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Aquaculture planning and local fisheries
The Case of Catalonia, Spain

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SUMMARY - Although aquaculture is normally developed by companies independent of the fishing sector, there are important positive synergies which can improve the viability and profitability of the projects when the fishing sector participates in them. In the case of the Autonomous Community of Catalonia, of the 32 existing fishermen's guilds, 20 of them sell fish, half of which are involved in marine fish farming and mollusc cultivation. Aquaculture production is approximately 15% of the fisheries production. As regards the planning process, the fishermen's guilds, their being representatives of the fishing sector and recognized as such by specific legal regulations, can report projects directly when they are involved and report on the planning through the Advisory Council of Fishing and Mariculture when they are more general. As a result of this experience, it is important to point out that the image of aquaculture as perceived by the fishing sector has been improved, as well as the opportunity to retrain fisheries workers in aquaculture and improve use of infrastructures, facilities and workers of fishing companies. A point which is worthy of mention is that there has been no interference between fishing products and aquaculture products.

Key words: Aquaculture, local fisheries, Catalonia.

RESUME *- "La planification aquacole et les pêcheries locales. Le cas de la Catalogne, Espagne". Bien que l'aquaculture soit normalement implantée par des sociétés indépendantes du secteur de la pêche, il existe de grandes synergies positives qui peuvent améliorer la viabilité et la rentabilité des projets lorsque le secteur de la pêche y participe. Dans le cas de la Communauté Autonome de Catalogne, parmi les 32 groupements de pêcheurs qui existent, 20 d'entre eux vendent du poisson, dont la moitié pratiquent la pisciculture marine et l'élevage de mollusques. La production aquacole représente environ 15% de la production des pêcheries. En ce qui concerne le processus de planification, le fait qu'ils soient représentatifs du secteur de la pêche et reconnus comme tels par des normes légales spécifiques fait que les groupements de pêcheurs puissent informer directement sur les projets lorsqu'ils y sont directement rattachés et informer sur la planification à travers le Conseil pour la Pêche et la Mariculture lorsqu'ils entrent dans un domaine plus général. Comme résultat de cette expérience, il est important de signaler que l'image de l'aquaculture telle qu'elle est perçue par le secteur de la pêche s'est améliorée, ainsi que l'opportunité de reconvertir les pêcheurs dans le domaine de l'aquaculture et d'améliorer l'utilisation des infrastructures, installations et de faire appel aux travailleurs des sociétés de pêche. Il y a lieu de mentionner qu'il n'y a pas d'interférence entre les produits de la pêche et les produits aquacoles.*

Mots-clés *: Aquaculture, pêcheries locales, Catalogne.*

Introduction

Traditional fisheries in Catalonia, as in many other parts of Spain, are facing a lack of possibilities to increase fisheries production due to stabilised catches as well as limited and scarce resources. Local fisheries are also characterized by their commercializing their production without added value through local markets, mainly fish markets at port. In this way local fisheries are nowadays facing difficulties to mantain the equilibrium between supply and demand of fish products for human consumption. In this context, where aquaculture is perceived as the only means to preserve the supply of fish products, the business world is awaking to the benefits of aquaculture, and it is here where the fisheries sector may find a new and growing field for investment or even reconversion.

The Mediterranean coast of Catalonia of about 550 km has very contrasted features. For instance, the northeastern coast has small coastal plains, coasts with cliffs and some deltas (Llobregat and Besos), whereas the southeastern coast is characterized by the presence of the Ebro delta stretching out into the sea. Although this coast offers plenty of opportunities for marine aquaculture, with water temperatures ranging from 11 to 26°C, the majority of the suitable coastal sites cannot be used, either because of competiton with tourism or due to the growing concern for the environment. In this context offshore fish farming is proving to be one of the major ways to develop aquaculture in Catalonia.

Evolution of marine aquaculture in Catalonia

In Catalonia, although most of its marine aquaculture production comes from bivalves: mussels, clams and oysters (4,163 t in 1997); its most significant development occurs in marine fish farming. In terms of volume, whilst in 1992 marine fish production accounted for 15 tonnes, it reached 626 tonnes in 1997, sea bream being the predominant reared species with 563 tonnes (Table 1). Catalonia is becoming one of the most important areas of fish farming activity in Spain, accounting for about 12% of the Spanish sea bream and sea bass production, and is now the second Autonomous Community after Andalusia.

Table 1. Marine aquaculture production in Catalonia

	Production (tonnes)					
	1992	1993	1994	1995	1996	1997
Fish						
Sea bass	7	73	84	97	85	54
Sea bream	7	228	227	452	460	563
Others	1	42	13	11	5	9
Subtotal fish	15	344	324	560	550	626
Mollusc						
Mussels	3,558	2,896	2,908	2,785	3,434	3,324
Others	1,360	244	168	618	525	839
Subtotal mollusc	4,918	3,140	3,076	3,403	3,959	4,163
Total	4,933	3,483	3,400	3,963	4,509	4,789

The development of marine fish farming has been based on a small range of species (sea bream, sea bass, eel and mullet), and on a wide range of production techniques, from production in earthponds to intensive culture in semi-offshore or offshore conditions in cages and platforms. Figure 1 situates the main marine aquaculture areas, both bivalves and fish, in Catalonia.

Nowadays, there are 31 marine aquaculture enterprises; some of them producing fish and also bivalves. As regards marine fish there are 18 units producing sea bream and/or sea bass, and 5 more units producing eel or mullet. There is also one marine fish hatchery. As regards the enterprise production scale, this may range from small family production units to highly intensive cages or platform units of more than 300 t of production capacity, with the particular characteristic that the fishermen's guilds participate in 12 of the already existing enterprises.

Fisheries versus aquaculture. Complementary or competitive activities?

The recent introduction of aquaculture, with its particular characteristics, contrasts with the longstanding traditions of capture fishing and arouses a certain degree of suspicion or fears among the fishing community who may see this new activity as: (i) an invasion of their space; (ii) competition for sales and resources; and (iii) a cause of possible environmental damage.

It is to be pointed out that Aquaculture is an activity which requires a high degree of management and can be performed by any contractor with sufficient preparation. In order to embark upon an Aquaculture activity, new projects require high investments and some constraints should be addressed, for instance: (i) high cost of equipment and material (ships, cages); (ii) need for harbour infrastructures; and (iii) need for people specialised in sea works.

Some of the above assets can be found in local fisheries, and therefore Aquaculture could benefit from them and also become a viable solution for the reconversion of the fishing sector, however local fisheries, before participating in Aquaculture, must first overcome some obstacles. Thus, there is: (i) knowledge of biology needed; (ii) need for specific managerial knowledge, related to enterprises with high working capital; and (iii) local market dependence.

Fig. 1. Map situating aquaculture main areas in Catalonia.

In addition, investors in new Aquaculture projects have certain misgivings about embarking upon activities in areas of traditional fishing activity for fear of possible damage to installations or social rejection of the exploitation.

Reasonable proposal

For the situation explained above important benefits can be obtained from the participation of the fishing sector in Aquaculture activities. Thus the participation of fishermen and local fisheries in Aquaculture enterprises is seen in Catalonia as a reasonable proposal and even as a must, offering some theoretical advantages: (i) capacity synergies; (ii) better use of human specialised resources; (iii) better use of existing materials and infrastructure; and (iv) assured vigilance of marine cultures.

The Fishermen's guilds (*Confraries de Pescadors*)

The Fishermen's Guilds (*Confraries de Pescadors*) are either partly public and partly private corporations. Each one groups fishermen according to a specific part of the coastal zone. In Catalonia there are 32; 22 of which have fish markets.

As regards the planning process, the fishermen's guilds, their being representatives of the fishing sector and recognized as such by specific legal regulations, can report projects directly when they are involved and report on the planning through the Advisory Council of Fishing and Mariculture when they are more general.

The Role of Fishermen's Guilds is to: (i) represent fisheries sector; (ii) inform about aquaculture projects; (iii) inform about authorisations and concessions; (iv) inform (Council) about the creation of specific areas for cultivation; and (v) inform (Council) about restricted areas for nurseries or for temporary explotation.

The current situation in Catalonia

There are some cases of fishermen's associations and other associations of the fishing sector which participate in aquaculture projects. Thus, in Catalonia, probably the Autonomous Community with most fishermen's associations participating in aquaculture projects, 10 out of the 32 existing Fishermen's Guilds participate in Aquaculture enterprises. Table 2 lists present aquaculture enterprsies with complete or partial participation from Fishermen's Guilds in Catalonia.

Table 2. Aquaculture activities undertaken by Fishermen's Guilds

Fishermen's guild	Enterprise	Production type	1996 production (TM)
Roses	Fishermen's Guild	Fish cages	9
Blanes	Blanes Peix S.A.	Fish cages	74
Sant Feliu Guíxols	C. Com. Baix Empordà	Fish cages	7
Arenys de Mar	CULTIMAR S.A.	Fish cages (Platform)	11 (1st year prod.)
Montgat	GMM Cultivos Marinos	Fish cages (Platform)	In construction
L'Ametlla	CRIPESA S.A.	Fish cages (Platform)	299
L'Ampolla	Pex Ampolla, S.L. Fishermen's Guild	Fish cages Mollusc cultivation	8 9
Les Cases d'Alcanar	Cases Aquicultura S.A.	Fish cages	54
Sant Carles Ràpita	Fishermen's Guild	Mollusc cultivation	22
Deltebre	Fishermen's Guild	Mollusc cultivation	96 (1997)
Port de la Selva	Fishermen's Guild	Experimental mollusc	--

Types of participation of local fisheries in aquaculture enterprises

There are different ways in which fishermen's associations and other associations of the fishing sector can participate in aquaculture projects. Among them: (i) complete installation management; (ii) participation in Capital; (iii) participation in Management; (iv) participation of fishermen; and (v) cooperation in services (ice, weighing, warehouses, ships).

As illustration, the cases of BLANES PEIX and CULTIMAR are below described.

BLANES PEIX. The Blanes project began at the beginning of the 1990s, entering into production in 1993. The Fishermen's Guild of Blanes, Girona, participates in this project. The project was set up as a medium to small-sized production unit which has gradually grown to produce about 100 tonnes in 1997. It is to be highlighted that most of the workers belong to the Guild, some have been fishermen and the marketing of the aquaculture products, although separate from the fishery products, is carried out using the facilities of the Guild.

Cultivos Marinos del Maresme, S.A. (CULTIMAR) was founded in December 1992. Shares were held by the Fishermen's Guild of Arenys de Mar, the Fishing Cooperative "Reyes Católicos", the Shellfishermen's Cooperative, the Shipowners' Cooperative "San Telmo", the Territorial Union of Sea Cooperatives of Barcelona (UCOMAR, S.C.C.L., the oldest active cooperative in the fishing sector, is more than 40 years old) and Ecos Risk Capital, S.C.R., S.A: (the only Risk Capital Company, created by the Ministry of Employment, with the purpose of investing in projects representing Social Economics, as in this case). The project has represented an investment of more than 400 million pesetas 20% of which has been granted as a life annuity from the former European Agricultural Guidance and Guarantee Fund (FEOGA in Spanish). The farm started its operation in 1996 and expects to produce about 300 tonnes in 2000.

Results of participation

The integration of local fisheries in Aquaculture enterprises, as a complement to traditional fisheries, obtains the best profit from the marine productivity and resources. As a result of this experience, it is important to point out that the image of aquaculture as perceived by the fishing sector has been improved, as well as the opportunity to retrain fisheries workers in aquaculture and improve

use of infrastructures, facilities and workers of fishing companies. One point that is worthy of mention is that there has been no interference between fishing products and aquaculture products.

As a conclusion the benefits of this integration can be summarised as follows: (i) diminishing of initial fears; (ii) raising managerial sense of fishermen; (iii) facilitating the fishermen and ships to Aquaculture; (iv) no market interference has been noted; (v) fisheries production near installations increased; and (vi) fishermen are included in the added value benefits of this activity.