

**THE SEAFOOD ECOLABELING EXPERIENCE IN FRANCE: A NEW A NEW MARKET FOR LEMONS?**

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**ABSTRACT**

As compared to other countries, France has been involved very lately in the discussion about fisheries ecolabelling. Reluctant to adopt the existing ecolabels, the professional organisations, the Ministry of food, agriculture and fisheries and the European Commission itself tend to create their own label guidelines to take into consideration other criteria than the mere ecological sustainability. In the meantime, some influential processors and retailing chains are involved in various initiatives covering a wide range of more or less credible emerging ecolabels. The ongoing process is therefore uncertain about the conventional standard(s) that may come out of the asymmetrical situation between the poorly informed consumers on the one hand and the current investment of the whole value chain for more or less consistent fisheries ecolabels on the other. First, a brief historical look at the various events surrounding the European and French dissemination of ecolabels is proposed in the present research, revealing the confusing emergence of a standard that could be socially accepted by the stake-holders. Secondly, from an overall survey dealing with the public image of the fishing industry in Europe (5000 interviews throughout Belgium, the Netherlands, France, Italy and Denmark), a probit model applied to the willingness of developing an ecolabel for seafood products is estimated, showing the existing gap between the social awareness of responsible fisheries requirements and the actual criteria governing the consumer behaviour when purchasing fish. Some implications for the development of ecolabeling in Europe are discussed.

**Keywords: fish, ecolabels, Europe**

**Introduction**

As the number of ecolabeling definitions and certification programmes grows, the risk of confusion for consumers has never been so high. Ecolabels are theoretically meant to reduce the informational asymmetry between producers and consumers about the environmental quality of goods. By itself, the definition of this environmental quality for seafood products is problematic and does not result in any way in a consensus among the specialists from the industry or fishery sciences<sup>1</sup>. Do we speak about the quality of goods (organic, level of contaminants), the status of stocks, the conservation of marine ecosystems, the management of the fishery, the pollution induced by fishing or transport means (emissions of CO<sub>2</sub>, food miles)...? For the most popular fishing ecolabel in the world (Marine Stewardship Council), the mere concept of environmental-friendly fish is divided into 100 questions representing as many required criteria for the applicants. How can a consumer be aware of that? What happens if the seafood ecolabel is extended to aquaculture products? No need to say that environmental criteria are very different from those of wild-caught fish. Some other people think that the ecolabel should

be extended to a more global sustainable development framework, including a bundle of social and economic criteria. Is it wise to do so?

The low incentives for both producers and consumers to collect specific and reliable information about sustainability may result in a new “market for lemons” (Akerlof 1970), where the bad labels could be substituted for the good ones. In such circumstances, the awareness of consumers becomes of major interest to maximise the leverage effect of ecolabels on fisheries.

This paper opens with an overview of the ongoing discussion in Europe and France within the field of fish eco-certification, showing the great confusion surrounding what should be done or not. A few theoretical and empirical findings are recalled in the following section to outline the need for fish ecolabelling but also the hurdles to overcome before its achievement. One of the pillars lies on the social awareness and perception of the environmental impact of consumers’ choices, although environment is hardly on top of the fish consumer’s agenda. How far and fast can the market turn to this type of consideration? An ordered probit model is developed from a big survey that has been carried out with more than 5000 consumers. Unlike in a few previous ecolabel-focused studies, the environmental criterion comes long after many other ones (freshness, aspect, product form, price...), showing the gap to be filled up before the awareness of fish consumers for environmental issues. However, this awareness is explained by a range of sociological variables that are found consistent with other empirical research.

## **1. The debates surrounding the fish ecolabelling issue in europe**

### **The European unfinished framework**

Nearly a decade after the creation of the first world-wide eco-label for fisheries (the *Marine Stewardship Council*, created in 1997), the European Union has committed itself very lately in the debate through a long and unfinished debate. In June 2005, the European Commission adopted a Communication launching this debate on a Community approach to eco-labelling for fishery products. The communication considered 3 options:

- 1: No action or public intervention
- 2: A single Community scheme
- 3: Some minimum requirements for voluntary schemes

With a large consultation of stakeholders between 2005 and 2007 (Advisory Committee for Fish and Aquaculture –ACFA-, EU Institutions and Expert group), the reflexion is still under way in 2008. On November 25<sup>th</sup>, 2005, a conference gathering the major stakeholders was organised. A general consensus was obtained for the third option, considering that the fishermen should be involved. The main focus of the eco-label should be placed on sustainability, but the quality of the products was also considered as part of the label. Basically, the eco-labelling scheme should follow the FAO guidelines. This third scenario was confirmed a few months later (Feb 14<sup>th</sup>, 2006) by the European Economic and Social Committee. The issue of a fair distribution of ecolabeling costs along the supply chain was added to the agenda, as well as the compatibility with WTO rules. IUU fisheries should be targeted in priority to improve the public image of the fishing industry.

After this consultancy round, the debate went in April 2006 (26<sup>th</sup>) to the European parliament through the Committee on the environment, public health and food safety. The conclusion prioritised scenario 2 (single European scheme), seen as complementary with EU regulations regarding fisheries. A Resolution was adopted on September 7<sup>th</sup>, 2006, finally leaving open the choice between options 2 and 3. The former presents higher administrative costs, though a certain independence (accreditation, certification bodies and monitoring are more credible for consumers). The latter does not fully address the ecolabelling issue, particularly regarding this independence.

As the choice of the scheme was left open, there was room for more discussion and consultancy. An *ad hoc* expert group was constituted by the European Commission and a new report was produced on 16 February 2007. The representation of this group, by itself, is interesting to analyse, as the number of professional institutions and representatives make the core of this 15-member group: 5 members from seafood organisations, 2 from fishing companies, 2 from processing firms, 4 representatives of the certification industry and only 2 from academia. None of them was belonging to environmental NGOs or consumers associations.

In 2008, option 3 dominates the European discussion (this is confirmed by the Agriculture and Fisheries Council of 16 April 2007) but the list of minimum requirements is still expected and the administrative procedure of public accreditation needs to be clarified. In the meantime, the eco-labelling experiences are flourishing everywhere in Europe with more or less credibility and fame according to how it is developed and who is doing it.

### **A variety of initiatives in France**

The concept of fish products ecolabelling and fisheries sustainability was made visible by large scale operators (retailers, processors) since 2004 onwards, but the concept has only emerged within the French fishing industry quite recently, in 2007.

In 2004, Carrefour -the number one retail chain in France - was pioneer in introducing its own ecolabel (*Responsible fishing*) asserting that its eco-stamped products originate in sustainable fisheries. The scheme, kept secret by the chain, is based on a sort of HACCP methodology, i.e. a risk analysis at different stages of the process, where the critical points of the marine resource sustainability are identified in order to be corrected. Today, four species caught in Iceland and one in Greenland have received the chain's ecolabel, though only a very limited proportion of the chain sells ecolabelled fish (less than 1% of sales). This initiative has nonetheless contributed to settle the discussion in France.

To date, no other retail chain has attempted to develop its own eco label. According to most of the chains interviewed, it is not on their agenda for the near future. Two main reasons are given:

- Developing the standards and procedures for an eco-certification would not be cost efficient;
- Building up an in-house "ecolabel" will not fulfil the stakeholders' expectations and would be perceived as too risky in terms of image.

However, since the middle of the past decade, all of them adopted some specific purchasing criteria supposedly to alleviate the fishing pressure on endangered species. For instance, in November 2006, Auchan decided to purchase only flat fish of a minimum weight greater than the legal commercial weight. It also presented the sales of farmed tilapia as a way to decrease pressure on wild fish stocks. More recently, in winter 2007, Auchan claimed to remove bluefin tuna from its purchasing list.

The third French retail chain to take actions was Casino (2007) with the creation of a new label on five farmed species, so as to lower the fishing pressure. The chain committed publicly to go further and to work at preserving wild stocks. The specific logo mentioned: "selected products for a preserved ocean". Note that over the same period (2004-2008), the sales of MSC certified products in France developed quite rapidly. Most supermarket chains include MSC products in their range of fresh, frozen or canned seafood (40 products in March 2008).

On the fishing industry side, the first movements towards ecolabelling appeared very lately, in 2007. In 2006 and 2007, the MSC commercial team ran information tours in the French fisheries. During these visits, the whole concept of ecolabelling, the specific MSC standard and the certification procedure were presented. The response of fisheries' managers ranged from neutral to hostile, because of the negative image of being affiliated to a green NGO (WWF), a large multinational company (Unilever), and of being private. As a result, some fishermen's organisations asked the French authorities to consider a public scheme, when others developed an in-depth SWOT analysis of adopting a private ecolabel programme.

Ofimer, the French public organisation in charge of promoting seafood products, ordered a study (spring 2007) to define which criteria are the most relevant for a fishery ecolabel. In March 2008, the study concluded that MSC was the closest to comply with FAO guidelines and that demand for a public ecolabel that would include criteria other than the pure environmental ones. A public commitment was made by Ofimer in March 2008 that 10 fisheries would be ecolabelled within 3 years, according to a standard compliant with the FAO guidelines.

## 2. Some theoretical and empirical findings about ecolabeling

### Credence goods and lemons' curse

After Stigler's (1961) and Nelson's (1970) works, the economists used to consider two types of goods as far as information is concerned:

- *Search goods*, where the consumer looks for additional information as long as the marginal cost of information does not exceed the expected marginal benefit. Information is thus acquired before purchasing the good.
- *Experience goods*, where the consumer has greater benefit by acquiring information after the purchase than before because the research costs usually exceeds the price for these goods.

Through their environmental and peculiar characteristics of commons and living in the wilderness, fishery products are certainly of a third type known as *credence goods* (Darby and Karni 1973). The environmental quality is costly to determine, even after that the good is purchased (Bougherra and Piguet 2008). In such circumstances, the cost of information matters more than the timing of research. The credibility of the certifying organisation is crucial to internalise this social cost (commons) at the best possible price (Wessells *et al.* 1999). With the complexity of this environmental issue, the temptation is high for producers to reduce the certifying costs as much as possible by selecting a cheap procedure that the consumer will appreciate to the same extent as a higher standard of certification. Such a moral hazard may lead to a new curse of "market for lemons", this famous market described by Akerlof (1970) where asymmetry between buyers and sellers concern the quality of cars. Asymmetry of information reduces the overall quality level on the market throughout time by discouraging the sellers of higher quality goods.

### How much are we willing to pay for a "sustainable" fishery product?

Where do we stand regarding the empirical effects of fishery ecolabeling on consumption's behaviour, even though everybody considers that it is too early for an actual appraisal of the main eco-certification schemes (Wessells 2003; Leadbitter *et al.* 2006)? The dolphin-safe ecolabel campaign by the US tuna industry took at least 4 years to produce its first effects on demand, explaining that the first evaluation did not conclude to a positive effect of the dolphin-safe label after 2 or 3 years only (Walltrom and Wessells 1994; Bockstael and Strand 1995, cited in Teisl *et al.* 2002). Some years later, the positive impact was demonstrated through an AIDS (*Almost Ideal Demand System*) model using scanner data, although the conclusion was not straightforward for the authors whether the impact was due to the ecolabel itself or to other media campaigns (newspapers, TV, producers' advertising, congress debate...) (Teisl *et al.* 2002).

Another strand of research looks at the consumer's attitude towards the environmental aspect of seafood products by using discrete choice models. In 1998, a contingent choice survey (1640 households) was undertaken in the USA to assess consumer preferences for ecolabeled seafood (Wessells *et al.* 1999). The objective was to analyse by a logit model the determining socioeconomic factors behind the purchase of an ecolabeled fish: price, species, product form, demographic features, food budget, certifying body, seafood and environmental awareness... Among the main influential factors were the species (the negative sensitiveness of consumers to the premium for an ecolabeled product is greater or smaller according to the species), the region (the US west-coast inhabitants are more willing to buy "green" seafood), the product

form (the consumers buying frozen fish are less sensitive to ecolabels), the consumption level, the gender (women are more receptive to ecolabels) but curiously the type of certifying organisation (WWF, NMFS, MSC) plays no role for consumers, in spite of what is theoretically expected regarding the credibility of ecolabels (see above).

In 2001, a conditional logit model was applied to 600 questionnaires in the UK with the use of cue cards displaying 22 characteristics: 6 product forms, 3 types of certification (incl. ecolabel), 2 certifying organisations (governmental or NGO), 3 origins (UK, foreign, unknown), 2 production methods (farmed or wild fish), 4 price levels and 2 brands (producer or private retailer label), i.e. 1728 combinations in overall (Jaffry *et al.* 2004). The marginal effect of ecolabeling on cod's consumption is a major determining factor of consumption, increasing by nearly 7% the probability to choose this product. The same level is reached for canned tuna (6.3%). On the other hand, the origin (farmed vs wild) of fish affects negatively the purchase. A significant negative effect is also observed for foreign products as compared to domestic fish (from a 3.3 to 6.3% decrease of the probability according to the product form). Unlike the previous cited study, the certifying organisation is likely to affect fish consumption, with a preference granted to governmental organisations as compared to NGOs.

Finally a third study is of particular interest to understand the public attitude towards the environmental dimension of fish consumption (Whitmarsch and Wattage 2006). From a survey embracing 340 phone interviews in the UK, it demonstrates through an Analytic Hierarchy Process (AHP) which priority is given to environmental matters by the consumers of farmed salmon. Although the issue is linked with the pollution resulting from salmon farming (and not to the sustainable catch of wild fish), it is interesting to note that environment ranks at the first place among consumers' criteria, far ahead from the quality of products, the job creating role of fish farming, the capacity of avoiding conflicts among coastal users or the fair price of salmon. This seems very unusual to report prices as the last priority of consumers and environment as the first one. It looks as though the question itself has not been identically understood by all consumers: the authors asked about the achievements of aquaculture with regard to the 5 objectives, but also refer to the desirable goals of aquaculture. One may wonder whether the question was understood in a positive way (what has been achieved by salmon farming) or a normative way (what should be the goals). A contingent valuation follows with a scenario of "*willingness to pay (WTP) a price premium for salmon farmed using a method that caused only half the amount of organic pollution*" (*Ibid.*, p. 113). Some 76% of respondents had a positive WTP and the average premium fetched 22% with the positive influence of the AHP priority for environment and the income and the negative impact of the household size.

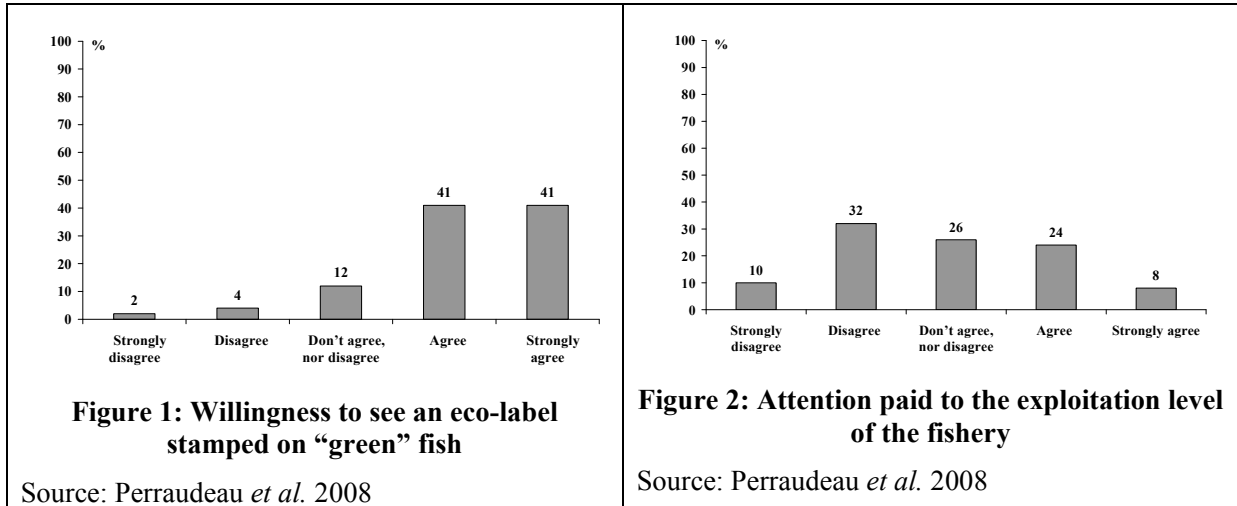
### **3. Survey and probit analysis**

All above mentioned studies show the positive concern of seafood consumers about environmental issues, at least in the UK or the USA. A recent European survey has attempted to assess the public image of fishing and fishermen by the European citizens (France, Denmark, Italy, the Netherlands and Belgium) (Perraudeau *et al.* 2008).

#### **The data**

The data used for this model were collected from a survey achieved in 2007 for Européche ETF (Perraudeau *et al.* 2008). This survey was conducted in five European countries by Européche-ETF (Belgium), CESVIP (Italy), Fisheries Circle (Denmark), SNV-PVIS (the Netherlands) and the University of Nantes (France). The database includes 5000 questionnaires completed by face-to-face interviews, out of which 4748 were finally usable (847 in Denmark, 849 in Belgium, 1110 in Italy, 1030 in France and 912 in the Netherlands, randomly selected with an error margin of 3-4%). The number of observations used in the regressions can be somewhat different from the full sample because the missing values have been systematically removed before the analyses.

The questionnaire form encompassed more than 50 questions about how the fishing industry is perceived by the European citizens so as to estimate the degree of knowledge and awareness about the industry and the fisheries in general. Concerning the eco-labeling question, a majority of respondents agree upon labelling fish caught in a sustainable way (fig. 1).



However, when it comes to the attention paid by consumers to the level of stocks from which is caught the fish they are about to pay for, the proportion of approvals falls dramatically (fig. 2). In other words, it confirms the peculiar informational status of fishery products as *credence goods*: although free, the information is not collected spontaneously by consumers who pay very little attention to this criterion when buying fish.

**The model**

The issue of ecolabelling has been analysed through an ordered *Probit* model. The survey itself was not dealing specifically on this issue (the name of eco-label itself is not used in the questionnaire), but with the more general public perception of the fishing industry in Europe. Among many others, one of the questions was addressed in the following terms: “*The fish caught with techniques that are environment-friendly should be stamped with a specific label (do you strongly agree, agree, don't agree nor disagree, disagree or strongly disagree with the proposal?)*”. In the model, this issue is linked with other issues about the consumption criteria that are commonly used in the literature (freshness, visual quality, price, origin, product form...) and other socioeconomic features.

Let  $e_i^*$  be an unobserved latent variable associated to the environmental perception of an individual  $i$ . The estimated model is given by:

$$e_i^* = \beta' X_i + \gamma' O_i + \varepsilon_i \tag{1}$$

Where  $X_i$  is a set of individual, sociological and economic characteristics,  $O_i$  is a set of dummy variables related to the country fixed effects (5 countries in the analysis),  $\beta$  and  $\gamma$  are the corresponding vectors of coefficients to estimate, and  $\varepsilon_i$  is a random disturbance supposed to be normally distributed. While  $e_i^*$  remains unobserved, the data provide information on its observed counterpart  $e_i$  :  $e_i = 0$  when the individual strongly disagrees with the proposal,  $e_i = 1$  when he disagrees,  $e_i = 2$  etc. The proposal is thus expressed as:

$$e_i = n \quad \text{if} \quad \mu_n < e_i^* \leq \mu_{n+1} \tag{2}$$

with  $n \in [0,1,2,3,4]$ . The different  $\mu_n$  are the threshold levels which have to be estimated jointly with  $\beta$  and  $\gamma$ . We assume that  $\mu_0 = -\infty, \mu_4 = +\infty$ , and we normalise  $\mu_1 = 0$  for identification purpose. The probability  $\Pr(e_i = n)$  is therefore:

$$\Pr(e_i = n) = \Phi(\mu_{n+1} - \beta' X_i - \gamma' O_i) - (\mu_n - \beta' X_i - \gamma' O_i) \tag{3}$$

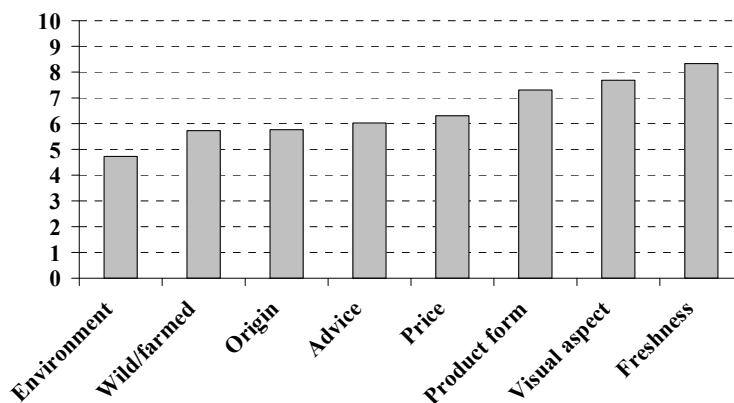
Where  $\Phi(\cdot)$  is the cumulative distribution function of the univariate normal distribution. The corresponding specification is an ordered *Probit* model, which can be estimated using a maximum likelihood approach. Consequently, this model allows, other things being equal, to identify the explanatory factors of the willingness to accept a fish ecolabel.

**Results**

*The fish consumers' criteria*

Various questions have tried to identify the main motivations that a consumer has when buying a fish product. In most of the studies dealing with seafood consumption (Anderson and Wessells 1992, Wessells *et al.* 1999, Jaffry *et al.* 2004), some recurrent characteristics are usually put forward: freshness, visual aspect, farmed or wild origin, product form, foreign or domestically produced...). Some of them are directly related to quality and health considerations (Anderson and Wessells 1992). Some others are rooted in more ethical or social dimensions of consumption (environment, job-creating effect) (Whitmarsch and Wattage 2006). Finally, some others are purely based on economic aspects.

An index is estimated with values between 0 and 10 according to the proportion of respondents that have chosen a given item ( $e_i$ ) along the ordered scale of possible answers. The greater the value, the higher the proportion of positive attitudes for the criterion (“when you buy a fish product, do you pay attention to...”).



**Figure 3: Purchasing criteria for fish in Europe**

Source: Perraudeau *et al.* 2008

Although the consumers were not invited in the present survey to sort out the different criteria used for their fish purchasing behaviour, the spontaneous ranking order appears clearly by placing the freshness and quality characteristics at the top of their priorities whereas the environmental criterion is cited by the lowest proportion of the population. The product form (fresh or frozen), the price, the advice by the

fishmonger, the site of production (domestic or foreign fish for example), or even the wild origin of fish (preferred to farmed fish) matters far more than the under or over-exploited status of the fishery. Although not totally surprising, this result rather contradicts those empirical studies whose aim is to assess the opinion of consumers regarding environment among other criteria, as environmental aspects seem to be very influential in the consumers' attitude (Jaffry *et al.* 2004, Whitmarsch and Wattage 2006).

**Table 2 The variables linked with the willingness to discriminate the environmental content of fish products** (“*The fish caught with techniques that are environment-friendly should be stamped with a specific label*”)

“When you buy a fish product, do you pay attention to:”	Coefficients (t-test)				
	Strongly disagree	Disagree	Don't agree, nor disagree	Agree	Strongly agree
the visual aspect of fish	Ref.	0.098 (0.43)	0.176 (0.80)	0.370* (1.71)	0.382* (1.74)
the environment (level of stocks)	Ref.	0.026 (0.31)	0.084 (0.96)	0.142 (1.58)	0.268** (2.39)
the wild or farmed origin of fish	Ref.	-0.071 (-0.68)	0.044 (0.42)	0.009 (0.09)	0.282** (2.46)
the price	Ref.	0.183 (1.53)	0.081 (0.72)	0.242** (2.19)	0.207* (1.73)
the geographical origin of fish	Ref.	0.323*** (3.01)	0.473*** (4.30)	0.517*** (4.74)	0.700*** (5.75)
the product form (frozen vs fresh)	Ref.	0.266 (1.39)	0.230 (1.25)	0.201 (1.12)	0.307* (1.67)
the freshness of the product	Ref.	-1.097*** (-4.05)	- 1.185***	- 0.965***	- 0.726***
Number of observations	3344				
LR chi2(46)	797.61				
Log Likelihood	-3482.33				
Pseudo R2	0.103				

The reported coefficients are estimated with an ordered *Probit* model. The significance thresholds are respectively 1%(\*\*\*), 5%(\*\*) and 10%(\*). The specification includes control variables: gender, age (4 categories), the family status (2 categories), the type of job (6 categories), the localisation of the habitation (2 categories), the general point of view regarding fishing activities (5 categories), and the perception of fishing regulation strictness (5 categories).

Source : Perraudon *et al.* 2008

What is also interesting from the *Probit* results (Table 2) is the consistency of some of our results with other studies showing the linkage between the acceptability of ecolabeling and other parameters such as the product form (Wessells *et al.* 1999), the wild vs farmed origin of the fish and the geographical origin of the fish (Jaffry *et al.* 2004). In the latter research, as above mentioned, the marginal effect of foreign produced goods was significantly negative for fish consumption. One may wonder what is behind this mistrust of domestic consumers for foreign fish: is it due to environmental or socioeconomic factors (*we don't know how well the fisheries are managed abroad; or I prefer a fish less harmful for the environment because of the food miles problem; or I prefer a fish whose production creates jobs in my country*)?

Also of interest is the significant linkage between the ecolabeling question and the price of fish. Those consumers in favour of an ecolabeling policy pay also more attention to prices when buying fish. To some



extent this result is surprising as the sociological profile of the eco-label *pros* is rather found in upper-class categories, supposedly less sensitive to price levels. However, it can also be interpreted in a more general view regarding information: the consumers who are more sensitive to the environmental information are also more likely to look at any type of information (health, quality, environment, economy...). The other sociological characteristics of these green consumers are presented in the next section.

### *The sociological profile of eco-label defenders*

One of the pleasant outcomes of the estimated model is to observe that the ecolabeling question, even addressed in such general terms (*“The fish caught with techniques that are environment-friendly should be stamped with a specific label”*), has been perfectly understood by a certain class of population. The general reference to the environment (and not to the level of stocks or ecosystems) in the question could have been interpreted in many different ways by the citizens (energy, pollution, by-catches, ecosystems and habitats, marine biodiversity, fish stocks...). Two other related answers proved that the environmental issue regarding fisheries is well connected with the level of fish stocks: *“the quantity of fish in the sea is stable”* and *“how regulated are the fisheries”*. These two issues are significantly (and negatively) linked at the 1% level in all categories (ordered) with the ecolabel question (Table 3). In other terms, those people thinking that green fish should be labelled also disagree with the proposal that fish stocks are stable over time, hence thinking of a decline, and rather believe that fisheries are not sufficiently regulated.

**Table 3 The socioeconomic factors of the willingness to discriminate the environmental content of fish products (*“The fish caught with techniques that are environment-friendly should be stamped with a specific label”*)**

	Results	
	Coeff.	t-test
<b>The quantity of fish in the sea is stable</b>		
Strongly disagree	Ref.	
Disagree	-0.301***	-5.55
Don't agree. nor disagree	-0.530***	-9.04
Agree	-0.609***	-7.55
Strongly agree	-0.782***	-5.23
<b>The fisheries are:</b>		
Not at all regulated	Ref.	
Insufficiently regulated	-0.109*	-1.68
Acceptably regulated	-0.384***	-5.94
Well regulated	-0.385***	-5.17
Very well regulated	-0.571***	-5.59
<b>Gender (Ref. = women)</b>	-0.117***	-3.21
<b>Age</b>		
15-25 years	Ref.	
25-45 years	0.024	0.36
45-65 years	-0.016	-0.21
More than 65 years	-0.301***	-2.64
<b>Marital status (Ref. = couple)</b>	0.004	0.16
<b>Professional situation</b>		
Farmer	Ref.	

Worker	-0.045	-0.59
Self-employed	0.035	0.49
Intellectual profession	0.206***	3.33
Intermediary profession	-0.083	-1.06
Unemployed	0.186*	1.73
<b>Type of habitat</b> (Ref. = urban)	-0.024	-0.54
<b>Countries</b>		
Denmark	Ref.	
Belgium	0.749***	9.49
France	0.615***	8.18
Italy	0.430***	5.72
The Netherlands	0.133*	1.74
Number of observations		3998
LR chi2(46)		565.86
Log Likelihood		-4389.15
Pseudo R2		0.061

The reported coefficients are estimated with an ordered *Probit* model. Significance thresholds are respectively 1%(\*\*\*), 5%(\*\*) and 10%(\*).

Source : Perraudau *et al.* 2008

Regarding the sociological features of “green” respondents, they appear to be very consistent with previous surveys (Wessells *et al.* 1999, Whitmarsh *et al.* 2006). They are rather young, female, living in urban areas and well educated. In particular, the sensitiveness of women to ecolabeling issues was already found in the Wessells *et al.* study (1999), although other social variables like age, income level, education or political opinion had shown very little effect on preferences.

#### 4) Discussion-conclusion

The late and unclear process of developing fish ecolabels in Europe has certainly delayed the awareness of European consumers for ecolabeling. Among three scenarios (no action, a single European scheme or a public list of minimum requirements), the debate is still under way and not passed on yet to consumers. Pushed by the strong demand for more information about the environmental conditions of seafood production, the food and retail industry has developed its own initiatives of eco-certification. The amount of involvement and credibility is variable and may result in a new “lemon market’s curse” described by Akerlof (1970) if nothing is done to regulate the fish ecolabeling sector.

This is exactly what could be the misfortune of ecolabelling. Because an independent and rigorous eco-certification requires a substantial investment that can hardly be fully understood by consumers in all its complexity, producers are likely to reduce their expenses in eco-labels unless the cost of certification can be passed on to the consumer through prices, assuming for the latter a significant willingness to pay for an environmental guarantee. The expertise on stock assessment being controversial, monitoring and traceability systems being poorly efficient in many cases (Jacquet and Pauly 2007) and consumers having other priorities (like prices or health) than environment in their day-to-day seafood consumption, uncertainty and asymmetry of information will be fairly difficult to eradicate from the eco-labelled markets.

Even worse, consumers are rationally ignorant when it comes to a certain type of information, like the sustainable origin of goods. Asia consume more than two-thirds of the world's seafood products but most of Asian consumers do not discriminate between products in the context of environmental issues (Jacquet and Pauly 2007; Phillips *et al.* 2003). In these countries like for a large proportion of the population in developed countries, consumers have a low incentive to search for environmental information, although it is free and accessible. Both the complexity and uncertainty surrounding the issue of natural resources sustainability may explain this poor interest for environmental issues. The same observation was done in the USA some years ago about the inability of consumers to discern seafood quality, thus making necessary extrinsic cues for reassurance (Anderson and Wessells 1992).

Through a large survey of European citizens and an ordered *Probit* model, this study shows an overall weak incidence of environmental issues on the day-to-day consumption behaviour. Unlike previous findings (Jaffry *et al.* 2004, Whitmarsch and Wattage 2006), environmental consideration appears at the final rank of their priorities, far behind other sanitary or socioeconomic aspects. However, the demand for visible information regarding ecolabeling of fisheries has never been so strong and the proportion of the population wishing a label for environment-friendly produced seafood is very high throughout Europe. This kind of dual outcomes is typical of *credence goods* where the consumer has very little incentive to collect complex environmental information before the purchase of the good and even after. However, for a certain group of respondents, the problem of overfishing is perfectly understood behind the ecolabeling question. The environmental problem arising with consumption is clearly associated with a decline of fish stocks and the lack of regulation or monitoring. The awareness is nonetheless not equally distributed among fish consumers: the youngest women of higher education are more likely to look at the environmental impact of fishing when buying seafood products. A country effect is also observed and would deserve greater scrutiny for its interpretation.

The global conclusion of the study is therefore to urge the public authorities to take actions in favour of the awareness of populations regarding fish stock levels and to promote ecolabeling in a clear legislation framework. In particular, advertising campaigns for seafood products originated from responsible fisheries could be implemented to improve the overall level of information among a broader fringe of consumers.

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## **ENDNOTES**

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<sup>i</sup> See the recent debate between the future of fishery resources in Worm *et alii* 2006 and Longhurst 2007.