

# Opportunities for the Development of Community Aquaculture.

## Response from the Board of Directors of the European Aquaculture Society



*EAS ([www.easonline.org](http://www.easonline.org)) is an independent international non-profit association (created in 1976) that promotes contacts and disseminates information among all involved or interested in aquaculture in Europe. These principal objectives are addressed through the organisation of meetings and conferences and through the participation of EAS in EU aquaculture initiatives. EAS<sup>1</sup> currently has members in more than 60 countries.*

### The 2002 Community Strategy for aquaculture

#### **1. Do you consider it justified for the Community to develop a specific strategy for aquaculture and why?**

Globally, aquaculture is the fastest growing food production sector and the European Community is home to a unique mix of world renowned expertise and experience which arguably remains fragmented due to the diverse number of stakeholders involved in a broad range of aquaculture species produced across Europe in different environments.

Until the 2002 strategy was communicated, aquaculture had only minor importance within the Common Fisheries Policy. With the development of the sector, and its increasing importance as a food production sector, a strategy for its sustainable development was crucial to integrate this wealth of knowledge and to ensure that Europe remains at the cutting-edge of this rapidly expanding sector.

The European Aquaculture Society plays a pivotal role in promoting dialogue and dissemination of information to all involved or interested in aquaculture in Europe and thus is keen to help develop a specific strategy for European Aquaculture with the aid of sufficient resources.

In 2007, aquaculture still has relatively minor importance in the CFP and in the proposal for a European Maritime Policy. The EAS Board of Directors therefore requests the Commission to further develop and monitor a strategy for the sustainable development of European aquaculture that can form a significant part of the process to develop an all-encompassing European Marine Strategy. This can only be achieved if aquaculture is given similar support as that offered to other maritime sectors.

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## **2. Do you share the vision for a sustainable development of European aquaculture as set out in the 2002 Strategy? Would you consider that it needs to be adapted to evolving circumstances?**

The vision of the 2002 strategy remains valid today. One of the principal objectives, notably on the creation of secure, long-term employment in the sector appears difficult to achieve and should be reviewed. This is partly due to a lack of understanding of the socio-economic characteristics that underpin employment of this sector.

The EAS Board agrees that many of the European level actions already initiated need time for completion and understanding of their impact, prior to developing further actions.

*Furthermore, due to the enlargement of the European Union, the profile of the aquaculture sector has significantly changed (e.g. pond fish culture has become an important component of EU aquaculture) which requires proper attention in the Strategy.*

This is equally applicable to the adaptation of the strategy in evolving circumstances beyond the direct control or influence of the European region – notably the global market (for both raw materials and finished products) and the effects of climate change. The latter is embedded in the Maritime Policy Green Paper and consultation documents, notably the recent Aberdeen Declaration, strongly support this.

## **ECONOMIC OUTLOOK FOR EU AQUACULTURE**

### **3. What effect is globalisation having on the EU aquaculture sector and what are the main factors affecting its competitiveness?**

Although aquaculture was mainly production driven (especially in marine aquaculture) in the 1990's, it is becoming more demand led. Retailers representing individual consumers and the catering sector are key drivers.

Demand for species not produced in Europe remains high and account for a substantial part of imports. This is especially the case for crustaceans. However, imports of molluscs are also on the rise and are competing successfully with EU-produced mussels.

The highest potential factor for future competitiveness could be the demand from the catering sector. As the demand for frozen and ready meals increases and especially for “a portion of white fish”, non-European produced species (especially cobia, tilapia and pangasius) will probably fill this gap.

As European production will most likely remain based on species that require a high level of marine protein in the diet, the cost of feed raw material - fish meal and oil and, where used, vegetable proteins will remain a major factor affecting competitiveness. However, there is a

strong potential in non-EU markets for Community production. Exports of Atlantic salmon, and in the future of turbot, cod, halibut and other species, could be grown considerably, following promotional campaigns made at the national level.

Seafood consumption is generally higher in older people (especially the case for oyster consumption – generally by the over 50s in France, for example). As the average age of the European population increases, and as life expectancy continues to rise, it is likely that European seafood consumption, and hence demand, will also rise.

As the global increase in fish demand increases, so do the imports into the EU. This therefore puts further pressure on global fisheries, and contributes to the widespread depletion of marine resources. *A controlled and sustainable increase in EU aquaculture production could therefore contribute to a reduced pressure on global marine resources.*

#### **4. How do you see the future of the market for Community aquaculture (niche markets, mass production ...)?**

On the basis of the above, Europe can have a leading position in both mass and niche markets.

The mass market for fresh, whole fish – portion trout, sea bass, sea bream, carp, Atlantic salmon and cod produced in Europe can be further developed by national and European consumer campaigns focussed on highlighting the benefits of sustainable farming practices.

The niche market for (notably) flatfish species for domestic and export markets can be further developed. Europe also has a leading position in organic aquaculture production and this capacity should be further exploited.

For white fish fillets – the future is not so clear, at least not in production. But Europe also has significant expertise in the food processing sector which can be further enhanced.

The mass markets for shellfish (in shell) will probably remain stagnant and could even decline, but the shellfish processing sector could present opportunities.

This said, the EAS Board favours the stimulation of shellfish production to promote extractive or Integrated Multitrophic Aquaculture (IMTA<sup>2</sup>), where marine algae and shellfish are produced in proximity to finfish production, thus making the maximum use of nutrients in the water column and hence decreasing eutrophication effects.

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<sup>2</sup> See [http://en.wikipedia.org/wiki/Integrated\\_Multi-trophic\\_Aquaculture](http://en.wikipedia.org/wiki/Integrated_Multi-trophic_Aquaculture)

*Fed-aquaculture therefore needs to be developed in conjunction with extractive aquaculture to support a sustainable increase in overall production.*

Finally, newer species for niche markets such as invertebrates like ragworms (*Nereis virens*) and marine plants have yet to realise their full growth potential. Europe has an opportunity to transfer to other countries its innovative technological and biological knowledge in the context of business enterprise. There is significant potential in developing countries.

## **5. How can the image problem of aquaculture be addressed to increase consumer acceptance of farmed products?**

Consumers are generally aware of the health benefits of seafood and there is a wealth of information available to scientifically justify that these health benefits are not only available from farmed fish and shellfish, but also that the farming activity can *manage and improve* health benefits for consumers.

*However, it appears that consumers are absolutely unaware of the latter.*

National actions and campaigns to promote aquaculture as an activity are therefore required, as these can focus on specific issues for specific target groups. They also have the possibility to provide information (in own language) to trusted sources (such as health practitioners and doctors) at the National level. The example of the Irish Sea Fishery Board (BIM) campaign “Nutritional Aspects of Fish” could be carried out in all Members States, but with a focus on the nutritional and health benefits of farmed fish and shellfish.

Proactive European initiatives, such as CONSENSUS<sup>3</sup>, are focussing on providing information to member organisations of European consumer and conservation associations, *where knowledge and awareness on aquaculture issues is low*. Furthermore, it is showing how the partners can work together to demonstrate to consumers the benefits of farmed seafood.

*However, longer-term effort is required (and funded at a European level) on raising awareness and building knowledge in these associations and in their membership.*

*The EAS Board therefore calls on the Commission to set up a stakeholder forum that will produce user-friendly information (in different languages) based on its activities and discussions.*

The forum will:

- Assess current knowledge of consumer attitudes and perceptions of aquaculture as a food production sector;
- Highlight key sustainability issues;

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<sup>3</sup> EU initiative CT 513998. [www.euraquaculture.info](http://www.euraquaculture.info)

- Find novel communication strategies to re-position the wild *versus* farmed mindset;
- Develop balanced and regular information that can be used by consumers, non-specialists and conservation organisations to better inform their members;
- Develop feedback and exchange of dialogue from these associations and feed into policy;
- Identify priority research areas that address consumer concerns such as the positive role of aquaculture in mitigating adverse impacts of climate change.

*The European Aquaculture Society (EAS) could moderate such a forum. Leading partners in the forum could be the European Consumers Organisation (BEUC), Euroconsumers (through Test Achats, BE), The European Bureau for Conservation and Development (EBCD), The Federation of European Aquaculture Producers (FEAP), The European Mollusc Producers Association (EMPA) and The European Feed Manufacturers' Federation (FEFAC).*

## ENVIRONMENTALLY - FRIENDLY AQUACULTURE GROWTH

### **6. What are the most important environmental challenges faced by aquaculture and what are the appropriate avenues to address them?**

One of the most important environmental challenges are seen by the EAS Board is the *impact of terrestrial human activities on the quality of water available for food production*. This includes the effect of agricultural run-off and of industrial (chemical) contamination of fresh and sea water. Furthermore, run-off and increased sedimentation from coastal development, particularly in relation to the tourism industry is exacerbating important coastal ecosystems. It is very much hoped that an increased recognition of the human impacts is researched especially the social and economic importance of aquaculture as a food production industry. The future Maritime Policy needs to address these issues in the context of participatory governance. This is where EAS has a unique position with its membership and dissemination strategy in being able to reach a wide and diverse range of stakeholders quickly and effectively.

The effects of aquaculture production activities on the environment (wastes, such as feed, faeces and mortality and the use of medicines and other health management products) are generally well known and underline production management and husbandry. Knowledge on the impacts of escaped fish from production units is also increasing with ongoing European and national initiatives.

Since pond fish production became an essential component of European aquaculture, some specific environmental issues, such as *the predation of protected animals (e.g. cormorants, otters, beavers...)* and *the environmental services of fish ponds (e.g. nutrient retention and habitat provision)* should be addressed in order to establish and apply an appropriate compensation system.

*Environmentally–friendly aquaculture growth is the only development possibility open to European aquaculture*. Initiatives taken by the FEAP and IUCN, and by CONSENSUS (with the European Bureau for Conservation and Development) are already making substantial progress on working together to address this issue.

What is needed now is a long term communication forum (see response to the previous question) and the further consolidation and incorporation of knowledge into policy at European and national level. PROFET Policy<sup>4</sup> is an excellent initiative in this area of support to policy that needs to be more widely communicated to policy makers and stakeholder groups.

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<sup>4</sup> PROFET Policy is at [www.profetpolicy.info](http://www.profetpolicy.info)

At the level of *environmental change*, the EAS Board would ask the Commission to bring together current knowledge on the potential effects of climate change on the European aquaculture sector.

**7. Can you identify, within the framework of Community environmental legislation, business-friendly options to regulate aquaculture activities?**

The EAS Board is unable to make specific recommendations on this question, but would comment that the regulatory environment should address long term, sustainable development, with the rationalisation of planning and environmental legislation as its core.

**8. In a context of increasing scarcity of pure water, what are the main avenues to ensure that aquaculture producers continue to get access to water of the best possible quality for aquaculture development?**

Perhaps the *key element* of the production of high quality and safe aquaculture products for the consumer is access to water of the highest quality.

It should also be recognised that aquaculture is an efficient water user (value/cubic meter) and technologies are readily available to minimize environmental impact through water reuse and efficient effluent treatment.

The EAS Board believes that this can only be achieved through the recognition of aquaculture as an equal stakeholder (and therefore with equal stakeholder rights) within the implementation of the Water Framework Directive and within the development of a European Maritime Policy.

Aspects of this recognition are addressed in significantly more detail in the section on space limitations and spatial planning, as the availability and siting of aquaculture production sites is driven by access to high quality water.

## AN AQUACULTURE INDUSTRY PROVIDING HEALTHY FOOD WHILE ENSURING ANIMAL HEALTH AND WELFARE

### **9. What are the most important challenges related to animal health and welfare and how should they be addressed, in view of the different constraints faced by the aquaculture sector?**

The EAS Board recognises several important challenges:

- Development of vaccines;
- Development of non-vaccine based preventative treatments, including the provision of probiotics and immunostimulants in fish feed ingredients;
- The further development of rapid, non-invasive detection methods and new preventative medicines;
- The availability of medicines; and
- The implementation of operating indicators of aquatic animal welfare.

The first two are already being addressed to some extent through research at Community and national level. However, the aquaculture sector faces new threats from emerging diseases, as well as re-emerging threats from existing ones.

The third point is a critical one. *Registration procedures for medicines* have resulted in a position where their licensing is too expensive for suppliers to the aquaculture sector. It appears that there are also many principle active compounds available at low cost, but for which no licensing dossier is available. Not all aquaculture species can be included within MUMS (Minor Uses Minor Species) and, therefore, cannot be the object of facilitation within the licensing process of medicines that are needed by the production sector.

The EAS Board therefore supports the 2006 resolution<sup>5</sup> of the FEAP to consider the need for a European review of the status of implementation, at the level of the Member States, of the EC Directives (2001/182 and 2004/128) on the licensing of veterinary medicines, in direct partnership with other DGs (Sanco and Enterprise).

Operating welfare indicators are being defined for European aquaculture in the WEALTH<sup>6</sup> initiative. At its Aqua Nor FORUM this summer, EAS is bring together stakeholders to discuss welfare as a driver for technology. Facilitation of the communication of these outcomes to aquaculture producer organisations and other organisations that are producing guidelines for good practices should be further encouraged.

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<sup>5</sup> Resolutions voted by the FEAP General Assembly. May 2006. Copenhagen.

<sup>6</sup> <http://wealth.imr.no/>

## AQUATIC FARMING: A NEW ERA IN ANIMAL DOMESTICATION

### **10. What do you see as the most promising avenues in fish or shellfish domestication to provide opportunities for aquaculture growth in the EU?**

Community aquaculture production is based on 'new' species. Only the European common carp has undergone a significant period of domestication.

Selective breeding programmes and the accompanying technology that can monitor success should therefore focus on better use of food (see below) but also disease resistance.

Biotechnology could offer new solutions to support domestication (and could accelerate the selection). RTD in this area should be supported by the Community and developed in cooperation with the industry sector, so that effective options can be proposed to European finfish and shellfish producers. Research carried out in Member States could be better coordinated to support this.

### **11. To what extent do you consider that fish oil and fish meal would represent a limiting factor to aquaculture growth in the European Community? Which option would you favour to reduce limitations from such feed?**

The current species mix in Community aquaculture, and the hypothesis that continued economic growth will not come from a change in production of species that require less fish meal and oil, would imply that fish meal and oil will become limited. It is difficult to say when. A series of factors would combine to better use this raw material:

- Breeding selection and husbandry for *better use of food* (digestibility, economic conversion, etc)
- Development of *different feeds for different parts of the lifecycle* (starter, pre-grower, grower, over-wintering, finisher...), but also for different products (whole fresh fish, smoked fish, others...)
- RTD towards new *sources of marine vegetable protein and oil* from marine plants.

Community support for research and technological development should therefore focus on the above elements, following the consolidation of existing knowledge in the domains and identification of knowledge gaps.

Communication on the use of marine protein should be based on the natural dietary regimes of the fish produced, whether they be carnivorous (piscivorous), omnivorous or herbivorous. Consumers favour "naturalness" as an attribute. Piscivorous fish are expected to eat other fish and general recommendations for levels of marine protein in their diets, as well as for the other groups of cultured fish, could be a means of channelling what may be a limited resource, based upon natural dietary needs.

Furthermore, the efficiency of fish to convert marine protein into flesh - especially compared to farmed terrestrial animals - should be recognised and communicated to consumers

## **OVERCOMING SPACE LIMITATIONS: THE IMPORTANCE OF TECHNOLOGICAL DEVELOPMENTS AND SPATIAL PLANNING**

### **12. What technological innovation would you consider most promising to allow aquaculture development in a limited space context? What are the main obstacles to their development and how could they be overcome?**

In the specific context of limited space, recirculation aquaculture systems (RAS) represent the technological solution and they of course have significant environmental advantages. Furthermore, they represent 'zero-escape' production systems, especially if used for non-native species.

The principal constraints on their further development do not totally lie in the understanding of the biological and engineering concepts upon which RAS are based, but more the uptake of this innovation by the sector. The constraints here are more concerned with investment cost (and access), the demonstration of long term financial feasibility, the operating constraints – for example regulation on health management issues and the need for trained (skilled) operating staff.

The perception of consumers to highly intensive RAS systems is an area where we have little knowledge. If consumers believe that intensive RAS systems are the 'aquaculture equivalent of battery chicken production', then actions put in place at a European and national level will be to little effect. *It is therefore important to focus clear consumer messages on the advantages of these systems.*

Although RAS systems are undoubtedly an important component of (future) European aquaculture, they should not be seen as the only solution.

A move to 'open ocean' or offshore aquaculture poses very specific technology and management challenges, but also has fundamental business questions associated with it. With high investment and high risk, the species produced must gain premium prices and/or be produced in sufficient volume to be economically viable.

But moving away from the coast potentially poses new conflicts for space – this time with fishers, maritime transport, renewable energy installations and others.

Man-made ponds will remain an important source of fish in the Central and Eastern European Member States. There is increasing competition for the use of these unique

wetland areas (e.g. tourism, environment protection), which has been established and maintained by the aquaculture sector for many years. *Aquaculture should remain a leader in the management of these valuable wetlands.*

The (possible) integration of fish production with other activities (e.g. tourism, wildlife- and environment services, water- and landscape management) should be the key of sustainable use of such valuable resources. *The development of such “multi-functional” pond fish farms should receive Community support.*

It is the following questions that represent the key issues in overcoming space limitations for the majority of aquaculture operations in Europe.

**13. What are the main obstacles to access to marine or fresh water space for aquaculture activities? Would you consider that there is a need for public decision maker to set aside specific locations dedicated to the development of aquaculture?**

The principal obstacles for development are identified as:

- The difficulties (mostly at Member State level) of obtaining licences for new aquaculture production and for the renewal of existing licences;
- The current (low) status of aquaculture as a stakeholder in maritime and freshwater policies.

The setting aside of specific (protected) locations is probably crucial for the sustainability of the shellfish sector, as well as for “artisanal” finfish production in riverine and coastal zones.

*The EAS Board also notes that protectionist measures such as Marine Protected Areas will not be sustainable in the long term, unless they are developed through participatory governance processes and encompass socio-economic activities that support rural and remote communities.*

#### 14. How could marine/maritime spatial planning be developed to provide appropriate conditions for the sustainable growth of aquaculture sectors in coastal and offshore waters?

The June 2007 Report of the European Parliament<sup>7</sup> encompasses the view of the EAS Board.

Paragraph 111 on page 21 of this report states that the Committee:

*“Highlights the increasing socio-economic significance of fish farming as marine fish stocks diminish worldwide; believes that the worldwide annual sale of aquaculture products will soon exceed the sale of wild catch; stresses that the EU has been at the forefront of this exciting development and should strive to maintain its leading position and encourage further development in a way that is compatible with other coastal and maritime uses; stresses the importance of fish farming for often remote, rural communities where few other job opportunities exist; **highlights that, within the context of an integrated coastal zone management approach, clearly defined areas where fish farms may be clustered should be promoted and that this should be linked to a simplified regulatory regime encouraging entrepreneurship and sustainability**; believes that new techniques should be developed in the aquaculture sector to enable improved management of quality, traceability assurance throughout the production and value-added chains **and the overall recognition of fish farming as a key stakeholder in the maritime sector;**”*

Quote ends.

The factors cited in this paragraph could provide the basis for the development of the 2002 Commission strategy. Furthermore, Marine Spatial Planning must be integrated with ICZM to ensure that both landward and seaward considerations are integrated into relevant policies.

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<sup>7</sup> Towards a future maritime policy for the Union: a European vision for the oceans and seas. Report of the Committee on Transport and Tourism. A6-9999 Final. 15 June 2007.

## PROVIDING SUPPORT FOR SUSTAINABILITY

### **15. How can we ensure that EFF implementation will contribute to sustainable aquaculture growth in the EU?**

The EAS Board is not the best-positioned stakeholder to provide detailed comment on this and the responses of individual members of the society may well be of higher relevance to the Commission. The precise issues of implementation are of course at Member State level, and the combination of the feedback from national monitoring will be the key to addressing this particular question.

In general terms, the EAS welcomes the simplification of the use and access to EFF funds and the inclusion of “research” projects as eligible actions.

Despite the fact that the vast majority of aquaculture companies in Europe are SMEs, the ineligibility of larger companies for EFF support may have an important impact, and this impact requires monitoring. If EFF is one of the main supporting measures of the (existing and future) strategy, and the strategy encourages access to new technologies that will develop aquaculture (for example in recirculation or offshore technologies, where investment represents a significant barrier), then the exclusion of these larger companies may not result in expected growth of the sector.

### **16. Are there already some lessons to be drawn from the preparation of your National Strategic Plan and Operational Programme regarding aquaculture?**

The EAS is unable to comment on this at a European level, however some of its members involved in related activities may be able to do so.

## RESEARCH: A POWERFUL DEVELOPMENT TOOL

### **17. How can research policy be set in a strategic context to enhance its benefits, specifically for European aquaculture and/or European technology and know-how?**

A long term research strategy going beyond the 5-7 years horizon of the Community Framework Programmes is necessary. It should be developed through foresight studies (as is the case with, e.g. the FEUFAR initiative) and consultation with the research community and other stakeholders, especially the users and funders.

The EAS Board welcomes the formation of the European Aquaculture Technology Platform – allowing industry to create a vision and accompanying strategy, and recognises the support of the Commission in its participation in the “Aquaculture Europe” conferences, organised by the EAS. Such events allow the periodical review of strategies within the aquaculture sector, and these reviews can form the basis of input from the sector into the wider-ranging marine science networks and conference activities.

### **18. How can the transfer of research results be optimised so as to maximise the benefit to European business?**

Dissemination of Community research remains at present on a project level. To increase impact, the EAS Board would like to see clustered information from projects within the same (policy or technology) area and pass this on to groups or organisations that can carry out dissemination and SME partnering activities at a European level and for the different target stakeholder groups.

This will have the effect of providing a higher impact through a higher critical mass of information and a “proximity” to industry. Furthermore, it will overcome the current situation where a high number of individual project web sites are created and then disappear once project funding ceases. Many useful reports and publications are lost in the process.

*The transfer of research results to the end users is a critical issue of European aquaculture development.*

Further efforts are required to improve communication and cooperation between the research sector and the industry through specific actions. “Industry Forums” for example are becoming a regular component in EAS Conferences. The EATP may contribute to the optimisation of the transfer of research results.

*The direction of the transfer of research result may not only be from science to industry but also from advanced farms to less advanced farms, therefore farmer exchange visits may also contribute to the optimisation of the transfer of research results and should also be a part of Community support in this area.*

### **19. Which cross-cutting areas in marine research would you consider most important for aquaculture?**

The EAS Board of Directors fully endorse the conclusions of the Seminar on Marine Sciences and Technologies in FP7, held in Brussels in January 2007, especially the collaborative approach linking the Commission, the FP7 Advisory Groups and the Programme Committee in the prioritisation of marine sciences and technologies as cross cutting measures.

For aquaculture, the most important cross cutting areas are (not in order of importance):

- The effects of *climate change* on Community aquaculture production and the *recognition of the positive role aquaculture can play* in mitigating the adverse impacts of climate change;
- Spatial planning, ICZM and *conflict resolution* for space;
- *Renewable energy* applications in aquaculture;
- *Marine biotechnology for new aquaculture feed ingredients*; and
- Data and monitoring systems to measure, compile and make available *economic performance of the sector and to measure sustainability indicators* of aquaculture production units.

A network of networks is required within the EU Marine Science, and the ESF Marine Board, EFARO, VLIZ and EAS are already starting to make this happen, through the creation of a “pole of excellence” in Oostende, Belgium, where these organisations are (now) based.

The EAS Board emphasises the high importance of the incorporation of strategies developed by foresight and by the EATP into a common European Marine strategy.