

MEDRAP



MEDITERRANEAN REGIONAL AQUACULTURE PROJECT
PROJET REGIONAL MEDITERRANEEN D'AQUACULTURE



Medrap
2025 Salammbô Tunis - Tunisie
Tel. 01/ 731 572 / 731 060
Telex 14739- Tunis



*PROJET REGIONAL MEDITERRANEEN DE DEVELOPPEMENT
DE L'AQUACULTURE*



MEDITERRANEAN REGIONAL AQUACULTURE PROJECT

SEMINAR

**SOCIO-ECONOMIC ASPECTS OF AQUACULTURE DEVELOPMENT IN THE
MEDITERRANEAN COUNTRIES**

DJERBA (Tunisia) November 14-24 1985

Edited by Alain BERGER

Centre National de la Recherche Scientifique

C.R.P.E.E. - Université de MONTPELLIER

With collaboration of

James SMITH

and

François FERAL

(C.N.R.S. - C.R.P.E.E.)

The list of participants at the seminar in DJERBA

November 14-24 1985

TUNISIA

AKROUT Hassem	General commissioner of Fisheries
HADJ ALI Salem	Director of 1NSTOP
NEDHIF Mohamed	
8ELKHADI Abdelhamid	
BELLAGHA Ismail	

MOROCCO

EL GHARBI Rachid	National Fisheries Department
BARHOUM1 Mohamed	National Fisheries Department

ALGERIA

MEZACHE Zin El Abidine	Agricultural and Fisheries Department
------------------------	---------------------------------------

TURKEY

CANSIZ AHMET	Agricultural Department
ATILA Oktay	T.O.K.B.

CYPRUS

STEPHANOU Daphné	
------------------	--

GREECE

BAKELA Zoë	Institute of Economic and Industrial Research
IOAKINIDtS Staphanos	Greek Agricultural Bank

YUGOSLAVIA

VASILEJEVIC Rajko	Interpublic Dour Marketing
GJUKIC Mirko	

ITALIA

SPAGNOLO Mass imo	I.R.E.P.A.
-------------------	------------

DURAZZO

ALESSANDRA Giuseppe	
---------------------	--

FRANCE

CRESCENZO Jacques	F.I.O.M
BERGER Alain	C.N.R.S.
COUDY Claire	CEPRALMAR

SPAIN

MASSIP SEGARA. José Manuel

The Marine Social Institute

BARTOLOME Juan Manuel

General Direction of Fisheries in Andalusia

MEDRAP

FERLIN Philippe

SCHMIDT Ulrich

LOIX Brigid

SELTZ Jacques

Spectators

TUNISIA

BEN AMOR Ameer

National Fisheries Department

RHOUMA Abdel Majid

National Aquaculture Centre

ZARGLAIOUN Tahar

The Agricultural Investment Promotion Agency

SPAIN

NARVAEZ BUENO Antonio

University of Malaga

Contents

Opening session : Novembre 18th

- Preliminary remarks (Chairman FERLIN)
- Welcoming speech by the Municipal Delegate
- Opening address by the Tunisian Commissioner of Fisheries
- Opening and programme (Chairman FERLIN)

GENERAL OVERVIEW OF AQUACULTURE IN EACH COUNTRY REPRESENTED

Morocco

Algeria

Greece

Cyprus

Tunisia

Turkey

Yugoslavia

Egypt, Syria, Malta

SOCIO-ECONOMIC ASPECTS OF AQUACULTURE

- The economics of fish and aquaculture in Languedoc-Roussillon (France)
- Further considerations on the economy of aquaculture
- Strategy for aquaculture in the mediterranean region. Interaction between aquaculture and other coastal activities
- Socio-economic aspects of aquaculture development in the Mediterranean
- Socio-economic aspects of fishing and aquaculture in coastal and lagoon areas of the northern Spanish Mediterranean
- A model of regional policy : development of aquaculture. Social and administrative aspects
- Regional policy for fishing and aquaculture in Venice (Italy)

THE MARKETING OF PRODUCTS FROM AQUACULTURE

- The Italian market for bass and sea-bream
- Marketing of shell-fish production in Languedoc-Roussillon (France)
- The F.I.O.M. (Market Regulation and Orientation Fund)

CLOSING SESSION

OPENING SESSION; November 18th

Preliminary remarks : Chairman FERLIN

Welcoming speech by the municipal delegate

The municipality of DJERBA greeted the participants and welcomed them on behalf of DJERBA

Opening address made by the Tunisian commissioner of fisheries

– Welcoming speech : The commissioner of fisheries expressed to the seminar participants, as well as to the people in charge of MEDRAP, gratitude and honour felt by Tunisia and DJERBA in hosting the seminar.

– The importance of the seminar for Tunisia : The subject of the seminar centered on various aspects of aquaculture, which are of particular interest for Tunisia, Since Tunisia has already been involved in this field for some time, it recognises the prospect of new forms of production and of the development of rich Mediterranean resources. The results of the present workshop are therefore of profound interest.

– Research : Aquacultural research is still in an embryonic stage, however, it already has recorded tangible results in the industrial and agricultural fields.

– Inconclusive marine culture experiments : In the marine world, the private sector has undertaken big industrial aquacultural projects, however, the results of these initiatives in terms of employment are definitely not in accordance with the money invested. The present meeting should reveal real openings for small and medium-sized concerns.

– Socio-economic study of the Tunisian context : Tunisia also hopes that certain specific types of aquaculture in the southern regions (including Gabon) could be developed as family operations combined with other types of farming or cultivation (Duck farming, for example),

– Compatibility : In principal, aquaculture shouldn't be incompatible with tourism. But the assembly should be able to clear any last doubts on the subject.

– Fish culture in fresh or brackish water : is already in operation to a small degree in Tunisia. However, those in charge are still doubtful in regards to the profits in relation to the investments made, and the socio-economic consequences of these activities in comparison with other types of production (cotton) or other uses for these waters.

– The Tunisian representatives are anxious to hear conclusions reached by the assembly.

Opening session and the MEDRAP programme (P. FERLIN)

– Response to the welcoming speeches : The meeting will bring up tangible elements on the whole of the economic problems raised by Tunisia, both in the field of aquaculture itself and by conflicts over land use.

– The seminar's origin : Since its creation, MEDRAP has given preference to aquaculture; to training (sessions, study field trips, visits, the setting up of a training Center in POLICORO (Italy), and technical aid to the pilot projects (11 to 12, half of which are already operational).

– Subject agenda - The socio-economic aspects from now on must be approached under the following headings :

– Aquaculture's place on a socio-economic level, specific importance, compatibility and/or competitiveness with other activities.

– The impact of aquaculture in terms of employment, in both production and related activities; types of aquaculture production.

– The question of aquaculture markets : narrowness of the market; luxury products with a high value added; overproduction.

– Funding and regulatory action by administrations (at national, regional and international levels).

– Presentation of the seminar's programme : In continuation of the above-mentioned subjects, the following programme *and* organization are put to a vote.

Proposed subjects :

– The macro-economic aspects of the aquaculture programmes and of projects in the context of planning policies : the production of fish, creation of new employment, diversification of activities, site protection, etc...

– Socio-economic impact of the aquaculture projects on a local level : use of the environment conflicts or incompatibility with fishing, integration or conflict with agriculture, aquaculture and tourism, production models maximizing the socio-economic benefits.

– Present market structure for fish and in particular for aquaculture products in the countries in the region, as determining criteria for planning.

– Aquaculture strategies and economic, financial and administrative policies at regional, national and local levels.

Organization of the seminar

– A day will be devoted to presenting and examining the national situations in each country in the region.

– On each of the five days, two or three papers, followed by round tables and group discussions, will be devoted to the subject on hand.

– The last day will be devoted to, among other things, suggestions made by the participants.

– The languages used will be French and English.

Adoption and questions

– The programme was adopted unanimously.

– Cyprus question : In reference to point n° 4323, the Cyprus representative asked if the recommendations and decisions made by the participants govern the rest of the MEDRAP programme.

– The Chairman's response : The continuation of the MEDRAP project cannot be questioned as it benefits from mixed funding until July 1987, for the implementation of decisions,

in particular (funding by the United Nations and also by Mediterranean countries, especially Italy; The possibility of contribution by the Mediterranean Trust Fund is being studied). The future of the U.N.D.P. was uniquely discussed in CASABLANCA, and no matter what other decisions may be taken concerning the U.N.D.P., this will have no effect on the MEDRAP programme.

November 18th 1985 - Day One

GENERAL OVERVIEW OF AQUACULTURE IN EACH OF THE COUNTRIES REPRESENTED

1. MOROCCO

1.1. GENERAL PRESENTATION

- General aspect. The development of aquaculture in MOROCCO depends on fishery planning. A study has been done by F.A.O/MEDRAP on the aquaculture possibilities in this country. These are not greatly developed due to the lack of suitable sites and to limited available technology.
 - History. Aquaculture first started in 1956, south of CASABLANCA, in the form of growing-out stations for imported cupped oyster seeds. This strictly private activity, limited to the Atlantic coast, only concerned its direct promoters, and wasn't the object of any state intervention.
 - Present production situation. It is limited to four oyster farmers. The seed is imported, the companies are dependant on foreign technology (3 cupped oyster producers in Oualidia, producing a total of 200 tonnes, 1 flat oyster producer is in the process of setting up in NADOR).
 - Institutional context:
 - General orientation, Aquaculture is not one of Morocco's priorities. However, we can hope to see it in the next five-year plan starting in 1986 (Statement by Uli SCHMIT). Aquaculture is not included in a national development programme nor is it governed by a specific administrative body.
 - Infrastructure. On a local level, aquaculture production still lacks an infrastructure (fry, seeds, feed, technicians). At national level, the infrastructure consists of very limited human and material means provided by the I.S.T.P.M. and which is being transferred to NADOR. The Ministry of Agriculture has a fresh water hatchery at AZROU for restocking purposes. There is no special training in this area. Personnel training and a defined programme were set up thanks to an international MEDRAP grant.
 - Development projects
 - NADOR lagoon,
 - growing of flat oysters collected in situ,
 - farming of grey mullets, bass, sea-bream and shrimp.
 - OUM-ER-TBIA springs,
 - trout farming project aiming for a yearly production level of 300 tonnes, 200 kilometres from MARRAKECH;
 - Market situation
- On the whole, Morocco is self sufficient in sea products. The new production will, therefore, be oriented towards export markets. (An answer to a question formulated by Algeria on luxury markets). In particular, fish culture productions at NADOR, with the exception of grey mullet are especially for Spain (Sea-bream, bass) or more generally for western Europe

(Shrimp).

Both present and projected oyster production is aimed at the CASABLANCA and OUALIDIA (restaurants) markets.

1.2. THE PLANNING OF THE NADOR LAGOON. This is an illustration of socio-economic problems of aquaculture (See appendix 1 - the technical paper submitted by the Moroccan delegation).

- Presentation of the site and production. The NADOR lagoon is the only Moroccan aquaculture site on the Mediterranean coast. It has a surface area of 11,400 hectares. At this point, 200 families of fishermen fish in this area using gillnets. Some French concerns have fished for eel. A private company has begun the collection and farming of flat oysters,

- Scientific and technical knowledge of fishery resources. Only a few and somewhat unsystematic studies were carried out on the lagoon and have revealed that there is a progressive decrease in salinity. No socio-economic study has been undertaken.

- Setting up of projects and ensuing socio-economic problems. In 1976, certain incidents broke out between private companies fishing for eel and traditional fishermen. The fishermen started exploiting this resource themselves due to the opening up of this market.

started to develop fish culture in lake MELLAH and CUBEIRA : Number of employees : a total of 92 people.

- Improvement of fisheries. Fish production in these two lakes is 130 tonnes (115 tonnes in 1985; Grey mullet, sea-bream, bass, eel, sole, barbel).

- Aquaculturc development. With the help of MEDRAP, the unit will be endowed with a hatchery and a growing-out station.

- Improvement of fish culture in ponds: Development planning for the Mazafran fish culture station - Current number of employees: 27; ornamental fish, fish farming in conjunction with animal husbandry, fingerling production for restocking purposes.

- Restocking : Reintroducing fry and brood-fish (carp, pike perch, catfish). Study of a structure for exploitation.

- Complementary public initiatives:

- Creation of a national office for aquaculture production and development.

- Training activities

- Registry on a national level of the development of aquaculture farms, shellfish culture, fish ponds.

- Obtaining foreign assistance for the implementation of projects (U.N.D.P. in particular).

2.3. FOLLOW-UP DISCUSSION ON REPORTS FROM MOROCCO AND ALGERIA

OPENING DISCUSSION (Chairman FERLIN)

Emcompassing the critical points : A country by country submission permitted certain major points to be covered. Such as in Morocco, the goal of aquaculture is to gain export markets and to create employment. This is not an exclusive strategy and presents certain stumbling-blocks :

lack of available markets, unreasonable level of investments for the number of jobs created.

- Diversity of problems (SCHMIDT) : The comparison of Morocco and Algeria is pertinent to illustrating the range of aquaculture problems. At one extreme, Morocco, with important fish stocks, views aquaculture as a sector for creating jobs and income. At the other extreme is Algeria which is poor in fish

The access channel to the Mediterranean was closed off. This also created problems. At last, in 1982, a group of Breton oyster farmers were put in charge of installing oyster beds. The initial results are encouraging and therefore inspire a more ambitious project of complementing the oyster with clam, shrimp, bass, sea-bream and grey mullet farming. The Government sees this as a source of local employment and the creation of new resources.

- The socio-economical uncertainties. The opposition of traditional fishermen to a previous initiative and to the present project raises a problem of coexistence between the two activities : zoning of the lagoon, integration of traditional workforces within the new activities, maintaining the existing resources, profitability of the aquaculture projects within this conflicting context in terms of employment and amortization.

2. ALGERIA

2.1. GENERAL PRESENTATION

- Geophysical background. Algeria has the possibility to develop aquaculture, either in its two natural lakes, MELLAH (which communicates with the sea) and OUBEIRA (fresh water) or in artificial stretches of water (There are large dams and hillside reservoirs).

- Origin of the aquaculture development programme

- Difficult beginnings : The development of small aquaculture units began at the end of the 19th-century in Algeria. These first traditional farms disappeared due to lack of support. The projects undertaken by the F.A.O. has disappointing results with the exception of shellfish farming in lake MELLAH. These setbacks are due to the lack of qualified Algerian workforces.

- Establishment of an ad hoc structure : The Government then set up a structure to administer fisheries. The plan was then to develop aquaculture on a scale which would contribute to the economic development of the country. In 1980, a very ambitious study identified all the elements required for the implementation of a programme.

2.2. ALGERIAN AQUACULTURE DEVELOPMENT PROGRAMME

- Exploitation of lagoon areas. The EL KALA aquaculture unit has stocks, and views aquaculture as the only way to make up for its deficit in this area.

- The market (Questions put to the Algerian representative).

- The production level is such that there is no problem of market sales for Algerian production (115 tonnes), one part is exported (eels).

- Due to their prices, most species are not accessible to the average local population with the exception of grey mullet.

- This production is based on traditional lagoon fishing. The effects of aquaculture production are not yet tangible.

- Structure of production (Question put to the Algerian representative). The present

programme is assured by public investment. It is only in the later stages of development that the private can invest in this activity (after the programme has proved itself valid at mastership level).

– Compatibility of traditional fishing methods and aquaculture systems (Question put to the Moroccan representative). The idea is to associate fishermen with the project by providing them with equipment, management and fixed price markets. Later, they will become completely autonomous. The aquaculture development projects would obviously have an impact on fishing communities which are not yet able to be evaluated, in particular, in NADOR (as mentioned by the Chairman Mr. FERLIN).

3. GREECE

3.1. GEO-PHYSICAL AND BIOLOGICAL OUTLINE

Greece has many advantages for aquaculture development :

- There are 50 lagoons which cover 40,000 hectares,
- Numerous sheltered gulfs and bays,
- High water temperatures which are favourable to fast growth.

However certain limiting factors cannot be ignored :

- Polluted zones are unfavourable for shell fish culture (MERMAIKOS),
- Low seed production rates.

3.2. PRESENT STATE OF FISH PRODUCTION

– Lagoon production

– Lagoon production presently remains extensive in traditional fishery systems. Annual production is 2 800 tonnes of bass, sea-bream, eel and grey mullet. The lagoons are owned by the state who in turn rents them to private individuals or to fishing cooperatives.

– The development of lagoon production is subject to a semi-extensive and rationalized resource management. An illustration of this is the granting of the MESSOLOGUI lagoons (250 hectares) to the riverside municipality and of the GIALOUA lagoon (250 hectares) to an association made up of two banks. In the second case, the combination of semi-extensive and intensive production should yield 70 tonnes per year (bass, grey mullet, sea-bream) for an initial investment of 150,000,000 drachmas.

– Market situation for lagoon products. The species caught have a high commercial value : bass, sea-bream and eel. The very favourable increase of selling prices and the positive market prospects make this an area to be developed depending on the availability of brackish waters.

– fish culture both in cages and in tanks (fresh water). Greece is in a beginning phase so it is difficult to discern the real economic trends in this sector. At the moment intensive growing-out is carried out in live units with an overall yearly production rate of between 250 and 500 tonnes (Bass, sea-bream). Fingerlings are obtained by capture or in hatcheries. A private, experimental fish farm is working on eel culture.

– Freshwater farming

- Trout farming. Its development since 1960 has been spectacular. Today there are 108 stations which produce 1,640 tonnes per year. Trout farming's potential is high but it depends on market orientation (see below) and the extension of artificial feeding.
- Carp farming. Technical conditions for this type of farming (growingout) are favourable in Greece: high temperatures, appropriate sites. There are two intensive units and fifteen poorly managed farms.
- Market situation for freshwater products. The Greek consumer is not really attracted to freshwater fish. However, the shortfall in natural fish production and the development of tourism may open this domestic market. The present regions of carp production in Thrace, Macedonia and Epirus, which could provide a few more hundred tonnes but no more. Exporting trout to E.E.C. countries requires an extra effort by the producers both for the quality and minimum size of their product.

3.3. THE PARTICULAR CASE OF SHELLFISH CULTURE

- The sites are good, growth is rapid but pollution and low seed productivity are limiting factors.
- With a potential of 5,000 to 10,000 tonnes per year per site, 23 mussel beds produce only 200 tonnes per year. The small size of the market seems to be a limiting factor.

3.4. QUESTIONS PUT TO THE GREEK REPRESENTATIVE

- Question relative to the market. Aquaculture products hold little attraction for consumers and prices remain low. Greece only exports captured eel (700 tonnes), trout and mussels.
- Government objectives. Measures for the distribution of fish products, and to encourage the entry of national industries into the aquaculture field (for the manufacture of fish cages for example), complete control of water quality, promotion of mariculture products.

4. CYPRUS

Background information

In Cyprus, there are now at various stages of construction, three private marine commercial farms for the culture of sea-bass and sea-breams. Another one is in its final stages of planning. In addition, the Government owns a small marine fish hatchery and broodfish rearing and stocking cage unit in PAPHOS harbour. Steps are presently being taken for the setting up of a governmental marine hatchery station. The intensive method of culture, combined to some extent with the semiintensive method, is expected to be employed in all commercial farms. This is justified by the existing situation as regards the coastal land.

4.1. AVAILABILITY OF COASTAL LAND-RESTRICTIONS ON SETTING UP AND RUNNING OF FISH FARMS

There are not protected bays, estuaries, lagoons, marshes or extensive coastal stretches which could be used for fish culture. The total length of the coastline of Cyprus is 782 km out of which 413 km are in the occupied Turkish part of the island, 72.82 km belong to the Sovereign British bases, and 296 km is controlled by the Cyprus Government. There is a great pressure for tourist development along the coast. A great part of the coastal land is covered by zoning restrictions formulated under the Streets and Building Regulation Law which controls the

use and the intensity of use, defining residential, tourist, conservation, industrial, agricultural zones, etc... There is no provision as yet for aquaculture, which is a quite recent development. One such farm is built in an agricultural zone, on land which is poor for agricultural purposes, while the Government's new hatchery is expected to be set up in a tourist zone.

In addition to Town Planning Zones, the Foreshore Protection Law has some provisions which control human activities on the seashore. The most important is the enforcement of a building line acting as the limit to the development of buildings on the seashore. The strip of land between the seashore and the building line varies according to the topography, being usually 200-300 ft wide. In this area no permanent installations are allowed unless specific permission is granted by the Council of Ministers.

There are also some other laws that regulate to a lesser extent activities on the seashore and the sea like the Fisheries Law, the Immovable Property law which provides for the leasing of the seashore for fisheries, etc...

Because of the limited coastal land and the great demand by various prospective users, its price is very high. So the Government leases suitable coastal land to prospective fishfarmers after scrutinizing a prefeasibility study of their farm and plans. The rent granted is low and the lease is on longterm basis (33 years, with option for renewal). The area in question is usually about 40 donums (about 5/4 ha). One of the farms is on Government land, another one is expected to be set up on forest land, while the other two are on private land.

The Fisheries Law provides for regulations which could limit "the number, in terms of establishment and running of fish farms, as well as the selection of the people to whom a fish farm licence will be granted". No such regulations were formulated as yet, although this will be necessary in the future. Presently no licence is required from the Department of Fisheries for the setting up of a fish farm. Also the Fisheries Regulations of 1981 made under the Fisheries Law, impose standards for effluents running into the sea (intended for factories) and regulate the import of live fish for culture.

4.2. MARKET SITUATION

Production - Imports

There is excellent market potential for marine aquaculture products as there is a shortage of fresh marine fish and limitations to the increase of fish production by fishing or freshwater aquaculture. Fisheries contribute about 1,7 % to the gross national product. Local production meets only 46 % of the total consumption. In 1984 total domestic fisheries yielded about 2,300 T valued at about US \$ 8,000,000*. This included about 56 T of cultivated trout and about 183 T from trawl fishing trips to international waters which were Government subsidized. About 56 T were fish of A and B quality. In addition about 2,700 T valued at about US \$ 6,200,00 had to be imported. This included about 141 T of good quality fresh fish.

Consumers

Marine fish are highly esteemed by Cypriots. The consumption of fish *per capita*, in 1984 "was 9.21 kg. A significant part of the good quality fish is consumed by the continuously growing tourist industry, the major industry of the Island : In 1984, about 735,000 tourists visited Cyprus (local population 538,400). The demand for seafood is gradually increasing. It is anticipated that much larger quantities of fish could be sold, if available at reasonable prices.

Prices

As a result of the shortage of fresh marine fish, its price is high. During 1984, prime quality fish were sold at about US \$ 9/kg gross and US \$ 11.5/kg retail, while second quality secured US \$ 5/kg gross and US \$ 8.5/kg retail. Prices during summer were higher by up to 20 % due to higher demand from the tourism industry.

It is anticipated that aquaculture products (mainly bass and bream) will command high prices considered as good quality fish. Brackish water tilapia is already marketed at US \$ 7.65/kg retail (chilled, ungutted) and US \$ 6.4/kg gross. The fixing of the price of aquaculture products is expected to be done not according to their actual cost, but: while taking into consideration the price of marine fish of similar quality

– Outlets - Distribution

Traditionally, fresh marine fish is sold wholesale to the fish mongers by both inshore fishermen and trawlers at prices fixed through contract. Retailing of the fish is undertaken in special shops in the main towns and stands in the municipal markets. In the countryside fish marketing is carried out by using the retailers' cars. Generally, the supply of fresh fish to the countryside is rather seasonal and inadequate.

The marketing of the farmed marine fish could be undertaken by the producers (gross or retail). The fish could be sold at specialized sale markets, or directly to hotels, restaurants, supermarkets, etc... This is presently being done with trout, which are sold at markets, in certain cases along with other food products. Aquaculture products could also be sold in existing fresh seafood systems although they are quite exclusive, they ensure good profit to the middle men. However this can not be considered as very probable since the system is controlled mainly by the fish mongers who have interests in fisheries.

The favourable environmental conditions (high sea temperature 15-30° C, clean water) could possibly result in end products which could be sold at competitive prices abroad. There exist good plane connections with both Europe, Near East, and Gulf countries which could facilitate the export of aquaculture products.

Prospects

In the early stages of production no price competition between marine fish and farmed fish is expected. Bass and gilthead sea-bream, and especially bass, are scarce in Cyprus, but no marketing problems are envisaged, as the Cypriot prefers the taste of sea-fish to that of freshwater fish. Farmed fish is likely to substitute imported fresh, good quality fish. In the long run, with the expected increase of farmed fish, possible conflicts may arise, due to competition with the marine fish which may affect their prices. This is not expected in the next few years. All four commercial farms will operate in stages and are scheduled, in the first stage, to reach an average of about 50 t p.a. each.

It is not advisable, at this stage, to take measures restricting aquaculture development, considering the ad hoc technological problems of the intensive fish production methods* Export of fish could serve as a safety valve, while import restrictions could be imposed when required. Presently fish are imported duty free, with the exception of Crustacea. As the production of farmed fish increases, the Government could re-examine its position on subsidized fishing trips, etc...

- Financing

The prospective aquaculturists could secure loans covering, in some instances, up to 60 % of their capital investment. Potential sources of finance are the Government (through the Loan Commissioners), the Cyprus Development Bank Ltd, the Central Cooperative Bank and other Banks. They all require immovable property as security for the loan. In the case of farms built on leased land, the installations could serve as such, on the condition that the lease agreement is for over 15 years. The interest ranges between 5 - 6 % for loans granted by the Government and 9 % for loans granted by banks, The Cyprus Development Bank Ltd can also participate as a share holder in selected projects from 5 % to 25 %. In all cases, the techno-economical aspects of the projects are examined and the views of the Department of Fisheries are taken into consideration.

- Other

The formulation of special income tax incentives to encourage investments in aquaculture operations is not considered necessary for the moment; there is great interest in the setting up of marine farms by the private sector.

As regards import duties almost all equipment which is used in fish culture as well as fish food ingredients, are imported duty free,

5. TUNISIA

(See also opening declaration by the Commissioner of Fisheries and Appendix II, technical document on the market for fish),

5.1. GEOGRAPHICAL CONTEXT

Tunisia has 80,000 hectares of lagoons and coastal lakes and 20,000 hectares of mountain lakes and stretches of freshwater. The species found in these sites are grey mullet, bass, sea-bream, eel and shrimp.

5.2. PRODUCTION

- Traditional production of lagoon fish. (fish traps, gill-nets). Production in inland waters only represent a negligible proportion of the total fish production, about 4 %, for an average production of less than 2,500 tonnes per year.

- Shellfish production. Very low, less than 150 tonnes per year (less than 140 tonnes of mussels and less than 15 tonnes of oysters). Oysters and mussels are produced in MENZELJEMIL and mostly sold to the cleansing station in RAOUD, near TUNIS.

5.3. MARKET TRENDS

- By contrast, the market for lagoon fish production (bass, sea-bream, grey mullet, shrimp), is constantly on the increase. The market absorbs all production and at attractive prices. 80 % of eels are exported to Italy. This market doesn't seem to be saturated and appears to offer further outlets for this species at relatively high prices.

- On the other hand shellfish are practically ignored by the Tunisian consumer due to both high prices and eating habits. Therefore, at the moment, shellfish production projects can be ruled out.

- The same remarks can be made for freshwater fish (carp, barbel) which rarely find a

market.

5.4. UNCERTAINTY OF SHELLFISH POLICIES

- Difficulties faced by the initial programmes
- The failure of freshwater aquaculture. The initial aquaculture projects in freshwater have failed. The species produced weren't appreciated by consumers. Plans for the exploitation of reservoirs and high-lying lakes presently held up by technical obstacles to the raising of a marketable species (grey mullet ?).
- The economic uncertainties of mariculture. There is a long experimental phase involved. Both national and international efforts enabled many studies and research to be carried out. The transition to an operational phase has given rise to numerous socio-economic problems. Development banks have invested heavily in this phase, but results are still uncertain.
- Tunisia is going through a phase of doubt and of reflection
- The search for economically viable production models. Tunisian officials are now thinking in terms of small family enterprises. Therefore, a profitable market has to be assured as well as an improved and coherent infrastructure for inputs and outputs and institutional backup.
- The search for a stable and profitable market. Tunisian promoters hope that the E.E.C. will make up the commercial base of their aquaculture activities. This production may be seen as an element of North/South interdependence.

6. TURKEY

The country is surrounded by three seas: the Black Sea in the North, the Aegean Sea in the West and the Mediterranean Sea in the South, joined together by the "Bosphorus and the Canakkale Straits (Dardanelles). The Turkish coastline is 8,333 kms long, and there are 175/715 kms of river; natural lakes and lagoons cover a total area of 906,118 ha, respectively. This suggests considerable potential for aquaculture.

Sea fisheries production, which is mainly coastal in character, increased from 161,000 tonnes in 1974 to 520,000 tonnes in 1983, while inland fisheries increased from 13,926 to 38,695 tonnes during the same period. In 1980, 83 % of sea-fisheries production was from the Black Sea, 9.4 % from the Marmara Sea, 4.3 % from the Aegean and 3.3 % from the Mediterranean: The catch included a wide variety of species of economic value.

Besides the country's favourable geographical position and climate, and relatively low pollution levels, a number of measures taken by the Government account for the steady increase in production since the 1970's. Sectoral planning began with the setting up of a general Directorate of Fisheries in 1971, and special attention has been paid to coordination between fishermen or fishmongers, and between scientific and governmental bodies. Every effort has been made to solve fishermen's specific problems.

6.1. NATIONAL CONSUMPTION AND MARKETING

A large proportion of the total production of 557/288 tonnes is transported to the major towns, and there is a marked preference for fresh fish on the domestic market (70.7 %), 20.6% of fish production is converted into fishmeal and oil, 3.9 % is salted, dried or smoked; 4.4 % is frozen and chilled, and about 1 % is canned.

The conference's attention was drawn to the fact that prices of fish caught in Turkish

waters are often half those in the rest of Europe: Bass, US \$ 5 per kilo; sea-bream, US \$ 7/kg; grey mullet, US \$ 3/kg; eel, US \$ 2/kg; trout, US \$ 2/kg; carp, US \$ 1/kg; shrimp, US \$ 7/kg; fresh-water crayfish, US \$ 6/kg. It was felt that the reasons for these low price levels should be studied.

Despite increased production, marketing has always been a problem in the fisheries sector in Turkey, and solutions will only be found through better coordination between the deepfreeze chain and market structures.

Exports

<u>Year</u>	<u>Quantity (tonnes)</u>	<u>Value (Turkish pounds)</u>
1980	7 500	1 882 845
1981	12 208	3 054 674
1982	11 005	4 013 238
		(= US \$ 25 m)

Turkey is an exporter of traditional products, particularly to Greece and Italy. Most of the crustacean catch (made up essentially of fresh water crayfish) is exported, so this should be taken into consideration for the improvement in the organization of production. Eel and carp are also among exported species, and it is expected that exports will continue to grow with increased total production, especially of species such as bonito, mackerel and sea-bream. During the last years, ray and shark have been added to exported species, sometimes in processed form.

6.2. FISHERIES INFRASTRUCTURE AND ORGANISATION

The number of fishermen's cooperatives increased from 276 in 1980, to 340 in 1984, and there were 6 cooperative associations. 14,750 fishermen are registered members. It was pointed out that fisheries and agricultural cooperatives are often integrated, according to a long-standing system.

The Agricultural Bank has lent 5 billion Turkish pounds to Fishermen, and industrialists, credit institutions and Government bodies have cooperated for the supply of fishing gear.

In 1984, cooperative members imported 54 diesel engines, 46 echosounders, and 11 transreceivers duty-free, as well as 3,150,000 fingerlings. 2 yarn and 5 net factories are in active production and, in 1984, only anchovy, sardine and shrimp nets were imported. There are also 18 fishmeal and fish-oil production plants and 191 cold storage units (with a total capacity of 2,500 tonnes a day).

6.3. RECOMMENDATIONS FOR THE SOLUTION OF FISHERIES PROBLEMS

- Collection of statistical data on captured species, stock assessment of these species, identification of species of high economic value, stock improvement.
- Definition of criteria for stock control.
- Definition of criteria for selection of fishing gear and equipment.
- Definition of criteria for granting credit to the fisheries sector and for conducting economic appraisals.

- Improved coordination between the deep-freeze chain and marketing of fisheries products.
- Proposal of incentives for the export of fisheries products.
- Monitoring and control of cooperatives' working methods.
- Determination and implementation of measures to improve fishermen's living and working conditions beyond their own demands, so as to establish harmonious interaction between fishermen, cooperatives, government officials and scientists.
- Finding solutions to the problems of fishermen's social security.
- Education of fishermen's Families.
- Purchase of transreceivers and other electronic equipment for fishing vessels.
- Training in navigation and improved seamanship for crews of vessels exceeding 100 gross tonnes.
- Definition of incentives to encourage fishermen to use diesel oil.
- Avoidance of sand extraction from fishing grounds.
- Implementation of measures to ensure that fishermen abide by all fishing restrictions.
- Ensuring that fishermen use cold storage facilities during holidays especially during the fishing season.

7. YUGOSLAVIA

7.1. GENERAL BACKGROUND

- Physical background : There are many favourable sites for mariculture on the Yugoslavian coast, especially due to the presence of many closed bays, a network of canals and river estuaries. These coastal waters have the usual fish populations and there are natural banks of shellfish such as mussels, date shells and flat oysters.

- Historical context

- Traditional mariculture : There is a firmly rooted tradition of mariculture in Yugoslavia, oyster and mussel seed collection with traditional techniques which were developed in particular between the wars, from the fifties onwards more elaborate techniques evolved. Also, fishermen have long practised fish culture by capturing fingerlings in closed bays in a view of allowing them to grow up to market size,

- These activities were slowed down during the sixties due to the accelerated development of tourism and the priority given to other coastal activities.

7.2. PRESENT SITUATION

- A recent planning of a decisive kind

- The plan set out in 1970 mark the real beginnings of mariculture. This plan is based on research and experimentation and on revitalization of abandoned traditional areas.

- Development options: These depend on the cooperation between scientists and

producers within cooperative agriculture systems. In shellfish farming, the use of new material is sought and envisaged. Intensive culture of bass and sea-bream is being undertaken. Cage or brackish water salmon culture is also encouraged.

– Production results

About 10 production centers are already operational and developing as a result of considerable investment since the beginning of the 1980's.

· Variety of sites : Aquaculture production can be found all along the coast; ISTRA: 4 sites are being exploited by the 2 private companies; In Dalmatia: 3 sites are being exploited by 4 private companies; In Montenegro, there is one site.

· Production variety : 500 to 2,000 tonnes per year of mussels, 2,000,000 of oysters; fish : bass, sea-bream, eel, salmonidae (1250 tonnes per year). Production methods are also very varied: tidal bed culture, exploitation of natural beds, traditional capture fisheries, intensive aquaculture in tanks, cage, and pens.

7.3. THE FUTURE OF YUGOSLAVIAN AQUACULTURE

– Officials have expressed anxiety about the weakness in the market which has already reached saturation point for mussels. Moreover, inadequate quality control facilities, the lack of quality feed and the persistence of polluted areas are important limiting factors.

– The aquaculture sector will therefore need considerable investment in terms of research, site planning and protection, establishment of infrastructures in the field and product promotion, in order to progress beyond its present semi-operational phase.

8. AQUACULTURE PROSPECTS IN EGYPT, SYRIA AND MALTA (as described by P. FERLIN)

EGYPT

The search for a domestic market. Despite the absence of representatives for these countries, the Egyptian experience is important for other Mediterranean countries. It is currently a country that benefits from its vast experience in slightly brackish water fish culture and is mainly a producer for the domestic market, grey mullet and some tilapia.

SYRIA

One of the projects within MEDRAP. In Syria, marine aquaculture has not yet reached a production stage, but a project carried out by MEDRAP is in the process of being implemented. However, Syria has good potential as, like Algeria, there are considerable freshwater resources which are in the initial stages of exploitation. Present production reaches almost 5,000 tonnes of fresh-water fish while sea fisheries produce less than 1,000 tonnes (around 800 - 900 tonnes).

MALTA

There is no aquaculture activity. Malta, for the time being, has no aquaculture production, and no programmes or projects have yet been set up.

SOCIO-ECONOMIC ASPECTS OF AQUACULTURE

- The economic aspects of fisheries and aquaculture in Languedoc-Roussillon (France)
- Further considerations on the economic aspects of aquaculture
- Strategy for aquaculture in the Mediterranean region, interaction between aquaculture and other coastal activities
- Socio-economic aspects of aquaculture development in the Mediterranean
- Socio-economic aspects of fishing and aquaculture in coastal and lagoon areas of the Northern Spanish Mediterranean
- A model of regional policy : development of aquaculture. Social and administrative aspects
- Regional policy for fishing and aquaculture in VENICE (Italy)

THE ECONOMIC ASPECTS OF FISHERIES AND AQUACULTURE IN LANGUEDOC-ROUSSILLON (FRANCE)

Presented by Alain BERGER - University of MONPELLIER

From an economic viewpoint, fishing, whether in lagoons or at sea, is a harvesting activity. It involves a predatory activity in a natural environment, using more or less sophisticated and efficient methods.

The major problem arising at planning level is to adapt fishing to the potential of renewable stock. Two optimum situations can thus be defined from a biological viewpoint, fishable optimum corresponding to the maximum fish supply permitting the renewal of stocks and from an economical viewpoint, a fishable optimum which is profitable. Theoretical analysis shows that these two optimums do not coincide.

Aquaculture, in its most modern form, is an agrarian type of farming based on space and biological potentials. Whether practised in a natural or totally artificial environment, aquaculture leads to technical and biological constraints which must first be resolved. Its transition from the experimental to the production stages creates problems for production costs and a minimum price level for marketing.

Except in the case of lagoons where the two activities can exist simultaneously and enter into competition for the use of the biomass, encounter between fishing and aquaculture is purely an economic one. It is revealed in the actual cost of the products when they are the same or interchangeable, in the quantities available on the local, national or international markets and the capacity of these markets to absorb them. Access to these markets creates a common problem of prices, sales and processing.

Shellfish coming between fishing and aquacultural production, does not represent any economic threat linked to direct competition between products. In fact, the specific nature of its production means that it should be analysed in comparison with fishing and aquaculture in the light of the added value it creates based on the use of a common biomass.

1. SMALL-SCALE FISHING

Within the framework of this seminar, semi-industrial fishing involving 150 trawlers and tunny boats operating off the Mediterranean, can be left aside. In contrast, because of its production and the areas in which it operates, small-scale fishing is closely related to various forms of marine culture.

Small-scale fishing is still very important in Languedoc Roussillon. Unique, traditional and highly diversified, this type of activity is carried out in all of the region's ports. In 1982, official figures showed that there were 1,265 ownerskippers and a total of 1,500 crew (CEPRALMAR, 1983). In 1984, a very comprehensive census showed that on the sea alone, there was a fleet that was definitely larger than that revealed in the official figures and that two-thirds of it were located in the neighbourhood of SETE (FARRUGIO, IFREMER, 1984).

Numerous factors hinder the gathering of information of a regular quality and complicate attempts to initiate an overall socio-economic approach for this activity. It involves the diversify of fishing techniques: passive methods (fixed nets, etc...), active methods (drag nets, long-lines, seine-netting, etc...), dispersed landing points and the individualistic character of small-scale fishermen.

Although their equipment varies widely, these small-scale fleets do have a certain number of points in common and their boats are small (between 4 and 15 metres), their motor power is often limited (20 to 100 HP). In the case of very old vessels (over 45 years old), there is a trend towards updating them, particularly in the SETE area (almost 30 % of the vessels are under ten years old).

The economic situation of small-scale fisheries has not yet been the subject of an overall analysis. Only studies of specific ports or certain other activities throw some light on fishing statistics. In spite of a large number of variables and different practices, some elements for economic analysis of small-scale fisheries performances may be advanced.

Small-scale fishing is often centered on products with a high added value and rarely has the marketing problems encountered by semi-industrial fisheries. Meanwhile, distribution networks are difficult to pinpoint, be they direct sales to retailers, restaurants or even to consumers, a practice which is often common during the summer months.

Using limited capital, often already paid off, and rarely having to call upon a salaried labour force, the profits of small-scale fisheries is almost always based on the fishermen's own competence and hard work. Thus, lagoon fishermen can be found to make much greater profits than the industrial owners of recently equipped launches.

Future problems are showing up for certain types of small-scale fishing. Overfishing and a decrease in catches and therefore, in revenues are being noted for certain types of lagoon fishing, as are competition and conflicts with trawler fishing within the three mile limit zone.

Small-scale fisheries long abandoned by the official policies of fishing authorities, today find themselves involved in planned projects in lagoons as well as in coastal areas. Their position and participation in these new activities, extensive aquaculture and artificial reefs, for example, are important elements which must be considered seriously and treated as more than mere scientific studies which is actually the case.

2. SHELLFISH CULTURE

Shellfish culture, the raising of comestible shellfish, in Languedoc-Roussillon consists primarily of oyster and mussel farming.

It is carried out in two sites, the Thau and Salces-Leucate lagoons. The Thau lagoon production is greater and represents 90 % to 95 % of the area's total production.

The analysis of the shellfish production system places it between the agricultural system and the predatory fishing system. In relation to agriculture, farming shellfish in an almost closed environment, such as a lagoon, means that, in fact, each producer creates a negative effect on his neighbouring producers. The question is one of sharing the limited primary plankton resource which is fairly close to a pastoral activity.

As is the case for fishing, shellfish farming relies on a limited natural potential and involves the risk of over-exploitation if it is not organized and governed by production regulations.

In relation to fishing, shellfish culture, when it is practised in the same areas, creates the problems of compatibility or competition between the two activities as far as space is concerned.

The competition for space in a site like the Thau lagoon is not only shared with fishing activities. This lagoon is also subject to strong pressures from tourist activities, urbanization and

surrounding industrialization. These factors make the Thau basin a fragile area liable to suffer from crises of biological origin (harmful algae blooms) or of human origin (industrial or urban pollution).

2.1. THE SHELLFISH PRODUCTION SYSTEM

Investigation on the means of exploitation of the Thau lagoon is essential so as to analyse the production system. Recent studies (E. LEBRUN, 1985) allow us to answer certain questions.

Shellfish production is based on government concessions granted to private individuals. In reality economic production units are often made up of groups of legally independent leaseholders. Thus E. LEBRUN shows that almost 850 concessionaires, really represent little more than 700 production units. Such reorganizing allows us to estimate the average production level of the Thau lagoon at 4.7 "tables" which is relatively small.

Between themselves, shellfish farmers reveal different situations which have consequences on their economic activity. Even though a great majority farm shellfish exclusively, almost 300 are also lagoon fishermen and some 100 others have a separate activity (farming, trade, etc...).

2.2. PRODUCTION AND RESULTS OF EXPLOITATION

Starting with the "natural" production of oysters and clams at the beginning of the century, during the 1950's, shellfish culture in the Thau lagoon, favoured mussels. But, for some years now, mussel culture has declined in favour of the cupped oyster.

Production estimates are subject to controversy depending on whether they are based on administrative controls or biological estimates. In 1984, the total production of mussels was between 5,150 and 7,200 tonnes while the cupped oyster production was between 9,000 and 15,000 tonnes (E. LEBRUN, 1985).

The calculation of production results is greatly affected by the range of production estimates. At the same time, calculations are further complicated by the differences in output according to the location of the parks in the basin. In the areas with the highest production, however, E.LEBRUN's estimates show that in spite of foreign competition, mussel culture is still the most profitable activity, while in other areas it is losing ground to the much less demanding cupped oyster culture. The marketing networks used by the producers also affect their profits according to whether their sales are direct or wholesale,

3. THE PROSPECTS FOR INTENSIVE AQUACULTURE

With more than 200 kilometres of mostly sandy coastline and over 30,000 hectares of lagoons, the Languedoc-Roussillon region offers numerous potentially favourable sites for the development of various types of aquaculture. The evaluations of current various experiences and types of exploitation (H. REY, 1984-1985) show that bass, sea-bream and open-sea shellfish farming are activities which are beginning to be mastered at technical level.

It may seem premature, however, to speak about aquaculture as a productive sector. Quantities currently marketed by the region are still extremely limited.

On a socio-economic level, as recent studies (H, REY, 1985) show, it is research which is the most developed component in the aquaculture field, in terms of both the Organizations involved and the employment and financial benefits.

BIBLIOGRAPHY ON LANGUEDOC-ROUSSILLON

A. BERGER et P. PEYRONNEL

Approche de la rentabilité de l'effort de pêche en Languedoc-Roussillon, C.R.P.E.E.,
MONTPELLIER, 1983.

J. CATANZANO

Contribution a l'économie de la mer : la pêche en Méditerranée Occidentale, C.R.P.E.E.,
MONTPELLIER, 1983.

CEPRALMAR

La pêche aux petits métiers en Languedoc-Roussillon, MONTPELLIER, 1983.

H. FARRUGIO et G. LE CORRE

Stratégie d'échantillonnage des pêches aux "petits métiers" en Méditerranée, IFREMER
- SETE, 1984.

E. LEBRUN

La conchyliculture dans le bassin de Thau, C.R.P.E.E., MONTPELLIER, 1985.

H. REY, M. ANTONA, et E. LEBRUN

Analyse des filières conchylicoles et aquacoles en Languedoc-Roussillon, C. E. P.,
MONTPELLIER, 1985.

FURTHER CONSIDERATIONS ON THE ECONOMIC ASPECT OF AQUACULTURE

By Antonio NARVAEZ BUENO - University of MALAGA

During the last few years, a university group from the University of MALAGA have been studying the economic aspects of fishing and aquaculture.

With help from the Andalusian government and the Spanish government some initial studies have been carried out mostly on the theoretical aspects of problems in aquaculture, as well as on practical aspects of experiments being conducted in the south of Spain.

The University studies haven't yet come up with complete results and the presentation of the latter at this seminar only deals with the study hypothesis and with the ideas which are actually developed.

When examining aquaculture economic aspects, three considerations must be taken into account :

- An overall approach on the socio-economic situation of the country and on its level of development. The aquaculture projects cannot be of the same nature when carried out in a developing country and in a developed country,
- Approaching markets which are concerned with new production. One cannot only produce for a hypothetical market, generally an export one, which promises to absorb unlimited quantities of expensive produce. One has to be sure of the markets in focus, whether they are local, national or international. This helps with the development of aquaculture production;
- An employment approach. Whether one is in a developing country or in a developed country, the problem of employment in the aquaculture sectors must be examined. Who is affected by the jobs created ? Relations with traditional fishermen, professional training, management, etc...

The early experiments in the South of Spain showed that aquaculture was simply a game in the hands of biologists. However, in 1973, with the economic crisis, methods until then undeveloped were considered in order to find a substitute for certain severely affected traditional sectors.

Efforts made in research and the encouragement of private initiatives resulted in many projects, however these projects haven't yet given any tangible results. Everyone concerned, for years now, have been saying that next year the programme will work better. The only positive results from an economic standpoint came from traditional aquaculture exploitations (in particular shellfish farming).

Observations currently made are like a "black cloud" in the clear blue sky of tomorrow's aquaculture. What can we do about it ?

- either continue to improve techniques and wait for better biological results which would allow us to develop, on an economic level, efficient production results,
- or consider that "intensive" aquaculture isn't yet up to expectations, except for a few species, and therefore transfer all financial efforts to traditional or extensive aquaculture along with the development of lagoon and coastal fisheries.

Debates on aquaculture are often ambiguous due to the uncertainty of the terms used. Aquaculture is culture in freshwater, brackish water or in salt water, of plants or fish. It is also

the culture of shellfish and crustaceans. It is therefore necessary to define the concepts used in order to rationally resolve problems.

The experiments in the South of Spain are numerous and some have already reached production stage.

There are concerns considered as serious which use very sophisticated techniques imported from Japan. They have obtained some results, especially in the area of hatcheries, but are not yet conclusive from a financial point of view. They are all waiting for tomorrow for production levels to improve.

There is a Bank group which bought a saltworks that was in difficulty, made up of around 1,000 hectares of crystallisers. The purchase price was based on to 0.50 ff per m², for land destined to aquaculture, but located in an area where the expansion of the neighbouring city is foreseeable (according to the urban development plan).

The investments made are for laboratories and hatcheries. This financial group therefore helps aquaculture development by supplying small-scale producers with fingerlings. The risks are therefore born by the others and the real estate prospects limit the hazardous aspects of the operation.

The Spanish economists' questions are also on the nature of aquaculture concerns. Theoretically, the problem is very close to that of organization *and* managing agricultural exploitations. Yet, in Andalusia, we started off from a traditional fishing system technically perfected, but not studied in detail to go on to a new system, which technically isn't entirely mastered, but on *an* economic management level is known, as it can be assimilated to a modern agricultural production system. Problems concerning concessions and, more generally, the appropriation of the marine and lagoon domains must be closely studied both on a legislative level and on a regulatory level.

Within this seminar, three lines of thought developed by Spanish researchers should be noted:

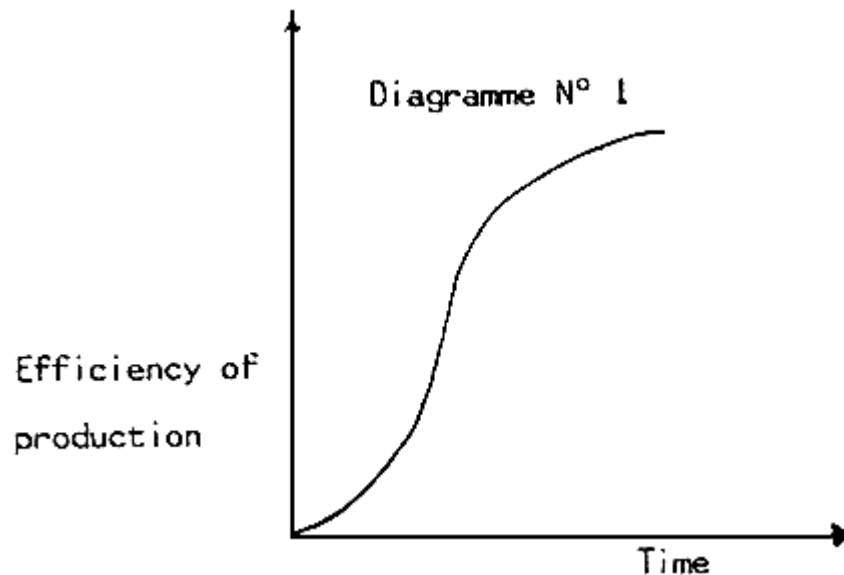
- The place of aquaculture as an element in the system of food production,
- The role held by aquaculture in the development process, as a new economic activity,
- The fishing-aquaculture relationship in food production.

For the greater part, aquaculture seems to be a way to increase the volume of protein in the diet, by using unutilized resources. However, it is not proven that all types of aquaculture result in this, nor that production is sufficient, nor that it is accepted. We cannot say that producing bass or sea-bream in developing countries has a final effect on food production, in other words, production is better. Also, in most communities it will often be difficult to introduce a certain type of fish into local eating habits just because it is easy to produce. Anyway, we cannot talk about aquaculture development without being somewhat discriminating due to our own eating habits.

If we analyse the evolution of the efficiency of production techniques in relation to time, we will come up with the diagramme shown here under.

The techniques that we pass on to developing countries are fundamentally very efficient. They have probably reached their highest level of production efficiency. Developing

countries have become, thanks to these techniques, capable of using the techniques but haven't acquired any "real know-how". Therefore, they cannot improve the efficiency of the techniques used. In other words, the more sophisticated the techniques used are the more dependent the developing countries are on developed countries as it is even harder to understand the "real know-how" of these techniques.



Fishing and aquaculture appear to be types of production of a special kind of food. Without describing the compatibility and differences between these two activities, it would be interesting to make one point stand out; aquaculture needs products that come from fishing in order to develop its production. Now, to feed sea-bream and bass, low quality fish are required. In this way, low priced proteins are revalued and become a means of protein with a high economic value. Aquaculture can, therefore, appear to be a revaluation process which increases the value of fish production by changing it into another type of consumption. However, thought must be given to the fact that for aquaculture to develop, prices of fish that come from fishing must be low, in other words, fishing must be ensured in a crisis situation.

BIBLIOGRAPHY

ANTONIO J. NARVAEZ BUENO, La acuicultura como factor de desarrollo en las regiones espanolas. Universidad de MALAGA, Noviembre 1985, 10 p.

G. RUIZ BRAVO, A. NARVAEZ BUENO. Relacion entre economia y ecologia en el analisis de la pesca. J.C. MARTINEZ coll. Universidad de MALAGA, Noviembre 1985, 26 p.

STRATEGY FOR AQUACULTURE IN THE MEDITERRANEAN REGION

INTERACTION BETWEEN AQUACULTURE AND OTHER COASTAL ACTIVITIES

Philippe FERLIN presented a paper by Stephano CATAUDELLA on aquaculture strategies and an analysis of interactions between aquaculture and other activities.

1. STRATEGY FOR AQUACULTURE IN THE MEDITERRANEAN REGION

Mediterranean aquaculture includes many types of activities having different features and roles to play in the production strategy, and varying impacts on the local economy and environment.

Some types of production tend to produce only for the local market, These are more socially orientated in as much as they are integrated into already existing activities. Other types tend to industrialize production with a view towards optimal profits, and therefore adopt a less social approach.

1.1. Basic strategic data

1.1.1. Fry and fingerling production for the Mediterranean

There are two types of Mediterranean aquaculture, one based on collecting fry in their natural habitat, the other on producing fry in hatcheries.

Despite the fact that some scientists and administrators encourage "the hatchery production of fry in certain countries because of overfishing of certain coastal areas, most aquaculture depends on the capture of fry in the wild. Thus for instance, in the case of sea-bream; whereas the demand for fry reaches 50 million specimens per year, hatcheries in the Mediterranean supply only one million.

This reliance on nature for the supply of "raw materials" limits aquaculture development and therefore requires on increased effort to improve fry production in a controlled environment.

In all aquaculture development programmes, the origin of the fry must be clearly identified and environmental impact analyzed.

1.1.2. Traditional activities in Mediterranean aquaculture

Mediterranean aquaculture is based on very ancient traditions. Some practices, such as Italian valliculture, and the exploitation of lagoons in the Nile delta are more closely related to aquaculture than fishing.

The borderline between the two activities isn't really clear. Many lagoon activities may be defined as aquacultural.

Coastal lagoon management must be integrated into aquaculture activities, due to its socio-economic impact and its role in environmental quality control.

The environment of coastal areas can also encompass certain aquaculture activities which are integrated into the system, especially shellfish culture, and which can also furnish employment for some of the labour force already working in lagoon fishing.

1.1.3. The various aquaculture practices

On the Mediterranean, different situations can be found, each with many possibilities for the choice of an appropriate development policy.

Thus for instance, Egypt may direct its aquaculture production towards bottom-feeding species and which satisfy a high domestic demand for food. Other southern countries tend to produce for Northern Mediterranean markets. For this purpose, the most advanced technologies and models are constantly being developed in order to produce as quickly as possible.

In Northern Mediterranean regions production models attempt to use the most advanced techniques in limited space, thus creating tension with already existing activities. However, aquaculture seems to be evolving towards greater use of natural resources.

1.2. MAIN PRODUCTION STRATEGIES

1.2.1. Management of closed systems

It involves practices which enable man to control the dynamics of marketable stocks by means of selective fishing. This is a method of extensive farming, without any particular feeding or restocking activities. Emphasis on management of the aquatic environment collection of fry in the wild, protection of the environment. Investments are generally large and due to their social impact are subject to public policy.

1.2.2. Shellfish production

It is a type of aquaculture that, with specific techniques, depends on the use of natural food resources.

Many Mediterranean areas are suitable for this type of production which can be combined with intensive fish culture in floating cages.

Shellfish culture is an old northern Mediterranean tradition.

1.2.3. Semi-intensive pond production

This type of production is widely used in freshwater ponds and brackish water lagoons.

In the Mediterranean region, certain species such as mullet, sea-bream and shrimp are suited to this type of production. These are good bottom-feeding species,

The high cost of earth removal and pumping limit the development of such methods.

1.2.4. Intensive production models

In Northern Mediterranean regions these models are prevalent and are directed towards the production of bass, eel and occasionally other species-Intensive farming installations tend towards the production of a considerable biomass with the total introduction of food and rapid changes in water. These installations require strict management which is technologically extremely advanced.

The impact on the environment is terrific, due to the necessity for constructions in concrete and the quality of the water used. The food needs and the application of appropriate technology in some regions, can become the principal limiting factors.

2. INTERACTIONS BETWEEN AQUACULTURE AND OTHER COASTAL ACTIVITIES

Due to its history, its geographic location and its climate and hydrological characteristics, the Mediterranean coast is highly attractive for various human pursuits. Aquaculture must either take these activities into consideration or compete with them.

2.1. Aquaculture and fishing

By their very nature, there are very few contrasts between these two activities. One ensures production based on natural resources, the other tries to control the productive cycle. From the point of view of space required, aquaculture takes up very limited space in comparison to fishing.

In certain places, competition may exist (as in Japan, for example).

2.1.1. Competition for the use of space

In lagoon areas, the conflict is mainly between traditional fishermen and shellfish farmers. These problems can be resolved by sharing the territory (as at Thau, France) or by forbidding fishing (as at Limski Canal, in Yugoslavia).

2.1.2. Competition for biological resources

Some conflicts can arise around the use of natural biological resources common to fishing : such as the natural production of fry, bottom feeders which may lead to the over-exploitation of natural resources.

2.1.3. Competition for human resources

A substantial increase in aquaculture may have a good effect for the fishing population especially on the younger generations.

2.1.4. Competition for financial resources

Aquaculture drains a high percentage of money invested in the sea product sector, without any relationship to its current production. In many cases, the investments do not come up with concrete results and, therefore, would have been used more profitably if invested in fishing.

2.1.5. Market competition

For the time being, it is not serious. However, if aquacultural production increases greatly, market problems would then arise. Possible eventual risks are shellfish, trout and salmon.

The relationship between fishing and aquaculture may, at times, be compatible on rare occasions and generally limited to lagoon production.

2.2. Aquaculture and agriculture

Competition may arise between these two forms of cultivation for the use of land, freshwater and food by-products.

In Mediterranean areas, land problems do not exist as tens of millions of hectares are available for aquaculture without interfering with agriculture.

However, problems concerning the use of freshwater are sensitive. freshwater is used to lower the level of salinity of water used in aquaculture. In Southern Mediterranean regions, this need for freshwater is in direct competition with agriculture needs.

Competition can also play a role in aquaculture's use of agricultural by-products. In the case of intensive aquaculture, feeding requirements are based on fish meal, soya, etc... also used by the agricultural sector.

Conflicts arise also due to the side effects that these two activities have on their surrounding environment; water pollution due to agricultural pesticides and fertilizers, and the increase in salinity of agricultural land surrounding certain aquaculture projects.

2.3. Aquaculture and tourism

The spectacular development of tourism in Mediterranean regions has consequences on aquaculture.

Here, conflicts mostly concern coastal land use. Excessive expansion of either of these activities will bring about problems such as:

- Water pollution due to waste product dumping by tourist installations.
- Disturbances created by tourists on aquaculture production sites (for example, Thau, in France).
- Esthetic impact of aquaculture installations located near tourist sites.

Despite these problems, tourism and aquaculture can coexist and even an integration on a certain level is possible. Infrastructural work and equipping of the areas concerned, complementary employment for seasonal workers and the creation of markets in proximity to aquaculture production.

SOCIO-ECONOMIC ASPECTS OF AQUACULTURE DEVELOPMENT IN THE MEDITERRANEAN

By Uli SCHMIDT

Certain points should be made clear with regard to the complexities, not to say the paradoxical aspects of aquaculture socio-economics. First of all, economic analysis alone cannot adequately explain how the producer, who is rarely an economist, arrives at his decision to start production. His motivation is based on a combination of tradition and socio-cultural factors. Moreover, although aquaculture is often referred to as an industry, it belongs, in fact, to the primary sector.

Aquaculture also has an important historical dimension. In a Mediterranean context, fresh-water aquaculture has medieval origins, having been started by monks. Mariculture, on the other hand, is closely connected to lagoon fisheries: for instance, it is not clear whether one should call the practice of fish-trapping in Greece aquaculture or fisheries. The management or regulation of effort in coastal fisheries comes close to extensive aquaculture.

Intensive, semi-intensive and extensive aquaculture have different implications for a socio-economist. The property structure implied by each is an important aspect. In extensive aquaculture or lagoon fisheries, you often have a collective property structure or use of the resource, if there is no property as such. In intensive or semi-intensive aquaculture, there is a multi-species stock, there is usually free access to it; whereas, with a mono-species resource, such as clam-fishing in Italy, property rights are very often applied. It would be useful for fisheries administrators and researchers to monitor and predict the gradual trend towards adoption of such rights.

The conventional approach for socio-economic analysis of aquaculture is to look first at the resource, secondly at the production sphere, and thirdly at the market.

1. RESOURCE (land, water):

In mariculture, this resource is normally already used, and the decision to use it for aquaculture is taken either by the private or public sectors, or by both. The socio-economist has to ask himself why this decision is taken: by the investor to make a profit, by the Government to increase income or employment opportunities, by the environmental lobby to preserve a certain habitat. The socio-economist is also apt to look for the socio-economic benefits which can accrue to the people from aquaculture, and therefore recommend small-scale or medium-scale development of a public resource over large-scale industrial types. He also has a role to play for predicting and resolving conflicts that may appear over use of the resource.

There exist physical resources which are considered sometimes in terms of production factors. For example, in fresh-water aquaculture in semi-arid regions, water is a scarce production factor: In Egypt; since the Government's priority is agriculture, the use of irrigation water for aquaculture is virtually forbidden,

Fish-feed is another case in point, where the national resource base may be tapped. In Northern Italy, a large-scale mariculture programme intended to use almost the entire blue-fish production of the Adriatic to feed his fish. In some tropical countries, the import of subsidized fish-feed may make sense to the entrepreneur, but it may also mean a macro-economic loss to the country. In the planning of aquaculture development, the fact that agricultural by products are already used by other sectors of the economy is not always fully considered.

Where fingerling production is concerned, the catching of fry in the wild may initially provide jobs for small-scale fishermen, but eventually be in competition with the small-scale fisheries sector for the same natural resource. As for hatchery production, experience shows that dependency on foreign technology may be created.

Another item is the competition for public funds, as in Italy and France. Fisheries people consider that subsidies and research budgets for aquaculture should be, in effect, deducted from funds available for fisheries. Indeed, hardly any aquaculture in the Mediterranean is not assisted in some way by public funding.

Lastly, the human resource should be considered. It may be considered as cheap labour (as in the textile industry in some NIC countries); as a scarce resource in industrialized countries: from the point of view of educational levels required, or as the chief resource involved in the development process.

Where fisheries and aquaculture are concerned, in 9 publications out of 10, production is the focal point, rather than the producer. It is high time people should be seen as the subjects and justification for development, however polemical a topic this may be.

2. MEANS OF PRODUCTION : Tools, machinery, technology

The question of appropriate or inappropriate technology arises, so the socio-economist has to predict whether a given technology is suitable at a particular time and in a particular place. The socio-economist can also join forces with a suitable partner from the technological sector to create appropriate technology. The appropriateness of technology can be measured by the extent to which it is dependent on continuous foreign inputs. In an African context (for example, the building of a hatchery in Congo-Brazzaville) logistical difficulties for the supply of inputs lead to frequent breakdowns, and their withdrawal may mean the total collapse of the enterprise. The same would apply if there are no inbuilt mechanisms to transfer technical expertise to local people.

Appropriate technology needs adequate transfer methods. It is sometimes fallaciously thought that technology that has proved its worth in one context will also do so in another. Or the donor of technology may not be patient enough to allow local people to learn by their own mistakes and experience. Technology transfer is also but a means, and not an end for development.

SOCIO-ECONOMIC ASPECTS OF FISHING AND AQUACULTURE IN COASTAL AND LAGOON AREAS OF THE NORTHERN SPANISH MEDITERRANEAN

By Jose Manuel MASSIP- SEGARA

1. DEFINITION OF THE GEOGRAPHICAL AREA

The coastal provinces of Catalonia, Valencia, Murcia and the Balearic Islands constitute an area large enough for the production of live resources, and can be referred to as a Northern Spanish Mediterranean entity.

2. SOCIAL AND GEOGRAPHICAL CHARACTERISTICS OF THE AREA

2.1. The dynamic nature of maritime production

The harsh geographic conditions have led to the development of imaginative coastal fishing activities backed up by constant innovations for the exploitation of new resources. Since 1960, this predatory behaviour, backed by modern forms of exploitation, such as the trawler, has forced this maritime population into a suicidal economic situation. However, thanks to its inherent dynamic nature, it can probably look forward to a number of opportunities for the future.

2.2. The socio-economic standstill in estuaries and lagoons

Despite being the subjects of multiple attacks, lagoons, deltas and estuaries are favourable speculation sites. Man can adapt to the area, especially because of the variety and abundance of the resources available which allow for passive exploitation. This type of exploitation remains technically archaic and has strong social traditions. As it stems from an enormous Latin civilisation, it is based on a communal system. The lack of change is in sharp contrast to the dynamism of these zones.

2.3. Prospects for an integrated plan of lagoons and the coastline

The contrast and compatibility of the physical and socio-economic aspects require the establishment of an integrated plan in which organisation and facilities will take an overall vision: artificial reefs, restocking, quotas, control of fishing activities, etc... We will take up this point below.

3. SITUATION AND RESULTS OF THE EXPLOITATION OF LIVING RESOURCES IN THE NORTHERN SPANISH MEDITERRANEAN

3.1. Fishing (See appendix, tables)

The zone reveals a production structure which is distinctly less industrialized than the rest of Spain.

Two fifths of the trawlers are in the Northern part of the Spanish Mediterranean. However, their total motor power is less than one-quarter of the total in this category and only slightly higher than one-fifth of the gross tonnage. Industrial forms of mass exploitation do not exist in the zone. Both in volume and in value, for one-quarter of the boats and one-fifth of the crews, production represents 10 % of the national total.

This data shows that the nature of production is selective rather than industrial.

3.2. Aquaculture and lagoon production

The statistical data available is sparse, incomplete and of doubtful quality. For Fishing, some studies (DOUMENGE) show a production per hectare ratio of 84 to 250 kgs, depending

on the site. Other studies, either public or private, make reference to global production rates of over 200,000 tonnes.

Two statistical examples give us a fish production of over 60 tonnes For the Erbe lagoons (1,100 hectares) and 260 tonnes For the Valencia estuary (3,000 hectares, see appendix).

Mussel culture is carried out in various forms throughout the zone, however they do not feature in statistical evaluations.

4. PROSPECTS FOR FISHING AND MARICULTURE IN THE NORTHERN SPANISH MEDITERRANEAN

4.1 Prospects For an expanding market

Spain has a commercial deficit of over US \$ 100 million worth of products From the sea. Spanish national and E.E.C. demand is increasing at such a rate that traditional production structures will definitely not be able to supply enough.

4.2. The future of maritime fishing

Due to geographic conditions, most likely the exploitation of Northern Spanish Mediterranean will be based on the same fishing resources as they are at present. Production techniques will also remain the same unless there is an unlikely technical revolution. They will rely on classic techniques: the lamparo, longlining trawlers, dragnets and trawl lines. The lamparos specialize in catching pelegian species such as: sardines, anchovies, mackerel and herring;

The trawlers are specialized in catching benthic species such as dogfish, caplin, codfish, rockling, pageot, seabream, red shrimp, whiting lemon sole, sole, Norway lobster.

Coastal fishing's future relies on the European Common Market which will direct the maritime environment by professional organisation; controlling production tools (size and capacity of vessels, conforming to specific standards) intercommunity money exchanges, ecological observation of the sector.

In any event, Northern Spanish Mediterranean fishing will retain its selective approach by opposing a massive production of proteins.

4.3. The future of mariculture

This practice is already rather important in lagoon zones, estuaries and canals. Here too, the E.E.C. context will radically affect the area.

The future market situation requires that planning for the lagoons be improved, such as building and modernising breeding grounds, initiating pilot projects and new techniques of intensive breeding, environmental quality control, building artificial reefs, etc...

The future of mariculture will first manifest itself by an increase in technological methods: eel breeding in farms or in swamps, bass, sea-bream and sole in parks or on rafts; trout raised in sea-water.

Many problems will have to be overcome: reorganizing mussel culture, the shortage of salmonidae and tench fry, and of oyster and clam seed.

From a structural standpoint, a flexible production and commercialisation system must

be drawn up, but follow through in investment is lacking, research centres are scattered, the technicians who are trained in to short of a period of time are unqualified also technology, documentation and information are lacking. The Government's objective is a production of 600,000 tonnes. It stresses and encourages investing, the promulgation of an outline plan, and public investments in research projects, pilot experimental schemes, artificial reefs and nets.

5. INSTITUTIONAL ENVIRONMENT OF FISHERMEN

5.1. The marine social security institute (See appendix)

This national public establishment has the moral strength to fulfill many social public service missions which would benefit people who are dependent on the sea :

- health assurance invalidity/accident assurance for fishermen and their dependents, by managing a social security fund and establishing these structures,
- wide socio-educational programmes aimed at people who are dependent on the sea and their families : health information, education and professional training, unemployment benefits, foreign fishermen,
- assurance for boats, public information, cooperative production.

The I.S.M. assures the social security coverage for over one million people. Its turnover for 1984 was close to US \$ 320 million.

5.2. Fishermen's "brotherhoods" and shared reimbursement

5.2.1. "Brotherhoods"

These corporations date back to the 13th century. Since 1978, they have a legal status as a consulting organisation and participate in the Government. Therefore, they have the power to negotiate and ensure authority. These corporations have evolved. They have become real professional chambers with extensive management powers, mainly based on the need of small-scale and small groups of fishermen. Shared reimbursement seems to be the main vitality of these corporations.

5.2.2. Shored reimbursement

For small-scale fishing units which make up the major part of the region's fleet, the seamen are reimbursed, not *on* a fixed salary basis but on a share of the benefits basis. The benefits are divided into shares whose base unit is how hard each fisherman works, some shares are used to reimburse the fishermen and for amortizing capital investments (nets, emberkations).

A remarkable peculiarity of this system is that the benefit is calculated with certain deductions made for certain costs of production: social services, boat maintenance, fuel, due to the brotherhood. The brotherhood resolve work conflicts that may arise at any time, especially those involving this "sharing" process.

For the time being, the brotherhoods have the flexibility to insure the smooth running of collective management and representation, transitions with modern democratic organisations : tradeunions, paternal associations, and groups of producers which are required by the E.E.C.

5.3. Specialized banking organisations : F.R.O.M. and C.S.P.

5.3.1. The Fund for Regulation and Organisation of the Market for sea and marine culture products

This organisation's aim is to improve the collective infrastructure of the small-scale fishing sector. Its interventions were notably the financing of port information facilities, refrigeration material, market studies and agro-alimentary technology. For aquaculture (between 1982 and 1983), the F.R.O.M. quadrupled its investments in this domaine, It also financed the purchase of seeds (oyster, clam, cokles), trout fingerlings and restocking and improving sites.

5.3.2. The fishermen's Credit Union (C.P.S.)

This organisation depends on the Industrial Credit Bank. It finances the construction of vessels, land equipment and marine culture. It also makes loans for licensing and trips. The interest rates are between 11 % and 17 % for all of these activities and coverage ranges from 85 % to 70 %, depending on the project. The Northern Spanish Mediterranean companies borrowed about 7 % of the funds available in the area. The brotherhoods in the zone cover about 40 % of the risks (See appendix).

5.4. Participation and representation of fishermen

Fishermen are represented in the participation and management organisations mentioned above (I.S.M., C.S.P., B.C.I., F.R.O.M.; brotherhoods). They are represented on, among others, the permanent Mediterranean Fishing Authority and also specific fish/agriculture organisations within different autonomous communities. This representation is essential for the sector itself, and For effective administration,

5.5. Social situation of the fishermen

The social situation of the Spanish Mediterranean fishermen reflects the economic difficulties of the area and the marginal social status of this profession. Beyond the low turnover linked to overexploitation, the deterioration of marine environment and periodic difficulties of the market, one can remark out dated production equipment, the independent and archaic solidarity of their professional relations.

Low level of education of this population is noticeable as is its autonomy in the face of public interference, Spanish politicians are now preoccupied with resolving the marginal status of fishermen.

6, ONE HOPE FOR MARINE ACTIVITIES IN THE ZONE: THE UNDERSECRETARY OF THE F.A.O.'S POSITION (Declaration made by Mr. de la TOJA et the "Fishing Fair").

The importance of developing fishing on a small-scale has being recognized. Along side, the prospects for the social progress of men and community groups is being studied. The necessity for professional training and the improvement of well-being of fishermen is also affirmed.

A MODEL OF REGIONAL POLICY : DEVELOPMENT OF AQUACULTURE

SOCIAL AND ADMINISTRATIVE ASPECTS

By Juan Manuel GARCIA BARTOLOME

1. THE DEVELOPMENT OF AQUACULTURE IS A PRIORITY FOR AGRICULTURE AND FISHING AUTHORITIES

This project of the central services merits an operational formula in socio-economic terms. The Andalusian project which is supported by the Fisheries Authority seems to be an excellent example of a programme developed on a regional level.

Natural resources in the Andalusian region are especially favourable for aquaculture speculation: 2,500 hectares of intertidal zone, 10,000 hectares of salt marshes, 20,000 hectares of ponds and lakes, 3,000 hectares of shallow coastal waters on 850 kilometres of coast.

This creates a potential aquaculture production level of 140,000 tonnes simply by using current techniques. Future progress in this area and exploitation of open sea will multiply these possibilities. The authority's goal for the next decade is to reach a level of 40,000 tonnes of shellfish, 10,000 tonnes of fish, 100 tonnes of crustaceans. The social gains of this goal are fundamental for the Andalusian population in terms of employment and quality of life.

2. THE STRUCTURE OF ADMINISTRATIVE INTERVENTION

During changes in Central Government, the Fisheries Authority didn't have much in the way of administrative means. Its infrastructure was reinforced according to a unique plan developed by a multidisciplinary team which included: biologists, economists, sociologists, legal experts, fishing and marine technicians. These interventions are more flexible and less formalized and marked by pragmatism. The team's plan enhanced the collaboration of those concerned with fishing.

The Maricultural Exploitation Plan for the South Atlantic Regions (P.E.M.A.R.E.S.) was undertaken by the Authorities. The director of Fisheries has taken over. His collaborators, who are responsible for aquaculture services or of inland waters, are part of the scientific commission. The Head Office (in SEVILLE) is made up of a scientific section and of two prefectural zones : CADIZ and HUELVA.

P.E.M.A.R.E.S.'s objective is to assure the promotion of aquaculture production :

- rationalizing of the exploiting of natural shellfish beds,
- promotion of fish and shellfish,
- programming activities on a local level,
- socio-economic follow-up of the producer population,
- market harmony,
- increase in production.

3. COLLABORATING WITH THE SOCIO-PROFESSIONAL MILIEU

This idea, inspires the use of public powers and many conciliatory bodies are used by the Government: an expert advisory group has been set up to help the general manager, which includes four representatives from aquaculture cooperatives: - The fishermen's brotherhood -

corporations placed by the marine administration and whose contribution is essential: This enables the ensurance of a running account of fish resources

- The rio Piedras management commission (is a kind of brotherhood, in LEPE).

4. SOCIAL ASSISTANCE

4.1. An approach of socio-economic facts

The general management directed studies in four fields: socio-economic and cultural analysis of the professional milieu, inventory of natural environment (resources, pollution, cartography of maricultural areas), present situation of the structure of production, analysis of cooperations.

The P.E.M.A.R.E.S has therefore carried out aquaculture zoning based on technical, geographical, economical and social considerations.

4.2. Interventions on social groups : professionalization

The first part of this notion consists in improving the way shellfish are collected, whether the fishermen are on boats or are wading : methods used to fish, quantity and type of species fished.

The second element relies on the distribution of a professional register by the Autonomous Community of Andalusia. This register allowed us to separate the professionals and identify those whose commercial activity is at a high level. This is therefore the first evaluation of the profession, however, it is still very incomplete.

The other part of social policy relies on the encouraging of cooperation which has appreciable social effects in terms of employment. The promoting of this area is done by attributing domanial concessions, continual support from the authorities, subventions, training. Forty cooperatives, including 300 cooperators, were set up in the provinces of CADIZ and HUELVA.

At this point, twenty private companies are installed on domanial concessions for marine culture purposes.

The "Guadalquivir swamps" (near SEVILLE) production site has developed a highly cooperative system for exploiting red crab. (263 cooperators working in 8 cooperatives).

5. DIFFICULTIES ENCOUNTERED AND RESULTS OF THE DEVELOPMENT PROGRAMMES

5.1. On an institutional level

The sector analysed, showed the problems that occurred when setting up a new administrative structure, There was opposition between the inherent constraint of traditional formalism of administrative structures and the pragmatic or innovative dynamism of new organisations.

The lack of an administrative representative on the field convinced central authorities to privilege management tasks to the detriment of its role of a coordinator.

On the other hand, the Director of Fisheries has progressed in coordinating between various administrations concerned. For example, Rio Carreras is, for this, very significant.

5.2. Intervention measures

The authorities had a hard time to define the limits of the social groups concerned, wavering between the "aquaculturist" and "aquaculture farmer". The fisheries Authority made *an* effort to inform, to train and to educate. However, the individuality of each professional, and the weakness of collective structure of *an* "untouchable" profession are fundamental handicaps for establishing united programmes. In other words, the answer to most of the problems encountered when setting up the projects were found, by the various authorities and organisations, to be not dependent on the Fisheries Authority. Only the technical problems (biology, judiciary, and economic) haven't yet been resolved.

No matter what, the results obtained by the Fisheries Authority are incontestable, despite very limited experiences. This first stage makes up the "starting block" and is a model of regional development policy. The experience may found a fruitful scientific exchange between MEDRAP and Mediterranean partners.

APPENDIX

1. COASTAL FISHING

Characteristics of the fishing Fleet
Classification by the Category of the Boat according to Gross Tonnage

The whole of Spain

	0 to 20 TGT	20 to 25 TGT	- 50 TGT	- 100 TGT	- 150 TGT	- 250 TGT	- 500 TGT	- 900 TGT	- 1 800 TGT
Boats (number)	13 311	252	1 213	1 149	570	639	467	60	73
Total gross tonnage (TGT)	69 936	5 720	46 199	83 029	70 703	126 340	157 021	40 099	92 781
Horsepower (HP)	493	34 612	273 514	387 436	247 808	399 678	487 169	93 930	217 451
Ship crew	483 39 832	2 310	14 068	15 730	8 603	9 714	8 772	1 493	2 590

The whole of the Northern Spanish Mediterranean

	0 to 20 TGT	20 to 25 TGT	- 50 TGT	- 100 TGT	- 150 TGT	- 250 TGT	- 500 TGT	- 900 TGT	- 1 800 TGT
Boats (number)	3 548	110	505	370	62	9			1
Total gross tonnage (TGT)	13 749	1 964	19 507	25 670	7 470	1 499	653		1 113
Horsepower (HP)	116	13 979	126 343	155 225	37 345	5 248	1 910		1 850
Ship crew	289 8 936	966	5 103	3 821	756	131	28		37

FLEET CHARACTERISTICS

By type of Fishing

The whole of Spain

	Trawler	Refrigerated trawler	Cod boats	Lamparo	Small-scale fishing	Seine-fishing freezers	Factory ships	Auxiliary service
Ships (number)	2 608	475	84	2 048	11 959	62	6	498
Total gross tonnage	243 804	188 098	43 794	95 175	61 149	56 534	4 970	5 289
Horsepower (HP)	949 015	515 563	96 180	453 343	437 316	167 190	11 770	31 144
Crew	27 953	9 871	2 107	25 984	34 606	1 360	196	1 417

Northern Spanish Mediterranean

	Trawler	Refrigerated trawler	Cod boats	Lamparo	Small-scale fishing	Seine-fishing freezers	Factory ships	Auxiliary service
Ships (number)	1 143	4		377	3 034			49
Total gross tonnage	52 174	1 648		9 234	8 964			105
Horsepower (HP)	305 746	3 815		66 503	81 054			1 071
Crew	8 924	83		4 255	6 419			97

FISH PRODUCTION IN TERMS OF VOLUME AND OF VALUE

	Spain	Northern Spanish Mediterranean	in %
Vessels	17 740	4 607	26
Gross tonnage	698 813	72 125	10
Horse power (HF)	2 661 521	416 741	16
Crew	103 494	19 778	19
Production (tonnes)	1 206 390	118 749	10
Production (dollars value)	1 151 572 168	135 856 506	12

I.I - LAGOON PRODUCTION

ERBE LAGOONS - 1,100 hectares

	In Kg
Silver eel	33 343
Green eel	3 514
Bass	8 496
Grey mullet	17 343

VALENCIA ESTUARY - 3,000 hectares

Grey mullet	250 000
Bass	500
Silver eel	6 000
Green eel	4 000

III - I.S.M.

1. Analysis of the I.S.M. Fishermen

Concerns (number of)

Spain	24 553
Northern Spanish Mediterranean.	3 962

Vessels (number of)

Spain	11 098
Northern Spanish Mediterranean.	4 337

Affiliated fishermen

Spain	68 200
Northern Spanish Mediterranean.	13 068

EVOLUTION OF THE LEVEL OF FINANCING BY THE I.S.M.

National Insurance Benefits

	Social Security	Health measures	Training	Unemployments	Investments
1980	146 327 162	25 871 437	4 394 013	17 185 738	3 569 730
1981	182 048 131	30 341 242	5 188 196	31 661 746	2 564 111
1982	211 510 587	32 357 464	5 885 036	29 588 289	3 091 570
1983	242 998 237	34 917 816	6 572 783	31 031 309	2 903 662

CLAIMANTS OF THE I.S.M.

(fishermen, fish dealers, dock workers, foreign marine fishermen,
retired and beneficiaries)

National assets	142 336
Foreigners	16 179
Retired	96 106
Total Assured	254 621
Beneficiaries	763 025
Total	1 017 646

IV - fishermen's Credit Union

Lines of Credit and Loan Conditions

Object	Maximum quota %	Period	Interest %	Guarantee
Boat construction	85	12 years	11	Motgage and/or deposit
Modernisation and converting of boats	70	3/5 years	11 to 17	"
Related industries	70	7/8 years	11 to 17	"
Marine culture	70	8 years	11 to 17	"
Campaign and lisceneing financing	80	6 months	14	Personal guarantee with a deposit

REGIONAL POLICY FOR FISHING AND AQUACULTURE IN VENICE (Italy)

Presentation of an intervention by Giuseppe ALESSANDRA

Head of the Regional Centre for Defense and Experimentation of Fish and Aquaculture

1. THE TRUE VENICE SI_TUATION

A few figures allow us to measure the importance of fishing and aquaculture activities in the VENICE region.

Fishing

1,817 motor boats are counted, with a total tonnage of 11,505 tonnes. There are 4/733 professional sea licences and 3,154 for inland waters. The total production level for VENICE represents 12.5 % of the national production. There are 6 wholesale markets in the north, the total sector employs 7,887 people.

Aquacu1ture

- In freshwater, there are 142 intensive farms, of which :
96 are trout farms, equal to 32 % of national production,
10 eel farms, representing 13 % of national production,
36 various other farms equal to 22 % of national production.
In all, these farms employ 304 people.
- In brackish water, there are 9 intensive farms in the VENICE area, of which 4 are eel farms. 30 people are employed.

Valliculture

37 concerns, installed on 17,015 hectares, give a production representing 40 % of national production and employ 252 people.

Mussel culture

Here there are 110 installations on 78 hectares. Production equals 43 % of national production. 800 people are employed in family operations. Mussel culture is carried out in Venitian lagoons (50,000 ha).

In all, for the region around VENICE, fishing and aquaculture employ 17,500 people including those working in related activities. Gross production in this sector reaches 190 million Lira, or 8 % of the Gross National Production, of animal origins, which is commercialized (1983). There are 45 cooperatives operating in this sector, but for most, they are exclusively fishing cooperatives.

2. REGIONAL INTERVENTIONS

Due to the fact that fishing and aquaculture hold an important role in both employment and in production, the VENICE region tries to encourage this field of activities, which may be further developed.

We shall now discuss the most significant areas of intervention in countries present, specifying the types of interventions and kinds of financing (loans without security or low interest rate loans).

In the fishing sector

- Aiming at increasing efforts made for fishing :
 - aid for the construction of many boats and the replacement of certain boats,
 - in order to modernize the existing fleet, the introduction of new standards of security and the replacement of old navigation equipment should be carried out.
- Improvement and development of the infrastructures :
 - Development of ports and harbour installations,
 - Setting up canning factories and transformation shipyards,
 - Improvement and increase of the means of transportation.

Financial aid to fishing is given in two ways : contributions to capital, representing 30 % and 50 % of planned expenses, and loans with a maximum period of 20 years and covering between 70 % and 80 % of investments. Cooperatives, groups of producers and individuals can benefit from these aids and credits.

In the domain of aquaculture

The region intervenes in salt water aquaculture, to increase production and to encourage new installations and pilot projects installations. It gives aid to research projects on new strains that will ensure the repopulation of species and the development of artificial reproduction.

Investments vary between 25 % and 50 % of the total and other contributions are added on. These forms of aid help to reimburse interest rates. As for fishing, the cooperatives, the consortiums, the groups of producers and individuals. may benefit from these aids.

For aquaculture in freshwater

Regional measures bear on :

- The consolidation and improvement of trout farming, and reorganization and improvement of the concerns,
- The development of eel farming, encouraging the creation of new concerns, using residual energy resources,
- The development of small scale aquaculture.

Aid available is of the same kind as that for aquaculture in sea-water and is distributed to the same organizations or people.

The region also finances research programmes as well as experiments, technical assistance and the disclosure of information to offices and organizations. These operations are coordinated by the Regional Centre for the Protection of fishing and aquaculture of the E.S.A.V.

3. THE AGRICULTURE DEVELOPMENT OFFICE OF VENICE (E.S.A.V.) FOR FISHING AND AQUACULTURE

The Regional Centre of Protection and Experimentation was created in 1980 by the regional authorities. Its three main preoccupations are:

- brackish water and mariculture,

- mussel, shellfish and algae culture,
- freshwater.

Its role is particularly directed towards research, experimentation and specialized technical assistance.

For freshwater areas, the measures aim at perfecting the selection of the "parents" and improving the artificial reproduction techniques for various species of trout, small salmon and freshwater crayfish, in order to restock the freshwater waterways.

For the production part of aquaculture activities, the region and the E.S.A.V. assure a particularly important techno-scientific support, for everything concerning environment, feeding and pathology.

The Centre's importance exceeds the bounds of the VENICE region. Measures are planned on a national scale, and also For the E.E.C. and even the F.A.O.

The Centre is conducting research studies and testing on species of Fish that live in brackish water, with the help of other organizations for brackish water areas. This is how the Regional Centre of Fishing and Aquaculture of the E.S.A.V. participates in work done by the Industrial Company for the Artificial Reproduction of Fish (S.I.R.A.P,) by the C.I.V.V. specialized in valliculture and in the Consortium For the Development of Venitian Fishing and Aquaculture (C.O.S.O.A.V.) which specialize in studying and developing molluscs, Crustacea and algae.

4. THE REGIONAL PLAN FOR THE FISHING AND AQUACULTURE SECTOR

In order to develop fishing and aquaculture in a harmonious and rational way, the Venitian region joined the E.S.A.V, and together they elaborated a development plan for the productive sector.

The main ideas covered by this plan, based on a detailed analysis of the sector, can be summarised in the following manner :

Goals and measures planned for the different types of production :

- Development and modernization of the fishing fleet and installations on land,
- Development of valliculture concerns, especially integrated systems,
- Introduction of new hatching practices,
- Development of mariculture,
- Reinforcement and reorganization of trout Farms,
- Increase in production of farmed eel,
- Genetic improvements and restocking of inland waters.

Goals and measures planned For commercialization :

- Reorganization of fish markets and their management,
- Transformation and commercialization of products from Pishing and aquaculture,
- Product image.

Goals and measures planned For development :

- Research and experimentation projects,
- Use of results obtained from these projects to improve the profession,
- Training and re-employment of some workmen.

Lastly, the plan indicates financial needs in the short-term, medium term and longterm, in order to execute all planned measures and reach the goal previously laid out.

On an international level, E.S.A.V. coordinates the "International Conferences on aquaculture" which are held every two years,

In conclusion, all action in the VENICE region and the Office of Agricultural Development aims to rationalize increase potentials and develop the fishing-aquaculture sector, by giving techno-scientific support to producers. The investments made will then benefit from financial aids from the region, and State and the E.E.C.

THE MARKETING OF PRODUCTS FROM AQUACULTURE

- The Italian Market for Bass and Sea-bream
- Marketing of Shell-fish production in Languedoc-Roussillon (France)
- The F.I.O.M. (Market Regulation and Orientation Fund)

THE ITALIAN MARKET FOR BASS AND SEA BREAM

Paper presented by the Chairman, Mr, FERLIN, on behalf of the Italian Delegation

1. GENERAL BACKGROUND

By its high price-structure, variety and prospects, the Italian market for bass and sea-bream attracts great interest among MEDRAP members. These two species are traditionally caught throughout the Mediterranean in the open sea or in lagoons. There are also a number of intensive aquaculture projects for raising them, using new sophisticated technology. The latter has benefited from substantial investment which has yet to be amortized.

However, no proper study of the Italian market for bass and sea-bream exists to date. The following information is available concerning these species :

- national production : a complete set of figures up to 1983 for monthly production from all sources (catches at sea, extensive and intensive aquaculture),
- foreign markets : customs statistics make no special mention of bass and sea-bream, so that quantities imported are included with other species, there being no other official or published information on the subject;
- domestic markets : main wholesale markets have records of quantities and maximum and minimum prices.

Despite the dearth of official information on the subject, Italy can be divided into ten major consumption areas identified by the principal cities in each one. From North to South, these areas are : TURIN, MILAN, VENICE, GENOA Tuscan coast (VIAREGGIO), ROME, Adriatic coast (RIMINI), NAPLES, BARI and the rest of the country.

The consumption areas are covered by wholesalers or by wholesale importers generally based in the above-mentioned cities. In descending order of importance, the wholesalers market their-produce through the following outlets:

- Institutions (hotels, restaurants),
 - Semi-wholesalers in provincial cities, and large fishmongers,
 - Official wholesale markets (run by municipalities) in which the remainder is sold (I).
- (1) It should be emphasized that luxury fish acts as the controlling factor for the sale of other fish, since none of the large buyers mentioned above can avoid supplying their customers with bass and sea-bream on a regular basis.

2. PRICE FIXING

There is a free price-fixing system in Italy, which means that wholesalers and retailers can determine their own profit margins.

Despite the lack of data on the subject, it would appear that traders' margins follow price levels, which fluctuate enormously on the wholesale market. Despite the free price structure, retailers' margins seem relatively stable. Where high value fish are concerned, profit margins are narrow compared to those for inexpensive species.

The overall trend for prices of these products shows that increases are in line with

Inflation.

Best sales periods with corresponding prices (See also appendix)

Bass

- Highest prices in March, April, May, June, August, September and December,
- Average price for bass exported to Italy from all sources during these periods : 18,000 lire/Kg (16-20,000 lire)
- Farm-produced bass : 2,000 lire/Kg mark-up (according to quality, freshness, calibration),

Sea-bream

- Fresh-fish,
- Freshness criteria: fish kept at 5 degrees centigrade must arrive on the market within 48 hours. Fish five to six days old loose fifty per cent of its value,
- Size criteria : ideal size is 350 or 500 grams
- Presentation : boxes of fifteen kilograms maximum. On the southern markets (NAPLES and BARI), fish must be folded in two (in the position known as "crocchiato") and this can only be done at the place of capture.

3. OVERALL MARKET STRUCTURE

The Italian market for bass and sea-bream amounted to about 2,700 tonnes in 1983, of which 1,000 tonnes were imported, representing some 40 % of the market. Bass makes up the largest proportion of imported fish (over 50 % of the national consumption).

	National Production	Imports	Consumption
Bass	864	916	1,780
Sea-Bream	<u>845</u>	<u>115</u>	<u>960</u>
Total	1,709	1,030	2,740

4. ITALIAN PRODUCTION PATTERN

Catches at sea account for more than half of Italian production, and extensive lagoon fisheries are also significant, amounting to 700-800 tonnes. Intensive aquaculture production remains therefore quite limited, amounting to less 10 % of total production,

5. SECTORAL STUDY BY PRINCIPAL ITALIAN MARKETS (See appendix)

As mentioned above, recent data is fragmented and refers only to organized markets. Due to import levels, the wholesale market is highly concentrated (44 wholesalers in ROME alone) and extremely dispersed in the retail trade (1,200 retailers in ROME), as throughout the Italian marketing system. But there is also *an* unofficial market in which transactions are clandestine and unquantifiable. The size of this market may sometimes be very large, supplying individuals, restaurants and retailers (as in NAPLES).

Analysis of wholesale market source reveals the existence of multiple trading partners: France, Spain, Portugal, for produce originating either from capture Fisheries or aquaculture. In three cases out of five, these imports account for the majority of wholesale trade in both species.

6. DISCUSSION FOLLOWING THE ITALIAN PAPER

- Supermarket sales of marine produce (Question asked by the French delegate).

For the present, Italian consumption habits rule out fish sold in supermarkets: The Italian consumer is extremely demanding on quality, the promotion of fish is not yet a common practice, and supermarkets have difficulty in managing the fresh fish sector.

- Bass and sea-bream are not widely eaten (Question asked by the Algerian delegate)

Over the year as a whole, these products are restricted to high income consumers. On the other hand, during festive seasons, they are bought by a far broader spectrum of society.

- The special nature of the relationship retailers and consumers in Italy

Italians insist upon a high degree of freshness. Retailers in very specialized and fragmented market sectors operate according to an "atomized monopolistic" system: for a given species in a limited area, they establish relationships with the consumer based on trust and preferential treatment. Profit margins are known to fluctuate and are heavily conditioned by demand.

- The potential for the Italian market

The Italian market is far from being saturated but there is no evidence that it could absorb the whole of the production from capture fisheries and aquaculture in the Mediterranean. There is a very real danger of over-production, although we know absolutely nothing about the true potential and trends of the market.

- Flat-fish farming in the Mediterranean (sole and turbot)

Prospects are presently dampened by technical problems (fry production, and intensive growing-out) or economic ones (high production costs) and by the weakness of the potential market in the Mediterranean.

- International cooperation and market stability

Cooperation between Italy and Yugoslavia is envisaged for mussels, oysters and bass during the growing-out process.

On the other hand, the amortization of investment in aquaculture by Italy's partners is threatened by the very varied nature of her policies: mastering of technology (canning of mussels), fluctuation of exchange rates (in the case of Greek eels), change in the terms of cooperative agreements (between Yugoslavia and Spain where shellfish farming is concerned).

- The exemplary nature of fish market organization in Turkey (Statement by the Turkish delegate)

The marketing of fish in Turkey is entirely in private hands but seems highly controlled. It consists of a North-South flow of low value fish from the Black Sea (which has a good production level) towards the Mediterranean (which has a high consumption level). In the latter, production is low but of high-value.

The delegate voiced his concern less the Mediterranean fish trade should become entirely directed at a specifically tourist market.

APPENDIX 1
AVERAGE PRICES

Italian markets: Average prices of sea-bream Found in municipal markets studied in 1983
(In thousands of Lira)

VENICE	16,8
MILAN	25,0
ROME	18,5
NAPLES	13,0
GENOA	

Italian markets: Average bass prices Found in municipal markets studied in 1983
(In thousands of Lira)

VENICE	16,7
MILAN	24,7
ROME	19,5
NAPLES	13,0
GENOA	

APPENDIX II

ORIGINS OF DOMESTIC PRODUCTION

Total caught at sea	930 tonnes
Total caught in lagoons	720 to 850 tonnes per year
VENICE	400 to 500 tonnes per year
Sardinia	100 to 150 tonnes per year
Others (Tuscany, Lazio, Puglia)	30 to 50 tonnes per year
Total domestic production	200 to 250 tonnes per year
VENICE	100 to 150 tonnes per year
Tuscany	50 tonnes per year (3 concerns)
Basilicata	50 tonnes per year (1 concern)

APPENDIX III

Analysis per sector

A. THE ROMAN AND LATIUM (LAZIO) REGION MARKETS

ROME is in the Latium region of Italy and, as the other regions, 70 % of its needs are supplied by wholesalers and wholesale importers and the remaining 30 % by the following three markets:

- The central market in ROME,
- The "de facto" markets of FIUMICINO and of ANZIO. The size of these markets is increasing.

Fish trading is controlled by 44 wholesalers/authorized agents and authorized agents on the central market in ROME. Here, about 1,200 retail dealers buy their stock.

Available information: until 1983 daily statements giving details such as quantities sold, total billed value and minimum and maximum prices.

B. THE MARKETS IN NAPLES AND IN THE SOUTH-WESTERN CONTINENTAL AREAS

The zone defined as the Campagna region and the North-West of Calabria, includes NAPLES, the Amalfi coast, Pozzuoli and the Islands of Capri, Ischia and Procida, Maratea. These are all areas that enjoy a high level of tourism. This zone is supplied, in part, directly by wholesalers and also by the following five sales points :

- The central municipal market in NAPLES which supplies the city Centre.
- The tolerated market of Pozzuoli supplies its own restaurants as well the touristic Islands of Procida, Ischia and Capri. The Pozzuoli market:, as a sales point, has shrunk in size ever since the city has been affected by sysmic phenomena.
- The only official information available concerns the NAPLES market, the only one officially recognized and which has sanitary inspections and statistical verifications. The data which the mission was able to get hold of is thus as following:
 - The NAPLES market : daily statements of sales on the central market including details such as : species, quantities, global value of the operations, minimum and maximum prices, and this for 1982, 1983 as well as the first five months of 1984,
 - The Pozzuoli market : an estimation of authorized agents from the Pozzuoli market (visited by the mission),
 - The Torre Annunziata, Salerno and Mugnano markets: estimation of authorized agents from the Pozzuoli and NAPLES markets.
 - The wholesale market in NAPLES only trades about 30 % of commercialized fish.

C. THE MARKETS Of LIGURIA, TUSCANY, PIEDMONT, etc...

– The wholesale-importers of GENOA supply a zone which includes: Liguria, a part of Tuscany (Viareggio) and of Piedmont (TURIN, NOVI LIGRE, VERCELLI, etc...) as well as a part of Lombardy. From time to time, they also supply Southern Central Italy,

The distribution market of GENOA distinguishes itself as it is essentially (over 80 %) an

import market. Its main suppliers are:

- France : Breton bass, sea bream, bass from SETE, farmed bass from SETE (1),
- Spain : sea bream and bass, approximately 20 tonnes of which have an aquaculture origin,

(1) The municipal market, in MILAN suffered, in August from an important decrease in quantities traded due to the annual closing of restaurants for the holidays in the city, and especially due to the private consumers leaving for the holidays.

Portugal: bass and sea-bream.

- This market also distinguishes itself because, at times, in order to keep good relations with the big suppliers, the importers have to sell stock outside of their zone of influence. This is how the Southern Central parts of Italy are sometimes supplied.

- Other than wholesale importers who distribute their products directly, the Greek municipal wholesale market trades about 20 to 30 tonnes per year, less than 10 % of consumption. Small retailers from the Centre of GENOA get their supply from this market.

- It is interesting to note that the wholesalers in GENOA refuse to buy fish from Venitian lagoons while they buy some from other Italian regions (ORBETELLO Ittica Val d'AGRI).

D. THE LOMBARDY MARKET

- The consumer market of Lombardy includes MILAN, big cities such as BERGAMO, PAVIA, PIACENZA, COMO, etc... It is supplied by wholesale importers based in MILAN.

- The imports mostly come from France, Portugal and Spain. The local production mostly comes from the Chioggia market which is the main Venitian fishing port and the centre of commercialization of Venitian lagoon production.

- Apart from Lombardy, the wholesalers from MILAN supply in part : TURIN's consumption via intermediary wholesalers from TURIN, In the summer, the two Ligurian Rivas (from VENTIMIGLIA to VIAREGGIO where they follow their customers). (1)

- For the MILAN municipal market, statistics aren't available for any period prior to 1983. These are monthly statements of quantity and of minimum and maximum prices.

(1) The municipal market, in MILAN suffered, in August From a severe decrease in quantities traded due to the annual closing of restaurants in the city for the holidays, and especially due to the private consumers leaving for' the holidays

MARKETING OF SHELLFISH PRODUCTION OF THE LANGUEDOC-ROUSSILLON

(Region of France)

REPORT PRESENTED BY CLAIRE COUDY (CEPRALMAR)

This report is based on studies carried out by CEPRALMAR (Centre for the study and promotion of lagoon and maritime activities in Languedoc-Roussillon) on the marketing of shellfish produced in lagoons in the Languedoc area.

1. SHELLFISH PRODUCTION IN THE LANGUEDOC BASIN

French production in the Mediterranean comes mainly from two coastal lakes. The Thau Basin alone is responsible for almost 90 per cent of the shellfish production and most of the work done in the field.

Oyster and mussel culture in the Thau lagoon is performed while employing the suspension method from "tables" fixed to the bottom by stakes. Mussels seed is bought from local fishermen. Oyster seed comes from the Atlantic coast.

There are a total of more than 2,000 "tables" covering an area of 1,300 hectares devoted to shellfish culture. Although official figures are not entirely reliable, the production accounts for about 10 per cent of the national total.

– The family-run production units vary in size and are often put to multiple use. Mixed production of oysters and mussels is widespread, although mussels are gradually being replaced by oysters.

2. THE FRENCH MARKET FOR OYSTERS AND MUSSELS

The national production of cupped oysters, which had been on the increase since 1970, seems to have stagnated over the last few years. The main production area is the MARENNES basin on the West coast.

Foreign trade is extremely weak and mainly concerns the flat oyster. Domestic production determines the volume of national consumption. At the end of the 1970's between 2,500 and 3,000 tonnes of fished flat oysters were imported from Greece (P. FERLIN). These extremely low-priced products are often poorly presented and need to be reprocessed by the importers.

Consumption is relatively stable and unevenly spread over the whole country. Proximity of the production areas is a determining factor for consumption levels, which are low in the North and Centre of the country.

Oysters are festive-season products and considered to be luxury items. Thus consumption is very seasonal. Half the annual consumption is at Christmas and the New-Year.

Being relatively expensive, oysters are eaten by the well-to-do-over-forties. They are considered to be a healthy and natural food which depends on considerable trust on the part of consumers.

Oyster marketing channels are very varied and mostly traditional:

- Direct outlets,
- Wholesale outlets supplying fishmongers,
- Supermarkets.

There is similar variety at the retail stage:

- Supermarkets : 21 per cent.
- Direct sales : 14 per cent
- Fishmongers : 30 per cent
- Markets : 24 per cent
- Ocher : 11 per cent.

The oyster market in France appears to be fairly stable, its consumption being concentrated in the festive season. Supermarkets take an ever-increasing share of sales in a marketing system which continues to be very varied.

MUSSELS

The last few years have seen production increase rapidly. Imports from Spain and Holland are determined by very strong domestic demand.

The consumption pattern appears to be geographically stable; but there are big differences in consumption sizes and forms. Mussels are a traditional inexpensive product, of a less seasonal nature than oysters.

Due to imports, marketing is more concentrated, two thirds of production being sold by wholesalers.

At the retail stage, the sales pattern is :

- Supermarkets : 20 per cent
- Direct sales : 6 per cent
- Fishmongers : 47 per cent
- Markets : 24 per cent

3. THE MARKET FOR OYSTERS AND MUSSELS FROM THE THAU BASIN

It is a narrow, essentially regional market from a geographical point; of view, shared between TOULOUSE, MARSEILLE and PERPIGNAN.

60 per cent of mussel production goes to the South-East (MARSEILLE and NICE), 20 to 30 per cent to the Languedoc area, and only 5 to 15 per cent to PARIS and the North.

Where oysters are concerned, the market is restricted to the Mediterranean: MARSEILLE, NICE, the Languedoc region and TOULOUSE.

The limitations of the market are partly due to the fact that the products are insufficiently well known outside the traditional frontiers of the South of France. Three factors account for this:

- A narrow production base,
- The specific nature of the products (the oyster's meat is more salty and less firm, the quality of the mussels is comparatively inferior),
- The profession lacks organization, producers receive insufficient technical support and direction and behave in a very individualistic fashion, the supply is extremely dispersed, there is no clear picture of the market where prices and quantities are concerned.

THE F.I.O.M. (MARKET REGULATION AND ORIENTATION FUND)

Report presented by M. CRESCENZO (France)

Established at the end of 1975 following a very serious crisis, the F.I.O.M. has had a profound effect on marine fisheries. It was created to find remedies for the chronic and structural imbalances of the markets for marine produce. It also has to "help the production system adapt to new operating conditions.

The F.I.O.M. is a public body of industrial and commercial character under the responsibility of the Ministry which deals with Maritime Fisheries.

From the outset, the F.I.O.M. has acted within the framework of the E.E.C. regulations regarding the organization of markets for marine products in the community. Its structure is based on existing producers' organizations in the fisheries sector.

Judging from the complexity and diversity of its mechanisms, the organization of the fish market has reached a very advanced stage. The market for marine aquaculture products, on the other hand, raises specific problems. Whereas fishing is subject to unpredictable catches, marine aquaculture must be able to control its production levels.

1. TRADITIONAL MARICULTURE

1.1. The state of production in France

According to the Directorate of Maritime Fisheries' official statistics, oyster production in 1984 amounted to 105,000 tonnes, while mussels reached 51,000 tonnes.

Whereas the national production of oysters is sufficient for domestic consumption, France is a big importer of mussels: what then are the characteristics of these two production systems ?

- Demand has become increasingly concentrated as a result of the grouping together of buyers,
- 60 per cent to the producers' turnover is achieved over a period of three weeks.

1.2. Specific organizational structures

- Shellfish culture regional sections (S.R.C.)

Professional shell fish producers are grouped together in each producing area under "regional sections". These sections represent the producers' interests in all dealings with governmental institutions.

They also decide under what conditions production should be undertaken in each basin, and who should have access to the latter.

- The shellfish producers' interprofessional Committee

This body represents the regional sections at national level. Its aim is to examine and propose all measures of a general nature concerning shellfish culture to governmental and other concerned institutions.

- The Mariculture Commission

This was created by decree on March 22nd 1983 and includes representatives from the

regional sections. Each shellfish facility has such a commission whose purpose is to define for each facility a type of enterprise (Classification of these enterprises per type of activity. Capture, partial or complete culture).

This policy aims to evaluate minimum production areas according to the nutritional capacity of a particular basin.

Without such a policy, over-loading of production units could lead to biological accidents.

– Producer organizations

The European Community encourages the creation of producer organizations in order to rationalize Fisheries and improve marketing conditions,

Recognition of such organizations is decided at Community level and implemented by each member state. Among other things, the aim of the producer organisations is to improve efficiency by increasing supply,

1.3. The role played by F.I.O.M.

– Its role is to ensure that the regional sections and producer organizations work together coherently. By deliberately adopting a Community approach, the F.I.O.M. attempts to bring these two bodies closer together, their Functions being of a complementary nature.

– The shellfish culture regional sections have no economic role, but define the structural policy as described above.

– The producer organizations, on the other hand, determine the marketing policy for each facility.

The ideal situation would be that each facility have at disposal a shellfish culture regional section (which is already the case), along with a Producer organization. The latter are the F.I.O.M.'s specific partners, the relationship covering a number of different functions :

a) The producer organization is responsible for the quality of the marketed product and is expected to develop a "trade mark" policy, based on a notion similar to that of local wine-production (since there is considerable difference between an oyster from the Mediterranean and one from ARCAÇON, or between the MARENNES and OLERON basins...). The distinguishing factors are, of course, the marine environment and the production methods.

b) The producer organization should have as precise a knowledge as possible of the stock situation, both at seed collection stage (when it should be possible to predict the potential volume of production after three years), and at partial production stage, so that marketing can be planned.

c) The producer organization should strive to minimize costs at all levels of the production and marketing process. At the production stage, profit margins can be improved in the following ways:

– By mechanized oyster calibration (calibration and packing requiring a large amount of manual labour), research is being conducted by IFREMER in this field;

– By standardizing packing (since manufacturers should be able to reduce costs with the introduction of greater uniformity),

– By improving transport through diversification : this is a problem we are

working on for all marine products.

d) The producer organization should play a key role for the transport of seed and partially grown oysters between the different facilities, for only two facilities out of five are self-sufficient in this field.

The ARCACHON facility is the only one which has both a shellfish production regional section and a producer organization.

e) Consumer promotion

Until such time as an ideal system is established, the F.I.O.M. has decided to play a parallel role in this field at the final stages of the production process.

By studying consumer behaviour in cooperation with the profession, the F.I.O.M. has been able to design a communication strategy aimed at inducing people to eat more oysters outside the festive season, so as to spread the sales period over six months instead of the present three months. This action is decisive in as much as it should lead to an improvement in the financial structure of production units.

2. MARICULTURE WHICH IS STILL AT TO RESEARCH STAGE (Sometimes referred to as new aquaculture)

Marine aquaculture has not yet reached the marketable production stage. Culture methods have not yet been completely mastered : there are still problems connected with feed, disease control, equipment, and the transfer from laboratory to industrial-scale production.

The F.I.O.M. has worked on two species : trout raised in sea-water and clams at two very different stages of development.

Trout raised in sea-water

Production was at a critical level (200 tonnes) : This volume was large enough to cause producer marketing problems, but insufficient to warrant promotion of the product.

Clams

It seemed essential to make sure of commercial outlets for this produce before developing in on a larger scale. There was an urgent need to inform producers before they embarked on the production of this species in a disorderly fashion. A market study was therefore conducted.

The F.I.O.M.'s work on these two cases make it clear that great prudence is required where technology transfer is concerned.

It is always essential to make sure that producers do not embark on the production of species whose culture is not yet mastered and which will necessarily require state intervention unwarranted by the level of commercial interests involved.

However, the experience gained from these two examples does not yet provide all the answers to the marketing problems of aquaculture products.

There is reason to believe that when we have mastered the raising of a wide enough range of species, it will be possible to market them through different channels from those traditionally used for marine products.

A "trade mark" policy could be based on the following positive factors :

- Aquaculture products have the potential to be both homogeneous and to satisfy consumer preferences,
- There should be a regular supply.

CLOSING SESSION

During the closing session, the representatives from the participating countries stated their recommendations for aquaculture development projects *and* the national policies that should be established. The delegates also stated their action plan that the MEDRAP may follow to give international aid to Southern Mediterranean countries.

ALGERIA

Aquaculture is a modern activity, based on the use of recent scientific and technical knowledge for exploiting natural and artificial environments for the production of fish. In this way, aquaculture can contribute to the efforts made to satisfy food needs.

As there is a high water potential, and also as the objective of the recently created National Office of Development of Aquaculture and Production is to coordinate, plan, set up and manage the development of aquaculture in Algeria.

In this context, the Algerian representative makes the following recommendations :

- Use of technological methods adapted to each zone in order to develop and train the workforce necessary,
- Training must be done on two levels :
for people working in fishing and aquaculture fields, a multiple purpose training (technicians and workmen in aquaculture).
- High-quality university type course in biology, agronomy and economics,
- With the help of preliminary studies, the definition of markets and local consumption of aquaculture species found in aquaculture production,
- Standardization of intervention in the area of aquaculture by setting up a convention between users and public environmental protection organisations.
- Give careful consideration to the profession; the aquaculture farmer, and his status compared to that of the Fisherman, and the way he is paid.

Strengthen the bonds of cooperation between the different Southern Mediterranean countries and the Northern Mediterranean countries.

TUNISIA

Development of aquaculture in Tunisia must be carried out in response to the following two questions :

- Which markets to produce For ?
- How to produce more and better ?

Aquaculture, in its various Forms, must be encouraged so that it can compensate for the diminishing availability of natural stock due to overexploitation and pollution.

As a result of the seminar on the socio-economic aspects of aquaculture development, the Tunisian representatives reached the following conclusions :

- On a technical level, there is a more or less important lack of certain species considered to be of value and the only types that can amortize the technical investments ;

- The socio-economic viability of the projects is unclear due to the lack of meaningful results and competition from other sectors of production and the uncertainty of what the future results will be.
- The partial or total absence of a development plan for fishing aquaculture sectors in certain countries should be noted.

Recommendations made

- The need to plan aquaculture development in relation to the local physical and socio-economic conditions using better adapted technology,
- Help for projects of small and medium-sized concerns, by assuring scientific and technical assistance.
- Better comprehension of the Mediterranean markets for sea-products, and their prospects for evolution,
- Support efforts made in applied research and training in the various Mediterranean basin countries.
- Strengthen cooperation and exchange of information between neighbouring countries.

MOROCCO

The Moroccan representative suggested that research and analysis efforts be made, both by MEDRAP and the national specialists From the concerned countries in the following fields.

- To understand the different markets and prospects for the future for each of the Mediterranean countries,
- To define the level of compatibility between agriculture, fishing, tourism, and aquaculture in each region,
- To establish the various implications of aquaculture production systems aiming at a fair redistribution of created revenues,

To clearly establish the different social and judiciary aspects of aquaculture activities, particularly in relation to local communities.

YUGOSLAVIA

For the Yugoslavian representatives, the MEDRAP seminar on socio-economic aspects was especially interesting.

It showed the complexity of developing these new activities, the need to depend on technology which is more rational in relation to the local context and the need to train the people in charge.

The development of aquaculture in Mediterranean countries must yet deal with more problems :

- The amount of investments and the financial means necessary,
- On a technological level, methods of production must be rationalized in order to

make them more operational,

- The need to train competent managers for modern aquaculture production especially in countries with no previous experience.

The recommendations rely particularly on MEDRAP's role and its future activities :

- MEDRAP must prolonge and reinforce its activities, especially concerning the exchange of experiments between countries;
- Mediterranean countries must stress the priority of orienting their aquaculture production towards domestic consumption; exports should be limited and optional;
- All production activities in sea-water must be controlled to ensure the protection of the ecological balance of the environment to permit aquaculture activities
- To enhance the relationship between tourism and the consumption of sea-products;
- MEDRAP must; develop its activities in the field of technology, biology, economics and training;
- In the case of Yugoslavia, shellfish Farming must take precedence (mussel and oysters).

CYPRUS

The MEDRAP seminar on the socio-economic aspects of aquaculture showed that this activity can make positive contributions to national production.. The areas where conflicts may arise were specified, as were the possibilities for compatibility and coexistence. Commercialization and marketing hold fundamental roles in the development of aquaculture.

Some conclusions may therefore be presented as recommendations :

- Planning the development of aquaculture must take into account social aspects;
- Aquaculture development must follow market trends as regards local market potential and export markets;
- A reliable statistical system must be set up, so that the prospective markets may be evaluated;
- MEDRAP must continue its technology transfer projects and regional cooperation. It must also develop socio-economic activities.
- On a national level, the resources must be carefully distributed in order to avoid conflicts between different producers;
- Aquaculture can be a source of employment. Its socio-economic impact must be seriously taken into account;
- The private sector can effectively handle the commercialization of new production while the State will provide the aid for the necessary infrastructures to develop aquaculture. quantities of aquaculture products, must be based on a local or national development plan, and certainly for the whole of the Mediterranean.

The understanding of the socio-economic context of the regions and the countries is essential before defining the aquaculture investments possible.

The successes and setbacks of aquaculture experiments may be useful, if an exchange of data and information is established between the countries concerned. MEDRAP can play an important role in this field.

MEDRAP measures must be pursued to accelerate the development of certain aquaculture sectors, and also to hinder programmes opposing this type of development. To increase its effectiveness, MEDRAP should be decentralised, by establishing representatives in each Mediterranean country.

ITALY

For Italian representatives, four principal factors determine the types of sea-production and their future :

- The environment in which aquaculture is carried out,
- The men who practice and develop this activity,
- The technology used and its results,
- Markets.

In the spirit, an effort must be undertaken to make a plan in order to follow the evolution of productive systems, of technology and markets, etc... Serious market studies will orient production. At the same time, technical support and research must develop with the help of technology transfer.

The recommendations made are based on the role that MEDRAP must ensure :

- Better cooperation between the Mediterranean countries,
- Better distribution of information,
- The development of stronger relations between the FAO and the E.E.C. (Spain, Portugal and Greece).

Beyond this, the Italian representatives note the necessity to :

- Undertake thorough market studies in order to direct production and new installations,

TURKEY

Researchers like to refer to the Mediterranean as the "blue desert". For the past 30 years, pollution has increased and it is feared that the Mediterranean will end up being a lake of destruction and death.

In order to stop this from happening, serious efforts must be made to maintain peace in the threatened area and strengthen cooperation and mutual help between all of the Mediterranean countries.

For a long time, the populations that oriented themselves towards fishing activities did so because they didn't have any economic prospects. Fishing is the activity of last recourse, undertaken with the single goal of survival and, up to now, governments haven't bothered to develop this activity.

Today, marine production has become an important sector perhaps even a vital one,

and international cooperation has become essential.

The measures taken to develop this sector haven't yet given satisfactory and sufficient results.

The Turkish representatives feel that all Mediterranean countries must get together and share their 'know-how'. In this way, the Mediterranean will become a "blue paradise" instead of a desert.

MEDRAP must help to find a solution to numerous problems, market knowledge, lagoon planning, aquaculture development, financial development, financial and socio-economic problems.

GREECE

The development of aquaculture in the Mediterranean has reached a critical threshold, because of the high degree of technology required and the complexity of establishing new production structures. Transferring this activity to interested countries requires a level of competence and previous experience which are often absent. Also, efforts made to quickly develop aquaculture have been bogged down by errors and setbacks which increase the value of previously chosen options. In most cases, transferring technology from one country to another has not sufficiently taken into account the local conditions and the region's needs.

A true development of aquaculture, and not the production of small

- Develop technical support and research in developing countries by transferring the technology best suited to the real conditions within various locations,
- Develop Freshwater aquaculture by including it in future programmes.

SPAIN

Taking into account MEDRAP goals, which aim at better use of marine resources and the establishment of aquaculture production, the Spanish representatives think that in their country, special considerations must be made for the small-scale fishing in the inland waters of the Mediterranean :

- training in aquaculture must concern in priority the small-scale fishermen,
- Pluridisciplinary research centered on socio-economic aspects must be carried out before any measures and expert interventions are taken in the field;
- The development of production statistics procedures or an overall Mediterranean scale seems to be essential. In this pursuit, it is necessary to have :
 - Statistical information on the structure of aquaculture production.
 - Relative data on jobs created by this activity,
 - Statistics comparing the position of aquaculture production with other national means of production.

FRANCE

It seems important to have a clear overall understanding of what we call aquaculture. It is therefore necessary to make a reasonable inventory of all types of marine activities, from "catching" fish to the most sophisticated production system on a technological level.

We cannot have a restricted view of aquaculture in view of current experiments. These have existed for a very long time and have succeeded well in certain fields, for example shellfish culture and fish culture. It can be efficient in new fields of production.

It would seem essential, within the framework of each Mediterranean country, to examine the socio-economic and natural contexts in which productive systems can be developed and the different typos of possible aquaculture applications. One can often note that aquaculture experiments conducted within the Mediterranean basin reveal the same production systems which are independent of their local context and are not always adapted to the real needs of the countries involved.

The needs of each country are often very different. For example, in some cases, it is in response to an imbalance, in food production, for others, the priority is to increase exports.

The natural environment of each country is also highly varied, as some have large lagoon areas and strong fishing traditions, while others are poorly supplied in these fields.

RECOMMENDATIONS

Up to now, intensive aquaculture experiments have not given conclusive and lasting results on an economic level (apart from a few exceptions). Thus, when discussing future investments, we must be prudent when making technological choices, particularly in developing countries,

- Which are often more directed towards producing luxury products destined for European countries. Beyond the technological problems to be overcome (fry, feeding, etc...) aquaculture must also face the problems of oversupply and of being too dependent on export markets.

The poor understanding of currently established markets for various products brings into question the effectiveness of aquaculture development plans.

A plan, whether regional and national, is essential due to the complex nature of aquaculture-related industries and the contributions of marine culture and other activities shouldn't stop at the border of each country.

In effect, conditions and project development within each country make the international coordination of national policies essential.

On a national level, the measures must stress small-scale units which, due to their size, pose fewer management problems and function with more flexibility. These projects must have a privileged status on domestic markets particularly in developing countries.