ANNEX TO THE **WORLDWIDE FISHERIES MARKETING STUDY:** PROSPECTS TO 1985

HUNGARY

Government of Canada
Fisheries and Oceans

Gouvernement du Canada
Pêches et Océans

(This report is one of a series of country and species annexes to the main study entitled the Overview)

D R A F T

Annex to the
Worldwide Fisheries Marketing Study:
Prospects to 1985

HUNGARY

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December, 1981

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The views expressed in this Study, however, are ours alone and reflect the Canadian perception of worldwide markets.

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E. Wong
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FOREWORD

As a consequence of global extension of fisheries jurisdictions, a radical shift has taken place in the pattern of worldwide fish supply and demand. This change is still going on and will continue for many years before a new dynamic equilibrium situation is reached. However, in the midst of this re-adjustment, a new trade pattern is emerging -- some net exporting countries are now importing and vice versa. In the longer term, some countries will experience shortages of supply and others will have a surplus. Fortunately, Canada is amongst the latter group.

The implications for the marketing of Canadian fisheries products arising from the worldwide introduction of the 200-mile limit are extensive. With our vastly improved supply position relative to world demand, government and industry are understandably concerned about ensuring that the bright promise of increased market opportunities are real and can be fulfilled. One of the steps in this process is the publication of the Worldwide Fisheries Marketing Study which assesses the global potential on a country and species basis.

Specifically, the purpose of the Study is to identify the longer term market opportunities for selected traditional and non-traditional species in existing and prospective markets and to identify factors which may hinder or help Canadian fisheries trade in world markets. To date, over 40 country markets and 8 species groups have been analyzed. It should be noted that while the information contained in the Reports was up-to-date when collected, some information may now be dated given the speed with which changes are occurring in the marketplace. In this same vein, the market projections should be viewed with caution given the present and still evolving re-alignment in the pattern of international fisheries trade, keeping in mind the variability of key factors such as foreign exchange rates, energy costs, bilateral fisheries arrangements and GATT agreements which have a direct effect on trade flows.

Notwithstanding, the findings contained in these Reports represent an important consolidation of knowledge regarding market potential and implications for improvements in our existing marketing and production practices. The results of the Study should, therefore, usefully serve as a basis for planning fisheries development and marketing activities by both government and industry in order to capitalize on the identified market opportunities.

This draft report is published for discussion purposes and as such we invite your critical comments.

Ed Wong

Marketing Services Branch.
Marketing Directorate.
Fisheries Economic Development and Marketing.
Department of Fisheries and Oceans.
October, 1981.
Ottawa

WORLDWIDE FISHERIES MARKETING STUDY

HUNGARY

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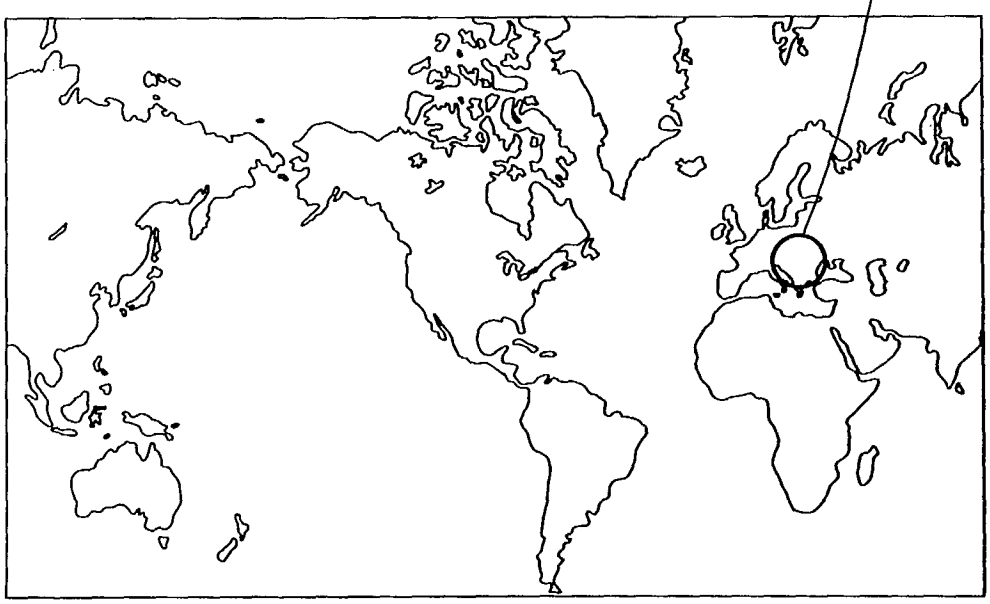

A. INTRODUCTION

With a total area of 93 000 square kilometres, Hungary is a landlocked nation that supports a population of 10.7 million. Some 52% of the people live in towns and cities, and of these 2.1 million are in Budapest, which is not only the capital city but also the economic, commercial, political and cultural centre of the country.

Located in the Carpathian Basin of Central Europe, Hungary has a diverse landscape of plains, highlands and hills, with a profusion of rivers and lakes. The largest body of water is Lake Balaton at 595 square kilometres and the longest river is the Danube, running 417 kilometres across the country. Hungary is bordered by Austria, Czechoslovakia, Romania and the Soviet Union.

Hungary was mainly an agrarian country before World War II, but since then it has undergone considerable industrial development and can now be classed as an intermediately-developed industrial-agrarian society.

B. DEMAND

Being a landlocked country, Hungary has to rely on inland freshwater fisheries for its domestic production. Indeed, the country ranks first among European nations in per capita consumption of freshwater fish. Nonetheless, overall consumption of fish is quite low -- 3.2 kilograms per capita annually, far less than the yearly meat consumption of 76 kilograms per capita.

Hungarians obviously have a strong preference for meat, and among meat products pork is the clear favorite, accounting for more than 60% of consumption. This is a matter of some urgent concern to the Hungarian authorities, who are actively promoting increased consumption of fish as a means of reducing pressure on the meat industry and encouraging the people to adopt healthier dietary habits.

Fish consumption is expected to increase to around 4.5 kilograms per capita by 1985 and, given the limited capacity of the domestic inland fishery to meet the growing demand, opportunities could be generated for sales of Canadian products.

Even though the level of fish consumption is quite low now, it is still four times what it was in 1950, while in the same period consumption of meat products doubled. Fish has long been a traditional food item, but not one that is eaten regularly, every day. This is reflected in consumer spending statistics which show that the population spends one billion forints a year on fish and fish products[1], a mere 1% of total food expenditures in the country.

There are both regional and seasonal variations in fish consumption patterns. For example, consumption is higher than the average in the southern part of the country, particularly in the area of the lower course of the Danube and Tisza Rivers. In western regions, demand is more moderate. In Budapest there is a marked upsurge in consumption during the three or four days before Christmas and New Year's Day, a period during which consumers buy as much fish as they would normally over two months.

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[1] Nearly C$50 million, on 12 February 1981, 1 Hungarian forint was equivalent to C$0.0499.

C. SUPPLY

Current and Expected Supply Picture to 1985

1. The Domestic Fishery

There are 70 species of fish caught in Hungary's inland waters and the majority are carp (cyprinadae) or perch (percidae). Catch totals are shown in Table 1. The fish are caught from approximately 120 000 hectares of natural lakes and rivers and from artificial ponds and reservoirs which have a total area of 36 000 hectares. Fish production is shown in Table 2.

The biggest producers are the six state owned farms which caught 17 375 tonnes of fish in 1978, over 50% of Hungary's total. The Balaton fish farm, operating on Lake Balaton, is one of the most important. Its specialty is eel which has been successfully planted in the lake and is much in demand for export. Unfamiliar species such as the plant eating amur, and bousha have also been introduced and are doing very well, often growing to a weight of 10 kilograms. However, they are not yet popular with the Hungarian consumer.

The Szeged state farm is situated in the south of the country near the city of Szeged which has an advanced food processing industry. Technology for processing fish is being developed here.

The state farms also lead in the development of new technology. The Biklai farm in Southwest Hungary has developed a fish production system which is used by 25 other fish farms. These farms have increased their yields by 26% since 1976.

TABLE 1

Hungary: catches of fish, crustaceans and molluscs

	Total Tonnes	Cyprinids, NEI	Freshwater Fish, NEI
1970	26 000	N/A	N/A
1971	25 800	N/A	N/A
1972	28 900	N/A	N/A
1973	29 100	23 200	5 900
1974	30 159	23 662	6 497
1975	30 788	22 981	7 807
1976	31 855	22 876	8 979
1977	34 661	23 169	11 492
1978	32 584	22 609	9 975

Source: FAO, Yearbook of Fishery Statistics - Fishery Commodities, Rome, Italy, 1978, Vol. 46.

TABLE 2

Hungary: fish production
(Net Product Weight '000 tonnes)

	1972	1973	1974	1975	1976	1977	1978
Fish, Fresh, Chilled or Frozen	2.1	2.1	0.5	0.9	1.1	1.0	1.0
Fish Products & Preparations	2.9	2.8	3.3	4.2	4.9	3.6	7.1

Source: IBID.

Many primarily agricultural co-operatives have suitable conditions for fish farming but lack expertise. They find ready-made fish production systems, such as Biklai's, very useful.

Several regions of Hungary have suitable terrain for the building of artificial ponds. Some of these ponds are as large as 600 hectares and the average size, on the Hungarian Plain, is more than 100 hectares. Nationally, these pond farms produce an average yield of one tonne per hectare, made up of 68-69% carp, 30% plant eating species, and 1% predatory fish (which eat other fish animals, insects, etc.).

Other organizations, apart from large state farms, are also involved in fish production. The Federation of Fishing Co-operatives plays a significant role in the country's industry, especially on the Danube and the Tisza. Some 200 co-ops, operate on 46 000 hectares of natural water and 5 300 hectares of pond area.

Angling also contributes significantly to Hungarian fish production. The Hungarian Angling Association is a social organization which owns 20 000 hectares of natural waters, establishes new fish ponds and breeds fish. Members are encouraged to fight water pollution. The average angler catches 18 - 20 kilograms a year. The total angling yield is about 2 700 tonnes a year, 8.3% of the 1978 total fish production.

One of the angler's favourite catches is river silure, which sometimes reach 50 kilograms in weight. The stocks of silure are decreasing as are those of pike-perch (a Hungarian delicacy) and pike. Trout, which abhors the slightest pollution, has not occurred naturally since 1945 and is now only produced on fish farms such as the one at Tapolce. The natural waters are now dominated by less popular fish, particularly large plant eating species. Carp are found mainly in artificial ponds where they account for 70% of the total production.

Hungary is developing much expertise in fish breeding. The TEHAG fish farm was established at Szazhalombatta, on the Danube, and fish are bred in thermostatically controlled tanks. TEHAG has concentrated on producing fry, and accounts for 30% of the country's supply. The TEHAG is one of the most modern pond farms in Europe, and the only fish-fry producer in international fishery operations which is capable of really large-scale propagation. TEHAG produces all species of fish for the Hungarian market, except trout, and is responsible for about one-third of the country's production of one-summer fingerlings. It has been particularly successful in raising pike.

Hungary increased its production of fish by 46% between 1975 and 1980 and further expansion is planned to 1985. The emphasis is on maximizing the yield from natural waters, rather than building new artificial ponds. The co-operative fish farms have been good managers of the natural waters and in some cases their yields surpass the level of fish ponds.

Other projects include the use of a warm water supply from a thermal power plant in a highly intensive fish rearing operation. Large scale production of trout and other intensively kept species is planned. In future years, fish processing plants will begin operation, with a capacity of up to 10 000 tonnes.

2. Imports

In 1978, Hungary imported approximately 55 000 tonnes of fish and fish products, with fish meal and solubles accounting for over 90% of the total. Details of imports since 1970 are shown in Table 3 which also reflects a dramatic decrease in imports of fresh, chilled or frozen fish, with a steady increase in purchases of fish products and preparations.

TABLE 3

Hungarian imports of fishery products

Q = Quantity: 000 tonnes

V = Value: US$000

	1970		1975		1976		1977		1978	
	Q	V	Q	V	Q	V	Q	V	Q	V
Fish: fresh, chilled or frozen	3 400	1 112	5 600	2 905	6 100	3 940	3 854	3 854	2	25
Fish products and preparations	3 400	2 244	4 400	4 685	4 800	5 271	4 778	5 394	5 026	5 725
Oils, fats, crude or refined of aquatic animal origin	6 100	1 611	800	429	500	364	524	651	476	426
Meals, solubles and similar animal feeding	60 000	9 000F	57 000	13 300F	42 400	20 558	52 475	35 913	49 400	30 780
Total	72 900	13 967F	67 800	21 319F	53 800	30 133	61 631	45 812	54 904	36 956

F: FAO estimates

Source: IBID.

TABLE 4

Hungary: imports of fishery products by country

	1976	1977
	tonnes	
Fish, fresh, chilled, frozen		
USSR	3 700	2 200
Norway	1 300	1 200
Poland	900	170
FRG	--	400
Sweden	--	310
Total*	6 100	4 280

* Include Countries NES

Source: Hungarian Trade Commission, Montreal.

TABLE 5

Hungary: imports of animal meals
(including fish meals)
('000 tonnes)

	1976	1977
Peru	18	25
Denmark	21	26
Italy	18	18
Mongolia	2	1
Iceland	5	4
France	--	6
Norway	2	--
Total*	66	80

* Includes Countries NES

Source: Hungarian Trade Commission, Montreal.

TABLE 6

Hungary: imports of fish: by country*

Category	Q tonnes	V US$ 000
Fish, fresh, chilled, frozen		
Norway	869	852
Fish, prepared, preserved		
Denmark	52	79
Austria	31	61
Norway	256	386
Portugal	85	85
Spain	62	77
Yugoslavia	165	203
Fish NES	--	5
Total	1 520	1 748

* Does not include trade with the Soviet Bloc and therefore differs from Table 4.

Source: Statistical Office of the United Nations, 1977, Supplement to the World Trade Annual Volume 1. Eastern Europe and the USSR, New York: Walker & Co, 1979.

Hungary's fish imports currently come mainly form the USSR, Norway, FRG, (Poland) and Sweden. German exporters act mainly as brokers for sales of hake. Fish meal is imported from Peru, Denmark and Italy.

3. Exports

Although it must import fish to meet the domestic demand, Hungary is also an exporter of a relatively large quantity of fish products, as can be seen from Table 7. Exports are mostly perch, wells, trout and eel.

TABLE 7

Hungarian exports of fishery products, by category

Q = Quantity: 000 tonnes

V = Value: US$000

	1970		1985		1976		1977		1978	
	Q	V	Q	V	Q	V	Q	V	Q	V
Fish: fresh, chilled or frozen	2 800	1 506	2 100	2 047	2 500	3 031	2 846	3 984	2 704	4 271
Crustaceans, molluscs; fresh, frozen, dried salted, etc.	800	505	700	1 080	1 200	2 521	967	2 132	1 421	3 493
Fish products and preparations	100	52	400	449	500	606	677	782	253	309
Meals, solubles and similar animal feed	--	--	600F	114F	--	--	--	--	--	--
Total	3 700	2 063	3 800F	3 690F	4 200	6 158	4 490	6 898	4 378	8 073

F: FAO estimates

Source: FAO, OP. CIT.

Before hostilities broke out between Iran and Iraq, Hungary was selling herbivorous carp to Iraq, transported live by truck. Live carp is still trucked to the FRG, which is the main buyer of Hungarian fish. Hungary also exports some fish to the USSR and Austria. Results of 1977 exports by country are shown in Tables 8 and 9.

TABLE 8

Hungary: exports of fishery products by country

	1976	1977
	tonnes	
Fish, fresh, chilled, frozen		
FRG	3 000	3 300
USSR	300	300
Poland	300	--
Austria	--	700
Total*	4 200	4 490

* Includes outher countries NES

Source: Hungarian Trade Commission, Montreal.

TABLE 9

Hungary: exports of fish by country

Category	Q tonnes	V $US'000
Fish, fresh, chilled, frozen		
FRG	1 138	1 762
Italy	61	76
Austria	165	229
Shellfish, fresh, frozen		
France	822	1 374
FRG	16	88
	113	190
Total*	2 315	3 719

* Does not include Soviet Bloc and therefore differs in detail from Table 8.

Source: Statistical Office of the United Nations 1977, Supplement to the World Trade, Annual Volume 1, East Europe and the USSR, N.Y., Walker & Co., 1979.

4. Fish Processing and Distribution

Currently both sea and domestic freshwater fish are being processed in Hungary. Sea fish is mainly canned, and to a lesser extent cured, the latter method providing a wide variety of products for customers.

Among the species processed are carp, highead, silver carp, grass carp, barkel, pikeperch, wells, pike, eel, catfish, common bream and silver crucian.

The canning industry for a long time produced canned fish from Balaton bream, and (Pelews cultratus). While (a species of carp) production reached 700 to 800 tonnes some years ago, it is now only of 400 to 500 tonnes. This canned fish is of high quality, and larger amounts could be sold.

The fish farm of Lake Balaton prepared a wide range of "block fish" products: pikeperch, block trout, carp fillets, etc. Some of the co-operatives have also produced good results in the canning and processing of their catch. Long term plans call for further improvements in the fish processing industry.

About half of the Hungarian catch is purchased by a specialized state owned wholesale company on the basis of production contracts. The fish is then delivered to vendors. The other 50% is marketed directly by the producer. Many of the state farms and co-operatives very successfully run their own stores and restaurants. The restaurants are often roadside 'fishermen's inns' which are becoming internationally popular with travellers, especially foreign tourists.

The state controlled wholesale company sells most of its fish to food retail trade companies. In Budapest stores of the 'Kozert' companies, and in the countryside stores owned by county food companies and co-operative retail traders, sell fish to consumers. The main selling places are the shops in local markets, but there are also specialty shops that handle fish, game and poultry. Some butcher shops sell fish, as well. Substantial purchases from the wholesale trade are the catering and tourist industries.

The ever increasing volume of tourism (in 1978, 11 million foreigners visited Hungary, 36% more than in the previous year) has led to visible growth in the catering industry.

D. POTENTIAL TRADE

The potential is there for the sale of certain Canadian fish products in Hungary, given the policy of the Hungarian government to encourage greater consumption of fish and the limited capacity of the domestic inland fishery to meet the anticipated growth in demand.

Whether Canadian suppliers can take advantage of the opportunities depends on a number of factors, not the least of which is price. Stiff competition can be expected, notably from Norway, which has a good and established relationship with the Hungarian state import-export corporation TERIMPEX.

Nonetheless, TERIMPEX has indicated an interest in importing about 2 000 tonnes of hake (Merlucius) per year, to be made up mostly of boneless fillets in packages of 500 grams (each package could contain five 100-gram units interleaved).

The Hungarian agency is also interested in cod fillets if the price is similar to that of hake. TERIMPEX would welcome samples (two-kilogram packs) of hake, pollock, turbot and cod (fillets and headed and gutted), as well as headed and gutted mackerel, and 500-gram mackerel fillet packs. (All 500-gram packs should have Hungarian labels).

Hungarian government officials responsible for the purchase of fish products raised a number of points concerning possible deals with Canada:

- Food prices are generally quite low in Hungary. If imported fish products are expensive, the government would have to subsidize them to keep the consumer cost down.

- Freight costs could be a serious problem in transporting Canadian products to Hungary.

Discussions with officials of the state trading agency also raised the possibility of two-way trade with Canada. Hungary is interested in selling breaded freshwater fish products, block frozen trout and smoked eels to the Canadian market. In turn, the country is interested in importing marine fish

blocks and fillets (consumer packs) and live rainbow trout for breeding purposes.

The Hungarian Ministry of Fisheries is also interested in receiving technical information on fish freezing and processing.

Canadian suppliers interested in exploring the market should work with TERIMPEX and/or the Hungarian Department of the Interior. The address is:

TERIMPEX
1053 Budapest U
Karoly, Mihaly W.G.
Tel: 175-011
Telex 22-4551
Hungary
(Mrs. Susan Sarosi Horacek, Director)

E. CONCLUSIONS

1. Hungary is a landlocked nation in Central Europe, with an area of 93 000 square kilometres and a population of 10.7 million. Some 52% of the people live in towns and cities, 2.1 million in Budapest, which is the capital city and the economic, commercial, political and cultural centre.

2. With no access to the sea, Hungary has to rely on inland freshwater fisheries for domestic production from a profusion of natural lakes and rivers and a highly developed system of fish farms.

3. Overall fish consumption is quite low at 3.2 kilograms per capita annually, representing just 4% of meat consumption of 76 kilograms per capita.

4. Traditionally, Hungarians are meat eaters, particularly pork which accounts for more than 60% of consumption. This is a matter of concern to Hungarian authorities, who are promoting increased use of fish to reduce pressure on the meat industry and encourage the people to adopt healthier eating habits.

5. Given these circumstances, fish consumption is expected to increase to around 4.5 kilograms per capita by 1985, and this could generate opportunities for sales of Canadian fish and products.

6. In 1978, Hungary imported approximately 55 000 tonnes of fish and fish products, with fish meal and solubles making up nearly 50 000 tonnes of the total. Imports of fresh, chilled or frozen fish have dropped sharply, while purchases of products and preparations have increased steadily. Major suppliers to Hungary are the USSR, Norway and the German Democratic Republic.

7. The state trading agency, TERIMPEX, has expressed interest in importing about 2 000 tonnes of hake per year. It would also welcome samples of pollock, turbot, cod and mackerel.

8. Whether Canadian suppliers can take advantage of anticipated opportunities depends on a number of factors, including price. TERIMPEX points out that food prices in Hungary are generally low, and if imported fish is expensive the government must subsidize it. Freight costs could also be a serious problem in shipping Canadian products to Hungary.

9. Hungarian officials have also expressed some interest in two-way trade with Canada. They would export breaded freshwater fish products, block frozen trout and smoked eel. In turn, they are interested in buying marine fish blocks and fillets, and live rainbow trout for breeding purposes. There also is some interest in receiving technical information on fish freezing and processing.

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APPENDICES

APPENDIX I

FISHING AND FISH FARMS IN HUNGARY

In fishing, autumn is the period which resembles the wheat or, in some countries, the rice harvest. In the countries of the temperate zone, and thus in Hungary, fish complete their annual cycle at the middle or end of October. That is the time when they weigh most, when they are in the peak of condition. As the chills of winter approach, they withdraw into the deepest parts of the water where they burrow to hibernate and are relatively easy to catch, but when freezing starts in early December and a thin armour of ice coats first the stillwaters and then the backwaters of the rivers, the fishing season is over.

Fish are still not an important item in the Hungarian diet, but their flesh is assuming an increasing importance in the national nutrition. Per capita fish consumption was only 3.4 kilograms in 1978, but is expected to increase to 4 kilograms in 1980, to 4.5 kilograms five years later, and may reach 5.9 kg by 1990. This seems very little, indeed, in view of the fact that in other countries the average person eats much more fish a year than that - about 18 kg in the USSR and 8.5 kg in the GDR, and more than 18 kg in some other coastal countries.

What matters, however, is that the nutritive value of fish has come to be recognized. The current five-year plan, ending at the end of 1980, has called for a 46% increase in the gross production of fish, and the results to date show that this target will be met.

State and Cooperative Fish Farms

At present there are 17 cooperative fish farms in Hungary, and six large state farms play an important part in fish production. The Balaton Fish Farm operates on Lake Balaton, the biggest lake in Central Europe, and its vicinity, a tourist paradise. For 1981 to date, 1 000 tonnes of fish were caught from the

lake which has a water surface of 60 000 hectares. Part of the catch went for exports. Particularly the eel recently planted are in great demand among foreign customers. The plant eating amur and the delicious bousha are also newcomers in Hungarian waters and doing well in Lake Balaton, where they often grow up to weigh 10 kilos. In Hungary they are still not very popular as our cuisine prefers meat-eating species.

The Szeged State farm in south Hungary is a big producer of fish, doing excellently in this branch, too. It operates in an area where the chances for improving fish processing are very good as the city of Szeged has for long been known for its advanced food industry.

Noteworthy is the Bikali Fish Production System in south-west Hungary. Up to now 25 fish farms have adopted the spawning technology developed by the Bikali Farm, and are following it with great discipline, which they know is the token of success. At the farms that adhere to the system, the fish yield per hectare of water surface area has gone up by 26.5% since 1976. The Ministry of Agriculture and Food sees a need to provide better professional guidance for all the smaller fish ponds and are therefore encouraging the setting up of additional production systems, each suited to the area where it is based. The fact is that several agricultural cooperatives whose chief task is crop growing and livestock raising are interested in fish farming if they have suitable natural conditions for it. These farms rarely have the expertise for fish breeding and need to rely on already tried-and-tested systems.

Connections with Water Management

Although industrialization has made considerable progress in Hungary during the thirty years of socialist construction, the country is still relatively rich in waters which have not yet been affected by industrial pollution. At present fish-farming is carried on over 115 000 hectares of natural waters. The surface areas of artificial fish ponds add up to 232 000 hectares, the backwaters of rivers used for this purpose total 4 000, the reservoirs occupy 13 000, and the so-called super-intensive fish farms, where scientific breeding and experiments are conducted take up 32 000 hectares of area.

Apart from the Ministry and the big production systems, other organizations, too, assume the responsibility for fish cultivation in Hungary. The Federation of Fishing Cooperatives and the Hungarian Angling Association are national organizations. The latter is a social organization that gets its membership to combat all forms of water pollution and is also busy setting up new fish ponds and breeding fish. The anglers are the exclusive owners of about 20 000 hectares of the natural waters of Hungary. The angling yield is about 2 700 tonnes a year, the average angler raising about 18 to 20 kilos of fish annually. Anglers are proud of the fact that just about every year produces at least one lucky catch - generally a river silure over 50 kilos or larger in weight.

The stock of silure in the Hungarian waters is fast diminishing, and there has been a restructuring in the relative occurrence of the various species. The pikeperch, a typically Hungarian gourmet's variety, has become a rarity, and so is the pike. Since World War II, trout, which abhor even the slightest amount of pollution in the water, are only spawned in fish farms, most recently in ponds based on the carstic waters which are a side-product of quarrying in western Hungary.

Less noble varieties of fish and the large plant-eating species are dominant in the natural waters, and carp are the rule in the artificial ponds.

Obviously, today the composition of the fish population and fish breeding can no longer be left to nature in Hungary either. Man intervenes with scientific means. Hungarian ichthyobiologists recognized in time that there was a shortage of fry of reliable quality. For this reason they established the TEHAG fish farm at Szazhalombatta by the Danube, where work takes place with scientific methods in thermostatically controlled tanks. One third of the young fish needed for fish-farming in Hungary were bred at TEHAG. They have produced outstanding results especially with pike.

Ichthyologists know that the up-to-date methods of pike spawning were originally developed in Switzerland at the turn of the century, and later the Finnish, Swedish and Austrian breeders improved the method. Today one of the three largest pike stations in Europe is at Szazhalombatta, Hungary. The other two are in Holland and Austria. The Hungarian station has been operating since

1975, and it hatches 1.3 to 1.5 million fry a year, raising them until they reach a length of 20 to 60 mm. When they are planted in Lake Balaton and Lake Velence (the latter the country's second largest lake), with some of them let loose in angling waters and fish farms at home and abroad.

Long Term Development

The long term water management plan which is of particular concern to agriculture, prescribes that during the sixth five-year plan starting with 1981, new fish ponds totalling 4 100 hectares in area are to be set up, and in the next five-year period 4 500 hectares have to be built where water is available for the purpose and the soil is less suitable for cultivation.

In addition about 4 000 hectares of river backwaters and some larger water reservoirs can be turned to intensive utilization, of course, without impairing primary utilization. The plan says that if the natural waters can be increased to a larger extent in an area than planned, the building of artificial ponds can be proportionately cut. This means that the intensive use of natural waters is emphasized. It has been demonstrated that the cooperative fish farms are good managers of the natural waters entrusted to them. They have tried-and-tested methods for making the most of reservoirs and of backwaters and in some of these areas the yields surpass the level of fish ponds, reaching 2 000 kg per hectare.

Moreover, the fishing cooperative have been most resourceful in their marketing of fish, in fostering contacts with the consumers. They run fish stalls and grills where they can best tempt tourists, have a good many fish restaurants throughout Hungary, many of them roadside inns by now familiar to foreign visitors, too, and some of them have produced good results in canning and processing as well. Improvements in fish processing are among the most important long term plans in this field.