

1 = Hardangerfjord 3 = Algarve Coast 5 = Coastal North Sea
2 = Atlantic Sea Coast 4 = Adriatic Sea Coast 6 = Baltic Sea

Figure 1. Diverse case studies will provide data for further analysis to identify benefits and bottlenecks for development.

Lessons can be learned from the coastal nations that surround the shallow southern part of the North Sea. The demand for space in these areas of the Netherlands, Denmark and the German part of the North Sea is great and has forced these nations to adapt marine spatial planning to a high degree.

Governance

A divergence in governance frameworks exists in Europe's aquaculture regions. Whereas salmonid aquaculture in Northern European countries is relatively strictly regulated, shellfish farming in Portugal is strongly based on tradition.

The lack of biological and legal control mechanisms could leave the shellfish industry vulnerable due to low biosecurity against invading organisms or diseases.

Governance of the marine sector in Europe is dynamic and evolving, and improvements might benefit both industries and environmental protection interests.

Ecological Conditions

In addition, the ecological conditions are diverse, as are local adaptations. In Finland, for example, ownership of marine areas is allowed, while they are considered public property in other countries. Furthermore, Finnish aquaculture is subject to

strict regulations on excess nutrients because of the overall nutrient situation in the Baltic Sea. This has led to creative synergies with fisheries in which less-valuable fish are used to feed cultured fish, reducing the net loading of nutrients to the sea.

In contrast, Norwegian aquaculture produces high quantities of nutrients that can have local effects. However, they are considered negligible in the large scale due to excess nutrients from the Scandinavian Coastal Current that dominates the coastline.

The protection of nature interests seems more comparable despite the extreme differences in natural and cultural geography that can be seen along the European coastline. Furthermore, tourist fisheries and fishing by local inhabitants are important interests, but the economic and ecological impacts of these activities are usually poorly monitored.

Stakeholder Interests

Interviews with stakeholders are an important source of information for the COEXIST project. The interviews are systematically performed throughout the different study areas and are therefore comparable.

Representatives of various interests have been interviewed on a range of questions to determine major activities, conflicts and possible synergies. The interviews have also provided important information about jurisdiction and governance in the study areas.

Multicriteria analysis is used as a tool to structure and analyze the relevant issues for coastal management in different countries. Other important aspects of the analysis include present and future governance policies, interests of stakeholders and possible risks and future impacts on the different stakeholders. In addition to providing some transparency, multicriteria analysis provides an opportunity to identify positive governance methods for the future based on comparisons of preferences and future impacts in the different societies.

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Example of a choice set. Which is "better"?

Catalonia Consumers Prefer Wild Mussels
Study Finds Knowledge Of Mussel Farming Limited

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Summary:

The authors analyzed consumers' preferences for mussels in Catalonia using choice experiment methodology in a structured questionnaire. Results showed that for the 233 mussel consumers who participated, product presentation was the most valued attribute. Fresh mussels, whether loose in bulk or in a string bag, obtained the highest willingness to pay. Consumers also valued mussels produced in Catalonia by means of extractive fishing.

Mussels are one of the main seafood products in the Catalonia region of Spain. Recent production accounted for

53% of the volume of aquaculture products and over 20% of the value.

Mainly located in the Ebro Delta, most mussel production in Catalonia uses the rope culture system. The main species produced is the blue or Mediterranean mussel, *Mytilus galloprovincialis*. Its marketing is differentiated through labeling that indicates "mussels from the Ebro Delta."

Consumer Study

The authors recently explored consumer preferences toward mussels in Catalonia. The study was funded by Aqüi-CAT, the Cluster Plan to Promote Aquiculture in Catalonia, and led by IRTA Research and Technology in Food and Agriculture, and ACCIÓ, Competitiveness for Catalonia.

The research considered the following attributes of mussels and the degrees to which consumers valued them.

- **Mussel presentation.** In Catalonia, mussels can typically be found fresh in bulk or in a string bag. However, other presentations are being introduced. For this work, frozen mussels without valves were included.
- **Mussel origin.** Origin information helped determine the necessity of promoting a regional label for product differentiation. For this attribute, three origins were chosen: Catalonia; Galicia, a main producer

in Spain; and Holland, a foreign origin.

- **Mussel production system.** Identification of production systems helped identify whether farmed products were desirable to consumers. Its options included mussels from extractive fishing, mussels produced by means of aquaculture and mussels whose production method was not indicated on their labels.

Study Methodology

The authors' choice experiments were based on the creation of a hypothetical market for the analyzed goods and services. A series of descriptors were com-

Table 1. Implicit values for the considered levels.

Attribute Level	Implicit Value (Lower, Upper Levels) 90% significance
Catalonia	1.64 (1.33, 1.99)
Galicia	0.52 (0.24, 0.79)
Holland	-2.16 (-2.56, -1.76)
Fresh loose in bulk	1.66 (1.31, 2.01)
Fresh in string bag	1.61 (1.31, 1.98)
Frozen without valves	-3.27 (-3.89, -2.81)
Extractive fishing	0.78 (0.49, 1.14)
Aquaculture	-0.37 (-0.63, -0.11)
Not indicated	-0.41 (-0.71, -0.16)

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bined to create different product alternatives grouped to construct "choice sets." One of the choice attributes was usually defined in monetary terms to allow the association of monetary values with attributes and attribute levels.

A questionnaire was designed, and 233 mussel consumers were interviewed. A stratified sampling method by age and postal districts using minimum quotas by stratum was used. By considered only the attributes' main effects, the number of choice sets was reduced to nine.

Results

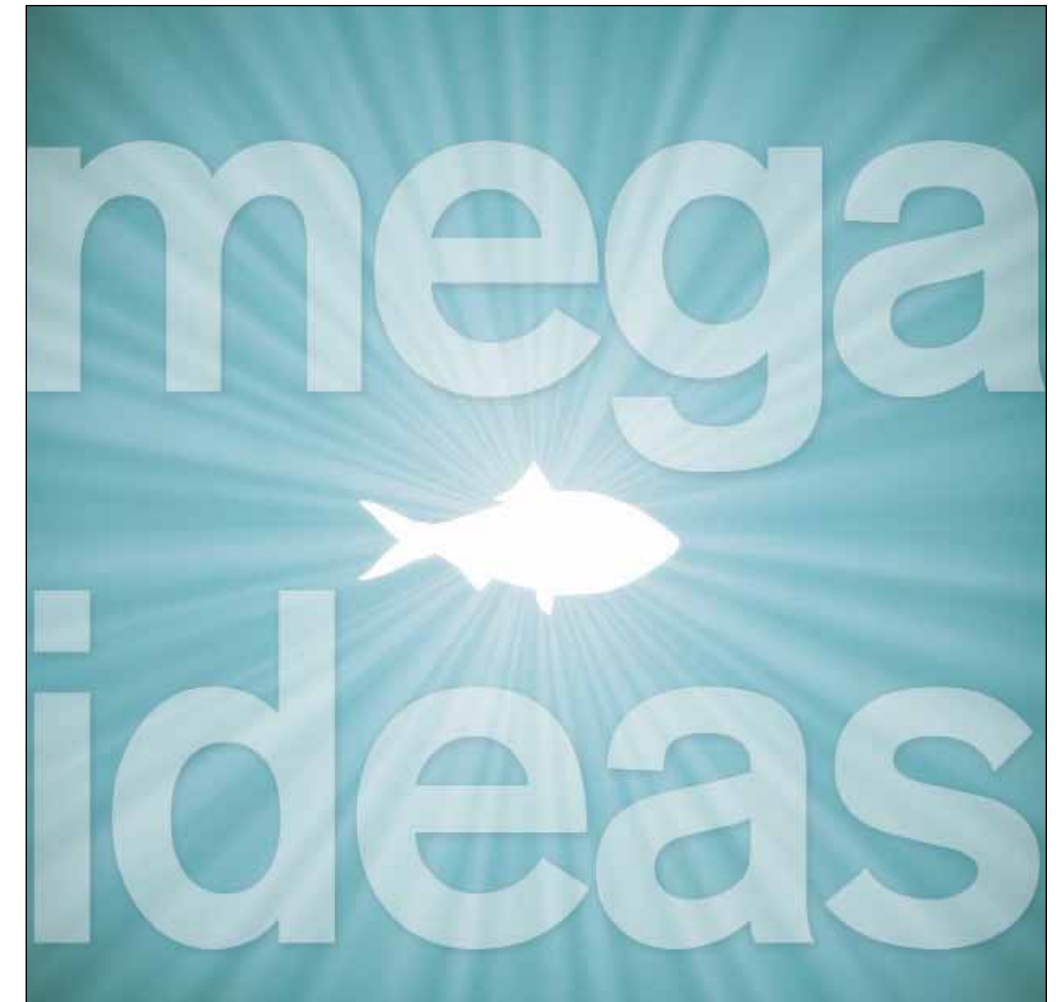
Results showed that all attributes and levels were statistically significant determinants of consumer welfare. For the economic interpretation of the models obtained, implicit values were calculated. Table 1 shows the average values obtained for all the considered levels.

There was a strong preference for product presentation, followed by the origin and the method of production. For mussel presentation, consumers preferred a fresh product, whether loose in bulk or in a string bag. On the contrary, frozen mussels scored a negative willingness to pay.

The preferred origin was Catalonia, which additionally showed the highest positive willingness to pay. Mussels from Galicia were also positively valued, but mussels of Dutch origin were not.

The preferred production method was extractive fishing, as it obtained positive and significant willingness to pay scores. When the production method was not indicated on the label, or when the mussels were produced by aquaculture, implicit prices showed negatively. All in all, fresh mussels from Catalonia – obtained by extractive fishing – were the preferred product.

These results could be explained by the lack of consumer awareness regarding mussel production. Press releases about red tides and other causes for temporary closures of mussel harvesting could also have introduced negative connotations in the consumers' minds toward mussel production.



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