

TRENDS IN NATIONAL AQUACULTURE LEGISLATION – PART II

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This two-part article highlights the most significant trends and initiatives in national aquaculture legislation over the last decade. The previous issue of FAN addressed the tendency to draft comprehensive regulatory frameworks, integrated coastal management and the tendency to coordinate the various governmental authorizations related to aquaculture. This issue of FAN addresses the growing environmental concerns, food safety and other health issues, the concept of sea ranching, law enforcement and the tendency of the aquaculture sector toward self-regulation. It concludes with a comprehensive list of references and selected reading material. FAO continues to assist countries to develop and adopt appropriate legal frameworks and legislature through its technical assistance programme. For further information and advice on national aquaculture legislation, please contact Ms Annick van Houtte, Legal Officer of the FAO Development Law Service (annick.vanhoutte@fao.org)

Increasing environmental restrictions

There is a growing concern noticeable about the environmental impacts of aquaculture activities. Environmental concerns increasingly form a major part of licensing procedures, from the initial environmental impacts of establishing an aquaculture activity to the impacts that may arise through the actual operation of an aquaculture farm. The environmental legislation related to aquaculture has become more direct and stringent over the years given the degree of ecological hazard that can be involved in aquaculture farming. This tendency can be demonstrated by developments in the following areas:

Environmental Impact Assessment (EIA). In order to prevent developments from being undertaken in an environmentally unsustainable manner it is nowadays required to perform an EIA before establishing and/or operating an aquaculture farm. The instrument as such is usually regulated in basic environmental laws, but in some cases reference to the requirement of EIA is made in a specific fisheries and/or aquaculture text. Submission to an EIA is usually determined by various factors such as the proposed size of the aquaculture farm or the sensibility of the area involved. In developed countries it is most common to make use of an EIA and the procedures are usually laid down in impressive and exhaustive detail. Increasingly, also developing countries require aquaculture activities to be subject to an EIA. Recent examples can be found in the *Aquaculture Management Regulations 1996* of Sri Lanka and the *Fisheries and*

Marine Resources Act 1998 of Mauritius. Other countries have developed special guidelines relating to EIA for aquaculture operations, such as Egypt, Tanzania and – with particular attention to shrimp farms – Vietnam.

Chemicals. Over-use and misuse of chemicals, including veterinary drugs, in the aquaculture industry, causing pollution and contamination of the aquatic environment, is another area of growing concern. In addition, the improper use of chemicals raises serious concerns about the quality of the aquaculture product and subsequently human health (see below). While the overriding consideration should be minimizing the use of chemicals in aquaculture, it is recognized that the use of some chemicals is essential. A particular problem is that the expanding aquaculture industry has adopted chemicals that were originally developed for use in other industrial sectors, most notably the agricultural sector. Since many chemicals have not been evaluated yet with respect to their effects on the aquatic environment, a precautionary approach should therefore be applied.

Chemical contamination can be controlled in two ways. The first technique concerns a direct prohibition or restriction upon the use of specific chemicals that are harmful to the environment. The use, import, distribution or sale of particular hazardous chemicals can be made a criminal offence, while such activities in relation to less dangerous chemicals can be made subject to authorization schemes and licensing requirements. Generally, this type of control legislation is found in basic environmental laws or more specific acts related to the use of specific chemicals. Some countries have simply adopted lists of chemicals that are allowed to be used in aquaculture, including rules on how they have to be used. Examples can be found in Vietnam, Malaysia, Thailand, Sri Lanka and China. The second tool to regulate the presence of various chemicals in the environment consists of a system of wastewater discharge licensing. Again, such licenses are in most instances likely to be regulated under the same general system of environmental legislation that applies to the normal industry. A specific example related to aquaculture is the Australian *Great Barrier Reef Marine Park (Aquaculture) Regulations 2000*, whose purpose it is to regulate the discharge of waste from aquaculture operations, which may affect animals and plants in the Great Barrier Reef Marine Park.

Introduction and movement of species. One of the most potentially serious effects of aquaculture on the environment is the introduction of exotic species into environments where they may compete with, or replace, native species. Such introductions are generally unintended, though some can also be the result of deliberate actions. Increasingly, countries have introduced legislation that prohibits the introduction of non-indigenous species and/or limits the movement of fish and other aquatic organisms. In addition, such restrictions are often justified in order to prevent the spread of diseases (see below). Recent attempts to increasingly control the introduction and movement of species can be found in the EU and Japan. In 2001, Peru adopted a specific provision on disease control and the introduction of new species in order to protect the ecosystem and the environment.

Special attention must be given to the relatively new phenomenon of genetically modified aquatic organisms (GMOs). They are usually defined as being essentially transgenic organisms, i.e. organisms that have had foreign genes inserted into their cells. Although currently the majority of farm-raised products are still similar to their wild forms, globally more than a dozen transgenic fish are being developed for aquaculture in developed countries, and it seems likely that aquatic GMOs will soon be available for consumers. Generally, it is accepted that the genetic modification of aquatic species has the potential to increase both quantity and quality of aquaculture products. Biotechnology can be used to increase production, to manage disease outbreaks or can even result in the culture of new species. However, it is the question what the exact impact of GMOs on the local genetic biodiversity will be if GMOs breed with local stocks. They might compete with native species, but interbreeding could also damage the genetic integrity of the wild stock. Although much research has already been done, definite answers are not available yet.

A precautionary approach toward the introduction and release of GMOs should therefore be applied for the prevention of environmental harm. This can be illustrated by the extensive provisions on the use of aquatic genetic resources in FAOs *Code of Conduct for Responsible Fisheries*. In most developed countries, stringent legislation on the introduction and use of GMOs has been adopted over the years. Although there is a widespread feeling in developing countries to regulate the issue as well, only few specific measures have

been taken so far. In some countries the issue is considered to be sufficiently addressed by existing legislation on the introduction and movement of species. During the negotiations leading to the Cartagena Protocol on Biosafety, which entered into force on 11 September 2003, the developing countries have pressed for strict regulation of GMOs since they generally lack an adequate regulatory system and believe that all kinds of unsafe experiments will be carried out in their countries. Nevertheless, in some developing countries strict regulations to the use of GMOs in aquaculture do exist. In the Philippines, a National Committee of Biosafety that identifies and evaluates potential hazards from genetic experiments or introductions addresses the issue. Another example is Mozambique, where the recent *Aquaculture Regulation 2001* contains a special provision on genetic manipulation.

Food safety and other health issues

At the end of the 1980s, developed countries arrived at the conclusion that classic inspection procedures, usually based on the analysis of samples and tests, were not sufficient to provide the necessary level of protection to consumers. In order to address all the relevant hazards in food production, a new control system was developed and incorporated into the harvesting, processing and distribution of - amongst other - fish products. This system is called Hazard Analysis and Critical Control Point (HACCP) and has currently been incorporated in the legislation of many importing countries of fish products, particularly the United States and in the European Union. The issue is often regulated in general food safety legislation, since food safety is not a concern that is unique to aquaculture products.

Increasingly, the legislation of aquaculture exporting countries is influenced by the legislative developments in importing countries. In particular, exporting countries have been forced to meet the strict HACCP regulations of the USA and the EU by means of implementing similar regulations in their own national legislation. While nowadays the implementation of safety assurance systems may be well advanced in the fish-processing sector, the application and enforcement of such systems at aquaculture farm level is a relatively new approach. Nevertheless, in 1998 Sri Lanka implemented the applicable EU Directive in its aquaculture legislation. Recently, also Jamaica adopted a special law, which provides for the inspection and certification of various categories

of aquaculture, inland and marine products intended for export. The law also contains provisions for the licensing of persons and facilities engaged in the production, harvesting, processing, handling, storage and transport for export of such products and includes the development of a HACCP plan.

Whereas food safety regulations primarily aim at preventing human diseases, it is as important to protect the health of fish and other aquatic organisms. Increasingly, disease outbreaks are being recognized as a major problem for the aquaculture industry, affecting trade, production and economic and socio-economic development. Particularly in the shrimp sector disease is now considered to be the most limiting factor. Many circumstances have contributed to the health problems currently faced by the aquaculture industry, such as the uncontrolled expansion and the inadequate management of aquaculture farms. Also the increasing use of chemicals and the introduction and movement of fish and other aquatic organisms have contributed to the spread of diseases upon wild and/or farmed populations.

There appears to be a tendency to adopt stringent legislation in order to control the outbreak of diseases. Examples relating to the introduction and movement of fish and other aquatic products have been discussed above. Also noted for their detailed legislation on disease matters are the Governments of Norway and Japan. Increasing attention to the control of disease matters is also given in the basic fisheries laws of some developing countries. The *Fisheries Proclamation 1998* of Eritrea, for instance, states that the prevention from the spread of disease and the protection of the quality of aquatic organisms is one of the main reasons to suspend the operation or close an aquaculture facility. Other similar legislative attempts can be found in Mauritius and Honduras. Noteworthy for its comprehensive strategy is the Australian National Strategic Plan for Aquatic Animal Health 1998-2003. The Plan outlines the objectives and projects in order to develop a national approach to emergency preparedness and response and to the over-all management of aquatic animal health in Australia. Key programmes of the Plan consist of quarantine, surveillance, monitoring and reporting, research and development as well as legislation, policies and jurisdiction.

Enforcement and self-regulation

Until the 1990s aquaculture was hardly considered in any law enforcement sanction. Where aquaculture was dealt with under a basic fisheries law the enforcement sections had often been drafted with only capture fisheries in mind. Progress has certainly been made under the more recently adopted fisheries and aquaculture laws and frameworks. In many countries the practising of aquaculture without authorisation, the discharge of wastewater without a permit or the illegal import of fish or aquatic organisms all result in some sort of defined penalty. In particular, there is a trend toward the imposition of administrative sanctions, i.e. sanctions imposed by an administrative agency or an independent institution for breach of a regulation or rule established by that agency or institution or enacted by parliament without intervention by a court. As a consequence, the regulator is not required to prove a matter to the criminal standard and is not constrained by criminal court procedures. It thus provides for an alternative enforcement mechanism that can be more cost-effective, timely and practical. Administrative sanctions may take different forms. They can be a warning, a suspension or revocation of an authorization, a temporary ineligibility to apply for an authorization, the confiscation equipment, a monetary penalty, the closure of aquaculture facilities or the exercise of summary powers.

However, due to the overlap of laws, regulations, government institutions and agencies involved, the implementation of enforcement mechanisms remains difficult and may even lead to an attitude of limited responsibility by the farmer. A major problem, particularly in developing countries, is the availability of a sufficient number of trained staff with a sufficient expertise. Limited budgets practically mean that aquaculture rules often cannot be properly and adequately enforced. Other options are therefore being explored in order to encourage farmers to make more efficient use of resources and to take full responsibility for mitigating or minimising environmental changes caused by their aquaculture operations. In particular, there appears to be a growing interest in the use of economic (market-based) instruments, such as various forms of subsidy for environmental friendly locations, technologies and management or tradable permits for resource use and harvesting rights.

Where the introduction of new legislation is difficult, or will cause excessive delay, other - voluntary - options such as guidelines or codes of conduct may be introduced prior or in addition to specific legislation. These instruments are also considered to have great value in promoting the sustainability of the aquaculture sector over the long-term, for example through the implementation of self-monitor and control systems or by tying them to eco-labelling schemes (on the assumption that some consumers will pay a premium for environmentally friendly goods). Although voluntary in nature, the effectiveness of guidelines and codes can be enhanced by creating incentives to encourage compliance. For instance, the authorisation to engage in aquaculture activities or the membership of an aquaculture organization can be made dependent on compliance with the applicable guideline or code.

At the global level, the introduction of the *FAO Code of Responsible Fisheries*, which contains special provisions on aquaculture development, has been important. More detailed guidelines on specific issues and topics that are covered by the *Code* have been developed afterwards or are still in preparation. At the regional level, the Federation of European Aquaculture Producers (FEAP) drafted an influential *Code of Conduct for European Aquaculture*, which establishes and recommends the guiding principles for the European aquaculture industry. At the national level, the self-regulatory approach has received increasing attention particularly in farmed shrimp producing countries. Codes of conduct have been adopted over the years in India, Malaysia, Sri Lanka, Philippines and Thailand. In Japan, the development of aquaculture management has even led to a complete self-imposed and self-controlled system via Fisheries Co-operative Associations (FCAs). The members of FCAs engage in aquaculture according to FCA-management plans, while the FCAs also develop and implement Aquaculture Ground Improvement Programs.

Special attention deserves sophisticated agreements between government and industry to protect the environment, such as "eco-contracts" in Denmark or "covenants" in The Netherlands. This type of agreement could also be applied to the aquaculture environment. The basic idea of these agreements is that pollution control cannot be achieved without close and active co-operation of the industry. Therefore, binding objectives and targets for the reduction of pollution are laid down on a

sector by sector basis. Then members of the group work out plans and mechanisms and set time frames for the shared reduction of pollution. The construction limits the constant issuance of all kinds of licenses and permits and helps to reduce the bureaucracy and input from governments. However, these mechanisms can only be applied in legal systems with a tradition of consensus seeking and a joint problem approach and where the sectors of industry have organized themselves in production organizations.

Concluding remarks

As we have seen in both Part I and Part II of this article, aquaculture is slowly developing itself into a maturing sector. Modern aquaculture legislation should meet the overall needs of the farmer, the consumers as well as other water and land users, while specific attention should be given to the environmental impacts of and on aquaculture. Under pressure of the growing industry many countries are in the process of reviewing their existing legislation or even adopting a new comprehensive regulatory framework in order to encourage a sustainable and commercial aquaculture industry. However, such efforts are often complicated and time-consuming due to the many issues and interests involved.

Ideally, control is established by a license or permit system, which allows the authorities to examine the suitability of a location and the potential environmental effects of the operation. Increasingly a single window approach is adopted for the numerous licenses that are usually required. All activities with an adverse environmental impact, such as wastewater discharge or the use of chemicals, should be continuously monitored and evaluated after the legal establishment of the aquaculture farm. Stricter regulation is also noticeable with respect to food safety and health issues. Strongly influenced by the importing countries quality and safety standards are becoming more requisite than optional nowadays.

Although the development of aquaculture legal frameworks is progressing slowly, law enforcement often remains the weak link in the legal regimes. Special attention should also be given to the transitional state of aquaculture farms that have been lawfully established for a number of years, but become unlawful due to subsequent legal requirements. For these farms it would be unrealistic to expect immediate compliance with new rules unless

sufficient time has been allowed for changes to accommodate in practice. An effective and powerful option for the future will be the application of administrative sanctions and of economic incentives and disincentives. Likewise, voluntary instruments, such as Codes and Guidelines, will serve as an alternative prior or in addition to legal frameworks and will undoubtedly require a greater involvement and participation of the aquaculture community.

With many of the world's capture fisheries being over-fished, aquaculture is often viewed as the industry that could meet the increasing shortfall in supply of fish. However, due to its environmental and technical limitations it is becoming clear that the conventional aquaculture industry will not be able to fulfil these expectations to the fullest extent. Stock enhancement and sea ranching should therefore be considered as valuable long-term alternatives, but in order to be cost effective the crucial hurdle of property rights needs to be taken first.

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