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EUROPEAN INLAND FISHERIES ADVISORY COMMISSION

REPORT OF THE AD HOC EIFAC/EC WORKING PARTY ON MARKET PERSPECTIVES FOR EUROPEAN FRESHWATER AQUACULTURE

Brussels, Belgium, 14-16 May 2001

Food and Agriculture Organization of the United Nations

European Commission

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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PREPARATION OF THIS DOCUMENT

This report summarizes the presentations, discussions and recommendations of the Ad Hoc Working Party on Market Perspectives for European Freshwater Aquaculture, Brussels, Belgium, 14-16 May 2001, which was jointly sponsored by the European Inland Fisheries Advisory Commission and the European Commission.

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ABSTRACT

The **Ad Hoc EIFAC/EC Working Party on Market Perspectives of European Freshwater Aquaculture** met to address the current situation of the freshwater aquaculture sector in the EIFAC region with particular focus on problems in marketing. The outcome of the workshop aims to provide key information and strategic advice on how to fulfil the production potential of the sector to (i) policy makers, administrators and legislators; (ii) future investors; (iii) consumers, and, particularly, (iv) producers. Trout and carp (about 94 percent) dominate European aquaculture, whereas there are other promising candidates for culture that have not been profitably exploited. The freshwater aquaculture industry in Europe is product or producer driven along traditional lines and suffers particularly from a lack of vertical integration, linking producers to consumers through the marketing chain. The producers will remain at a disadvantage unless they develop better links through association or cooperation. While the preparation and implementation of marketing plans is a responsibility of the industry, and must be financed from this source, additional progress and great benefit could be derived from a comprehensive policy framework. Aquaculture as a food producing system in some cases has been perceived as being in conflict with other parts of the eco-system. This can best be addressed by the development and dissemination of codes of good aquaculture practice. While the demand for organically produced aquaculture products is growing, certification is still largely based on the standards of private certification bodies.

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1. BACKGROUND

Production of freshwater fish is a major branch of European aquaculture, but the products have a relatively low market value in relation to production costs and producers' profit margins are low. Moreover, market demand for freshwater species, other than trout and carp, is currently rather limited throughout Europe.

The main marketing problems associated with freshwater aquaculture products include low prices, lack of reliable commercial information, a limited product range, based on a small number of species and products (not always adapted to modern market requirements), difficulties in diversification, and lack of promotion. Significant growth of market demand for freshwater fish in the EIFAC region in the near future seems unlikely, unless initiatives are taken to change current trends. Future developments must be considered in an international strategic context.

The ***ad hoc*** **EIFAC/EC Working Party on Market Perspectives for European Freshwater Aquaculture** was called to address these issues with particular focus on visions and scenarios for the market and production potential of the freshwater aquaculture sector in the EIFAC region. The outcome of the workshop aims to provide key information and strategic advice to (i) policy makers, administrators and legislators; (ii) future investors; (iii) consumers, and, particularly, (iv) producers. The Agenda of the Workshop and the List of Participants are attached as Appendix 1 and 2, respectively.

2. STATUS OF EUROPEAN FRESHWATER AQUACULTURE

Although freshwater aquaculture in Europe faces serious constraints there are also significant opportunities, particularly from the growing gap between supply and demand for fish products, resulting both from the stagnation or decline of marine capture fisheries and increases in demand.

In the decade from 1988-1998 freshwater aquaculture production in Europe dropped from about 600 000 t to 430 000 t. This compares with marine aquaculture which increased from 150 000 t to 660 000 t, excluding molluscs and aquatic plants. A digest of production statistics from the FAO Fishstat database (FAO 2000) is available (under Meeting Documents Twenty-first Session EIFAC/XXI/2000/Inf.4) on the EIFAC website at http://www.fao.org/fi/body/eifac/eifac.asp. These gross figures, however, hide significant differences between Western and Eastern Europe. While production in Western Europe increased from 195 500 t to 250 000 t during the period, in Eastern Europe it fell from 411 500 t to 180 000 t, mainly as result of turbulent economic times. There are also major differences in species composition. In the east carps dominated with around 86 percent while salmonids were restricted to 9.4 percent (although trout production did increase during the period). In the west the reverse was true with salmonids just over 85 percent and carps almost 9 percent. The balance in the west represents diversification to small quantities of eel, and smaller quantities of sturgeon and catfish.

It is impossible to avoid the conclusion that, as a result of a variety of factors, freshwater aquaculture has been eclipsed by marine aquaculture both in importance and diversity. The task of identifying these factors is not simple and the core question is whether they can be resolved in order to allow sectoral development.

In the freshwater aquaculture sector production is influenced by two major factors: the climate and the water availability at a specific site (this effectively determines whether cyprinids or salmonids are produced). While water limitations have traditionally governed the maximum production capacity for a location, environmental legislation on waste

loading has largely replaced water availability as the criterion. In the European Community such production limitations have generally restricted corporate growth. This has confirmed the dominance of family-owned and operated units, (micro-enterprises in European Community terms). However, in certain areas there has been a degree of concentration of production leading to cooperative structures for processing and distribution. In other cases mergers and buy-outs have led to establishment of larger companies, able to provide the retail sector with modern consumer products. In the east the transition to a market-led economy has caused the dismantling of some of the large state-run aquaculture enterprises and the emergence of family-run operations similar to those in the European Community.

There are four clear market areas available to the producer of freshwater fish: the food market, restocking, production of ornamental fish and sport fisheries. The food market is the predominant outlet for all freshwater aquaculture whether for immediate local consumption, distribution on a wider scale *e.g.,* through supermarkets or for export. Export opportunities have been limited to some trade between the east and Germany for carp because of production cost differences. Carp is regarded as a traditional product and Germany is the major market. Although in recent times consumption has been increasingly restricted to festive seasons attempts are being made to reverse this trend. Trout on the other hand has been able to develop a more modern consumer-friendly image, enabling the trout sector to keep up with developments in other competing food products. However, salmon from marine aquaculture, supported by very effective promotion, is a serious competitor. The important lessons to be learnt by the trout producers are obvious.

There is a degree of interest in the production of organically certified freshwater fish products but this is hampered by the drop of productivity needed to meet organic standards (a significant aspect in all organic production practices is the issue of transition from the "traditional" practice to organic production), the high cost of certification and the lack of regulation of private certification bodies. If common and transparent standards, based on sound science, are introduced the future could be bright in some selected markets.

The market for stocking fish into rivers, lakes and reservoirs is of interest and should increase with growing environmental pressure to return species that used to be abundant in specific habitats. Salmon, sturgeon and the traditional sports species (including both brown trout and coarse fish) are produced in hatcheries throughout Europe for enhancing native stocks or for restocking. Restocking of species such as sturgeon also has a promising future, both for conservation and commercial purposes.

Ornamental fish production for the aquarium trade is of growing importance, not least to replace the high level of imports.

Sport fisheries offer an attractive diversification opportunity for some freshwater fish farms. Increasing leisure time and the growth of agro-tourism provide a viable market for the development of on-farm freshwater angling facilities. These can easily be integrated with food fish production and can also provide publicity for the food fish through use in restaurants associated with such developments.

3. REGULATORY FRAMEWORK

Throughout Europe aquaculture suffers from the lack of an adequate regulatory framework. It is important that as such a framework is developed it is done so in

consultation with the industry. The industry therefore has the responsibility of cooperation as a coherent partner for discussion.

Within the EC it is recognised that aquaculture producers face a complex regulatory structure and there are moves to make this more transparent. A directory containing the most important regulations, directives and decisions currently in force regarding aquaculture, as well as processing and marketing of fishery products, has been prepared by the EC DG Fisheries services. This will be the nucleus of a database available on the website: http://europa.eu.int/comm/dgs/fisheries/index_en.htm. Of the 350 acts currently in the directory approximately half are germane to aquaculture. The key legislative acts are less numerous and are summarised below.

3.1 Environmental Legislation

Environmental protection has assumed a central role in the objectives of the European Community. While current environmental provisions do not create a specific framework for aquaculture, they have relevance for the sector. When setting up a fish farm location and environmental constraints have to be taken into account. Nature conservation requirements are principally found in Directive 79/409/EEC on the conservation of wild birds; as well as Directive 92/43/EEC on the conservation of natural habitats and wild flora and fauna. Since October 2000, most water quality issues have been taken into account through Directive 2000/60/EEC which establishes a framework for Community action in the field of water quality covering inland surface waters, transitional waters, coastal waters and groundwater. In the long term this directive will introduce river basin management, monitoring of the chemical and ecological status of water and pollution measurement. It repeals earlier directives on water quality standards.

Directive 85/337/EEC on the assessment of the effects of public and private projects on the environment requires that projects likely to have a significant effect should be subject to environmental impact assessment (EIA). According to the Directive, the Member States decide whether an intensive fish farm should undergo an EIA. Directive 76/464/EEC on control of pollution by discharge of dangerous substances into the aquatic environment also covers biocides and organic substances used in aquaculture.

Aquaculture activities will be subject to monitoring and possible enforcement action to ensure that they meet emission standards fixed under Directive 76/464/EEC. There may also be restrictions on the use of some chemicals in aquaculture under a set of Directives relating to restriction on the marketing and use of certain dangerous substances.

There are also other controls that may have an effect on aquaculture. Examples are Directive 76/464/EEC controlling discharges of dangerous substances from industry (including heavy metals) and Directive 91/271/EEC on urban wastewater treatment. Both should contribute to achieving better water quality for aquaculture.

3.2 Hygiene in Foodstuffs

EC legislation on food safety is complex and not always clear. Consolidation has progressed under the Simplification of Legislation for the Internal Market (SLIM), with a draft proposal merging 16 Council directives on animal health and food hygiene into four regulations and one directive. These are not yet adopted by the Council but are expected to enter into force in July 2002. The legislation places the full responsibility for food safety on the food producer at all levels of the food chain, from primary production to the consumer. The veterinary rules have also been recast to prevent the spread of animal diseases through products of animal origin. The new directive will repeal previous texts and will apply both to EC products and imports from third countries. Fish farmers will

now be expected to implement hazard analysis and control principles and to keep records relevant to fish health protection.

3.3 Fish Disease

There are two directives concerned with the spread of aquaculture disease: Directive 91/67/EEC concerns animal health conditions governing placing on the market of aquaculture animals and products, while Directive 93/53/EEC introduces minimum measures for control of fish diseases. There are also a number of accessory acts.

3.4 Markets

Council Regulation (EC) 104/2000 on the common organisation of markets in fishery and aquaculture products allows the setting up of producers' organisations to improve marketing coordination. Market legislation also deals with tariff quotas and duties for imports.

3.5 Financial Assistance

The Community provides financial support to aquaculture in two ways. Firstly, through funding research under the Community Research and Technological Development (RTD) Programme, although the bulk of research funding comes from Member Sates and the industry. Secondly, as capital grant contributions within the framework of structural funds. This is done by the Financial Instrument for Fisheries Guidance (FIFG) under regulation (EC) 2792/1999, which in addition to providing funds for productive units, emphasises efforts to improve the environment and collective actions.

4. PRODUCTION, PRODUCTS AND SALES

The picture that emerges is of an industry facing severe constraints of stagnation and fragmentation. Partly to blame is the small size of most individual operations and lack of cooperation between producers. Fish farmers, both in fresh and marine waters, are characteristically good at fish production but in general have not always been attuned to changing market requirements. The freshwater aquaculture industry as a whole lacks cohesion, which will be required for a successful future. A combination of low prices and a poor image of the aquaculture industry, aggravated by a strained relationship with environmentalists and lack of political clout, mitigates against increased investment in new processing and product technology. This would be necessary in order to move the product up-market, away from traditional near-pond outlets to the modern, more sophisticated market place.

Trends towards more filleted and smoked products, rather that whole gutted fish, and the availability of trout through supermarket outlets are already apparent. Carp, however, retains a traditional image and suffers from falling sales, implying the need for urgent market action as production volumes could be significantly increased.

Apart from the present concentration on carp, trout and eel there are other candidates for aquaculture, both native and introduced exotic species. The development of fish rearing and processing technologies has opened new possibilities for production of native carnivorous fish such as pike perch and perch. Although they face competition from salmon and marine capture fisheries some 5 000 t/year of each species is expected to enter the EC market. The appearance of new goals in the European fish culture, as fish production for sport fishing, for restocking or for rehabilitation of the original fish fauna, also directed the interest toward other native species. There is controversy surrounding the introduction of exotic species such as tilapia, African catfish or paddlefish, but large quantities of them could be grown in closed culture systems, subject to sufficient

safeguards. However, such controversies may well be overcome by applying relevant existing technical provisions and guideline documents[1].

Being disorganised the industry is often at the mercy of the processing and marketing sector. It is almost always price-taking rather that price-making. The producers need to devise means of connecting to the consumers with information on farming practices, products and promotion of consumption. There is clearly a need to support consumer-oriented economic research and greater attention to the institutional food service market.

The European industry could draw important lessons from the experience of US catfish farmers. Although little more than 20 years old the US catfish industry already produces 280 000 t/year on land where cotton had become unprofitable. The industry is strongly vertically integrated, from feed supply to the table and relies heavily on an industry association, The Catfish Institute (TCI), for coordination and promotion. The Institute has as its mandate raising awareness of catfish as food through permanent communication (particularly with consumers) and the integration of farmers, processors and the retail sector.

5. FOOD QUALITY AND SAFETY, TRACEABILITY AND LABELLING

In recent years the aquaculture industry has been under strain to keep pace with developments and changes in food safety legislation. A worldwide rise in food poisoning outbreaks and the publicity attached to a number of food fraud scandals has increased consumer pressure on governments to ensure consumer protection through improved legislation. All food producing industries now need to comply and to accept the responsibility for the production of safe food, principally through the introduction of control systems based on hazard analysis critical control point theory ("own checks" in the EC). These replace end product inspection. There has inevitably been resistance and misunderstandings but the situation is rapidly improving. In order to enter profitable European markets both domestic production and imports from third countries must be produced under control and be accompanied by production records. It is apparent that the individual small producers have difficulty in understanding and keeping up with legislative changes in such aspects as consumer health and safety as well as environmental protection. This can best be addressed by providing information and training to the industry.

In common with other sectors of the fishing industry, the aquaculture industry in the last few years has had to develop management systems in a pro-active way in order to provide consumer assurance of product safety and, increasingly that production is from sustainable resources. As a result a growing number of aquaculture and fisheries codes of conduct and certification programmes have been developed or are under development. These take many forms from advisory, voluntary to mandatory and are led by government, private sector or joint initiatives. An outline of some of the programmes is presented in Appendix 3.

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[1] **Codes of Practice and Manual of Procedures for Consideration of Introductions and Transfers of Marine and Freshwater Organisms**
1988 - FAO European Inland Fisheries Advisory Commission/ International Council for the Exploration of the Sea (ICES) - 1995

There are also numerous private label schemes established by producers and retailers. These vary in nature but usually try to convince consumers via an attached logo or label that the product meets certain standards.

As a consequence of the large number of eco-labelling schemes in operation the EC issued a draft publication entitled 'A Community Approach towards Eco-Labelling of Fisheries Products' in February 2001. This stresses that national authorities should require that all fisheries eco-labelling schemes comply with the following requirements:

- objective and verifiable criteria: the criteria for certification of eco-labelled products shall be precise, objective and verifiable;
- independent assessment and control: eco-labelling schemes shall be independently and continuously controlled and shall ensure accurate identification of the product throughout the chain of custody. (A body that meets the requirements of EN 45011 (equivalent to ISO Guide 65) shall itself accredit the certifying body);
- open access which means that eco-labelling schemes shall not discriminate in terms of access to certification, and
- accurate information to the consumer implying that the criteria used to assess the eligibility of the product for the eco-label shall be available to the consumer. Product information at the point of sale should also reflect the assessment undertaken.

An EC labelling requirement, to come into effect on 1 January 2002, has also been issued. It requires some fish products to be labelled, indicating the location of the production site, the commercial designation of the species and whether the product is wild or farmed.

Organically certified aquaculture is an important recent development. It is evident that consumer confidence in the safety and integrity of the food supply has been eroded by a number of scandals. A section of relatively affluent, environmentally conscious, consumers have turned to the organic movement to certify the integrity of the products they purchase. They are prepared to pay a premium of up to 75 percent for such products from aquaculture. There are as yet no internationally agreed regulations for organic aquaculture and so standard setting is still largely a private matter although verified by third parties and governed by legislation regarding protection of consumers and fair competition in the market. There are, however, supplementary national regulations in some EC Member States (for instance France and the UK both have national regulations on organic aquaculture). It is anticipated that the requirements that have been codified for other organic products will be extended to aquaculture. These are:

- FAO/WHO Codex Alimentarius "Organically Produced Foods" (1999) , based mainly on the IFOAM Basic Principles
  http://www.codexalimentarius.net/STANDARD/standard.htm
  ftp://ftp.fao.org/codex/standard/organic/gl99_32e.pdf
- Council Regulation (EEC) No. 2092/91 on organic production of agricultural products and indications referring thereto on agricultural produts and foodstuffs

The organic market offers a promising future for European aquaculture producers who can meet the requirements. However, the increased production costs, lower productivity and the multiplicity of competing private certifying bodies have so far discouraged most producers from turning to organic production. Despite these obstacles, the organic segment has developed at an interesting pace in recent years. There is some

controversy about whether the whole aquaculture industry will be forced to go organic, but the general feeling is that this will remain a high-value niche segment.

6. IMPACT ON TRADE OF ENVIRONMENTAL AND HEALTH/HYGIENE LEGISLATION: A TRADE BARRIER?

Recent decisions at an international level and within the EC will impact significantly on the institutional framework for trade in fisheries products, including the products of European freshwater aquaculture. The major trade barrier in the past has been the application of high tariffs to fishery products but these can be expected to be further reduced and in the long term removed through WTO negotiations.

The key measures affecting trade in the future will be rules governing the health and safety aspects of fisheries products, on the one hand, and rules to ensure that fishing and aquaculture are compatible with sustainable development, on the other. The EC as the world's major importer of fish products has a clear policy that the European consumer has the right to be assured that imported products meet the same health standards as those subject to the Community's control. Imports are only permitted from authorised countries included in the Annex to Commission Decision 97/296/EC as amended. For aquaculture products the residue monitoring requirements of Council Directive 96/23/EC, which have applied in the EC are currently being extended to imported aquaculture products.

The application of more stringent food safety regulations, based on hazard analysis critical control point theory and the assessment of risk, constitutes a burden to the small aquaculture operation. However, the changes should be seen in a positive light of providing increased security in the food chain, rather than as barriers to trade. The aquaculture industry will need assistance and training to meet the challenge.

7. MARKETS, DISTRIBUTION AND TRADE

A problem in the analysis of markets and of consumer behaviour is that most available data is on a very aggregated level. Therefore, information on regional market peculiarities or niche markets often gets lost. This is also the case for consumption data of freshwater species. Clearly more detailed information needs to be obtained on the preferences and consumption patterns of specific consumer groups. Current trends among consumers towards traditional, genuine or more convenient foods is also reflected in the demand for aquaculture products as these are increasingly required to be organic or at least consumer-friendly (filleted, packaged or part of a ready-meal available in the supermarket). In general, European aquaculture producers have drawn limited benefit from these trends. It is also clear that there is a need to increase consumer awareness and improve the image of the industry and its products. In addition, producers should get more market oriented, and over time, adapt choice of species and product forms to market requirements.

Any promotional campaign should be part of an overall strategy aimed at increasing the profitability of the industry and the economic well-being of the operators. The positive contribution to the rural economy by the industry should be emphasised and development programmes for alternative or supplementary economic activities such as recreational fishing, agro-tourism, etc. should be drawn up. Likewise, the use of specific labels denoting geographic origin, traditional production methods or other parameters should be promoted.

Research into the commercialisation of existing under-utilised species should be promoted, and more research on the implications of new requirements of retailers and

restaurants for the freshwater aquaculture industry encouraged. Lastly, more economic research into the demand for freshwater species in the European markets should be undertaken, in order to get a better understanding of how consumers respond to changes in income and prices.

The costs of such undertakings are obvious, as is the realisation that they must be borne by the industry. However, European aquaculture producers should draw heart from the successful examples of the Catfish Institute in the United States, the Norwegian Seafood Export Council, BIM (Irish Sea Fisheries Board) and Scottish Quality Salmon, especially in the field of market promotion and joint industry initiatives.

However, most importantly, the producers themselves must improve their own awareness on what the consumer wants, and their willingness to produce it, not only through research, but also by training, education and improved circulation of information.

8. NEW MARKETS, NEW COMPETITORS AND PROMOTION

The European seafood market is in constant evolution, characterised by a slow but steady rise in demand, increased imports from third countries due to stagnant European production, rising demand for fresh and value-added products and reduced demand for unsophisticated frozen and canned products. At the same time, the growing role of supermarkets in food and seafood sales has consequences also for the freshwater aquaculture sector. On the one hand, concentration of demand puts a pressure on producers' margins; on the other hand supermarkets increase overall seafood sales in regions with traditionally low seafood demand through improved availability of product on offer to the consumer.

There is much substitution among products and fast-growing species such as salmon are often supported by promotional campaigns or have special product characteristics that enable them to gain market share in a very short time. An example of the latter is imported fresh fillets of Nile perch, airborne to Europe from Lake Victoria.

Overall international trade in freshwater products is limited, partly caused by high transportation costs compared to product value. Exceptions are frozen trout from Finland and Norway to Japan, eel to China, fresh tilapia from Africa to Europe and from Ecuador and Taiwan to the US, frozen catfish from Vietnam to the US, and fresh Nile perch to Europe from Africa. In these cases, the market price has been high enough to overcome the considerable cost of transportation. The high market price has been possible because of the attractive image of the product in the market place and its strong competitive position in the local market.

Regarding the main freshwater species farmed in Europe, carp and trout, fragmentation on producer level is an obstacle to product development and effective marketing. For carp, a potential market is to be found in the fast-growing ethnic restaurant market, especially Asian and Chinese. However, it has also been suggested that promoting carp demand on this market could result in increased carp imports from third countries.

Both carp and trout suffer to some degree from a very traditional image and lack of product development. Highlighting the positive aspects of freshwater aquaculture and the product characteristics is thought to be necessary in order to increase sales and improve prices and margins. Creating awareness among consumers through promotional activities, following the example of the American Catfish Institute is instrumental in this respect.

9. CONCLUSIONS AND RECOMMENDATIONS

At the end of the Workshop all participants contributed to a SWOT analysis (Strengths, weaknesses, opportunities and threats), Appendix 4. The following conclusions and recommendations flow from the discussions and this analysis.

1. A recent study of the freshwater aquaculture sector in the European Community is available[2], together with a number of reports for the candidate accession countries[3]. However, there is a lack of a comprehensive sector study of European freshwater aquaculture, including impacts from potential competitors. It is **recommended** that available information be integrated and expanded to produce a comprehensive sector study of the freshwater aquaculture sector as an important component of the rural economy.

2. The freshwater aquaculture industry in Europe is product or producer driven along traditional lines and suffers particularly from a lack of vertical integration, linking producers to consumers through the marketing chain. The producers will remain at a disadvantage unless they develop better links through association or cooperation. The success in the USA of the Catfish Institute is an example of what can be achieved. It is **recommended** that producers consider forming stronger links through association or cooperation.

3. Some of the constraints to expansion of freshwater aquaculture could be better addressed if there were more information on consumer preferences and demand. It is therefore **recommended** that support be increased for consumer-oriented economic research directed to market development.

4. While the preparation and implementation of marketing plans is a responsibility of the industry, and must be financed from this source, additional progress and great benefit could be derived from a comprehensive policy framework. Political action is essential to generate coherent development policies. It is **recommended** that regional bodies, national governments and the European Commission undertake the formulation of comprehensive policies for aquaculture possibly including funding for regional development plans.

5. The aquaculture sector is dominated by small or micro enterprises, which often lack technical information, particularly on the impact of legislative changes driven by food safety or consumer considerations. The provision of a coherent flow of information to small producers, supported by training in all aspects of issues covered by new legislation is **recommended**.

6. Aquaculture as a food producing system in some cases has been perceived as being in conflict with other parts of the eco-system. This can best be addressed by the development and dissemination of codes of good aquaculture practice to producers, processors and by accurate information to consumers. In this regard it is also essential that inaccurate press reports be challenged immediately by soundly based scientific arguments (the benefit of a strong producer association is obvious here). It is

[2] **Forward Study of Community Aquaculture**
http://europa.eu.int/comm/fisheries/doc_et_publ/liste_publi/studies/aquaculture.pdf

[3] **Regional Reviews of Aquaculture Development Trends in Europe and former USSR area are available on** http://www.fao.org/fi/body/eifac/SubComII/review.asp

recommended that codes of good aquaculture management, feed production and food processing practices be adapted to the needs of the European sector and actively disseminated to all concerned.

7. While the demand for organically produced aquaculture products is growing, certification is still largely based on the standards of private certification bodies. It is **recommended** that a minimum set of common standards for organic aquaculture be produced at European level, with the collaboration of all stakeholders.

8. Trout and carp (about 94 percent) dominate European aquaculture, whereas there are other promising candidates for culture that have not been profitably exploited. It is **recommended** that an investigation of the lack of success with under-utilised species be conducted.

9. Freshwater species suffer from an image of low-value and lack of modernity. Many consumers are also unaware of the positive product attributes of freshwater species. This is exacerbated by lack of marketing aimed at the consumer. It is **recommended** that producers carry out marketing campaigns on a national and international level to raise awareness among consumers and increase the profile and image of freshwater species. Sufficient public funding to part-finance international generic promotion campaigns should be available, and access to it should be made easy.

10. Small- and large-scale aquaculture operations face different problems. Small-scale producers will probably face growing economic problems. As alternatives they could:

    - find special niches for their products, including the possibilities of organic production;
    - integrate with other rural activities such as agro-tourism and recreational fishing or,
    - aggregate into larger operations.

The difficulties of the small-scale sector could be ameliorated by cooperation between producers. This strengthens the recommendation that cooperation be carefully considered by the industry. Large-scale producers are more resilient but need to improve the image of aquaculture products.

APPENDIX 1

Agenda

Item	Title	Name(s)
1	Opening and Introductory remarks	**L. Váradi**, Chairman of EIFAC Sub-Commission II Aquaculture, and Convenor of the Working Party **M. Arnal Monreal** **EC/DG FISH**
2	Current state of European freshwater aquaculture products and markets	**C. Hough**
3	Regulatory framework in EC aquaculture	**C. Vamvakas** **EC/DG FISH**
Section* 1: *Supply Trends in production, new technologies and product development		
Production, products and sales		
4	Product development trends and new products from currently farmed species, including mid- and long-term perspectives	**V. Kristensen** (in cooperation with **D. Gorbaczow**)
5	Suggestions for improving sales and distribution of current major freshwater fish species: carp, trout, eel	**H. Neubacher**
6a	New species-potential developments of currently underproduced species	**A. Peteri**
6b	Experiences with catfish	**S. Vrignaud**
Environmental policy		
7	Influence of environmental policies on aquaculture development	**R. Rösch**
Quality, standards and labelling		
8	Development of policies, best practices and standards for health and hygiene-impact on production	**J. Ryder**
9	Quality, traceability and labelling	**A. Hilbrands**

10	Organic products and high quality niche products	**S. Bergleiter**
11	Section 1 summary and wrap-up	**D. James**

Section* 2: *Demand – Markets, distribution and trade
Markets and distribution

12	Review of recent market trends, consumer trends and changes in demand for products from aquaculture and capture fisheries	**N. Trachet**
13	Distribution channel development in Europe: Consequences for freshwater fish	**M.-C. Monfort**
13add	New products in European aquaculture	**P. Paquotte**

Institutional framework for trade

	Impact on trade of environmental and health/hygiene legislation: a trade barrier?	**R. Bates**

New markets, new competitors and promotion

	Measures to find and promote new market outlets, promotion campaigns-how to raise the profile of freshwater species	**A. Lem**
	Competitors from Africa: Tilapia, catfish and Nile Perch	**S. Boserman**
	Competition among existing (or potential) species farmed in Europe and between aquaculture and other internationalised channels of the food industry (pork, poultry, etc.).	**I. Szucs** (in cooperation with **E. Befeki**)
	Section 2 summary and wrap-up	**D. James**

<u>Section 3: Conclusions and recommendations</u>
Medium and long term economic viability of the industry

18	A joint SWOT analysis by the WP, including the drafting of a SWOT table and WP recommendations	Contributions from all the members of the WP Moderator: **A. Piccioli**
19	Tentative summary and conclusions	**D. James / L. Váradi**

APPENDIX 2

List of Participants

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APPENDIX 3

Summary of some codes of conduct and certification programmes that impact on the aquaculture sector

FAO Code of Conduct for Responsible Fisheries

Initiated in 1991 by the FAO Committee on Fisheries (COFI), developed in a multi-stakeholder consultation process, and adopted in 1995 by over 170 Member Governments of FAO, the Code of Conduct for Responsible Fisheries (CCRF) represents the most significant globally recognized international framework relating to the world's marine, coastal and inland fisheries, including aquaculture. Based on major international agreements (UNCLOS, UNCED, CBD), the voluntary Code sets out principles and international standards of behaviour for responsible practices with a view to ensuring the effective conservation, management and development of living aquatic resources, with respect for the ecosystem and biodiversity. The Articles of the Code cover all major issues and practices in fisheries, including fisheries management, fishing operations, aquaculture development, integration of fisheries into coastal area management, post-harvest practices, trade, and fisheries research, general principles, and provisions related to its implementation, monitoring, updating, and special requirements of developing countries. Progress in implementing the CCRF, at national, regional and global levels, is monitored and regularly discussed at COFI. However, implementation of all CCRF provisions is far from complete. Many fisheries and aquatic environments continue to suffer from inadequate management, significantly affecting resources and benefits.

The Code includes a section on Aquaculture Development and the FAO Fisheries Department has published technical guidelines for Aquaculture Development in support of the implementation of the Code.

The FAO Code of Conduct focuses more on production process quality than food safety, labelling or traceability issues although these are included in Article 9 (Aquaculture) and Article 11 (Post-harvest Practices and Trade). For more information visit the FAO Fisheries Department website at http://www.fao.org/fi.

FEAP Code of Conduct

The Federation of European Aquaculture Producers (FEAP) produced a Code of Conduct in the spring of 2000. The primary goal of this Code is to promote the responsible development and management of a viable European aquaculture sector in order to assure a high standard of quality food production while respecting environmental considerations and consumer's demands.

As a Code of Conduct, it serves to establish and recommend guiding principles for those in Europe who are producing live species through aquaculture. The Code does not seek to distinguish between the species nor the types or scales of farms that are encountered within the European aquaculture sector. Its purpose is to establish common ground, through effective self-regulation, for sectoral responsibility within society and demonstrate the considerations of the production sector towards the species it rears, the environment and the consumer. FEAP has developed this Code of Conduct with specific reference to:

- the provisions for responsible aquaculture development contained in the FAO Code of Conduct for Responsible Fisheries (FAO, 1995);
- the FAO Technical Guidelines for Responsible Fisheries No. 5: Aquaculture Development (FAO, 1997);

- the Holmenkollen Guidelines for Sustainable Industrial Fish Farming (Oslo, 1994);
- the Holmenkollen Guidelines for Sustainable Aquaculture (Oslo, 1997);
- the ICES Code of Practice on the Introductions and Transfers of Marine Organisms (Copenhagen, 1994);
- Codes of Practice and Manual of Procedures for Consideration of Introductions and Transfers of Marine and Freshwater Organisms (EIFAC, 1988);
- The Report on the Welfare of Farmed Fish (Farm Animal Welfare Council UK, 1996).

It is assumed that European and national legislation will provide minimum standards for aquaculture. The Code will then serve as the basis for the development of individual national Codes of Practice in order to interpret and apply existing standards and to develop, refine or improve standards, as required.

The FEAP Code of Conduct focuses on production process quality rather than food safety, labelling or traceability issues. No mandatory independent third party verification, certification and/or surveillance is included. For more information visit the FEAP website at **http://www.feap.org**.

EUREP-GAP

In an interesting development the Euro-Retailer Produce Working Group (EUREP), made up of leading European food retailers, has established a mechanism for drawing up production standards for commodities entering the retail trade through their outlets. Extension to the products of aquaculture started in 2001. This is a particularly important trend as regardless of lower standards prescribed by legislation, products will not enter the retail trade unless they meet the retailer's standard. The EUREP-GAP programme focuses on production process quality, labelling, traceability and food safety. Third party verification by an accredited certification body is required. More information can be found on the EUREP website at **http://www.eurep.org**.

Global Aquaculture Alliance (GAA)

The GAA is an international non-profit trade association dedicated to advancing environmentally responsible aquaculture and is working to finalize a Responsible Aquaculture Programme of certifiable standards. The GAA programme focuses mainly on the management of shrimp farming and processing operations. Third party verification is required and certified operations can label their products with the GAA logo. More information is available on the GAA website at **http://www.gaalliance.org**.

Marine Stewardship Council (MSC)

The MSC programme is currently only concerned with the certification of sustainably managed marine resources and chain of custody issues, but may be extended to aquaculture in the future. For more information visit the MSC website at **http://www.msc.org**.

APPENDIX 4

Strengths, Weaknesses, Opportunities, Threats Table

Medium and long term economic viability of the industry

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Production trends	Growing trout production Owner operated businesses Farmers' technical skills Capacity for production increase without investment in new facilities (trout) Low production costs (extensive systems, low level trophic chain)	Competition from marine fish Unpredictable production output due to climatic influence (carp) Difficult economic conditions for development (carp) Missing coherent policies (both at national and Community level) Insufficient communication between farmers, associations and policy makers	Local markets Development of on-farm activities (angling, eco-tourism etc) Multi-species production (pond farming)	Competition from marine fish Competition for water resource Lack of coherent policies (both at national and Community level) Protected predators (birds etc)
New technologies	Ongoing research for intensive technology	Very low technical level (pond farming)		
Under-utilised species	Technical background available for many species	High cost of marketing	Potential high demand at least for carnivorous species Some are low level trophic chain species	

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Environment	Positive environmental contribution (carp pond farming) Sustainable industry Potential for an environment friendly intensive production	Investment needed to meet environmental standards (Central & East Europe countries) Differences in national legislation	Co-operation with environmental groups/authorities	Public image
Quality	Good products and processes quality	Lack of information and awareness for farmers	Promote quality of controlled production	
Hygiene standards	Safe products Easy control on safety of production	Poor HACCP implementation	Safe product image HACCP can further improve consumers' confidence	Lack of information on HACCP (small businesses)
Labelling	Easy traceability	Lack of information and awareness for farmers	Promote quality of properly managed production	Incorrect species identification at point of sale Competition from wild fish
Organic products	Market already exists and it is growing Low cost of conversion to organic farming (pond farms) Premium price Consumer information already existing	Organic certification not for highly intensive systems Rejection from (part of) the farmers Certification cost	Increase supply to satisfy growing demand	Lack of minimum common standards for organic aquaculture

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Current market trends	Slowly increasing demand Continuous availability of raw material (trout)	Absence of coherent marketing Lack of concentration of the offer Difficulties to diversify species demand Poor organisation of the producers	Poor fish consumption in Central & East Europe countries Organic product development (as a potential new market) Capture fisheries decreasing yield	Organic product development (if it gives a poor image to the "normal" product) Cheap imports from overseas
Consumer behaviour	Image of the farmer	Lack of knowledge on the industry Poor image of the industry/farmer Consumer uneasy with new species/products In Europe fish is an expensive food for poor economies	Clarify (by legislation) difference between aquaculture and capture fisheries	Failure in the communication strategy towards the consumer
Changes in demand		Lack of investment in product development	Product development	Attitude of the public towards food "Fast food" competition

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
Distribution channels	Potential for direct marketing (family businesses)		Further development of direct sales at farm Development of supermarkets in regions where fish consumption is low Many different (potential) outlets	
New products	Need for raw material for the processing of new products	Production cost of highly processed new products	Enlargement of number of farmed species Demand for diversified species by the processors, in order to offer a large range of products	Irregularity of the supply (extensive aquaculture)
New markets			Enlargement of product variety	
Competitors			Increased demand in Asia	Incorrect species identification at point of sale Development of Asian production