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FISH FARMING AND OTTERS IN PORTUGAL

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Abstract: In Portugal fish farming has expanded very rapidly in the last decade, with trout, mullet, cuttlefish, seabream, eel, salmon and prawns being intensively reared in artificial ponds. A questionnaire was sent to all known fish farmers to assess the effect of predation, especially by otters; no compensation scheme exists in Portugal. This paper discusses the results of this exercise. It is suggested that fish farmers need to look beyond economic and technological aspects of aquaculture and consider the wider environmental impact of their activities.

In Portugal fish farming has expanded very rapidly in the last decade, mainly after 1985. There are two governmental bodies with authority to license the projects. One for aquaculture in freshwater systems and the other for fish farming in coastal environments such as marshes and lagoons. A high percentage of these farms are financed by EEC funds and some are still in development.

The most common species reared are the rainbow trout (*Salmo gairdneri*) in freshwater and the mullet (*Mugil* spp.), common cuttlefish (*Sephia officinalis*), gilthead seabream (*Sparus auratus*), eel (*Anguilla anguilla*), striped seabream (*Pagellus mormyrus*), common sole (*Solea vulgaris*), seabass (*Dicentrarchus* spp.), white seabream (*Diplodus* spp.), Atlantic salmon (*Salmo solar*) and Kuruma prawn (*Penaeus japonicus*) in salt or brackish water.

Pond culture is the system used most often - earth or cement ponds provided with water at ambient temperature and salinity where fish, fry, fingerlings or shrimp (post-larvae or juveniles) are stocked. They are usually collected from the wild or produced in hatcheries. The extensive production where no food is supplied by man is being gradually abandoned because of its low productivity, and replaced by semi-intensive and intensive fish farming. The polyculture of eels, common soles, seabasses and gilthead seabreams is very common in ponds, while cage culture has until now only concerned rainbow trout in dams. An interesting aspect of this activity is presently the conversion of all salinas for intensive aquaculture. Previously only extensive fish farms were associated with salt exploitation.

At the end of 1990 a general questionnaire was sent to all known fish farmers (n = 208). The object was to determine the impact of predation in their exploitation, in an attempt to figure out the magnitude of financial losses, especially due to otter activities.

Only 29.3 % of the farmers returned the form.

The European otter (*Lutra lutra* L.) is still widespread all over the country and otters are strictly protected by law. However the Portuguese state does not compensate for damage.

Otters and other predators

Otters, cormorants, herons, egrets, and gulls were reported as the more frequent visitors and users of fish farms. Predation as well as disturbance causing stress on the fish were the main problems. Fish farmers complained more about predation by otters than by birds. However, there are great differences in the scale of predation reported from farmers in the same area, and the financial losses are unknown. In some places it was reported that otters take fish all year round.

How to prevent the damage

Several owners have tested different methods such as fencing, human surveillance and dogs to prevent otters and avian predators coming in to the ponds. Other deterrents such as sonic scarers, lights, scarecrows, crossed nylon wires, traps, shots and poisoned baits were also referred to.

Electric fencing is not often used in Portugal, first because of the high price and second because a lot of farms are located in wetlands. Although being fully protected in Portugal, several otters are certainly killed each year on fish farms. Nobody has an idea of the total number of these illegally killed animals.

Opinions

These are different attitudes towards the otter. Some farmers consider them as serious pests and claim that otters are thriving because otters now get plenty of food from fish farms. In their opinion this situation is not acceptable since they have no compensation for the financial losses. None estimated the total yearly losses.

A more understanding group desires the cooperation of nature conservation associations to help them keep otters out of their areas. The possibility of transporting animals away from fish farming areas is plausible, but the problem is to find places sufficiently away from farms but not too distant from the capture areas.

Only a few farmers like to see otters and other wildlife species in and around their areas claiming that the damages they cause are not too significant. Generally this opinion comes from younger farmers.

These three different attitudes to otters are interesting. Something very similar was mentioned by Skarén (1990) in Finland.

Discussion

Additional data on fishfarms are certainly necessary.

The development of aquaculture has been viewed mainly from socio-economic and technological perspectives. Environmental problems have been scarcely considered and sometimes even neglected. Aquaculture, owing to the location of enterprises, is exposed to a variety of predatory wildlife which can cause considerable losses of fish, fry, fingerlings or shrimp. On the other hand the intensive fish culture in ponds is entirely dependent on incorporation of food resulting in great amounts of organic effluents. This material, associated with antibiotics used both to prevent and treat diseases, has sometimes led to water pollution problems.

However, damage by wildlife is the farmers' main concern, and some have claimed a negative impact of pollution caused by agricultural practises and industry wastes on the water quality.

Another aspect of the activity is the fish farm escapes of cultured fish, products of years of selective breeding, which can be genetically different from wild stocks. The maintenance of a viable wild gene pool is highly desirable and one must bear in mind that breeders depend to a large extent on wild stocks as a source of genetic material for further improvements on farmed stock.

When biological resources are considered, the promotion of production depends, in fact, on the quality of the environment and its maintenance (UNEP 1990). Fish farmers need to assess not just the impact of the environment on their activities, but also the impacts of their activities on the environment. It is important that adequate management measures are incorporated into all farms at the project stage (SSGA 1990).

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