



CSN-INTRAN

**Workshop on Enabling Innovation
in European Aquaculture
Tuesday 6th June 2006, Stirling**

REPORT

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(These Annexes are available as part of the Full report available from:

http://www.aquainnovation.net/aquainnovation/archive_en.asp)

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Introduction

The Aquaculture Innovation Network is an initiative of the EC supported research and demonstration project “CSN-INTRAN”, which is a consortium of 14 partners seeking to stimulate innovation and technology transfer in the aquaculture sector. It has a particular focus on the New Member States of the European Union and on the transfer of fish vaccine and recirculation system technologies.



Some of the workshop participants during the opening session

This workshop was arranged as one of the final activities within the period of EC funding in order to review some of the activities and lessons learned during the project and help to formulate recommendations for future activities and initiatives. It is hoped that the outcomes prove useful to all stakeholders, including industry, government, research, and training organisations.

The workshop was attended by members of the CSN-INTRAN consortium, and by a range of invited participants, mostly from Scotland, but also representing several other European and Asian countries. The participants included people from SMEs, industry associations, government innovation organisations, researchers and educators. A list of participants and the workshop timetable is included in Annex 1. The briefing notes sent to each participant are included as Annex 2.

The workshop commenced with an overview of the CSN-INTRAN project and an introduction to some of the key themes (Annex 3). This was followed by four invited presentations (two from CSN-INTRAN partners) which aimed to provide different perspectives on the key topic of innovation and technology transfer and provide further reports on CSN-INTRAN project activities. The four presentations were:

- Chris Hempleman (Wisefish): *Case study on product development and technology transfer* (see <http://www.wisefish.com/>). The company are an International SME producing Information Technology products for the aquaculture and fisheries sectors. They are therefore involved directly in commercial innovation and technology transfer within the European aquaculture industry.
- Panos Christofilogiannis (FEAP): *Research into the innovation needs of the aquaculture industry* (Annex 3). This presentation reported on a survey carried out by the Federation of European Aquaculture Producers (CSN-INTRAN partner) into industry views on innovation needs within different segments of the European aquaculture industry.
- Zdenek Adamek (University of South Bohemia): *Case study on reinventing carp as a traditional food fish for Europe and outcomes from the 2005 AIN Pond Aquaculture Workshop* (Annex 3). This presentation (from CSN-INTRAN partner) illustrated one of the key areas of attention for the project, in supporting innovation in a traditional



Panos Christofilogiannis presenting results of the FEAP research on innovation needs

aquaculture sector that is under considerable pressure due to EU enlargement and increased attention to environmental issues. Czech carp producers are now using market innovation to raise the value of their products

- Andras Woynarovich (Private consultant): *Experience as a participant in the AIN workshop in Hungary, and study tour of Germany* (Annex 3). This presentation provided an independent perspective on two of the key project demonstration approaches – training courses and study visits – as tools for technology transfer.

Following these presentations, the participants divided into four separate working groups to consider the issues raised, and to provide feedback to the project. Each group was allocated a workgroup leader and resource person (to help with recording the discussion and other facilitation tasks). Workgroup leaders were provided with additional resources to help guide discussion and analysis (Annex 4).

The workgroups each reported to the full meeting at the end of the afternoon, although shortage of time limited further debate. The separate outputs from each group are included



in Annex 5. A collated and edited summary of the workshop findings follows. It should be noted that the analysis and recommendations developed reflect the group discussions and views of individuals and not the formal conclusions of the CSN-INTRAN project, or European Community. However, the consortium hope that these will provide a resource that will aid not only future analysis and debate, but also more creative and effective future collaborative initiatives between stakeholders.

The workshop concluded with an appreciation of the work that the CSN-INTRAN consortium had done to date opening up the topic of innovation and technology transfer as a critical topic within European aquaculture, and for the services so far developed to support these processes and the transfer of innovative solutions. The workshop was followed by a local tour and dinner to help promote further discussion and networking.

Collated views

Opportunities for innovation

Although some types of aquaculture have come under critical scrutiny by environmental and other campaign organisations in recent years, the overall prospects are judged to be very good for aquaculture as demand for fish as a healthy food is growing, whilst supplies from the capture fisheries are increasingly constrained. Clearly, the long-term outlook for European producers will also depend heavily on international trade and aquaculture development elsewhere in the world, but population growth and rising prosperity, especially in Asia, is likely to increase rather than decrease opportunities for the sector.

As with other sectors, opportunities exist for technical, managerial or market innovation. Some of the key drivers for technical innovation are judged to lie in the challenges currently facing the industry with respect to environmental and resource constraints (sustainability issues), or the increased focus on food safety, quality and traceability. Market opportunities include responding to the increased interest in organic and local produce, certification schemes based on environmental and welfare criteria, and the demand for a wider variety of fresh easy to prepare and cook products.



It was felt that innovation in general is better simulated by commercial opportunities than by regulatory “sticks”.

Constraints to innovation

The type, background and age of the people involved in different aquaculture businesses are very important in defining industry characteristics with respect to innovation. This tends to be linked with the age and history of the industry involved, and in many respects follows a similar pattern to other industries, especially agriculture. Aquaculture activities in the New Member States are predominantly freshwater pond-based with basic carp farming dating back several hundred years. This has led to a sense of cultural tradition, especially among current owners and managers who have been involved in the industry all their lives. This contrasts with newer industries where owner/managers are first generation and usually more innovation oriented. Concern was expressed that younger people, who might be agents of change, are not being attracted into the more established aquaculture industries, or are not being properly nurtured once there.

Whilst SMEs can be very innovative, owner-operator fish farms in established fish farming industries rarely have the time, skills or other resources required for substantial innovation. Although highly skilled and resourceful, the same person is often responsible for production, marketing and administration and rarely has the opportunity to explore innovations. Furthermore, small companies have very limited financial resources for investment in new technologies or product development. The banks and insurance companies in many countries regard aquaculture as high risk and obtaining finance for new investments can be very difficult.

There was some feeling that aquaculture research institutions remain focused on production issues (especially biological) whilst for much of the industry, production is no longer a bottleneck and more research support is needed on marketing and public relations, or sustainability issues.

Institutional support for innovation

It was felt that governments do understand the need for innovation and most have programmes to support innovation activities in the private and public sectors. It was also appreciated that governments in mixed economies have to stimulate private enterprise, whilst at the same time protecting wider public and social interests. However, there was

debate as to how well innovation processes were understood, or the effectiveness of different schemes.

Innovation projects

Whilst the involvement of government agencies and the EC in supporting innovation was widely appreciated, the implementation of innovation projects gave rise to several key areas of concern. The first of these was the need to fit specific projects into the “mould” of the funding scheme, especially with respect to timescale, but often also with respect to different types of activity, or partnership arrangements. It was particularly noted that many forms of aquaculture have production cycles lasting 3-5 years, making the collection and reporting of results within the normal 3-year funding cycle very difficult. For networking and dissemination projects, there was concern that support for these often stops just when they are becoming most effective. The expectation by funding agencies that such initiatives will become self-sustaining was felt to be unrealistic as most organisations are driven by financial management regimes that take relatively little account of benefits that cannot be readily assessed with respect to their financial contribution. On the other hand, it was appreciated that EC or other government funding is unlikely to continue indefinitely, and that projects should include at the outset, clear plans for the withdrawal of that funding.



It was felt by some participants that there is far more emphasis in innovation funding on the research and development phase and relatively little on supporting the diffusion and implementation of those innovations into the industry (the transfer process).

There was concern that some companies are motivated to become involved in innovation projects by the financial support that is available, rather than through longer-term strategic objectives. However, this was countered by the observation

that commercial companies often have more to lose from involvement in unsuccessful projects than research organisations. There was also concern that many projects are dominated by the interests of the academic or research organisations for prestigious publications rather than real commercial benefit for the commercial partners. Projects are often developed by research organisations who then find suitable commercial partners (although it was noted that CRAFT projects do attempt to put the interests of commercial companies first). A good and equal relationship between research and commercial organisations was seen as very important.

There was general criticism of the level of bureaucracy in EU funded projects, which was felt to be a significant disincentive for involvement, especially by SMEs. A specific issue is the need for flexibility in project activities and budgets. Innovation projects should have the flexibility to adapt as new information becomes available, or as circumstances change (especially if the project is affected by external environment factors outside company control). Whilst this is not impossible, it was felt that there are bureaucratic disincentives to making significant changes.

SMEs in particular find it very difficult and time consuming to find out about EC support for aquaculture innovation, the progress of current projects and findings of completed projects. This is partly due to the proliferation of web sites, but also the complexity and variety of support schemes and the lack of a central portal for dissemination. There was also concern that aquaculture often has to compete with many other sectors for funding and that lack of knowledge about aquaculture in the agencies concerned can be a significant factor in constraining innovation funding. Research funding can also be affected by fairly rapidly shifting political priorities, which sometimes appear to respond more to media pressures than long-term strategic analysis.

It was proposed that EC innovation projects might benefit from including larger companies as well as SMEs, as these often have greater resources and therefore greater chance of developing and implementing innovations.

It was suggested that relatively simple projects involving student placements can often provide many of the benefits of more elaborate projects. Lessons may also be learned from studying the organisation and implementation of research, development and technology transfer projects in other countries. There is particular expertise in technology transfer in some developing countries.



Role of SMEs in innovation

SMEs have limited internal resources for innovation and therefore should be a primary target for innovation support programmes, especially training and information support. However, it is also common to find that SMEs are fully stretched by day-to-day business activities and cannot spare the time or other resources to participate in seminars, training, meetings etc.

It was felt that business incubator schemes, clustering, networks and trade associations can all play an important role in opening up innovation opportunities for SMEs. In many cases, it is an individual SME that innovates and shows the way forward for the rest of the industry.

Role of supply companies

The commercial suppliers of technology to aquaculture production companies were seen as an important source of technical innovation for the industry. This includes the feed and pharmaceutical suppliers and the equipment suppliers. These companies are often involved in research and development, in association with academic and government research institutions, and are responsible for bringing new technologies to market and often technology transfer between countries.



Professor Jimmy Young reporting back to the workshop

There was some concern expressed that supply companies use fish farmers to test their products and that it is the latter who suffer if the products do not perform as well as expected. This is a particular problem for the smaller farming companies that have little negotiating power with respect to trial samples etc. However, if a supply company develops a reputation for marketing untested products, the industry become reluctant to buy their products in the future, so business relationships can be very important in allowing new technologies to be tested and introduced. This is particularly significant where the supplier is also an SME with very limited resources for research and development. They may be more inclined to commercialise a product before it is fully tested for reasons of commercial viability.

It was suggested that fish farmers have difficulty in properly evaluating and comparing products from different companies as there is little standardisation with respect to the way in which performance should be measured or specified. It was felt by some that regulation was the only reliable way to overcome this, although independent testing for instance would be another approach. Reliance on word of mouth is relatively inefficient as few people have experience of all the products on the market and commercial confidentiality also inhibits open sharing of performance data.

Collaboration and competition as innovation drivers

Competition was considered to be a very important influence on the conduct of the industry. In a commodity market, this is commonly on the basis of cost, placing particular strains on aquaculture producers. It was felt that larger companies are often more protective of their knowledge assets than smaller ones, and certainly, companies involved in newer industries are more secretive than those in well established industries where the pace of innovation is often slower. It was felt by many that companies often consider information that is quite widely known in the industry as commercially confidential and that a greater spirit of cooperation, e.g. through industry associations, would enable more rapid innovation and benefit everyone. However, with the main focus of commercial companies on their financial bottom line and on competition for the same customers it may be unrealistic to expect this to change.

Significance of information access to Innovation

Whilst there is a reasonable amount of technical information available about aquaculture on the Internet, there was felt to be some gap with respect to support for aquaculture managers who need more information on relevant commercial, business, financial and regulatory issues. Finding relevant information on the Internet can also be a major challenge and one that many SME managers do not have time for. The segmentation of knowledge by academic discipline can also be a barrier as information for business needs to be integrated and focused on company objectives. There was also concern about the quality of some information, especially data collected without the involvement of the relevant stakeholders.

Some of the most relevant training for the industry is currently being provided by the feed suppliers. This is possible as that sector is already consolidated and is the single largest supplier to most fish farms. Feed supply contracts are therefore highly competitive and feed companies use training courses and a means to gain customer loyalty and competitive advantage. The training courses that are provided are usually well located and practically oriented, although naturally tend to promote the company's products. Fish farmers would often prefer a more independent course, but these are either not available from other providers, or it can be difficult for training organisations to compete on cost. Training organisations are often good at covering basic principles and contexts, but not always the practical and more specific skills required by industry.

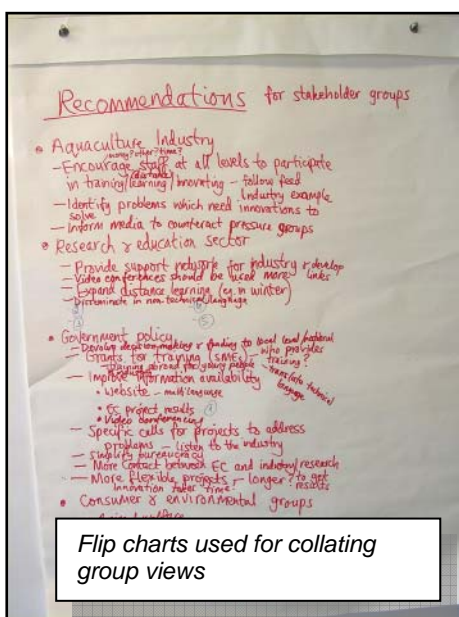


It was felt that the use of ICT (Information and Communications Technologies) by the aquaculture sector, especially SMEs, had not reached its full potential. There is a particular need for better market information to guide the production sector, but better analysis of information throughout the value chain could lead to efficiency gains.

Communication issues

One of the primary barriers for many people in the European aquaculture sector to accessing support for innovation is due to language. Much of the available information, and certainly most of the international meetings assume reasonable competence in the English language. The New Member States are particularly constrained in this regard, as languages such as Estonian, Czech and Hungarian are not well catered for outside of those countries.

With respect to communication between academics and industry, there was concern that academics did not always present their findings in a way that is accessible to industry. Conversely, there was a feeling on the part of some academics, that many parts of the industry are resistant to innovation and unwilling to engage with researchers.



Knowledge transfer was acknowledged to be very important for innovation, but concern was expressed that this is not well organised within the industry. Innovative solutions are often available, but not accessible to end-user farms.

Communication between the industry and public (consumers) was felt to be very poor at present and critical for the future development of the industry. Current emphasis on the health benefits of fish (especially omega-3 fatty acids) and sometimes on the sustainability benefits of aquaculture were felt to be worthy, but not exciting to younger people who would be the main consumers in the future. However, it was also felt that emphasising links with cultural tradition were important so that aquaculture was not just associated with high-technology intensive food production of the type that has come into disrepute in many places.

Recommendations

Opportunities for innovation

The future of SMEs in the aquaculture sector will depend on their ability to respond to emerging challenges such as sustainability and quality assurance. Increasing regulations in these areas are seen as a major threat by many companies as they do not feel able to accommodate the increased costs such regulations often require. Future innovation support programmes will need to focus on innovations that carry such companies forward.

Constraints to innovation

The industry needs to take a more pro-active approach to public relations, both to assure customers of the quality and safety of the products, but also to interest younger people in a career in the sector. Traditions should be nurtured where these encapsulate important social or environmental values, but the need for continual change and adaptation to new circumstances must also be appreciated and facilitated within the industry.

Institutional support for innovation

It would be helpful to develop a more comprehensive and transparent analysis of innovation processes and how all stages are best supported.

Innovation projects

More local/regional workshops to disseminate EC funded research and help SMEs to meet researchers and build collaborative links.

Develop and maintain a register of European expertise in aquaculture to help guide research funders when assessing or developing aquaculture research projects. This would also be useful for companies seeking research partners (It is noted that CORDIS and some other databases provide this service, but their usefulness is limited as the data is usually contributed voluntarily and is neither quality checked nor very complete).

Greater involvement of all key stakeholders in setting research priorities was felt to be essential. This may need to be done at regional/industry level to account for the considerable diversity within the European aquaculture sector.

There would be much to be gained from enhanced facilities for secondment of personnel from the commercial sector into academic institutions and vice versa, particularly in the context of innovation projects. Existing schemes tend to concentrate on young people, when it might often be advantageous if they could involve people later in their career.

Greater emphasis is required on transfer of innovation into companies, especially SMEs and this would be best implemented within the commercial sector by professional managers.

Innovation project consortiums should be developed to build a team that can collaborate through the value chain, and avoid the inclusion of competing companies or research organisations. Industry associations might have a greater role to play in building such consortia.

Role of SMEs in innovation

Support for SME innovation is likely to be most effective when it involves active outreach programmes where events, training and other activities are organised locally rather than requiring SMEs to travel and participate in expensive meetings.

SMEs should be encouraged to promote learning by their staff and provide appropriate reward mechanisms for staff that pursue further training and contribute towards company innovation.

Role of supply companies

Greater standardisation in the measurement and specification of performance parameters for aquaculture equipment should be encouraged, either through voluntary schemes, independent testing services or regulation.

Collaboration and competition as innovation drivers

Innovation projects can be developed out of partnerships along the value chain rather than involving direct competitors. Industry associations can also do much to foster and focus collaborative efforts.

Significance of information access to Innovation

A project to create a more systematic (and multi-lingual) source of information for commercial aquaculture (e.g. building on the Aquainnovation knowledge base) would be a very useful contribution.

SMEs within the aquaculture value chain need better information systems, particularly to help with market intelligence, quality and production optimisation issues.

Further investment is needed in highly targeted training courses, preferably involving greater collaboration between industrial and academic partners.

Communication issues

EC projects aiming to support SMEs and others involved in the aquaculture sector, should allocate more resources to translation and providing access to information in national languages.

Activities that bring industry and researchers together for personal meetings appear to be very beneficial, especially when this can be done locally.



Participants at the workshop dinner