animal products is the need of the hour, keeping in view the importance of environmental pollution and sustainability issues attached to agricultural sector. Whereas the developed countries are making their farm sector equipped with latest technical know-how to make their products acceptable at world market with fulfilment of all the norms laid down under World Trade Organisation (WTO), the developing and underdeveloped countries, on the other hand, are not able to match the regulations require to offer the products at international level. The present paper is an attempt to analyse the issues involved in eco-labelling of aquaculture products in India. It can be summarised that there are serious efforts require to be implemented in order to adhere to the stringent norms required for eco-labelling in aquaculture products.

**Keywords:** Aquaculture, eco-labelling, *Codex alimentarius*

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Eco-label is a label which identifies overall environmental preference of a product (i.e. good or service) within a product category based on life cycle considerations. In contrast to a self-styled environmental symbol or claim statement developed by a manufacturer or service provider, an eco-label is awarded by an impartial third party to products that meet established environmental leadership criteria. Eco-labelling is only one type of environmental performance labelling, and refers specifically to the provision of information to consumers about the relative environmental quality of a product. There are many different environmental performance labels and declarations being used or contemplated around the world. On the other hand, eco-labelling encourages manufacturing industries to be actively involved in environmental protection and pollution control by designing and

developing environmentally friendly products. Special features of this kind of labelling include eco-labelling is based on voluntary application, and it is a third party certification labelling. An eco-labelling program usually identifies products that have less environmental impact than other similar products, sets up non-binding environmental requirements for these products, and awards a special label to producers who meet these standards. Eco-labelling has increasingly seen as an important market instrument used to complement mandatory laws and regulations for environmental protection.

Labels have been used for at least a century as means to inform consumers of special features of certain products or to warn consumers of possible impacts of particular products. Since the late 1980s or so, the increased public awareness of environmental impacts of products has prompted the rise of a new body of

labelling, often call eco-labelling or environmental labelling, to provide the necessary information for environmentally conscious consumers on products that have less environmental impact. The world's first eco-labelling was initiated by Germany in 1978. Canada, Japan, and the United States established eco-labelling schemes in the late 1980s. Many more were launched in the early 1990s. Eco-labelling programs have also been introduced to some developing countries including China. By now, eco-labelling is being implemented in more than thirty countries around the world. Some of them are government supported programs, and others are privately run schemes. The European Union and the Nordic Council have established intergovernmental eco-labelling schemes. In addition, there are also some international eco-labelling programs specialized in certain products, such as the Forest Stewardship Council (FSC) forest product eco-labelling program and the *Codex Alimentarius* organic food labelling.

## RESULTS AND DISCUSSION

### Eco-labelling programmes

**First party labelling schemes:** These are established by individual companies based on their own product standards. The standards might be based on criteria related to specific environmental issues known to informed consumers through the media or advertising. This form of eco-labelling can also be referred to as 'self-declaration'.

**Second party labelling schemes:** These are established by industry associations for their members' products. The members elaborate certification criteria, sometimes by drawing upon external expertise from academia and environmental organizations. Verification of compliance is achieved through internal certification procedures within the industry, or employment of external certifying companies.

**Third party labelling schemes:** These are usually established by an initiator (public or private) independent from the producers, distributors and sellers of the labelled products. Products supplied by organizations or resources that are certified are then labelled with information to the consumers that the product was produced in an 'environmentally friendly' fashion. The label (seal) is typically licensed

to a producer and may appear on or accompany a product derived from a certified fishery or producer. Producers are usually expected to track the 'chain of custody' of their products in order to ensure that the products derived from the certified fishery are in fact those that are so labelled.

In some instances the initiator accredits other organizations to be the certifier. An accrediting body provides some degree of assurance that the certifier has been trained by an accredited training programme and is qualified to perform an evaluation against a specific set of criteria in a given field. While the criteria may be established through a negotiation process among the various interested parties, they are often motivated by the objectives of the initiators of such schemes. Environmental organizations and consumers generally prefer eco-labelling schemes of this type because of the heightened confidence that private commercial interests will not compromise the criteria applied to the schemes and strict compliance with them based on verifiable and impartial certification procedures.

Environmental labels can be either mandatory or voluntary. Mandatory labels are government-backed and could act as a trade restriction for foreign producers (i.e., imports may be rejected if they do not comply) (WTO 1997). Imports of products that do not comply with voluntary labels are not restricted. In the case of voluntary labels, it is up to the manufacturer to decide whether or not to apply for certification of the product, and the consumer's choice whether to buy (or import) an eco-labelled product. Voluntary eco-labelling programmes may be funded and supervised by the private sector. Some, however, are government sponsored.

### Why to Certify?

**The Rise of Aquaculture:** Due to the stagnation and declining supply of capture fisheries, aquaculture is expected to play an increasingly important role in the future global supply of seafood products (Hall *et al.* 2011; FAO 2012a). Aquaculture is the fastest growing sector of animal-food production in the world and about half of all seafood products now originate from farming (FAO 2012a). Total aquaculture production in 2010 was 78 million tons, including aquatic plants (24 % of total production) (FAO 2012b). Aquatic plants are excluded from further analysis

in this article, which instead concentrates on aquatic animals. The greater part (89 %, seaweed excluded) of aquaculture production originates from the Asia-Pacific region, with China standing out as the top producer. A recent forecast predicts aquaculture based production of aquatic animals to reach up to 110 million tons in 2030, an increase of almost 100 % from current production (Hall *et al.* 2011).

### Environmental Concerns – Impacts on Local and Global Scales

As with other food production systems aquaculture can negatively impact ecosystems and affect global flows of energy and resources. Environmental effects of aquaculture can be seen at various scales. Local effects include discharge of untreated effluents, spreading of aquatic animal pathogens and invasive species, and habitat alteration and related loss of ecosystem services. More global impacts involve release of greenhouse gases, unsustainable fishing behaviors in response to growing demand for fishmeal and fish oil, and, possibly also from an ethical and global resource management perspective,

transformation of fish resources from human food to animal feeds (Naylor *et al.* 2000; Pauly *et al.* 2002) (Table 1).

### Eco-certification of Aquaculture

The concerns about the environmental impacts of aquaculture and growing demand for food products has led to increasing interest in mitigation measures. Market-based initiatives such as certification schemes and consumer recommendation lists for aquaculture and capture fisheries have become increasingly popular tools (Jacquet *et al.* 2009; Washington and Ababouch 2011). Certification schemes have been devised with various objectives in mind, from food safety, quality and traceability, to environmental and social impacts. Until recently, the majority of certification programs have been applicable mainly to capture fisheries, but the number of certification schemes targeting aquaculture is growing steadily (Vandergest 2007) (Table 2).

The key actors in the development of market-oriented standards include civil society and non-government organizations, governments, industry associations,

**Table 1:** Key environmental impacts of aquaculture production

Impact category	Activity/life cycle stage	Possible impacts	References
Habitat alteration	Conversion of natural terrestrial lands/wetlands	Biodiversity loss Loss of protection from storms, floods, and erosion Loss of water purification Loss of carbon sequestration Reduced capture fisheries production Loss of wetland products, e.g., wood, seafood and medicines	Diana (2009) Walters <i>et al.</i> (2008) Walters <i>et al.</i> (2008) Millennium Ecosystem Assessment (2005), McLeod <i>et al.</i> (2011), Walters <i>et al.</i> (2008) Moberg and Ro'nmba'ck (2003) Millennium Ecosystem Assessment (2005)
Feed	Forage fish fisheries Terrestrial feed production	Overfishing of forage fish for fish meal and fish oil Impacts originating from crop production (e.g., soy and maize) to feed	Tacon and Metian (2009) Foley <i>et al.</i> (2011)
Diseases	Hatchery and grow out phase	Spread of diseases and parasites to wild populations	Toranzo <i>et al.</i> (2005)
Larvae production	Fry and broodstock fisheries	Discarded bycatch and biodiversity concerns	Ro'nmba'ck <i>et al.</i> (2002)
Invasive species	Larvae production and grow out phase	Escapes of non-native species	Lind <i>et al.</i> (2012)

**Table 2:** Certification schemes of Aquaculture

Certification scheme	Description of scheme	Quantities certified (thousand tons)	References
Global GAP	Private sector body. Business to business. No label	2000	Global GAP Annual report (2011)
Aquaculture Certification Council (ACC)	Trade association introduced by the industry. Business to consumer. Label	212	(More, personal communication) – ACC, 3/2/2012
KRAV	Organic. Business to consumer. Label	0.7	(Finden, personal communication) Debio 14/10/2011
Debio	Organic. Business to consumer. Label	4.3	(Finden, personal communication) Debio 14/10/2011
AquaGAP	Business to consumer. Label	37	(Bedford, personal communication) Institute for Marketecology (IMO), 13/10/2011
Friends of The Sea	NGO. Business to consumer. Label	220	(Gledhill, personal communication) – FOTS 13/7/2011
Aquaculture Stewardship Council (ASC)	Business to consumer. Label	–	–

retailers and supermarket chains and consumers concerned about food safety, and/or social and environmental impacts (Parkes *et al.* 2010). A number of organizations working toward eco-certification are promoting a life cycle perspective in all standards for certification and the International Organization for Standardization (ISO) 14020 series requires that life cycle considerations are included when developing standards for an eco-label. Despite this requirement, eco-certification programs for aquaculture and capture fisheries have been criticized for not adequately addressing biophysical demands and global environmental impacts (Belton *et al.* 2010).

The goal of eco-labelling initiatives is to promote sustainably managed fisheries and highlight their products to consumers. Product claims associated with eco-labelling aim at tapping the growing public demand for environmentally preferable products. Eco-labels generally rely on life-cycle assessment to determine the environmental impact of a product ‘from cradle to grave’ (Staffin 1996). Usually claims appearing on a product must be preceded by a chain of custody exercise that documents that the product was derived from, for example, a fishery certified as

being ‘sustainably managed’. Prior to certification, a set of ‘sustainability’ standards or criteria against which a fishery is to be evaluated must be developed. Achieving and identifying ‘sustainability’ in fisheries is a complex process. The acceptance and credibility of standards is closely related to how the standards were developed, the standards themselves, and the accrediting or certifying process by which organizations are evaluated against the standard (EDF 1997).

## Benefits of Eco-labelling

### *Informing consumer choice*

Eco-labelling is an effective way of informing customers about the environmental impacts of selected products, and the choices they can make. It empowers people to discriminate between products that are harmful to the environment and those more compatible with environmental objectives. An eco-label makes the customer more aware of the benefits of certain products, for example, recycled paper or toxic-free cleaning agents. It also promotes energy efficiency, waste minimization and product

stewardship.

### ***Promoting economic efficiency***

Eco-labeling is generally cheaper than regulatory controls. By empowering customers and manufacturers to make environmentally supportive decisions, the need for regulation is kept to a minimum. This is beneficial to both government and industry.

### ***Stimulating market development***

When customers choose eco-labeled products, they have a direct impact on supply and demand in the marketplace. This is a signal which guides the market towards greater environmental awareness.

### ***Encouraging continuous improvement***

A dynamic market for eco-labeled products encourages a corporate commitment to continuous environmental improvement. Customers can expect to see the environmental impacts of products decline over time.

### ***Promoting certification***

An environmental certification program is a seal of approval which shows that a product meets a certain eco-label standard. It provides customers with visible evidence of the product's desirability from an environmental perspective. Certification therefore has an educational role for customers, and promotes competition among manufacturers. Since certified products have a prominent logo to help inform customer choices, the product stands out more readily on store shelves. Coveting the logo may induce manufacturers to re-engineer products so that they are less harmful to the environment.

### ***Assistance in monitoring***

Another benefit of an official eco-labelling program is that environmental claims can be more easily monitored. Competitors and customers are in a better position to judge the validity of a claim, and will have an incentive to do so should a claim appear dubious.

### ***Eco mark issued by the Bureau of Indian Standards, India***

The scheme was launched by the Ministry of Environment and Forests, and is administered

by the Bureau of Indian Standards (BIS), which also administers the Indian Standards Institute (ISI) *mark* quality label. In order to encourage the production of environmentally friendly products, to increase consumer awareness of green products, as well as to promote its international competitiveness, India established its own eco-labelling program known as 'Eco-mark' to products conforming to a set of standards aimed at the least impact on the ecosystem. The *marking* scheme was started in 1991. The mark is issued to various product categories and the development of standards for more products is in progress. Challenges of eco-labelling for India include the need to strengthen its eco-labelling program, to link its program to the international development in order to reduce negative trade effects of foreign eco-labelling programs, and to take advantage of opportunities created by eco-labelling to expand India's exports.

## **Economics of Ecolabeling**

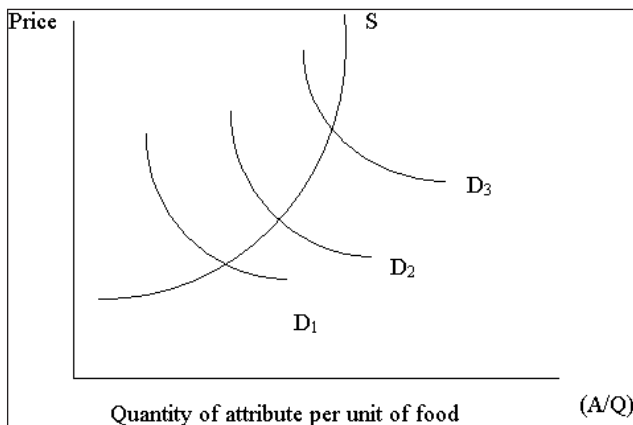
### ***Costs of Certification***

The cost of certification differ in different cases of aquaculture and marine capture fisheries. Unfortunately little information is available on exact costs paid by fishers on the cost of certification. In any eco-labelling programme, the costs of certification are of particular interest to economists, as well as to those involved with fisheries worldwide. Full cost of certification is determined between the certifier and the client, and depends on the size and complexity of the production process. For example if marine capture fisheries certified by the MSC, the test cases so far suggest that pre-assessments are likely to cost in the range of US\$3,000 to US\$25,000, and a full certification could be from US\$15,000 to US\$150,000 (Jonathan Peacey, MSC, personal communication, Feb. 17, 2000) (FAO fisheries technical paper 422).

Before spending money in certification, it is important to consider that consumer are willing to pay or not and consumer willingness may not directly translated into sustainable consumer behaviour (World Business Council for Sustainable Development, 2008; Clonan *et al.* 2011), because there is a scarce or poor relationship between this and quantifiable perceptions of environmental information on the label, rather than intrinsic environmental concerns

(Nguyen *et al.* 2010; Brécard *et al.* 2012). Within the seafood market, consumers may search for products with particular attributes by going to different markets and observing the difference in prices, and perhaps the visible differences in quality (cleanliness of counter, knowledge of wait staff, colour of product, etc). Experience is built up from tasting seafood; perhaps it tastes good to a consumer, or it does not. If one product has an ecolabel regarding its production process, an attribute not easily determined by the consumer, the consumer may choose to purchase the ecolabelled product, even if all other quality attributes are the same for the non-ecolabelled good. Similarly, the lack of an ecolabel on other seafoods may cause consumers to be suspicious of those products. In addition, the socio-demographic profile of environmentally friendly consumers can also vary by location as reported in different reports conducted in countries and regions such as the USA, China, Europe, UK and so on.

Recognizing that attributes of goods have value to consumers, Lancaster (1971) characterised consumer demand for products instead as consumer demand for a bundle of attributes, where each product has one or more attributes. The essence of Lancaster's framework is that a good by itself does not yield utility, but it possesses characteristics (attributes) that create utility. Kinsey (1993) reflects this characteristic of goods as a bundle of attributes with the graph in the figure below. On the axes of this graph are the prices of different quantities of an attribute per unit of food, and quantity as measured by the quantity of an attribute per unit of food ( $A/Q$ ).



**Fig. 1:** Demand and Supply of Attributes per Unit of Food

Supply,  $S$ , represents quantity of attribute per unit of food available in the market as price increases. The attribute might be increasing levels of quality as measured by environmental friendliness, and the growth of marginal cost implies an increase in marginal costs as the industry supplies increasing quantities of environmental friendliness. The demand schedule,  $D$ , represents consumers' willingness to pay for various amounts of attributes per unit of food, which reflects their perceptions of the benefits they will receive from those attributes (Caswell, 1998), at varying income levels. The demand curves are downward sloping to signify that for any level of income, the lower the price of quality per unit of food, the more consumers are willing to purchase.  $D_3$  represents the highest income level, while  $D_1$  represents the lowest income level. Thus, if improved quality is a superior product, then demand will shift up as the consumer becomes more affluent.

### **Recommendations for improving the potential for eco-certification as a tool toward improved environmental performance of aquaculture**

1. Additional species need to be explored for eco-certification. Omnivorous and herbivorous species can be produced with relatively little impact on the environment (though sometimes requiring large areas for production) and could thus be targeted by eco-certification.
2. Investment in technical and financial assistances for small-scale farmers and enterprises that face barriers to certification is required to enable their participation in certification programs.
3. Standards should be better aligned with environmental impacts of different aspects of aquaculture.
4. Finally, certification should be viewed as only one intervention to improve the environmental performance of the aquaculture industry. While improvements can certainly be made to current and planned certification programs, a wider tool box of regulatory and non-regulatory measures will be essential for environmental management of aquaculture as it continues to grow.

## CONCLUSION

Eco-labelling is primarily designed for providing accurate information to consumers on environmentally responsible products, encourage manufacturers to develop products that have less environmental impact, and ultimately for environmental protection. Nevertheless, it has potential to discriminate against foreign producers, in particular some sectors of products imported to OECD (Organisation for Economic Co-operation and Development) countries from developing countries.

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