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SEAFOOD PROCESSING

1) CURRENT SITUATION

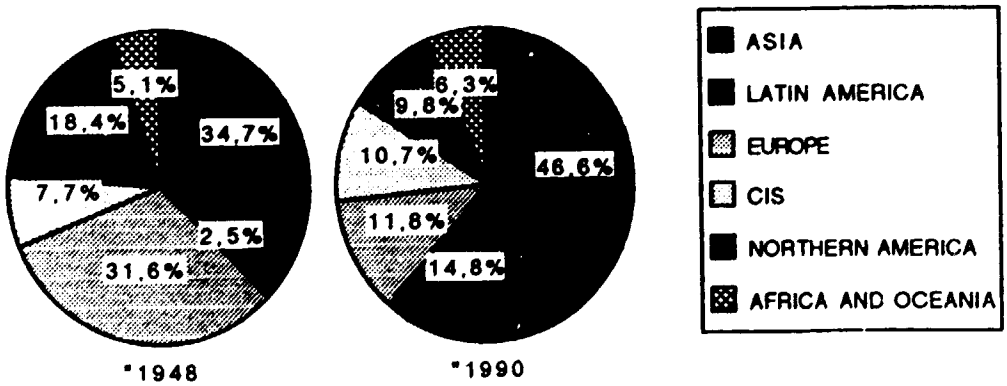
a) World fisheries

Fish and shellfish products include all animals or plants which are catched or breeded in marine areas or inland waters.

During the twentieth century, the marine production has experienced a spectacular growth. Estimated to 5 million tonnes in 1900 and to 20 million tonnes in 1940, world catches have increased by a factor of five in the last mid-century, to reach 97,2 million tonnes in 1990. Globally, these catches have augmented following a trend of 6 % per year in the sixties, of 1 % per year in the seventies and still of 2,8 % per year in the eighties. This development can be explained by the increasing efficiency of fisheries, by the modernisation of the carriage and by the improvement of the preservation.

Since the end of the world war II, we can notice the relative decline of Europe and of Northern America, the stagnation of Africa, the development of Southern America and the increasing part of Asia, especially of East and Southeast Asia. Now, Third-World countries effect about 60 % of the world production in volume and their part never stops increasing.

WORLD CATCHES BY REGIONS (percentage share in volume)

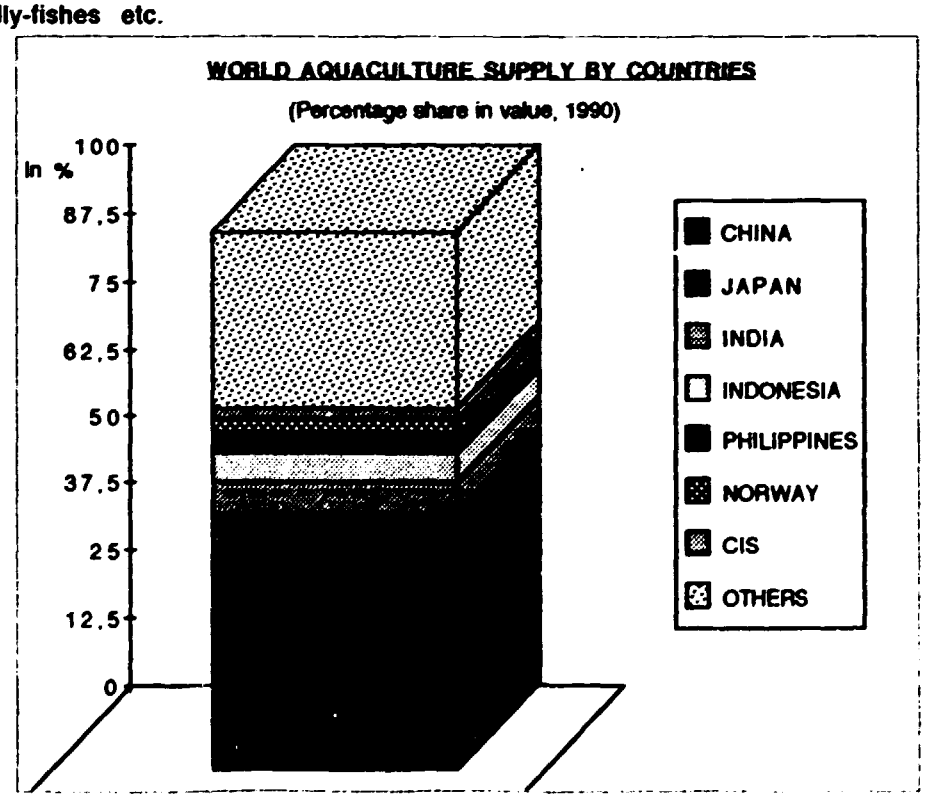


Source: Food and Agriculture Organization, Yearbook Fishery Statistics, Catches and Landings (Roma, 1950 and 1992).

Globally, three groups of countries can be distinguished. The first one (China, CIS, Japan) includes countries which produce more than 10 million tonnes per year. Like in 1985, this group effected in 1990 the third of world catches. But if the production declined quickly in Japan and CIS, it increased steadily in China. Indeed, in eleven years, from 1980 to 1990, chinese landings have tripled. The second group makes approximatively 45 % of world catches in volume and includes countries (15 in all), which produce from 1 to 10 million tonnes. This group includes old halieutic nations (Norway, Denmark, Iceland, Spain etc.), but also some more recent States (USA, Canada) and many developing countries (Peru, Chile, India, Indonesia, Thailand, Philippines etc.). The last group effects the fifth of the world production, with little producers (less than one million tonnes per year), as different as France, Viet Nam, Brazil, Morocco etc.

Inland fisheries spread out regularly. In 1990, it supplied 14,4 million tonnes (6 million tonnes in 1970) of products, essentially valuable freshwater fishes, used for human consumption. In 1990, 70 % of these inland catches originated in Asia (China, India, Indonesia, Bangladesh, Philippines etc.). In Africa (13,2 % of catches), this traditionnal fishery is well developed in Tanzania, Uganda, Egypt and Chad. Anywhere else, the production remains weak, with some exceptions, especially CIS (6,7% of catches), USA (1,8 %), Brazil (1,5 %) or Mexico (1,3 %).

Landings of marine fisheries represented 82,8 million tonnes of catches in 1990, compared to only 64,5 million tonnes in 1980. Now, main fishing areas settle in the Pacific (Northwest Pacific, Southeast Pacific), with more of 60 % of catches. The Atlantic ocean is only in second position, with 30 % of catches.
Globally, fishes represent the majority of marine landings: 85, 4 % of catches in volume in 1990, compared to 9,2 % for molluscs and 5 % for crustaceans. The same concentration appears for species, as the first six one (Alaska pollack, Japanese pilchard, Chilean jack, mackerel, Anchoveta, European pilchard) represent approximatively 30 % of world catches.
But these total data must not hide the extreme diversity of fish and shellfish products, which include 50 000 seaweed species and approximatively 250 000 animal species: pilchards, herrings, anchovies, tunas, mackerels, salmons, shrimps, lobsters, oysters, octopus, sponges, whales, jelly-fishes etc.



Source: Food and Agriculture Organization, Aquaculture Supply (1984-1990) (Roma, 1992)

EVOLUTION OF WORLD FISHERIES

Economic grouping, region, country	Production in 1000 tonnes 1985	1990	Percentage change 1985-1990	Percentage share 1985	1990
1-China	6778,8	12095,4	+78,4	7,8	12,4
2-CIS	10522,8	10389,0	-1,3	12,2	10,7
3-Japan	11408,9	10353,6	-9,3	13,2	10,6
4-Peru	4138,1	6875,1	+66,1	4,8	7,1
5-USA	4949,3	5856,0	+18,3	5,7	6,0
6-Chile	4804,4	5195,4	+8,1	5,6	5,3
7-India	2826,1	3790,6	+34,1	3,3	3,9
8-Indonesia	2332,7	3080,5	+32,1	2,7	3,2
9-South Korea	2649,9	2750,0	+3,8	3,1	2,8
10-Thailand	2225,1	2650,0	+19,1	2,6	2,7
11-Philippines	1865,0	2208,8	+18,4	2,2	2,3
12-North Korea	1700,0	1750,1	+2,9	2,0	1,8
13-Norway	2119,0	1747,1	-17,6	2,5	1,8
14-Canada	1453,3	1624,4	+11,8	1,7	1,7
15-Denmark	1764,8	1517,2	-14	2,0	1,6
16-Iceland	1680,4	1507,6	-10,3	1,9	1,6
17-Spain	1482,8	1458,1	-1,7	1,7	1,5
18-Mexico	1226,5	1401,0	+14,2	1,4	1,4
19-France	837,7	896,8	+7,1	1,0	0,9
20-Viet Nam	808,0	850,0	+5,2	0,9	0,9
ASIA (a)	37734,7	45337,4	+20,1	43,7	46,6
East and Southeast Asia	29831,9	36201,7	+21,4	34,5	37,2
Southern Asia	4261,3	5376,7	+26,2	4,9	5,5
SOUTHERN AMERICA	11932,4	14413,8	+20,8	13,8	14,8
EUROPE	12926,9	11466,5	-11,3	15,0	11,8
EEC	7192,4	6764,0	-6,0	8,3	7,0
Northern Europe	4558,2	3902,2	-14,4	5,3	4,0
Eastern Europe	1089,7	725,1	-33,5	1,3	0,7
CIS	10522,8	10389,0	-1,3	12,2	10,7
NORTHERN AMERICA	8375,0	9525,5	+13,7	9,7	9,8
AFRICA	4279,6	5164,5	+20,7	4,9	5,3
OCEANIA	606,7	949,0	+56,4	0,7	1,0
WORLD	86378,1	97245,7	+12,6	100,0	100,0
North (b)	42529,1	41027,7	-3,5	49,2	42,2
South	43849,0	56218,0	+28,2	50,8	57,8

Source: Food and Agriculture Organization, Yearbook Fishery Statistics, Catches and Landings (Roma, 1992).

(a) Including China and Japan

(b) Northern America, Europe, CIS, Japan, Oceania, South Africa.

Production data include generally aquaculture. In value, the world aquacultural supply has doubled since 1985, to reach 26,5 US $ billion in 1990. In volume, in 1990, main concerned species were carps (32,5 %), seaweeds (20,8 %), mussels (7,1 %), oysters (5,7 %), salmons (3,9 %) and shrimps (3,9 %). This farming is essentially effected in Asia (78 ,3%), in Europe (12 %) and in Northern America (3,2 %). Finally, in 1990 more than 140 countries practised aquaculture, compared to only 67 in 1975. But this success masks a large concentration of the production, as the first six countries provide in value two thirds of the world aquacultural supply.

b) World processed supply

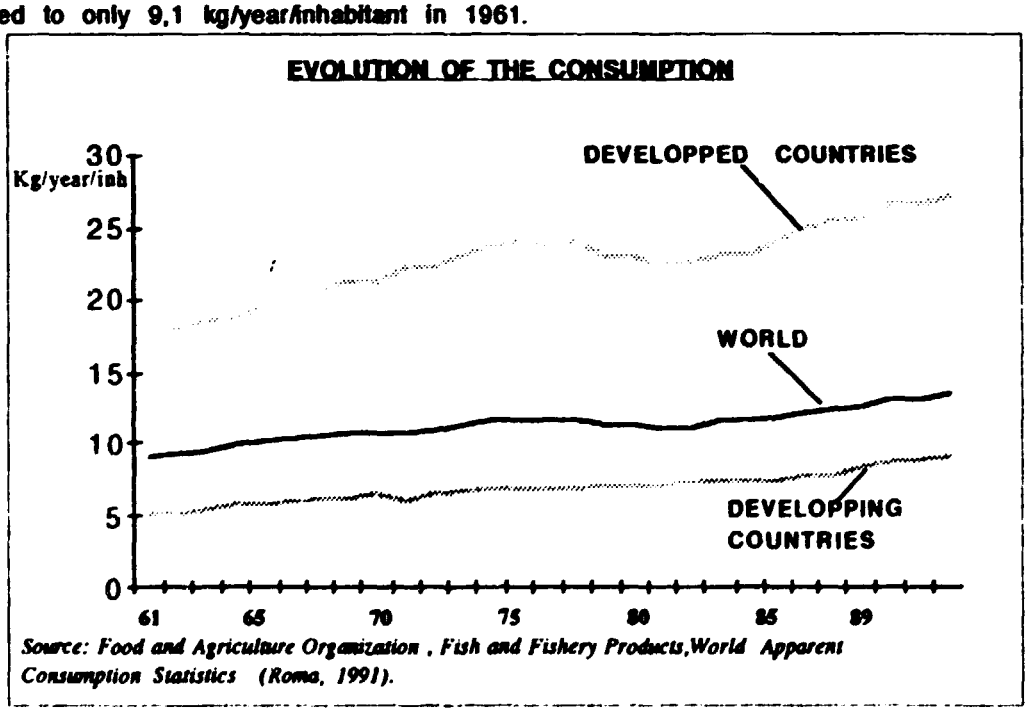
With 36 million tonnes in 1990, the world processed supply has increased by a quarter in 10 years. In volume, this industry concerns above all fresh, chilled and frozen (FCF) fishes (42 %), fishmeals (17,5 %), and canned products (16,5%).

The more valuable products are also the more dynamics (FCF fishes, crustaceans and molluscs in all forms). The FCF fish industry concerns first CIS and Japan, but also Europe and Northern America, especially for fillets. Crustaceans (shrimps, crabs) and molluscs (squids, cuttlefishes, octopus) are essentially frozen, especially in asian countries (Japan, Thailand etc.)., in Northern America and in Southern Europe. Crustacean products (canned products, preparations not in airtight containers) are rather an oriental tradition (Thailand, Philippines, Japan), when canned molluscs (clams, mussels) more originate in occidental countries.

The products of minor value are also the less dynamics. It is especially the case of industrial products (fishoil and fishmeal), of dried, salted or in brine fishes (asiatic or african regions) or of smoked fishes (CIS). But it is also the case of fish products, which are for about 60 % canned products, with three main producers: Japan, CIS and USA.

c) World consumption

The world consumption has notably increased in last decades: 13,4 kg/year/inhabitant in 1989, compared to only 9,1 kg/year/inhabitant in 1961.



Source: Food and Agriculture Organization , Fish and Fishery Products,World Apparent Consumption Statistics (Roma, 1991).

EVOLUTION OF THE WORLD PROCESSED SUPPLY

Products	Production 1981 in thousand tonnes	Production 1990 in thousand tonnes	Percentage Change 1981-1990	Share in % 1981	Share in % 1990	Main producing countries in 1990 (% in volume)
Fish fresh, chilled or frozen	11317,6	15144,8	+33,8	39,8	42,0	CIS (20,7), Japan (20,4), South Korea (9,0), China (8,5)
Fish dried, salted or smoked	3890,2	4502,4	+15,7	13,7	12,5	Japan (21,9), Indonesia (16,7), CIS (16,2), Philippines (5,4), India (4,2), China (4,0)
Crustaceans, molluscs fresh, frozen, dried, salted etc.	1465,4	2253,7	+53,8	5,2	6,2	Japan (22,5), USA (12,5), Thailand (8,3), China (7,3)
Fish products	5156,8	5924,0	+14,9	18,2	16,5	Japan (27,4), CIS(26,4), USA (6,4)
Crustaceans and molluscs products	340,9	488,4	+43,3	1,2	1,4	Philippines (20,9),Thail.(20,6), Japan (12,6), USA (11,0)
Oils and fats of aquatic animal origin	1165,9	1397,9	+19,9	4,1	3,9	Japan (29,9), Peru (13,7), Chile (13,5), USA (9,2)
Meals and solubles of aquatic animal origin	5058,9	6293,0	+24,4	17,8	17,5	Peru (19,1),Chile (17,1), Japan (15,5), CIS (11,0)
Processed supply	28395,7	36004,2	+26,8	100,0	100,0	

Source: Food and Agriculture Organization, Yearbook Fishery Statistics, Products (Roma, 1992).

But many disparities still survive. The consumption per inhabitant is, for example, three times higher in occidental regions than in developing countries. In the EEC, it varies from 8 kg/year/inhabitant in Netherlands to 57,7 kg/year/inhabitant in Portugal. Finally, the first five countries (China, Japan, CIS, USA, India) consume half of the world production. In 1990, great regions of consumption remained Asia (51,8 %), CIS (12,1 %), EEC (11,1 %) and Northern America (8,6 %). By contrast, three regions had a weak consumption: Africa (6,2 %), Latin America (5,5 %) and Eastern Europe (1,4 %).

Some three fourths of fish and shellfish goes into human consumption, a third of this consumed fresh and a further third being sold frozen. Of the remaining third, approximatively half is sold canned and the rest sold dried, smoked or salted.

Third World countries usually consume fresh or little processed (dried, salted or smoked) products. On account of the fish specificity (smell, difficulties of preparation etc.), developed countries prefer processed products: frozen fishes, cans, prepared dishes etc. CIS and Eastern european countries experiences an intermediate situation. Fresh or frozen fishes are often scarce. In CIS, this shortage of fresh fish can be explained by the removal of great harbours (Mourmansk, Riga, Vladivostok etc.) from different centers of consumption (Moscow, Kiev etc.). By contrast, cans and dried, salted or smoked products are often appreciated in these countries: herrings in the CIS, cod in Poland, mackerels in Bulgaria etc.

In last decades, the demographic bursting, the growth of the urban population, the putting up of the general standard of living (especially in developed countries) and the rise of intensive farmings have heavily contributed to the increment of fish and shellfish demand. But in the short term, the consumption depends above all, on the prices of these products, as fish have many substitutes (meats etc.). Others factors can be taken into account. Consumption fluctuates for example with consumers' anticipations. In Germany, after the Nematod crisis of 1987, the consumption has fallen by 50 to 60 %.

d) Prices

Real prices of fish are growing faster and more irregularly than those for other food commodities, such as meat or grains. In the short term, this evolution can be explained by the situation of the supply, which is generally fluctuating and rationed. By contrast, in the long term, fish and shellfish prices are above all determined by the demand.

Indeed, the make up of fish prices expresses an intricated phenomenon. In fresh, catches are generally sold by auction. So, wholesale prices fluctuate according to the law of supply and demand. Nevertheless, in most of OECD countries, the State interferes with a minimun price policy. Products bought in auctions are generally sold again in national markets (Tsukiji in Tokyo, Rungis in Paris etc.), where prices form gropely, retailers buying after having compared different supplies. But many parallel circuits coexist. In OECD, some restoratives and some great commercial chains lay for example directly from wholesale fishmongers. In some countries of the Third World, fishermen sell directly theirs products to consumers, when in others countries (India etc.), the system of distribution has become more and more complex, with the multiplication of middlemen.

In fresh, the price can also escape to the market system, with the instauration in some countries of official prices (Angola, Burundi etc.).

The case of processed products is still different. Processing industries usually lay from shipowners, within the framework of delivery contracts. So the purchase price doesn't fluctuate in the short term, as it is agreed in advance. Meanwhile, the retail price is more variable as it includes processing and distribution costs.

Concerning the international price, it isn't fixed on a real market, which would be a sort of world auction sale. In fact, this price results from traders' arbitrations between different national markets. With the general domination of one or two centers of consumption, that means that the international price of a product has usually as matrix, the price of this product in a dominating country.

2) INTERNATIONAL TRADE

The world trade experiences an expansion period. Indeed, in value, exchanges have been multiplied by 30 in 3 decades, to reach 39 US $ billion in 1990.
38 % of the world production (31,5 % in 1981) is sold in international markets and this figure reach even 52 % for fishmeals, 65 % for crustaceans and molluscs products etc.
If industrialized countries absorb about 90 % of total exports, the three main markets (EEC, Japan and USA) effect 80 % of world imports. In last years, the part of Japan and EEC have even been reinforced.
By contrast, developing countries (Thailand, South Korea etc.) are of growing importance for exports, accounting for 45 % of world supplies in 1990, compared to just 25 % in 1963. To the leadership of Asia (32 % of world exports) and Latin America can be opposed the relative retirement of Africa, which on a global point of view exports less than Thailand. Nevertheless, the part of developed countries remains essential as Europe effect one third of world exports and Northern America one sixth. And in fact, it is among developed countries that we can find most of great exporters (USA, Canada, Denmark, Norway etc.).
however, globally, the commercial deficit increases in developed countries. It has more than tripled in ten years, to reach 14,2 US $ billion in 1990.

FISH AND SHELLFISH IMPORTS
BY COUNTRIES AND BY REGIONS

	Imports in US$1000		Percentage change	Share in %	
	1985	1990	1985-1990	1985	1990
1-Japan	4744,3	10668,3	+ 124,9	25,5	27,1
2-USA	4051,8	5573,2	+ 37,5	21,8	14,1
3-France	1039,8	2809,0	+ 170,1	5,6	7,1
4-Italy	985,0	2458,1	+ 149,6	5,3	6,2
5-Spain	412,2	2360,7	+ 472,7	2,2	6,0
6-Germany a)	854,2	1916,8	+ 124,4	4,6	4,9
7-United-kingdom	940,6	1911,2	+ 103,2	5,1	4,8
8-Denmark	370,4	1116,1	+ 201 3	2,0	2,8
9-Hong Kong	471,6	1111,9	+ 135,8	2,5	2,8
10-Netherlands	308,4	843,5	+ 173,5	1,7	2,1
Europe	6464,8	16780,7	+ 159,6	34,7	42,6
EEC	5538,4	15080,1	+ 172,3	29,7	38,3
Asia	6301;9	14513,2	+ 130,3	33,9	36,8
Northern America	4602,5	6447,3	+ 40,1	24,7	16,4
Africa	653,2	886,4	+ 35,7	3,5	2,2
Oceania	313,9	464,3	+ 47,9	1,7	1,2
Southern America	125,8	155,9	+ 23,9	0,7	0,4
CIS	157,1	163,0	+ 3,8	0,8	0,4
World	18619,2	39410,8	+ 111,7	100,0	100,0
North	16135,0	34383,6	+ 113,1	86,6	87,2
South	2484,2	5027,2	+ 102,4	13,4	12,8

Source: Food and Agriculture Organization, Yearbook Fishery Statitics, Products (Roma, 1987 and 1992)

a) Unified Germany

FISH AND SHELLFISH EXPORTS
BY COUNTRIES AND BY REGIONS

	Exports in US$1000		Percentage change	Share in %	
	1985	1990	1985-1990	1985	1990
1-USA	1162,4	3019,9	+159,8	6,7	8,3
2-Canada	1359,2	2269,8	+67,0	7,8	6,2
3-Thailand	675,1	2264,9	+235,5	3,9	6,2
4-Denmark	952,7	2165,5	+127,3	5,5	5,9
5-Norway	922,5	2059,8	+123,3	5,3	5,7
6-China	366,9	1622,1	+342,1	2,1	4,5
7-South Korea	796,9	1363,3	+71,1	4,6	3,7
8-Netherlands	543,7	1332,9	+145,2	3,1	3,7
9-Iceland	617,4	1240,3	+100,9	3,6	3,4
10-Indonesia	236,6	978,7	+313,7	1,4	2,7
Europe	5285,0	12058,9	+128,2	30,5	33,1
EEC	3329,8	7908,9	+137,5	19,2	21,7
Asia	5322,8	11650,3	+118,9	30,7	32,0
Northern America	3402,9	6459,2	+89,8	19,6	17,7
Southern America	1490,4	2638,1	+77,0	8,6	7,2
Africa	823,5	1649,8	+100,3	4,7	4,5
Oceania	640,1	1038,4	+62,2	3,7	2,9
CIS	383,9	933,5	+143,2	2,2	2,6
World	17348,6	36428,2	+110,0	100,0	100,0
North	9684,8	20167,4	+108,2	55,8	55,4
South	7663,8	16260,8	+112,2	44,2	44,6

Source: Food and Agriculture Organization, Yearbook Fishery Statistics, Products (Roma, 1987 and 1992)

3) GREAT MARKETS

The international trade is organized around some great world markets. In fact, the notion of a world market applies rather only to the big trade items: shrimps, groundfishes, tunas, salmons, cephalopods, small pelagics and industrial products.

GREAT WORLD MARKETS

PRODUCTS	% OF WORLD TRADE	MAIN EXPORTERS COUNTRIES	MAIN IMPORTERS COUNTRIES
Groundfishes	**18,2**		
Fillets FCF	10,1	Canada (16,8), Denmark (14,1), Iceland (13,3), Norway (5,2)	USA (30,6), Germany (12,2), UK (11,8), France (11,4)
Gadiformes FCF	3,2	Denmark (15,5), USA (15,1), Chile (11,7), Iceland (10,0)	Spain (21,5), Denmark (15,9), UK (13,8), France (8,0)
Flatfishes FCF	2,4	Netherlands (32,3), USA (12,3), Iceland (7,3), Denmark (7,3)	Japan (22,6), Spain (12,8), Netherlands (12,0)
Gadiformes DSS	2,5	Norway (36,6), Iceland (21,3), Canada (15,6)	Portugal (38,3), Italy (17,8)
Shrimps FCF	**17,0**	China (13,8), Thailand (12,6), Indonesia (10,1), India (5,9), Ecuad (5,8), Hong-kong (4,5), Mexico (3,6)	Japan (38,3), USA (25), EEC (21,9)
Tunas	**9,2**		
Tunas FCF	6,3	Korea Rp. (14,9), Spain (8,0), Singapour (6,3), Fr(5,6), Japan (4,4)	Japan (36,7), Thailand (24,9), USA (10,2)
Tunas in cans	2,9	Thailand (47,5), Côte d'Ivoire (9,9), Philippines (8,4)	USA (28,5), France (14,9), UK (13,0)
Salmonids	**6,7**		
FCF	5,8	Norway (36,0), USA (31,3)	Japan (40,6), EEC (36,7)
Cans	0,9	Canada (42,1), USA (34,1)	UK (51,2), Australia (12,6)
Industrials products	**4,6**		
Fishmeals	4,0	Chile (32,8)*, Peru (32,0)*, Denmark (7,5)*	EEC (45,0)*, China (25,0)*, Japan (10,0)*
Fish oils	0,6	Japan (21,7), USA (12,3), Iceland (8,7), Norway (8,5)	UK (17,9), Netherlands (16,4), Germany (11,5), Norway (8,5)
Cephalopods	**4,0**		
FCF	3,7	Morocco (15,8), Thailand (14,5), Spain (11,5), Mauritania (10,0)	Japan (47,5), Italy (16,9), Spain (14,7)
DSS	0,3	Thailand (36,7), Vietnam (16,3)	Japan (34,3), Hong-Kong (32,4)
Small pélagics*	**4,0**		
Herrings, anchovies, sardines	2,8		
Cans	1,5	Morocco (22,3), Portugal (11,0)	USA (15,5), Ger. (15,4), France (10,7), UK (8,5)
FCF	0,9	USA (17,7), Netherlands (15,5), Norway (12), UK (7,8), France (7,5)	Japan (32,9), Spain (11,1), Denmark (9,4)
DSS	0,4	Netherlands (16,9), Iceland (16,0), Spain (13,7)	Italy (31,8), Ger. (21,4), Spain (15,7)
Mackerels	1,2		
FCF	0,8	Norway (30,3), UK (15,9), Netherlands (12,7)	Japan (33,1), Netherlands (8,0), France (7,2), Nigeria (5,6)
Cans	0,4	Denmark (27,6), Japan (22,9), Portugal (12,3), Morocco (7,8)	Papua New Guinea (23,5), Italy (19,3), Germany (8,4)

Data in value, 1990 (Food and Agriculture Organization, Yearbook Fishery Statistics, Products (Roma, 1992))

*: Data in volume, 1992 (Fishmeal Exporters Organization, Annual Conference (Paris, 1992))

FCF: Fresh/Chilled/Frozen DSS: Dried/Salted/Smoked *: Not including jacks, mullets etc.

a) Shrimps market

Various species of shrimps and prawns are traded internationally, each generally with its own specific market. Shrimp production has doubled over the past 15 years, mainly due to the extension of fish farming (750 000 tonnes), which now accounts for a quarter of world supplies in this subsector. Shrimp farming is above all practised in asiatic regions (Indonesia, China, Thailand etc.) and in Southern America (Ecuador etc.).

World trade has tripled in value over ten years, now accounting for around a sixth of all world trade in the fish and shellfish sector. The shrimp market is characterized by a high number of sellers and a small number of buyers. Exporters are Third World countries, especially in Asia and South America. There are three main import markets: Japan, the EEC and the US and these three effectively define the world import market.

Japan is the largest trading center and the lead market, in determining prices in world markets. Japanese shrimp prices follow an approximatively three-year cycle. This cycle can be illustrated by the growth of prices from the start of 1987 to mid -1988, their fall thereafter until the end of 1989, their subsequent rise again in 1990, with a new decline until mid-92 and a growth in 1993.

Price fluctuations are generally due to a number of factors. Increases often correspond to rises in the value of the yen. Demand levels also play a key role in prices. In 1992, japanese shrimp consumption, weak during the beginning of the year, increased until september, with a drop in the last quarter.

Asiatic zone always control this market, with 80% of total imports. Futhermore in the mediun term, the part of countries like China, India, Indonesia or Malaysia could increase. But, beside black tigers, freshwater species, now more abundant (Greenland, Norway) could also find important channels on this market.

In the United States, shrimp consumption tended to decrease in 1992. Parallel to this, national supply was down, with a weakening of stocks and a decline of landings. In this context, prices increased quickly by about 30%, during the first three quarters of the year. Parallel to this, imports increased. But at the end of the year, demand weakened with a fall of prices.
This market remains essentialy supplied by asiatic regions (half of supplying) and by southern american countries. In the medium term, countries of Southern America could regain a part of their preponderance of former times. Indeed, their production spread out quickly (Ecuador etc.). Moreover, some chinese or thai groups, like Charoen Pokphand already think to multiply their investments (Mexico etc.), in order to profit of the future great market of Northern America.

In Europe, the market picture is more complex. Globally, imports have tripled in ten years, with three main markets: Spain (75 000 tonnes), France (60 000 tonnes) and United Kingdom (50 000 tonnes).
Price movements here depend on numerous factors. For nordic species, they move with catches, which were especially abundant in 1992. So, in some months, prices collapsed. In june 1992, Crangon Crangon were sold, for example, at 1,35 US $ /kg compared to 6,90 US $/kg, a year before. In this context, exchanges increased quickly, especially in France and in United kingdom.

By contrast, on the european market of tropical shrimps, prices increased in order to fall into line with world prices. During the first three quarters of the year, the Indian Brown price has for example increased by 20% in Europe.
The outlook for further growth remains considerable, given that the european consumer consumes four times less than his japanese counterpart. In this regard and in the short term, sales of black tiger shrimp from suppliers such as Thailand, Indonesia and Malaysia should strongly increase, to the detriment of the intrinsicly more expensive and rarer cold water varieties of shrimp. Parallel to this, the part of high added value products (cooked, shell on and packaged shrimps) of Third World countries might also increase quickly on these markets.

b) Groundfishes market

The groundfishes family includes essentially gadiformes and flatfishes. Used for human consumption, they represent one fifth of world trade in fish and shellfish overall. Aside from the less important dried, smoked and salted market, the majority of trade is in the form of fresh, chilled or frozen fish and surimi.

The fresh, chilled and frozen market is by far the more important here, with traditionally a shortage of supply. In 1992, cod catches decreased heavily in most of producer countries (Canada, Iceland, Greenland, Feroes Islands, Denmark). By contrast, some areas experienced a relative abundance, with especially an increase of catches of cods in Barentz sea (Russia, Norway), an increase of catches of capelins in Iceland and good fisheries of hakes (Poland etc.) or of pollack (Russia, USA, South Korea etc.). But following a tendancy initiated in 1989, the demand remained especially weak in 1992.
In this context, exchanges and prices tended generally to drop, in 1992, in Europe and in the USA. According to this tendancy, in 1993 cod prices might stabilize in the United States and fall in Europe, with the duty free imports of norwegian products. In order to prevent this evolution, EEC has instaured in february 1993, a policy of import minimun price.

The market of surimi profited of this evolution. With the abundance of pollacks and the collapse of fillets prices, the surimi base price, especially high in 1991 tended to drop in 1992. Japan still effects the main part of the world supply (1,4 million tonnes) of surimi products, but this production is increasingly meeting competition from the industrial countries of the Asia-Pacific region (South Korea etc.). Japanese exports of surimi fell in fact by 75 %, from 1986 to 1991.
In 1993, surimi price might increase. In time, this market should grow increasingly global and increasingly diverse, supported by abundant and cheap supplies of fish, that means not directly substituable for cod.

c) Tunas market

The international tunas market (3,6 US $ billion) concerns essentially major species: bluefin, albacore and tropical tunas (yellowfin, skipjack and patudo). The major forms of trade are canned and fresh, chilled or frozen tunas.

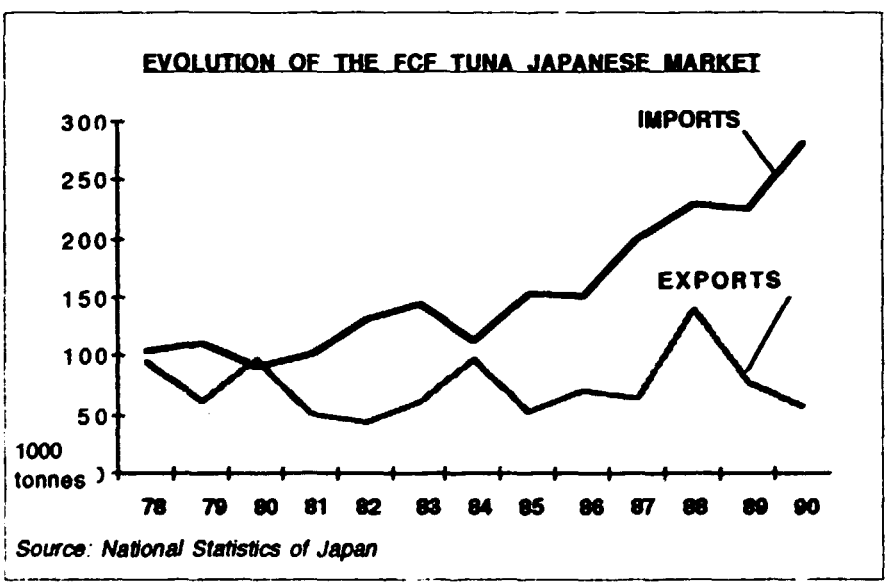
Given the duties that exist on canned foods, the fresh, chilled and frozen market is traditionally the most important. After the tuna crisis of 1975 and 1982, this subsector is again, since 1990, marked by falling prices.

In fact, all the elements of an heavy crisis are in position. With 3,6 million tonnes in 1990, tuna catches experience an abundance of medium term (trebling in 20 years). This abundance of catches lowers prices, but the structure of the market still amplifies these movements. Distinguished by some customers and by many suppliers (South Korea, Taiwan, EEC, USA, Indonesia, Mexico etc.), fresh, chilled or frozen tuna markets are traders' markets, with a spot structure (80% of exchanges) heavily internationalized. Since 1990, the american embargo on tunas of Eastern Central Pacific, catched with dolphins has worsened this crisis. About 10 % of the world supply has been cleared, with discounts of between 15 to 30 %, lowering prices in the whole market.

Globally, fresh, chilled or frozen tuna exchanges have tripled in value, in a decade. Generally, this trade takes place in an inter-regional basis, linking fishing zones to the nearest major consumer markets, these latter effectively Japan, the US, Thailand and Italy, with an increasing trend toward globalization.

Dominated by yellowfin and bigeye, the japanese market has progressively become, in the eighties, an imports market (two fifths of the world imports) supplied above all by the Pacific region (Taiwan, South Korea etc.).

The other three markets concern canneries species, with varial evolutions. With the embargo and competition from asian tuna canners, the US market is in net decline, over the medium term. By contrast, the italian market experienced sustained growth, with abundant supplies and growing demand. In Thailand, the volume of tuna imports usually from the asiatic region, (Taiwan, South Korea, Japan etc.) tends to decrease.



In the canned tuna market, the major exporters continue to be Third World countries: Southeast Asia, West Africa etc. the major import markets are in Europe and in the US. In 1992, american market (a quarter of world imports) has experienced a depressive context, with relatively low prices. While some three fourths of US imports continued to come from Thailand, Philippines, Indonesia and other Asian exporters were playing an increasing role in the market.

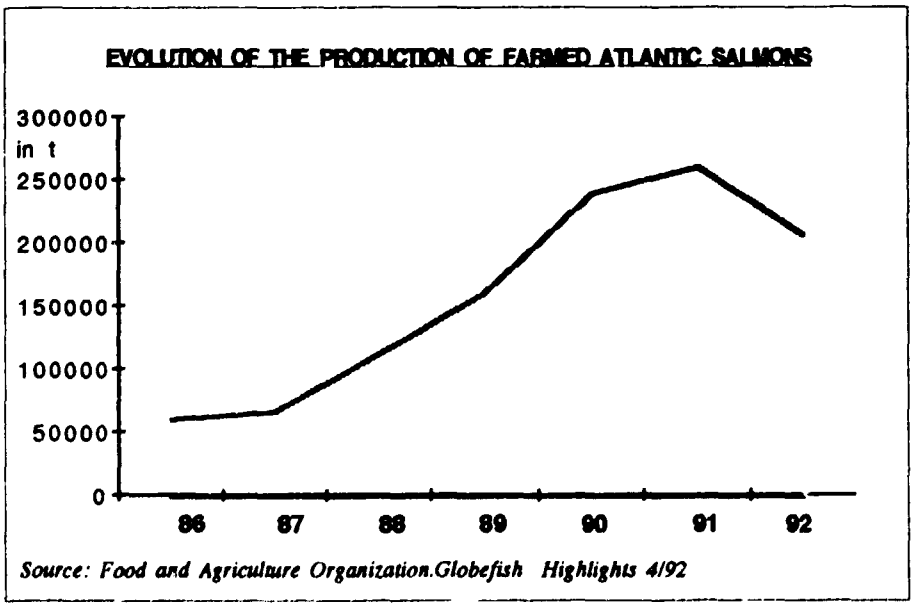
In Europe, low prices (decrease by 1/6 during the first three quarters) helped to stimulate an increase in trade, in France and United Kingdom. By contrast, the demand was more moderate in Germany, with imports in fall of a quarter, during the first three quarters of the year. If the french market remains essentially supplied by West Africa, the part of Madagascar and of asiatic countries is increasing and may still increase, with the single market. German and british imports originate essentially of Southeast Asia, of Thailand, but also of Philippines, Indonesia and Maldives.

d) Salmonids market

Salmonids include many species, but especially salmons and trouts. In 1992, world production of salmon was an estimated 1,1 million tonnes, a fourth of which were farmed salmon. Farmed salmon has gone through a period of spectacular growth, especially in Norway and in the United Kingdom and also in Canada, Japan and Chile.

But in 1992, in order to fight against oversupply, farmers have voluntary reduced their deliveries. Parallel to this, world catches of wild salmons, traditionally dominated by United States, Japan, CIS or Canada decreased in 1992.
But in spite of this evolution, salmon prices have continued to drop in the beginning of 1992, with great sales of norwegian stocks. In Germany, in march 1992, big atlantic salmons were sold for example at 6,80 US $ per kg compared to 8,7 US $ per kg a year before and 10 US $ per kg in 1988. However, in the second part of the year, atlantic salmon prices have notably increased, with slight drop at the end of the year.
Parallel to this, demand and exchanges (430 000 tonnes in 1990) quickly progressed in different fresh, chilled or frozen markets. Traditionally, this is a regional trade, with Japan importing from the US (and more and more from Chile) and the EEC importing from Norway and United Kingdom.

In the medium term supplies of salmonids could continue to grow. The catch of wild salmon will remain variable, but overall increasing, so long as conservation measures are respected. On an



Source: Food and Agriculture Organization.Globefish Highlights 4/92

other side, the reorganization of the salmon farming, undertaken in Europe risks being sapped by the development of this activity in others countries, like Chile, Canada, Japan etc. A great part of this supply will probably find new market opportunities, for example in supermarket chains. So, in time, salmon will gradually go from being a luxury item, to being one of the more commonly consumed fish.

e) Cephalopods market

The world cephalopod market (squids, cuttlefishes, octopus) has doubled in volume over ten years. It is a highly concentrated trade with Japan, Spain and Italy accounting for 80% of purchases. Supplies however are more widely scattered, with Third World countries among main suppliers. Mauritania, Thailand and Spain are the leading exporters.

After abundant markets of 1988 and 1989, squid markets until the first quarter of 1992 faced shortages of supplies, in a context of relatively low prices. But with the recovery of fisheries, after april 1992, prices tended to drop and more especially as demand weakened in Japan. Only some european markets (Spain, Italy) experienced, at the end of 1992, an increase of prices and a relative shortage of supplies, linked to cuts of indian landings.
Parallel to this, world exchanges which dropped in 1991, increased quickly in 1992. In the first three quarters of the year, japanese imports increased for example by half. On this market, Argentina asserts itself to the detriment of eastern european countries and to the detriment of the States of the Pacific belt (Thailand, Taiwan, New Zealand, South Korea etc.). European markets are traditionally for their part supplied by North Africa (Morocco), by Eastern countries (CIS, Poland) and by asiatic regions, Thailand and more and more India.

Cuttlefish is chiefly supplied out of Southern Europe (France, Italy, Spain), out of Asia (Thailand, South Korea). Production is falling in the medium term. In Japan, consumers are very fond of top quality cuttlefish, which is generally eaten raw. Since mid 87, the market has experienced high prices, especially at the end of 1992. In decline in 1991, japanese imports increased slightly in 1992, with Thailand and the group Morocco-Spain-Mauritania as main suppliers. In Europe, Italy represents an important place for small cuttlefishes frozen in blocks. On this market, which experienced a drop of prices at the end of 1992, major exporters remain France (30%) and west african countries. Spain imports for its part near of 16 000 tonnes of cuttlefishes, essentially from african countries (Morocco, Mauritania etc.), from South Africa and from India.

The 280 000 tonnes world catches of octopus are mainly fished by Japan, Morocco, Spain and Mauritania. In 1992, catches were relatively abundant, especially in the Eastern central Atlantic. In this context, prices which have doubled in four years, tended to decrease. So, exchanges spread out quickly, especially in japanese market, mainly supplied by Morocco and also more and more by Spain and Mauritania.

Cephalopod market could further develop, given that large resources remain, notably in the Atlantic. Some sixty species are marketable, and demand should grow in countries such as Spain, Italy or South Korea. But in 1993, with the drift net fishing prohibition, the face of markets could change. Indeed, traditionally, japaneses and South Koreans catched more of 200 000 tonnes of squids, in the North Pacific, thanks to these technics, now prohibited. So, their fleet could fall back upon peruvian and mexican stocks.

f) Small pelagics market

Small pelagic species include sardines, pilchards, anchovies, herings, mackerels and the like. Globally, these fishes represent nearly half of the total world maritime catches and a quarter of canned fish preparations.

Half of international pelagic transactions are accounted for by sardines of various types, generally canned. Since 1988 (and with the exception of the beginning of 1989), this market has been hit by bad catches by Spain, Italy and Morocco. Parallel to this, prices tend to increase, except in Germany. In this context, exchanges decrease with notable changes of markets. In Asia, Thailand progressively takes the place of Japan, when in Europe, the part of Morocco increases (except in France) quickly, to the detriment of Portugal.

The world mackerel catch totaled some 2,6 million tonnes in 1990. Conditions are stable for this market, which by volume accounts for 4,1 per cent of canned fish production and 1,2 per cent of world trade in fish and shellfish. Fresh fish is traded mostly in Europe and in the Pacific region. The canned mackerel market for its part is similarly european (for Atlantic mackerel) and asian. Denmark continues to be the main supplier to european clients (especially Italy and Germany), with Portugal increasingly displacing Morocco. In Southeast Asia, japanese exports, mostly now to Papua New Guinea are on the decline. In 1980, Japan exported 200 000 tonnes of mackerel, compared to 13 400 tonnes, twelve years later. This long term decline is due to the competition from other asian countries, notably from Thailand and also to a decline in resources, linked to the creation of 200 mile economic zones in the early 1980s and to the introduction into many asian waters of the japanese sardine, a predator of the spanish mackerel.

Different trade patterns exist for other small pelagics, for instance for anchovies, sauries and jacks. The trade in fresh, chilled of frozen herrings has notably increased in 1992, with the new abundance of catches and the decrease of prices. Now, most of the great herring markets (Western Europe, Northern America, CIS, Eastern Europe) develop on a regional basis. Only Japan remains notably internationalized, with imports originated from the United-States, from Europe (Norway) and from Canada (roes). Globally, the demand for herring will probably no increase notably in the next few years. But the catches will increase largely, with important drops of prices and an increasing part processed into feashmeals.

The future of the small pelagics market remains uncertain. Supplies are fluctuating and overfishing threatens all of these species, with the possible exception of anchovies, herrings and sardines (Angola, mauritania). This threatens to limit the potential of these markets, while at the same time, world demand seems to be weakening, except perhaps in some Third World countries and in the medium term, in Eastern Europe. Still, this evolution constitutes no great threat to the pelagic fishing industry, insofar as these fish are increasingly processed into oil and fishmeal.

g) Industrial products market

Fish oil is made primarily from fish such as pilchard, menhaden and capelin and is chiefly used by the margarine industry. Some 1,3 million tonnes of fishoil is used annually, accounting for 2 % of world consumption of edible oils. On average, Japan produces a fourth of the world total,

south american producers (mostly Peru and Chile) some 40 % and a further fifth coming from european producers (chiefly Denmark, Iceland and Norway).
Since 1989, this industry has experienced a short supply. In 1992, the fish oil production still decreased, except in some european countries (Iceland etc.), which profit of good catches of herrings and capelins. This global tendency can be explained by the shortage of catches (Japan) or by the weakness of yield (Northern and Southern America).
Parallel to this, following the abundance of vegetable oils, the price of fish oils experiments since mid 89, a notable appreciation of medium term.
In this context, the world trade decreased by one third in 1991, to reach 370 000 tonnes in 1992. But this evolution is less explained by the drop of demand than by the restriction of supply, with the fall of peruvian and japanese exports.
In 1993, the price competitivity of vegetable oils might still keeping up, as the global supply in fishoil might not increase, with in consequence a new appreciation of prices.

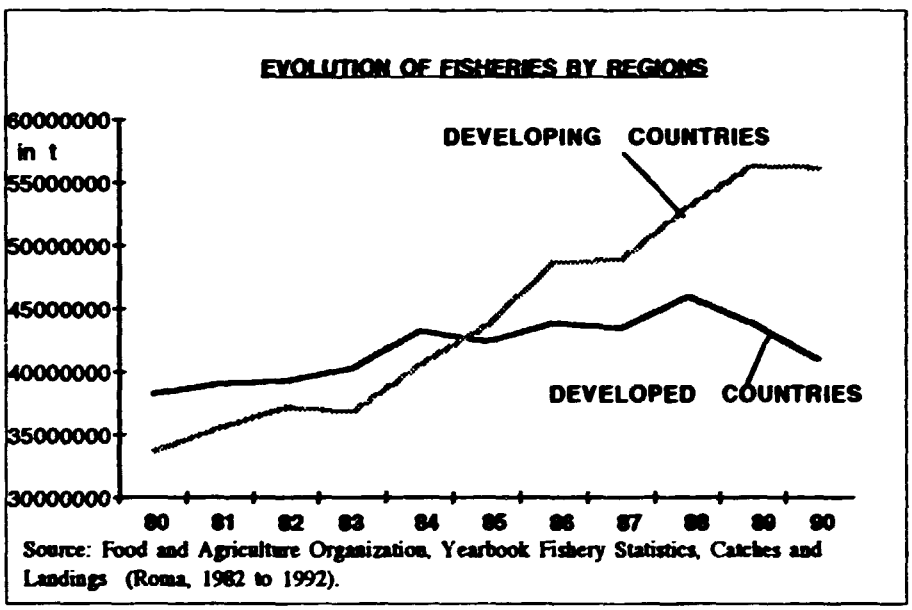
Fishmeal is made from fish such as pilchards, jacks, anchovies, and menhadens. This production originates for 2/5 of southern America (Chile, Peru), for 1/7 of the Far East (Japan, Thailand, China), for 1/8 of Northern Europe (Denmark, Norway, Iceland) and for 1/10 of CIS. Estimated to 6,1 million tonnes in 1992, this supply experiments a drop since 1989, especially noticeable in Japan and in CIS.
In Japan, with resources becoming rarer, the production has for example dropped by 3/5 between 1988 and 1992. Due to the general decay of its fishing fleet, the CIS's production is also in decline, with a fall of 12,3 % in 1992 alone.
With these variations in world supply, stocks of fishmeal which were already going down in 1991, diminished still further in 1992, keeping it a costy product and meaning that it was unable to gain in competitiveness next to soya, in 1992.
Although the volume of sales of fishmeal grew by a third between 1980 and 1985, trade has tended to stagnate around 3,3 million tonnes, today worth 2 US$ billion.
Transactions used to be on a "North-South" basis. The Third World still provides most of the total sales, as Latin America alone (Chile, Peru) takes care of 2/3 of exports worldwide. Up against restrictions in production, Japan has lowered its sales and is now becoming a major importer. In the West, only Northern Europe (Denmark, Iceland, Norway, Germany) is still an important seller, with 1/5 of the fishmeal export market.
This pattern is nonetheless altering rapidly and the changes can be sketched in terms of three major movements. First, with the development of aquaculture, southern countries such as China, Thailand, the Philippines and Indonesia have become important importers. For example, China which today produces 30 million tonnes of animal feed per year, imports some 660 000 tonnes of fishmeal. Second and by contrast, the former soviet bloc countries, short of hard currency have progressively disengaged from these markets as buyers. Third, some of the industrial countries such as germany and the USA are rather permanently withdrawing soybean meal as a substitute in animal feeds. Together, these three movements are revising trade patterns for this commodity and helping to develop a market far more concentrated at the export level than the import level.
To simplify things, the market should organize itself on a regional basis, with Latin America supplying Asia and South Africa and Northern Europe looking after the continental markets.
In the short term, supplies will remain tight, with a possibility of increasing prices. however,

the market should benefit from sustained demand in the Far East as well in Western Europe. Slightly more long term, around the year 2000, aquaculture will probably use 1/3 of the world production of fishmeal and therefore encourage the continued development of this sector.

4) MARKETS AND CAPACITIES OF DEVELOPING COUNTRIES

a) Production and exports capacities of developing countries

The part of developing countries in world fisheries increases regularly, and since 1985, in volume, they produce more than OECD countries.



Source: Food and Agriculture Organization, Yearbook Fishery Statistics, Catches and Landings (Roma, 1982 to 1992).

But a great part of this development is linked to inland fisheries. In 1990, Third World countries effected 86,1% of world inland catches, compared to only 80,6% in 1981. In developing countries, this fishery represents 22,1% of landings compared to only 4,8% in OECD. This increasing part of inland fisheries in the Third World partly explains the success of aquaculture (carps etc.) in these regions. Indeed, in 1990, in value, developing countries effected 66,9% of the world aquacultural supply, compared to only 61,9% in 1984. But this success can also be explained by the spectacular development of marine aquaculture: farming of shrimps in Thailand, India, Indonesia or Ecuador, farming of salmons in Chile etc. Parallel to this, in the last years, marine catches have also experienced a considerable growth in developing countries. Indeed, between 1981 and 1990, these catches have increased by 50,2% in those regions, when they only increase by 4,2% in OECD.

But this success in only partial. On average, a Third World inhabitant fishes three times less than a westerner. In Africa, in 1990, landings/year/inhabitant reached 8 kg, compared to 13,9 kg in

developing countries, 19,7 kg in the EEC, 27,1 kg in Northern America, 32,9 kg in developed countries and 37,9 kg in Japan. Parallel to this, the relative development of Third World countries conceals serious regional distortions. Indeed, in 1990, eight countries (China, Peru, Chile, India, Indonesia, South korea, Thailand, Philippines) effected 72% of landings and 90% of the increase of catches (1981-1990) of the whole Third World. Three of them (China, India, Indonesia) effected even two thirds of the aquacultural production. On this point, the case of Africa is exemplary. Globally, Africa fishes less than Chile, with an aquacultural production three times lesser than in France.

Developing countries don't profit by the richest fishing areas, which are usually in the northern hemisphere. They are also confronted to access problems. Indeed, the ten richest countries of the planet dispose of 36,5% of the world EEZ, compared to 1,8% for the ten poorest countries. But the deficiency of catching means often worsens this situation . Indeed, in Third World countries, small boats are especially frequent, with some problems: lack of rechanges and of maintenance, important losses during the carriage, absence of credit... In a human point of view, 15 million persons work in the Third World fisheries, with often problems of formation. Nevertheless, some States have succeed to create a real industrial fleet. It's the case of Chile, Senegal, Mauritania etc..

But for many Third World countries, the main topic remains the valorization of products. In spite of some examples (Morroco, Indonesia, South Africa, Argentina etc.), the canning factories are often scarce in those countries, with many impediments: deficiency of financial means, prohibitive costs of imported cans, little quality of oils etc.. Nevertheless, the canning factories could spread out in those countries, as this industry usually requires an abundant and quickly formed staff. Congelation factories are often scarce in Third World countries, with specific handicaps: absence of fish hold, of isothermal containers, lack of cold stores, of ice, of combustible etc.. The drying and salting industry only requires small investments. So, it is often practised in developing countries by small scale exploitations, that have however to affront many problems: deficiency of the salt supplying, little quality of the packing etc.. The fishmeal industry has only spread out in some countries (Chile, Peru, South Africa), as it is above all a capital industry, which requires few labor.

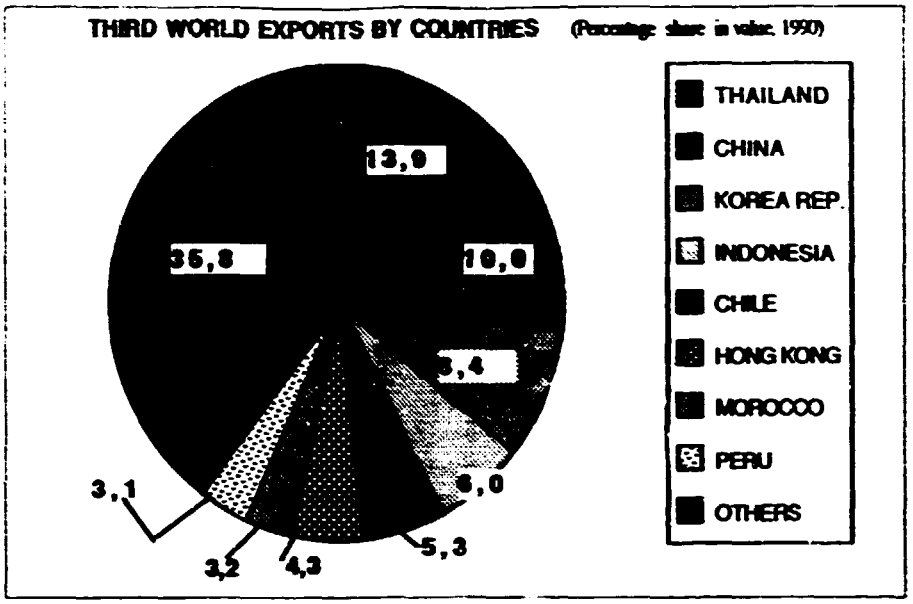
With the growth of the production, fish and shellfish exports have heavily increased in Third World countries. In 1990, these exports represented 16,3 US $ billion, compared to only 6,7 billion in 1981. Nevertheless, some countries still domineer this trade, as the first ten exporters (Thailand, China, South Korea etc.) effected ,in 1990, 60,2% of exchanges.

In value, 3/4 of these exchanges concerned high valuable products (crustaceans and molluscs, fresh, chilled or frozen fishes). By contrast, cans only represented, in 1990, 17,5% of Third World exports, industrial products 5,8% and dried, salted or smoked products 1,7%. As developing countries exports valuable products, they had, in 1990, a commercial surplus of 11,2 US $ billion.

b) Evolution of Third World markets

Third World markets remain narrows.

Nervertheless, the fish and shellfish consumption speads out in these countries. In 1989, in volume, developing countries consumed 51,8% of the world production, compared to only 38,5% in 1961. But this consumption remains unequally distributed. Indeed, the first five consumers (China, India, Indonesia, South Korea, Philippines) effected in 1989 half of purchases. In 1989, the consumption/year/inhabitant reached 9,1Kg in the whole Third World but 100 g in



Source: Food and Agriculture Organization, Yearbook Fishery Statistics, Products (Roma, 1992)

Ethiopia, 800 g in Bolivia, 35,5 kg in Congo, 42,3 kg in Fiji, 52 kg in South Korea etc.. Moreover, regional distortions are also frequent. In India, 95% of the fish is for example consumed in coastal zones.

But these markets are little open to imports. In 1990, with 5 US $ billion, the Third World only effected 12,8% of world fish and shellfish imports. However, these exchanges quickly spread out, as they have doubled, in value, in the eighties.
Aside from Hong Kong (22,1%), the first Third World importers remains Thailand (15,8%), South Korea (7,3%) and Singapore (7,2%). Sign of this retirement of developing countries, China imports 14 times less than Spain, Southern America doesn't buy more than Nigeria and Africa less than the small Hong Kong.
Half of these purchases concern fresh, chilled or frozen fishes, 1/5 crustaceans or molluscs (fresh, chilled, frozen, dried or salted), the last third being equally distributed between industrial products, cans and dried, salted or smoked products.

5) INDUSTRIAL STRUCTURE

a) Great companies.

In 1990, 13 of the 100 world agro-alimentary leaders practised a fish and shellfish processing, with a turnover, ranging from 2 to 40 US $ billion.

In Japan, these groups (Taiyo Fishery, Nippon suisan Kaisha, Nichirei corporation, Nichiro corporation) are really specialized in fish and shellfish. By contrast, in Europe and in the United States, the agro-alimentary groups have simply diversified theirs activities in fish and shellfish. Unilever or Nestle intervene for example indistincly in all the agro-alimentary sector, with only some trademarks (Findus, Igloo etc.) for fish and shellfish.

b) Industrial strategies

Now, great processing companies carry a triple strategy of concentration, of diversification, and of internationalization.

With the development of industrial fisheries, the scale of companies has notably increased. In Spain, Pescanova effects for example 40% of the national fish market. In Japan, the processing

GREAT COMPANIES AND FISH AND SHELLFISH ACTIVITIES

	Nationality	Turnover 1990 in US$ millions	Net profit 1990 in US$ millions	Assets 1990 in US$ millions	Effectives in 1990	Activities in 1990
Unilever	Netherlands/UK	39972	1638	24806	304000	Alimentary products, fish and shellfish products.
Nestlé	Swiss	33359	1635	27859	199020	Alimentary products, fish and shellfish products, mineral W.
Conagra	USA	15518	232	4804	58370	Alimentary products, fish and shellfish products.
Hillsdown Holdings	United-Kingdom	7537	108	4093	50000	fish and shellfish products, meats, fruits and vegetable cans, pet foods, biscuits, jams etc..
Taiyo Fishery	Japan	7439	40	3191	2530	Fish and shellfish products.
General Mills	USA	6487	381	3290	97240	Cereals,snacks,condiments, deep frozen products, fish and shellfish products.
HJ Heinz	USA	6112	505	4488	37300	Sauces, pet foods, condiments, fish and shellfish products.
Procordia	Sweden	5339	54	5884	44650	Confectioneries, beer,mineral waters, vegetable cans, fish and shellfish products, meats, sugar.
Booker PLC	United-Kingdom	5223	185	2128	22760	Fish and shellfish products, poultries, seeds, mushrooms.
SME	Italie	4425	100	3016	20890	Alimentary products, fish and shellfish products.
Nippon Suisan Kaisha	Japan	3690	44	2169	3140	Fish and shellfish products.
Nichirei corporation	Japan	3521	20	2383	2610	Deep frozen products (fish and shellfish and meat).
Nichiro corporation	Japan	1962	6	1107	1380	Fish and shellfish products.

Source: Centre Français du Commerce Extérieur, Les 100 leaders de l'industrie agro-alimentaire mondiale en 1990 (Paris, 1992).

industry remains basicly organised around some great companies (Taiyo Fishery, Nippon Suisan Kaisha, Nichirei corporation, Nichiro Corporation, Kyokuyo company). This phenomenon of concentration is particulary developed in sectors of canneries, congelation and fishmeal production. In the United States, four groups keep back, for example 80% of the national tuna market. In Spain, the number of fish and shellfish canneries has been reduced from 463 in 1974 to 170 in 1991. In France, the refrigeration industry remains organized around three companies (Saupiquet, Pêche et Froid, Pêcheurs de France). In Chile, the Angelini group effects alone half of the national fishmeal production.
But in Norway, in China and in many developing countries, small scale companies are always numerous.
Parallel to this, the vertical integration improves. From Iceland to Japan or Thailand, great companies develop fishing, processing and trading activities. The Royal Greenland Group has for example 11 trawlers, 16 processing factories and several branches of stores in Germany, United -Kingdom, Italy and Japan.
But this phenomenon is not universal. It is for example more limited in Denmark, in developing countries etc..
The concentration is not only horizontal or vertical. It has a third geographical component. In Indonesia, canneries are concentrated near Bali. In India, Kerala factories represent two fifths of the national congelation capacity. In France, Britany concentrate two thirds of canneries etc.

Parallel to this, processing companies increase their diversification. So canneries often complete the range of their activities by the preparation of shrimp butter, cooked dishes etc.. These factories intervene also in the delicatessen, the poultries sector etc..The refrigeration has also diversified in the canning industry, the fruits, the vegetables etc..
Implantations are equally more diversified. Indeed, with the development of cold technics, only factories of first processing are now confined in harbours.

Parallel to this, companies often choose to export their factories in developing countries. Some american canneries are for example implanted in Samoa, in Ecuador, or in Peru. French canners have also invested in Cote d'Ivoire or in Senegal. We can even see opposite movements. In july 1988, the indonesian group PJ Mantrust has for example bought the american company Van Camp Seafood, which control one fifth of the american cannery market. On all sides, the internationalization improves. The spanish group Pescanova has subsidiaries in South Africa, in Australia, in Namibia, in Uruguay, in Italy, in France etc.. The japanese Mitsubishi controls the british Princes Food. The british group Albert Fisher domineers the mussel industry in Netherlands etc..

6) CAPACITY UTILIZATION AND EXPANSION PLANS

a) Capacity utilization

Many OECD countries are now confronted with a shortage of catches. This evolution creates a fleet surcapacity, with supplying problems for processed industries.
In Third World regions, utilization rates vary with countries and sectors. Many african countries don't use, for example, all the potentialities of their artisanal fisheries. New processing industries (canneries, congelation factories etc.) could also spread out. But some countries already present heavy surcapacities. On this point, the case of Mauritania appears as exemplary. Indeed, in 1990, the utilization rate of mauritanian congelation units didn't exceed 25% and

distribution circuits of frozen fishes remained largely under utilized.

b) Restructuring and State support

In OECD countries, restructurations restrict capacities of production. On all sides, fishing fleets reduce their potentialities. Between 1985 and 1990, the number of vessels has been shortened, for example, by 5% in Canada, by 14% in Denmark, by 30% in Norway etc.. Even countries of Easten Europe reduce their fleet to the benefit of some Third World countries (China, Thailand etc..). On all sides, the State usually supports this evolution, thanks to a subsidies policy. In 1990, these helps represented, for example, 1125 KrN million in Norway, 52 Krs million in Sweden, 70,4 Ecus million in the EEC etc.. Nevertheless, the forms of these interventions can vary from a state to another: improvements of credit conditions, reductions of taxes etc.. In many countries (New Zealand, Australia, Iceland etc.), the progressive substitution of TACs (Total Admissible Catches) by TICs (Transferable Individual Contingents) also traduces this exigency of rationalization.
In this context, processing industries quickly restructure in limiting their capacities of production, in diversifying and in internationalizing their activities, in order to profit from new resources, new markets or low cost labour. Parallel to this, the concentration improves quickly, thanks to mergers ans acquisitions. The State usually supports this evolution. In Europe, in 1990, the EEC has for example paid 52,1 Ecus million for this help. Sweden and Finland grant improved credits etc..

Third World countries need more development than restructuration. In the medium term, they might center their growth on their local market. That supposes a support for artisanal fisheries, a substitution to foreign fleets, a valorisation of products and an improvement of distribution systems. Such an evolution can only be imagined through a global industrial strategy (productions of machines, of rechanges etc.). North-south cooperation, with joint-ventures engaged in processing and in trading could favour this evolution. But Third World countries might develop regional unions, that allow to make profitable investments, especially for shipbuilding, fishing, refiting or processing.

7) TECHNOLOGICAL AND ECOLOGICAL TRENDS

a) Thrown out fishes

Since catching to processing, the fish and shellfish system rests on an outrageous spoiling. Indeed, with the little selectivity of fishing, each year, 15 million tonnes of fishes are unusefulness catched, before being thrown out. To this spoiling, which becomes quickly an enormous threat for the environment, can be added losses linked to the carriage (10 %) and the processing (50%). Throwings out are proving particulary massive for some species (anglerfishes, hog-fishes, scallops, crabs, etc.) or some processings (fillets etc.).

Some countries have already tempted to make a stand against these spoilings. In Norway, throwings out are forbidden. In Japan, throwings out (heads, fins, viscera) are processed, in order to provide consumable products (pâtés, sausages etc.). In France, the "false fish" (species in limited demand, fishes of small height etc.) is used for the making of hydrolysats. In the USA, scrapes are recovered for making fish concentrates.

b) Industrial wastes

Aquacultural companies often prejudice the environment, by the sullage they deverse. In many countries (Indonesia, Taiwan, Thailand etc.), the shrimp farming has already created heavy problems. Numerous technics allow treatments of sullage. Nevertheless, in the case of the shrimp farming, chemical methods remain inefficacious, when physical technics (filtration) are still too expensive. But many biological methods are now examined in Thailand, Hawaii etc.. These methods foresee, in particular, the use of seaweeds and molluscs to fix wastes.

In many countries (Thailand etc.), the State already regulates this activity, in order to protect the environment. In 1990, Denmark has even decided to forbid new farms. In the medium term, the protection of the environment will probably become a priority for farms and processing companies, which still often discharge their wastes in seas.

8) SHORT AND MEDIUM TERM OUTLOOK

a) World demand outlook

With a yearly growth of 2%, the world fish and shellfish demand could exceed 110 million tonnes, at the end of the century.

Indeed, the world population could increase to reach 6,1 billion inhabitants in 2000. In the actual consumption structure, it means a demand of more than 100 million tonnes (including 25 million tonnes of fishmeals) and this demand will be more and more localized in developing countries, which represent 78 % of the world population.

Moreover, if we take into account the income growth, the consumption per inhabitant could increase, each decade, by 1 kg in developing countries (and probably more in developed countries). In this context, the world fish and shellfish consumption could exceed 110 million tonnes in 2000.

b) World supply outlook

At constant price, the supply could satisfy the demand, if we increase fishing, if we waste less and if we spread out farming.

World catches might not increase by more than 1% per year, between now and the end of the century.

In OECD countries, marine areas seem fully exploited. But in the Indian ocean and in the South Pacific, some new resources could be exploited. Continents present larger potentialities and inland catches could increase heavily in Africa and in Southern America.

Traditional crustaceans and demersal species are now fully exploited. Aside from pelagics, which are subject to fluctuations of catches, only krills and cephalopods seem able to support a greater exploitation. Indeed, cephalopods resources can be appraised to 200 million tonnes. Their use could increase, as if cephalopods are only consumed in some countries, they can, in any case, been processed into fishmeals, in substitution for pelagics more usefull to human direct consumption.

Technical progress in searching methods or in deep fisheries could also open new perspectives. Indeed, the bigeye tuna remains abundant until 600 m and beyond, until 1500 or 2000 m still live great eatable fishes.

In any case, catches will not increase without a sane administration policy. That implies a

stricter definition of TACs, a more careful knowledge of marine ecosystems, a more carping control of vessels, a real fight against pollutions, an extension of restocking policies, more consequent financial transfers in favour of Third World countries etc..

The growth of the world supply will also require a better use of catches and especially a recovery of wastes.

But finally, only the aquaculture will allow to increase durably the world supply. The comparison of potential yields is revealing: 200 to 500 kg/hectare/year for bovines compared to 3 to 8 tonnes for the fish and shellfish. The aquacultural production could reach 20 million tonnes in 1995 and represent a quarter of the world supply, in volume, in 2000.

Anyhow, in the short term, the State support will be necessary to the aquacultural development, to the management of fisheries, to the fight against pollutions and to the restructuration of processing industries. This support will require a greater international coordination, which will imply a real organization of markets, a regulation of high seas fisheries and an increasing help to Third World countries.
For lack of this effort, it is likely that the world supply could not satisfy the demand with the risk of an increase of prices, which would discourage a part of the consumption.

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DATA OF FIGURE PAGE 2

CHINA	32.9
JAPAN	15.1
INDIA	5.8
INDONESIA	5.2
PHILIPPINES	3.1
NORWAY	2.9
CIS	2.8
OTHERS	32.2

DATA OF FIGURE PAGE 11

	IMPORTS	EXPORTS
78	105.9	95.8
79	110.9	62.2
80	91.4	98.4
81	102.4	51.0
82	132.7	44.9
83	145.6	61.7
84	114.5	98.0
85	155.4	53.0
86	152	70.7
87	202.4	65.1
88	230.8	140.0
89	227	78.0
90	283.1	59.2

DATA OF FIGURE PAGE 12

86	60500
87	66900
88	112500
89	160400
90	238800
91	261400
92	206800

DATA OF FIGURE PAGE 16

	DEVELOPED COUNTRIES	DEVELOPING COUNTRIES
80	38420117	33707750
81	39066582	35676537
82	39462357	37319438
83	40426688	36961664
84	43244251	40680250
85	42529122	43848982
86	44046510	48782430
87	43586969	49011591
88	46003870	53058280
89	43946556	56386274
90	41027670	56217991

DATA OF FIGURE PAGE 4

	61	62	63	64	65	66	67	68	69	70	71	72
WORLD	9.1	9.3	9.6	10.0	10.2	10.4	10.7	10.9	10.8	10.9	11.0	11.4
DEVELOPING C.	5.1	5.2	5.5	6.0	6.0	6.2	6.3	6.4	6.5	6.2	6.5	6.7
DEVELOPED C.	17.6	18.2	18.6	18.8	19.8	20.0	20.7	21.5	21.3	22.3	22.2	23.2

	73	74	75	76	77	78	79	80	81	82	83	84
WORLD	11.6	11.7	11.6	11.7	11.4	11.4	11.3	11.3	11.6	11.6	11.8	12.2
DEVELOPING C.	6.9	6.9	7.0	7.0	7.1	7.2	7.2	7.3	7.5	7.6	7.6	7.9
DEVELOPED C.	23.7	24.1	23.8	24.0	23.1	23.0	22.5	22.7	23.2	23.2	24.1	25.1

	85	86	87	88	89
WORLD	12.4	12.7	13.2	13.3	13.4
DEVELOPING C.	8.0	8.4	8.8	9.0	9.1
DEVELOPED C.	25.5	25.7	26.7	26.7	27.1