Cefas contract report < C6078>

Title: Background information for sustainable aquaculture development, addressing environmental protection in particular

Sub-Title: Sustainable Aquaculture Development in the context of the Water Framework Directive and the Marine Strategy Framework Directive

Part 1 Main Report & References

Authors: Jeffery, K.R., Vivian, C.M.G., Painting, S.J., Hyder, K., Verner-Jeffreys, D.W., Walker, R.J., Ellis, T., Rae, L.J., Judd, A.D., Collingridge, K.A., Arkell, S., Kershaw, S.R., Kirby, D.R., Watts, S., Kershaw, P.J., and Auchterlonie, N.A.

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Executive Summary

This project was commissioned in late 2013 to gather information on European aquaculture development in the context of environmental protection, through literature review and extensive stakeholder consultation. The focus was European environmental legislation, in particular the Water Framework Directive (WFD) and Marine Strategy Framework Directive (MSFD). This focus recognises that high quality aquatic environments and the prevention of their deterioration are fundamental to the sustainable development of European aquaculture.

The project will provide background information for a guidance document on the application of environmental legislation in relation to aquaculture that will be developed by the Commission. The need to develop such guidance was identified in the Commission Communication on Guidelines for the sustainable development of EU Aquaculture. The WFD and the MSFD were key items of legislation highlighted as being important for the sector, and especially worthy of attention. This project represents a response to the raising of that issue, and the Commission Services would like to have a better understanding of how the sector meets its legal obligations under WFD, MSFD and other environmental legislation, and how aquaculture can benefit from subsequent improvements in clean water availability. The timing of this study is important, coinciding with a period where Commission Services also wish to see sustainable development of European aquaculture, and sustained growth in quality seafood from European aquaculture businesses. Protection of the environment and maintenance of high quality aquatic ecosystems are core principles in realising the obvious potential of the sector.

The report provides an overview of EU-28 aquaculture including production data, the types of aquaculture systems used in the EU and their environmental impacts, the environmental legislation and its application, and the views on implementation of environmental legislation with direct relevance to aquaculture from abroad spectrum of stakeholders right across EU-28 and some EEA states.

Aquaculture activities can potentially exert pressures and impacts upon aquatic ecosystems, for example through increased nutrient load, from concentrations of faecal matter and uneaten feed, from dispersal of cleaning agents and medicines. In addition, aquaculture can itself be subject to pressures and impacts from other activities taking place in the aquatic ecosystem, for example

pollution incidents, waste water treatment facilities upstream, and flow variations due to flow regulation in the river e.g. from dams and hydroelectric systems. Aquaculture producers require high quality waters, and are often the first in a river basin to detect problems with water quality, pathogens or introduced species in the aquatic environment. If properly managed, aquaculture can have positive impacts on the natural environment, such as retention of water in the landscape, buffering of extreme rainfall patterns with drought and flood protection (large ponds) and encouraging biodiversity. Aquaculture relies on, but does not consume, significant quantities of water.

Pressures and impacts of different aquaculture systems depend on multiple factors, including farm location, type of cultured organism, methods used, and the sensitivity or vulnerability of the environment to possible pressures. These pressures and impacts need to be monitored and managed closely in order to comply with the Water Framework Directive (WFD) and the Marine Strategy Framework Directive (MSFD).

The WFD and the MSFD do not contain explicit obligations for aquaculture. However, the aquaculture industry has to comply with the requirements of the WFD and MSFD via the national legislation that implements those Directives in each Member State. With regard to the WFD, a significant issue is the current frequent lack of integration of aquaculture into the RBMPs. For the WFD, even if additional objectives and measures have not been explicitly included in all the relevant River Basin Management Plans (RBMPs), these objectives and measures may exist and apply. As the MSFD is in its early stages of implementation, it is too early to assess how aquaculture is being addressed under this Directive.

Strategic Environmental Assessment has been used to a very limited extent for aquaculture developments and two examples are given in the report. While Environmental Impact Assessment (EIA) is only mandatory for 'intensive fish farming', a large number of EIAs for aquaculture projects have been carried out across Europe. A finding from reviews of some of these EIAs shows inconsistent application of the EIA Directive between countries. Also, one review found "In many locations throughout Europe for example there appears to be an unnecessary and high level of bureaucratic involvement in the development of aquaculture activity. There is poor transparency in the implementation of EIA legislation as it relates to aquaculture, and differential treatment of aquaculture sectors, which may be an impediment to aquaculture development."

Emerging and future technologies for aquaculture are presented, covering systems such as recirculation, offshore aquaculture, aquaponics and others, alongside the potential changes in interactions with the environment, and hence the regulatory framework for environmental protection.

Key recommendations in relation to environmental regulation and impact mitigation for aquaculture across EU-28 were derived from the reviews carried out by the project and the input of stakeholders. These fall into four categories (1) for national administrators and regulators (2) for the aquaculture industry (3) for further research (4) for the EC.

Recommendations for national administrators and regulators have been brigaded under four headings: Licensing, Monitoring, Planning and Charging, as follows:

Licensing:

- Having a single point of contact for the aquaculture industry in the regulatory system to improve the efficiency of regulation i.e. a "one-stop-shop".
- To provide a permitting system that is flexible enough to include mitigation practices or new techniques for the management of environmental impacts. Aquaculture is a young and dynamic industry and technological developments occur relatively quickly.
- To include within any review of consents/licence applications an assessment of the use of mitigation tools or practices (e.g. for effluent water quality) and how these may improve environmental performance.
- National administrations or regulators develop specific good practice guidelines for managing the environmental impacts of aquaculture for the main types of aquaculture within their jurisdiction, and that this is developed in conjunction with the aquaculture industry to ensure that it is directly appropriate.
- The Precautionary Principle be applied to aquaculture consistent with EU guidance (COM 2000b; EEA 2001). The guidance that has already been provided by the EU, if followed correctly, should help clarify the requirements in the adoption of this approach to sustainable aquaculture development.
- Administrators should develop simple guidance to help regulators and industry assess whether plans for new or expanded aquaculture facilities will comply with obligations of the MSFD and WFD (building on existing WFD Common Implementation Strategy guidance for Article 4(7).

- Guidance on environmental flows, allowing access to water at the same level as other food production sectors, and the possibility of taxing contaminants (i.e. emissions) as the sector is not a consumer of water.
- National Administrations and regulators should consider the mechanism for and application of nutrient trading schemes (including co-location) for sites that are already heavily impacted or otherwise compromised to facilitate the continuing sustainable development of aquaculture.
- Member States keep the national instruments transposing the Shellfish Waters Directive, or, if necessary, develop new ones to ensure equivalent protection of aquaculture production areas.

Monitoring:

- A risk and evidence-based approach to determine monitoring requirements is adopted and standardised across EU-28, ensuring that the approach is based on robust scientific principles and best available working knowledge within an overall ecosystem management methodology.
- There be a greater clarity on which parameters or data the aquaculture industry should provide for licensing and monitoring, as well as the quality and quantity of the information required.
- Data on both emission and uptake of nutrients is required, and it is necessary to make improvements in monitoring to quantify and allocate proportional nutrient loads from different sources, identifying the contribution from aquaculture within an overall nutrient budget.
- The adoption of regulatory codes may support improvements in the effective and efficient environmental regulation of aquaculture.
- The development and application of technical standards for aquaculture systems to mitigate environmental impacts and the management of the risk of escape of stock, across a range of aquaculture systems and species. It would also support monitoring programmes by ensuring that systems and equipment are appropriate for the location and species farmed.

Planning:

- It is recommended that national administrations/regulators provide strategic planning for marine aquaculture development to inform spatial planning processes, ensuring linkage with other marine industries, and that within spatial planning approaches. It is also recommended that Allocated Zones for Aquaculture (AZAs) are provided.
- It is recommended that aquaculture be integrated into objectives and measures in the 2nd round of RBMPs.

Charging:

- National administrations and regulators ensure administration costs are proportionate to the sector/business that is being regulated with the 'Polluter Pays' principle applied.

Recommendations for the aquaculture industry have been provided, split into three categories, Technology, Management and Liaison:

Technology:

- The adoption of aquaculture production system types appropriate to the local environment should be followed to ensure that the type of system, the biomass of the farmed stock, and the environmental pressures are appropriate for the location, and the risk of serious environmental impact is reduced.
- Aquaculture should continue to adopt new practices that improve sustainability.

Management:

- The adoption of an approach to the management of aquaculture systems that incorporates a broader ecosystem-level approach encompassing all environmental impacts (e.g. fish health, emissions, alien species, veterinary medicines, abstraction) can provide frameworks within which industry may adopt such an approach.
- The practices of self-monitoring and reporting (e.g. Codes of Practice, certification schemes), especially those independently audited can help clarify the environmental obligations of the industry, albeit within a non-regulatory framework.

Liaison:

- Liaise directly with regulators to achieve a common level of understanding about responsible aquaculture operations.

Recommendations for further research have also been provided:

- Research that provides more accurate predictive models for the fate of nutrients that originate from aquaculture sites and their cumulative effects, as well as effective ways of mitigating those impacts.
- Research to improve monitoring techniques and support the development and use of best available technology to reduce environmental impacts.
- Research that supports the development of new, efficient and innovative water processing technology for land-based aquaculture systems (RAS).

Finally, Recommendations for the European Commission Services have been suggested:

- The development of guidance to address the biological impacts of aquaculture e.g. pathogens, non-native invasive species, sea lice in farmed salmonids, escapees and the risk of introgression with wild populations.
- That the EFLOWS working group considers both the environment and the development of the aquaculture sector with respect to the management of abstraction in relation to flow-through systems.
- That this project information is retained as a readily accessible and usable resource to provide information to national administrators, regulators, industry and NGOs in the future.

The approach in this project represents an extensive review across Europe of the issues surrounding the environmental regulation of the aquaculture industry, extensive stakeholder consultation and a forward look at how the sector will develop. It represents a valuable resource for those who seek good practice in regulation or management of the aquaculture industry, and will be used as the basis for Commission Services to develop guidance on that topic.

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