

Inter-American Development Bank Lends To El Salvadore and Haiti for Fishery Work

The Inter-American Bank has approved a \$5.3 million loan to the Republic of El Salvador to increase the production and domestic consumption of fish in the country, according to Bank officials.

The program will improve management for small-scale maritime fishermen associated in cooperatives by providing them with specialized technical support and with docks, modern fishing tackle, and processing and marketing facilities; will stimulate fish farming by building ponds for intensive cultivation of inland fish on about 250 acres of marginal land; and will provide appropriate distribution and sales facilities for eligible small retail dealers.

The program will be carried out in three subprojects: 1) Global credit for maritime and inland fishing, consisting of an overall line of credit to be used by maritime fishermen's cooperatives, small fish dealers, fish farmers, and other beneficiaries; 2) Port facilities subproject, consisting of the construction of unloading installations at Acajutla, El Triunfo, and El

Tamarindo, remodeling of existing installations in La Unión, the provision of equipment and installations on land for the La Libertad dock, and related works; 3) Technical support for project execution, consisting of the contracting of consulting services to collaborate with the executing agency and the beneficiaries, especially fishermen's cooperatives.

The total cost of the project is estimated at \$6,735,000, of which the Bank loan will cover 78.7 percent and local sources the remaining 21.3 percent.

The Inter-American bank has also approved \$687,000 in nonreimbursable technical cooperation to help finance the first stage of a fishery development program in Haiti. The technical cooperation, granted to the Republic of Haiti, will be used by the Ministry of Agriculture to contract research of fish resources, processing, and marketing; the analysis of institutions and human resources; and the identification and prefeasibility study of possible investment projects. The

second stage of the project would include a feasibility study for the investment project identified in the first stage.

The project is designed to provide reliable information on the potential of Haiti's fish resources. If their existence and viability is confirmed, these resources will reportedly benefit the lower income sectors of the country. Because of the high cost of meat and fish, the Haitian diet consists basically of cereals. The project will signify a general improvement in the diet of low-income sectors as well as represent a new source of employment, higher income levels for those involved in the work, and savings in foreign exchange that is now used to pay for imports.

The total cost of the two stages is estimated at \$919,000. The first stage will take 12 months to complete and will cost \$742,000, of which the Bank will contribute \$687,000 in the following form: \$206,100 in gourdes from the Fund for Special Operations and Can\$480,900 from the Canadian Fund. In addition, the beneficiary will contribute \$55,000. The cost of the second stage has been estimated at \$177,000, of which the Bank would contribute Can\$111,300 and \$47,000 in gourdes. The Republic of Haiti would contribute \$18,000.

IRELAND POSTPONES FISHERY MEASURES

The Irish Government postponed unilateral fisheries conservation measures which were to have taken effect 1 March 1977. This decision reportedly followed a 1-hour meeting on 28 February 1977 between Irish Fisheries Minister Paddy Donegan and European Community (EC) Commissioner Finn Gundelach. The 2-week postponement of the conservation measures provoked an angry reaction from the Irish Fishermen's Organization (IFO). IFO secretary Frank Doyle, accused the Irish Government of reneging on its pledge to follow an independent fisheries policy despite EC pressures. Fisheries Minister Donegan defended the Government action by implying that

postponement of the measures would facilitate a settlement between Ireland and the EC.

According to the NMFS Office of International Fisheries, the Irish Government and the IFO have differed sharply over implementation of a national fisheries policy. Irish fishermen have little faith in EC capabilities to protect fishery stocks from overfishing and favor extension of Ireland's territorial sea to 50 miles. The Irish Government, however, feared EC backlash and loss of support on key issues such as farm prices, should it unilaterally impose measures in the face of strong EC opposition. Despite Government concern for relations with the EC, Irish fishermen will undoubtedly continue to pressure the Government to protect their interests. (Source: IFR-77/38.)

Japanese Longliner Is Fined \$250,000

On 20 January 1977, the Japanese longliner *Fukuyoshi Maru No. 75* entered port at Sitka, Alaska, seeking medical attention for a sick crew member. An inspection team from the U.S. Coast Guard Cutter *Clover* boarded the vessel while it was in Sitka, to inspect its catch and check its compliance with U.S. laws regulating foreign fishing. Coast Guard personnel discovered a box containing six tanner crab carapaces, 29 large pinchers, 63 small pinchers, and 76 leg segments. Retention of the crab violated U.S. laws protecting Continental Shelf Fisheries Resources (CSFR).

Further investigation revealed the retention of five immature chum salmon.

a violation of the International Convention for the High Seas Fisheries of the North Pacific Ocean (INPFC). The INPFC violation was recorded, and the information presented to the Japan Fisheries Agency for appropriate action.

The *Fukuyoshi Maru No. 75* was then seized for violation of the U.S. CSFR laws and placed in the custody of the U.S. Marshal, Sitka. The master was arraigned in U.S. District Court,

Anchorage. On 8 February, an out of court settlement for \$250,000 was reached. The vessel was allowed to depart U.S. waters on 9 February, and was taken into custody by a Japan Fisheries Agency patrol vessel for the INPFC violation. Japanese authorities subsequently banned the *Fukuyoshi Maru No. 75* from fishing U.S. waters for a period of 30 days.

According to the NMFS Office of International Fisheries, the 499 gross

ton longliner is owned by Nemuro Daiichi Gyogyo Suisan Kumiai of Hokkaido, Japan. At the time of boarding, the vessel was carrying about 250 metric tons of sablefish and turbot worth approximately \$259,000. The value of the vessel was estimated at about \$600,000. The *Fukuyoshi Maru No. 75* departed its homeport of Nemuro, Hokkaido, on 2 November 1976 and arrived in U.S. waters on 30 November. (Source: IFR-77/48.)

Fisheries of Progreso and Ciudad del Carmen, Mexico

The Regional Fisheries Attache for Latin America, Rolf Juhl, visited the Mexican fishing ports of Progreso and Ciudad del Carmen in February 1977 in the company of U.S. Consul Robert Ashford. Their report deals with the fisheries and the trade opportunities in that area (see map).

Progreso

Snapper and grouper are the most important species landed in the port of Progreso. Grouper catches are by far the largest and account for 90 percent of all landings there. A fleet of 200 vessels fishes for grouper, while 150 vessels fish for snapper. The snapper fishermen use reels and fish offshore; the grouper fishermen use dories and handlines and fish close to the coast. The snapper fishermen also land incidental catches of grouper.

Catches of snapper and grouper declined in 1976, even though 65 new vessels were added to the fishery (Table 1). The Regional Fishery Attache re-



ports that the addition of such a large number of new vessels with inexperienced crews, managed by fishing cooperatives, caused the average catch per vessel to decline 29 percent in 1976. Catches were also affected by labor disputes between the vessel owners and the cooperative fishermen.

There are nine fish processing companies in Progreso, but three of these process about 50 percent of the port's total landings. Cia, Industrial del Golfo y Caribe S.A. (General Manager, Jose Alonzo Benitez), operates a fleet of 75 vessels. Most of the catch is exported to the United States through Miami. The company's vessels make 20 to 22 trips per year and land between 5 and 10 metric tons (t) each trip.

Pescados Mexicanos, S.A., Progreso, Yucatan (Manager, Alberto Salis Pinedo), operates 40 vessels and the entire catch is processed and shipped to the United States. Productos Pesqueros de Yucalpeten (Manager, Manuel Lopez Garcia) is a subsidiary of the state-owned company Productos Pes-

queros Mexicanos (PROPEMEX). It owns and operates 43 vessels, of which 20 are the new fiberglass vessels built by Desco Marine in Chesapeake, Va. PROPEMEX is also using 20 Cuban-built ferro cement vessels to train apprentice fishermen¹.

Ciudad del Carmen

Shrimp is virtually the only significant fishery in Ciudad del Carmen, accounting for almost 98 percent of all fishery products processed in that port. About 9,000 t of shrimp tails were landed in 1976 (Table 2), significantly less than in 1974 and 1975 due to the cooperative fishermen's strike in September and October. Industry officials predict landings of 20,000 t by 1981.

Mexican vessels which operate on the Campeche Bank are primarily based in the ports of Ciudad del Carmen and Campeche. About two-thirds of the shrimp fleet is based in Ciudad del Carmen which has a better natural harbor.

About 1,528 fishermen operated 380 trawlers between 22 and 24 meters (m) long out of Ciudad del Carmen as of February 1977. The port has extensive facilities for constructing and repairing fishing vessels. There are 9 shipyards, 10 machine shops, and 10 vessel repair firms. Juhl visited one of the shipyards, Astilleros del Carmen, S.A. This shipyard was the first to construct steel-hulled trawlers in the area. In February there were three trawlers, 24 m long,

Table 1.—Snapper and grouper landings in Progreso and the number of vessels in the fishery, 1975-76.

Year	Landings (t)	Vessels (no)	Catch/vessel (t)
1975	12,900	285	45.3
1976	11,300	350	32.3

Source: Productos Pesqueros Mexicanos.

Table 2.—Shrimp landings in Ciudad del Carmen (tails), 1974-81.

Year	Quantity (t)	Year	Quantity (t)
1974	11,000	1978	NA
1975	10,000	1979	NA
1976	9,000	1980	NA
1977	NA	1981	P 20,000

P = Projected

Source: Camara Nacional de Pesca de Carmen

¹These vessels are owned by the Secretariat of Education and assigned to Mexican fishery schools. PROPEMEX cooperates with the schools by providing training and eventually jobs to the students. For additional information on these ferro cement vessels, request International Fisheries Report 76/93 dated 12 April 1976 from the nearest NMFS Statistics and Market News Office.



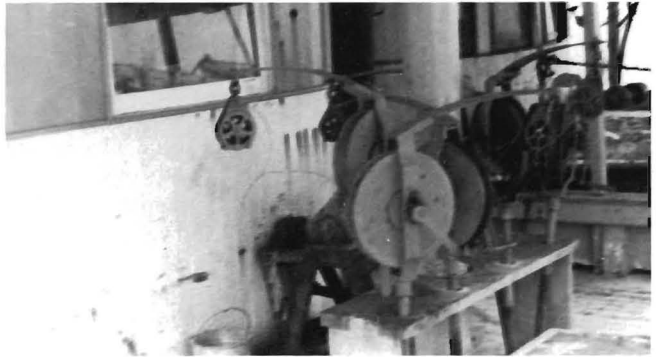
Shrimp fleet in port, Ciudad del Carmen, waiting for weather to improve.



Ciudad del Carmen, showing fish docks in protected inside waters.



A grouper fishing boat in Progreso with 10 one-man skiffs which are let overboard in the morning and retrieved in the afternoon.



Hand driven snapper reels admidship of a snapper boat. Reels are placed in sockets along the rail during fishing operation.

under construction. The vessels have Caterpillar-357 engines and cost about \$150,000 fully equipped.

There are 10 shrimp processing companies with 14 freezer plants in Ciudad del Carmen. The Regional Fishery Attache provided the following information about three of the processing companies.

Industrial Pesquera Santa Maria, S.A., Calle 20 No. 27, Ciudad del Carmen, Campeche (General Manager, Raul J. Ramirez). This company operates 12 shrimp trawlers and plans to double the size of its fleet. It is currently increasing its processing and freezing capability. In addition, fish-processing equipment is being purchased to utilize the incidental catch of the shrimp trawlers which was previously being discarded at sea.

Isla Camaronera, S.A., Calle 20 No. 1, Ciudad del Carmen, Campeche (General Manager, Felipe Charat). This company operates two processing plants; the plant in Campeche processes shrimp and fish; the plant in Ciudad del

Carmen processes only shrimp. The General Manager, who is on the Advisory Board to the Chief of Mexico's Department of Fisheries, has indicated an interest in a possible joint venture with a U.S. company. Charat is interested in the U.S. market as well as U.S. capital and technical assistance.

Camaronera del Carmen, S.A., Ciudad del Carmen, Campeche (General Manager, Federico Gutierrez). This company operates a fleet of 40 shrimp trawlers. It is believed to have the most efficient and modern shrimp processing plant in Mexico. The plant is equipped with a rotating drum to freeze the shrimp individually. No more than 12 of these drums are in operation throughout the world. All the equipment in the plant is made of stainless steel and the walls of the plant are covered with tile for easy maintenance and cleaning.

The Regional Fisheries Attache characterized the fishing industry of Progreso and Carmen as progressive and eager to form partnerships to attract

foreign capital and technology. While contacts have already been made with some foreign companies, Mexican businessmen would generally prefer to deal with U.S. companies, especially as most of Mexico's fishery exports are shipped to the United States. Interested U.S. companies should write to Robert Ashford, U.S. Consulate, Merida, % U.S. Department of State, Washington, DC 20520. A copy of all correspondence should also be sent to the Regional Fisheries Attache in Mexico City. His address is Rolf Juhl, Regional Fisheries Attache, U.S. Embassy, Mexico City, % U.S. Department of State, Washington, DC 20520.

South Africa Eyes Seal Repellents to Save Nets

The seal population off South Africa and Namibia is estimated at about 800,000 animals distributed among 23 breeding colonies situated on various offshore islands and in five areas on the mainland along the west coast. There

seems to be a double incentive for the South Africans to harvest seals in their waters. First, the seals, as a renewable natural resource, form the basis for a small but profitable industry producing valuable furs and oil. Secondly, the fishermen see seals as a menace to their nets and catch.

As a result of protective legislation, the South African seals seem to be in no danger of extinction. However, the methods of harvesting have attracted considerable attention from humane organizations. The U.S. Marine Mammal Protection Act of 1972 prohibits the harvesting by U.S. citizens or importing into the United States of almost all species of ocean mammals. This removes much of the economic incentive for other nations to harvest these species. However, the Secretaries of Commerce and of the Interior can lift the moratorium at their discretion. Therefore, in accordance with the Cape Fur Seal Management Waiver of the moratorium, fur sealskins may be imported into the United States from the 1976 harvest if the take does not exceed 70,000 animals and if all other terms of the waiver, established in February 1976, are met. This waiver does not apply to skins from Namibia.

Seals rob fishermen of thousands of tons of fish each year, both when they get trapped in nets and when they attack schools of fish off the coast. As a result, seals are often maimed and killed by angry fishermen. At one time, each fishing vessel carried two rifles and the crew would shoot any seals in the nets, thus protecting the catch as well as culling the herds. This has been prohibited. One solution to this problem would be to repel the seals from the nets. This is the aim of research conducted at the Central Acoustic Laboratory of the University of Cape Town. The research is largely being sponsored by the Society for the Prevention of Cruelty to Animals. Both the Government (Department of Sea Fisheries) and the South African inshore fishing industry (which contributed about \$2,500 as of April 1976) are also helping to promote this research.

Under consideration as seal repellents are two different sounds—that of a

killer whale and that of a shot fired into the water. An inexpensive device, which could be installed in the fishing vessels and operated by pressing a button, would need to be developed for broadcasting the sounds under water. Unfortunately, the experiments of underwater broadcasting of killer whale calls have not shown good results so far. This may be due to the fact that the recordings were of poor quality and came from a stationary sound. Another possibility is that the mating rather than the attacking whale calls may have been recorded. Thus stereo broadcasting and

more experimentation is needed, but a shortage of funds is making further research difficult. The Laboratory, therefore, turned its efforts to investigating the use of explosive shock waves to chase seals away from nets. Firing a bullet into the water repeatedly seemed to accomplish this. A mechanical device which would reproduce this sound inexpensively and effectively remains to be developed. Nevertheless, there is no assurance that this method would remain effective — the seals could eventually become accustomed to the sound and ignore it. (IFR-77/43.)

Japan's Abalone Industry Changing

Important abalone grounds in the Pacific Ocean are located along the coasts of California, Japan, and China. In Japan, two species of abalone are harvested commercially: *Haliotis gigantea* and *Haliotis japonicus*. Much of Japan's abalone is taken in the prefectures located along the coasts of the Pacific Ocean and East China Sea (Fig. 1), with landings in these prefectures accounting for about 70 percent of total production in 1974 (Table 1).

Yearly catches of abalone remained relatively stable until the late 1960's. The annual average catch for the 10-year period 1956-65 was about 4,800 t. Landings of abalone in subsequent years have been on the increase. A particularly good year for abalone was 1970 when 6,466 t was caught, an increase of 40 percent from the 1955 level

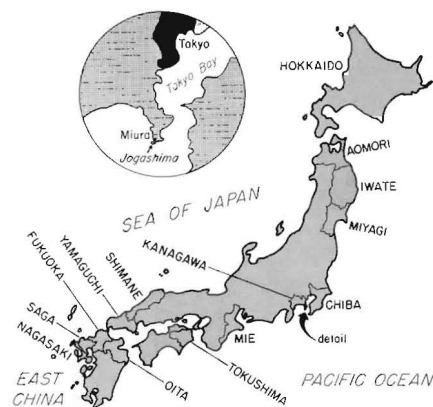


Figure 1.—Japan's abalone producing prefectures.

of 3,922 t. Since 1970, catches have been decreasing slightly, with 4,971 t reported in 1974 (Table 2). The overall increase in annual catches since 1955 is in part explained by improved artificial spawning methods developed in the late 1960's and early 1970's.

Most abalone is taken by hand, a method which produces a high-quality,

Table 1.—Principal Japanese landing areas of abalone, by prefecture and quantity (shell on), 1974.

Prefecture	Quantity (t)
Hokkaido	455
Pacific Coast	
Aomori	139
Iwate	780
Miyagi	490
Chiba	650
Mie	255
Tokushima	153
Oita	104
Japan Sea Coast	
Shimane	139
Yamaguchi	240
E. China Sea Coast	
Fukuoka	121
Saga	115
Nagasaki	716
Other Prefectures	614
Total	4,971

Source: Regional Fisheries Attache, Tokyo.

Table 2.—Japan's abalone catch (shell on), 1955-75.

Year	Quantity (t)	Year	Quantity (t)
1955	3,922	1966	5,580
1956	3,611	1967	5,958
1957	3,937	1968	6,141
1958	4,643	1969	6,463
1959	4,910	1970	6,466
1960	4,390	1971	5,659
1961	3,836	1972	5,815
1962	4,896	1973	5,839
1963	4,925	1974	4,971
1964	4,609	1975	5,416
1965	4,340		

FAO, "Yearbook of Fishery Statistics," 1975. Source: Regional Fisheries Attache, Tokyo.

costly product. Abalone, which has long been a valued food commodity on the Japanese market, sold for an average of US\$4.44 per pound (shell on) (¥2,854 per kg) on the Tokyo Central Wholesale Market in 1974.

Although abalone has traditionally been consumed raw in Japan, indications of change in the Japanese market are apparent. Imports of canned abalone have steadily increased since 1970. In 1976, Japan imported about 552 t of canned abalone valued at almost \$4 million, mainly from Mexico and Australia. This represents an increase of about 30 percent in quantity from 1970, and almost 300 percent in value (Tables 3 and 4). In contrast, Japan imported about 1,288 t of live, fresh, or chilled abalone in 1976, valued at approximately \$6 million (Table 5). (Source: Regional Fisheries Attache, Tokyo, IFR-77/55.)

Table 3.—Japanese imports of canned abalone, by country, 1975-76, in metric tons and US \$1,000.

Country	1975		1976	
	Quantity	Value	Quantity	Value
U.S.A.	1	4	—	—
Mexico	114	667	77	586
Australia	503	2,505	459	3,136
New Zealand	5	20	16	97
Total	623	3,196	552	3,819

Source: Regional Fisheries Attache, Tokyo.

Table 4.—Japanese imports of canned abalone, 1970-76, in metric tons and US \$1,000.

Year	Quantity	Value
1970	411	956
1971	696	2,123
1972	737	2,379
1973	1,002	3,654
1974	678	3,210
1975	623	3,197
1976	522	3,819

Source: Regional Fisheries Attache, Tokyo.

Table 5.—Japanese imports of live, fresh, chilled, or frozen abalone, by country, in metric tons and US\$1,000.

Country	1975		1976	
	Quantity	Value	Quantity	Value
S. Korea	124.0	799	83.0	573
N. Korea	5.0	13	—	—
Hong Kong	1.0	6	—	—
Philippines	2.0	4	0.4	2
Canada	71.0	240	183.0	751
U.S.A.	11.0	41	9.0	39
Chile ¹	119.0	212	430.0	783
S. Africa	0.5	3	—	—
Australia	558.0	2,582	583.0	3,743
Taiwan	—	—	0.4	1
Total	891.5	3,900	1,288.8	5,892

¹True abalone does not occur off Chile. However, a similar species, *Concholepas concholepas*, called "locos" by Chilean fishermen, is exported to Japan and marked as abalone.

Source: Regional Fisheries Attache, Tokyo.

According to the NMFS Office of International Fisheries, in 1975, a highly successful abalone farming experiment was conducted in waters off Jogashima, an island near Miura in Kanagawa Prefecture (Fig. 1). In this experiment some 100,000 abalone spat were planted on man-made iron reefs, and then submerged to depths of from 5 to 7 meters. Resulting harvests yielded

approximately 25 abalone per square meter, an astonishing rate when compared against the average yields previously recorded in the same region of from 0.3 to 0.5 abalone per square meter. The abalone produced in this experiment averaged 14 centimeters in length and 405 grams in weight, a product equal in size and weight to natural abalone. (Source: IFR-77/55.)

Ecuador Shrimp Industry Sets New Export Records

The Ecuador shrimp industry set new records in 1976. Ecuadorian companies exported a total of 4,338 metric tons (t) of shrimp tails, a 15 percent increase over the 3,784 t exported in 1975. The previous record year was 1969 when 4,082 t were exported. Shrimp exports account for over 50 percent of the value of Ecuador's fishery exports.

Exports for the first 2 months of 1977 were about 20 percent ahead of the same period in 1976. Heavy rains are expected to result in continued good catches, especially of the small "titi" species (*Xiphopenaeus riveti*), and 1977 shrimp exports could set a new record. Rumors of an Ecuadorian ban on shrimp exports due to poor catches have proven incorrect.

Of the total Ecuadorian shrimp catch, an estimated 90 percent is exported. Almost all Ecuadorian shrimp exports are shipped to the United States. U.S. import statistics indicate that the 4,243 t of shrimp imported in 1976 were worth \$25.6 million (Table

1). A total of 18 Ecuadorian companies exported shrimp in 1976. About 70 percent of all shrimp shipments were exported by the firms listed in Table 2.

Increased shrimp exports are partly due to aquaculture projects in the southern Ecuadorian province of el Oro. Pond culture of *Penaeus vannamei*, and to a lesser extent of *P. stylirostris*, accounted for the production of 600 t of tails in 1975. Estimates for 1976 indicate that the production of tails from pond culture increased to about 700 t and Ecuadorian officials believe that this production will expand significantly in the next 2 years. (Source: U.S. Consulate General, Guayaquil; IFR-77/64.)

Japanese Fisheries Developments Told

According to reports from the Regional Fisheries Attache, Tokyo, Japanese exports of fishery products were worth \$598.7 million in 1976 according to preliminary customs statistics released in Tokyo, 21 January 1977. While 1976 exports were 34 percent larger than in 1975, fishery imports were up 49 percent from 1975. Japanese fishery imports exceeded exports, as they have every year since 1972, and were worth \$1,781.4 million. Japanese exports of fishery products to the member nations of the European Economic Community doubled in 1976, to \$104 million, and exports to the United States also increased by 54 percent to \$177.8 million. At the same time, Japanese imports of fishery products, including large amounts of shrimp from Southeast Asian nations,

Table 1.—Ecuadorian shrimp exports to the United States, 1974-76.

Year	Quantity (t)	Value (U.S. \$1,000)
1974	2,817	11,480
1975	3,655	17,382
1976	4,243	25,627

Source: U.S. Department of Commerce, Bureau of the Census.

Table 2.—Ecuador's major shrimp exporting companies, 1976.

Company	Quantity ¹
IPESA	858.4
ENACA	589.7
Empacadora Shayne	572.6
COPESA	415.3
FRIMAR	288.0
FRIGORO	266.3
Total	2,990.3

¹Tails; metric tons.

Source: U.S. Consulate General, Guayaquil.

were worth \$1,110.2 million in 1976, an increase of 46 percent from 1975. Imports from the United States, particularly of tanner crab, salmon, and herring roe, increased 31 percent to \$21 million.

Japan's 1975 catch from its coastal and offshore fisheries increased, but did not offset a decline of 530,000 metric tons (t) in its high-seas fisheries catch. The total national catch for 1975 was 10,520,000 t, a decrease of 280,000 t from 1974.

The Soviet Ministry of Fisheries proposed to share information and swap species/area quotas with Japan's consolidated whaling company, Nippon Kyodo Hoge, according to Japanese press reports. The Soviet Union and Japan are the only nations now whaling in the Antarctic and a growing spirit of cooperation between the two which might result in joint venture was reported by the article. Japanese officials denied the report.

The Japanese Government and the country's fishing industry are seeking to learn the Soviet Union's intentions following the December 1976 declaration of a 200-mile fishery zone which the Soviets began enforcing 1 March 1977. Agriculture and Forestry Minister Zenko Suzuki, a leading fisheries politician before his appointment to the Fukuda Cabinet in December 1976, chose to send Akira Matsuura, Director of the Marine Fisheries Department of the Japanese Fisheries Agency, to Moscow. In Moscow, Director Matsuura met with his counterpart, Director Stepanov of the Soviet Fisheries Ministry, and, accompanied by the Japanese Ambassador to the Soviet Union, Shigemitsu, also met with Soviet Fisheries Minister A. A. Ishkov. Minister Ishkov recommended an early visit to Moscow by Minister Suzuki. Bilateral fishery talks on salmon, herring, crab, and other resources of the Sea of Japan and the northwestern Pacific, began 15 March in Tokyo.

Meanwhile, the largest private Japanese consolidated fishing corporation, Taiyo Gyogyo, sent its new president, Tojiro Nakabe, to Moscow. The Taiyo Company and the Soviet Ministry of Fisheries are reported to be discussing the purchase of \$33.7 mil-

lion of processing and refrigerating equipment suitable for use in the seafood industry in the Soviet Far East. The Soviet Union would pay for such equipment through sales of finished products to Taiyo.

The details of the discussions were not made public, but public controversy has resulted from the Soviet talks with Taiyo since coastal fishermen of northern Japan fear that giant Taiyo Company will strengthen the fishing industry of the Soviet Union at their expense. If the Soviet industry is able to catch and process larger amounts of fish, decreased quotas for Japanese fishermen fishing on the same grounds may result.

The Japan Trawler Association planned to reduce the size of the Japanese fishing fleet in the eastern Bering Sea in

1977. Preliminary plans would decrease catcherboats from 95 to 86 and independent stern trawlers from 17 to 15. The number of motherships would not change from the 5 vessels which were licensed in 1976. The decrease in vessels implies a reduction of catch by 97,000 t. Further reductions could be accomplished by decreasing the quotas of the remaining catcherboats and independent stern trawlers.

In 1977, the U.S. allocated Japan 836,400 t of pollock in the northeast Pacific, including 792,300 t in the Bering Sea and Aleutian area, and 44,100 t in the Gulf of Alaska. According to Japanese reports, Japanese fishermen caught 1,000,000 t of pollock in these areas in 1976 and 1,055,819 t in 1975. (Source: IFR-77/50.)

The Fisheries of Burundi

Commercial, artisanal, and "traditional" fishermen of Burundi in East Africa fish mostly in Lake Tanganyika, the country's only important fishing area.

The severe decrease in the catch by the artisanal and traditional fishermen in 1972, 1973, and 1974 (Table 1) was due to major ethnic strife, prolonged civil disturbances, and the consequent fear which prevailed, especially during 1972 and 1973. The return to normalcy in 1975 allowed for a more intensive effort by both the artisanal and traditional fishermen. For example, although the number of vessels owned by commercial fishermen increased from 18 to 21, their catch in 1975 was 1 percent below that of the previous year, and represented only 40 percent of the total catch compared to 56 percent in 1974. In contrast, the 389 artisanal fishing vessels (a 93 percent increase in the number of vessels since 1974) permitted the small fishermen to increase their catch by 52 percent. As a result, they took 31 percent of the total catch in 1975 compared to 28 percent in 1974. Similarly, the traditional fishing fleet, which was augmented by 92 percent to 784 vessels since 1974, increased its catch by 156 percent, and represented



Table 1.—Burundi fisheries catch, 1971-75, in metric tons.

Year	Commercial fishery	Artisanal fishery	Traditional fishery	Total
1971	6,053	4,876	5,966	16,895
1972	4,327	1,270	1,846	7,433
1973	5,620	1,336	1,568	8,524
1974	6,211	3,127	1,765	11,103
1975	6,144	4,746	4,526	15,416

¹The total fisheries catch reported to FAO was 14,531 metric tons.

Source: Burundi Fisheries Service.

29 percent of the total catch compared to 16 percent in 1974.

The fisheries catch in 1975 was valued at about \$3.0 million compared to \$2.2 million in 1974 (Table 2). The value may reach \$4 million in the future because a recent World Bank study indicates that as much as 20,000 to 25,000 tons of fish could be caught in Lake Tanganyika each year.

Table 2.—The value of Burundi's fisheries catch, 1971-75, in U.S.\$1,000.

Year	Commercial fishery	Artisanal fishery	Traditional fishery	Total
1971	697	400	389	1,486
1972	697	114	34	845
1973	1,016	— ¹⁴⁰	—	1,156
1974	1,346	571	317	2,234
1975	1,625	660	762	3,047

¹The value of the artisanal and traditional catch combined was \$140,000.

Source: Burundi Fisheries Service.

Table 3.—Burundi fisheries catch, by species, 1975, in metric tons.

Fishery	Species			Total
	Ndagala	Predators	Others	
Commercial	4,038	2,106	—	6,144
Small-scale	4,599	130	17	4,746
Traditional	3,579	12	935	4,526
Total	12,216	2,248	952	15,416

Source: Burundi Fisheries Service.

The artisanal and traditional fishermen generally restrict themselves to the catching of small fish, the ndagala¹ and similar species. On the other hand, the commercial fishermen have a virtual monopoly on predator fishes or "voraces." Table 3 indicates the 1975 catch by species.

The Burundi Fisheries Service is a part of the Department of Water Resources and Forestry which is within the Ministry of Agriculture, Livestock, and Rural Development. The principal responsibilities of the Service are the enforcement of laws and regulations applicable to the fishing industry, the coordination and direction of research, and the collection of data of concern to the industry.

The Société Régionale de Développement des Pêches (Regional Fisheries Development Company) is responsible for fisheries development and is also under the direction of the Ministry of Agriculture. It functions, however, as an autonomous agency and is empowered to undertake commercial, industrial, and financial activities. A general manager runs day-to-day operations.

As a result of fisheries research conducted by the World Bank on Lake Tanganyika, the International Development Association (IDA) granted US\$6.0 million to Burundi to promote

small-scale fishing on the lake. Because the financing has been granted by the IDA, some of the equipment to be supplied for the project, which will span 5 years, might offer trade opportunities for U.S. exporters. These goods and the estimated purchase val-

ues are: 1) Outboard motors, at US\$170,000; 2) fishing nets at US\$200,000; 3) lamps and lamp parts at US\$200,000; and 4) processing plant equipment at US\$125,000. (Source: U.S. Embassy, Bujumbura; IFR-77/70.)

EC NEGOTIATES FISHERY CLAIMS

The European Community (EC) fisheries negotiations with nonmember countries fall into three general categories depending on the interests in each others fisheries.

The USSR, Poland, East Germany, Finland, Sweden, Spain, Bulgaria, and Romania all belong to the group that have appreciable fishing interests in EC waters while EC fishermen have minimal interests in their waters. (Romania and Bulgaria have already been excluded due to their relatively recent arrival in the North Sea fisheries and also because of lack of EC interest in their waters, the Black Sea.)

The second group includes Norway, Iceland, and the Faeroe Islands which do have fishing areas of interest to the EC. These countries also have a traditional interest in EC waters. The EC is therefore attempting to achieve a flexible agreement whereby, for example, Norwegian fishermen will be permitted to catch the same amount of fish in the EC zone as EC fishermen will catch in the Norwegian zone. This approach has been unsuccessfully tried in negotiations with Iceland. (Iceland is primarily interested in EC herring and, anticipating an EC herring ban in 1977, the Icelanders are reluctant to permit EC fishermen into Iceland's waters to catch their valuable cod.)

The third category includes the United States and Canada in whose waters some EC members want to fish. Neither Canadian nor U.S. fishermen are interested in EC waters. The result of the negotiations with third countries will depend on quotas given member states. The resulting agreements will also necessitate a large high-seas patrol fleet. While the EC more or less agrees about negotiations with third nations and about control of third-country

fishermen, disagreements exist with regard to conservation measures and catch quotas for member states. Denmark is caught in the middle in both of the above disagreements.

Danish fishermen are troubled by prospects for herring, sprat, and blue whiting fisheries. It is primarily the large, traditional Danish reduction fishery in the North Sea which was threatened by the conservation measures under discussion. In particular, the Danes found most troublesome the proposal to ban fishing for the North Sea herring. Denmark cannot accept a total ban on herring without some allowance being made for a herring by-catch in the Danish reduction fishery. (In 1975 Denmark landed 174,000 tons of herring as by-catch.) Denmark also demanded that the herring fishery in the Skagerrak not be included in any herring ban zone (although the Skagerrak is contiguous to the North Sea).

Another area of contention is along the eastern coast of Scotland where the Danish fleets catch sprat (300,000 tons in 1975). The UK proposed that this area be closed to reduction fishing because they claim the sprat fishery is destroying most of the valuable juvenile groundfish stocks which will in a few years be caught for human consumption. Denmark also demanded that blue whiting not be subjected to conservation measures because this stock is largely unexploited and could supplement the Danish reduction industry.

Finally, the major problem to be resolved concerns Irish and Scottish fishermen's demands that they have an exclusive 50-mile zone off their coasts. They have not been willing to accept the 12-mile exclusive zone the EC has proposed. Both Scotland and Ireland

¹"Ndagala" or "dagaa" are small, sardine-like, freshwater fish and include the species *Limnothrissa miodon* and *Stolothrissa tanganicae*.

argue that their fisheries are underdeveloped and they want to have the opportunity to exploit more fully their own coastal resources to build up their fishing industries. Denmark has proposed that Ireland and Scotland have zones reserved for catching fish using methods traditionally used by coastal fishermen. (This implies the continuation of the present, semiartisanal fishing methods which produce smaller quantities of fish per unit of effort when compared with the more technically developed fleets.)

A later press release reported that the Danes had reached an agreement with that segment of the UK fleet which had been forced out of Iceland's waters to supply reduction fish (mackerel and herring) to Danish fish meal plants. These vessels will be allowed to fish inside the 12-mile limit and should fill a critical gap in Denmark's fish supply, provided the UK fishery management officials do not object. (Source: U.S. Embassy, Copenhagen; IFR-77/35.)

IRAQ MODERNIZES ITS FISHING INDUSTRY

The Iraqi State Fishing Company, established in 1972, has jurisdiction over marine and inland fisheries. It is responsible not only for developing the catch of fish, but also for its distribution. As a result, it owns cold stores and refrigerator trucks and is building its own marketing system.

The Company owns six 150-ton trawlers and six steel shrimp vessels, all recently acquired. It is also opening a fishermen's training center. Until now the fish harvesting industry depended entirely on traditional craft and methods.

Marine fish is cheap in Iraq and, because it is considered an essential food, its prices are controlled. To help keep prices down, Iraq imports 20,000 tons of fish a year. Freshwater fish is more expensive. Elaborate plans are being drawn up for the establishment of inland fish farms. There are plans for oceanographic and marine biology studies and for setting up a Center for Arabian Gulf Studies at Basrah. The

possibility of training experts in these fields in Ireland was raised on a number of occasions by the Iraqis.

The State Fishing Company has recently opened its own net factory near its new fish-processing plant on the Shatt-El-Arab, the Iraqi coast on the Persian Gulf.

The length of Iraqi coastline is only 48 km, but the country has sovereignty over a few islands in the Arabian Gulf, where a large new floating port has been created to service tankers of up to 265,000 tons. The number of fishermen, just over 1,000 in 1972, is expected to double by the end of the decade. Fishermen in the State Fishing Company trawlers are paid a basic wage.

Although the fishery catch has declined, the 1980 catch is expected to reach 80,000 t from the Gulf and the Indian Ocean (to which some of Iraq's new trawlers will be directed) and 120,000 t from the inland waters, where it is proposed to create 260 hectares of fish farms.

The marine fish caught are chiefly pelagic, but includes two species of shrimp. The per capita fish consumption in Iraq (population about 12 million), 2.2 kg in 1972, has been rising rapidly and is expected to reach 9 kg in 1977, and 15 kg for a population of 13.2 million in 1980. By 1980, the State Company hopes to have 19 smaller and 15 refrigerated trawlers as well as traditional craft. (Source: IFR-77/24.)

According to the NMFS Office of International Fisheries, under the 1969 fisheries cooperation agreement between Iraq and the Soviet Union, the formation of a joint fishing company, named Ar-Rafidayn Fish Co., Limited, was announced on 1 July 1975. (For details see International Fisheries Report 75-165.) No further information on this company is available. In 1976, however, the Soviet Union delivered two 340-ton trawlers, ordered by the State Fishing Company at a reported cost of US\$14.6 million¹. Deliveries of

¹The cost of the vessels in Iraqi currency is 4.25 million dinars. This figure converted directly into dollars yields \$14.6 million. If converted first to rubles then to dollars, it becomes about \$2.5 million, a more believable figure.

several smaller vessels or contracts to purchase fishing vessels from the Soviet Union were also reported.

The projected catch increases to 80,000 t from the Gulf and the Indian Ocean and 120,000 t from inland waters by 1980, appear overly optimistic. In 1975, the Iraqi marine catch was 7,200 t and the freshwater catch was 14,632 t. Moreover, Iraq's total fisheries catch has been declining since 1972. According to the FAO's "Yearbook of Fishery Statistics," Iraq's total fish catch has been: 1971, 27,200 t; 1972, 32,000 t; 1973, 27,700 t; 1974, 24,246 t; and 1975, 21,832 t.

U.S.-Russian Claims Board Notes Progress

The U.S.-USSR Fisheries Claims Board was established on 21 February 1973 and began to function officially in early 1974. The Board was established to facilitate the settlement of claims advanced by a national of one country against a national of the other country as a result of damage to fishing vessels or gear, or loss of or damage to the catch. The agreement initially provided for the consideration of claims arising from loss or damage sustained in the northeastern Pacific Ocean, including the Bering Sea. It was amended on 21 June 1973 to include consideration of claims arising from incidents in the western Atlantic Ocean.

Each Government appoints two members to the Board who act as independent judges in settling claims. Initially, the Board examines evidence submitted by fishermen of either country and then determines whether the evidence is sufficient to recommend a settlement as to who is responsible for the damages incurred. Cases in which the Board recommends payment by the Soviet Government are reviewed by that Government before payment is authorized. The recommendations of the Board are not binding on any party and a claimant may ask the Board to reconsider its recommendation.

In its 3 years of existence, the Board has examined 72 allegations of loss or damage to American fishing vessels or

gear by Soviet vessels. The Board made recommendations in 53 of these cases, 31 of which were favorable to U.S. claimants (Table 1). Settlements totaling \$205,910 have been made.

Table 1.—Claims board favorable and unfavorable recommendations to U.S. claimants and active cases at year's end, 1974-76.

Year	Favorable	Unfavorable	Active cases
1974	5	1	19
1975	10	4	33
1976	16	17	5

In 14 cases, the Board found that four claims were deficient in the amount of evidence required to establish the responsibility of Soviet vessels, three were submitted beyond the filing period established by the Agreement, five were filed after the period which the Board may consider, and two were terminated at the claimants' requests. Five cases remain under active consideration by the Board in 1977 (Table 1). (Source: Report for the Year 1976 of the U.S.-USSR Fisheries Board. IFR-77/42.)

Sri Lanka Gets Abu Dhabi Fishery Loan

The Government of Sri Lanka and the Sheikdom of Abu Dhabi signed a fisheries assistance agreement in late 1976. Under the agreement, Sri Lanka will receive a low interest loan of \$11.4 million from the Abu Dhabi Fund for Economic Development (ADFED). This loan, repayable in 10 years with a 4-year grace period, will be used to add 172 new trawlers to Sri Lanka's fishing fleet, and to purchase additional equipment and spare parts for the existing facilities of the Ceylon Fisheries Corporation.

The 172 new vessels include 150 shrimp trawlers (32 feet long), 20 multipurpose trawlers (38 feet long), and 2 multipurpose trawlers (60 feet long). These trawlers will operate in the Gulf of Mannar and the Palk Straits (see map) using midwater and bottom trawls.

The fisheries development plan financed by the loan will be administered by a special committee set up by

the Ministry of Fisheries in Sri Lanka and representatives of the ADFED. (Source: IFR-77/60.)

According to the NMFS Office of International Fisheries, Sri Lanka's 1975 fisheries catch was 129,123 metric tons (t), an increase of 16.6 percent from the 110,700 t caught in 1974. The Sri Lankan fishing fleet consisted of 6,293 mechanized and about 17,000 nonmechanized fishing vessels in 1973, the last year for which the fishing fleet statistics are available.

In recent years, Sri Lanka has received development assistance for its fishing industry from the Asian Development Bank, Japan, and the People's Republic of China, as well as from Abu Dhabi. For example, in 1962 Japan assisted Sri Lanka in establishing a fisheries training center at Negombo, close to a major Sri Lankan fishing area. This was followed in 1974 by additional assistance to help establish other fisheries training centers. In addition to providing funds for the construction and purchase of center facilities and equipment, Japan also provided training staff and a research vessel valued at US\$800,000. In 1974, Japan and Sri Lanka also agreed to undertake a

joint survey of Sri Lanka's tuna resources to determine the economic feasibility of initiating a joint tuna fishing venture.

Sri Lanka's 1976 exports of tuna, shrimp, and lobster to the United States were 728 t, worth about \$2.3 million. Almost 45 percent of these imports were frozen skipjack and yellowfin tuna. Frozen, peeled shrimp accounted for 32 percent (Table 1).

Table 1.—U.S. fishery product imports from Sri Lanka, 1976, in metric tons and US\$1,000.

Product	Quantity	Value
Yellowfin tuna, frozen	5	4
Skipjack, frozen	308	242
Other fish, frozen	2	1
Rock lobster tails, frozen	76	257
Other lobster, frozen	12	683
Shrimp, shell-on	87	105
Shrimp, peeled	234	451
Shrimp, other	4	25
Total	728	2,317

¹Less than \$500.

Source: NMFS Data Management and Statistics Division (F51).

Erratum

The butterflyfish referred to on page 30 of the April issue (39:4) of *Marine Fisheries Review* is *Peprilus triacanthus*, not *Psenopsis anomala*, which is a Pacific species.

Japan Tries Solar Heat System for Aquaculture

A new solar heating system has been designed in Numazu, Japan, to help stimulate the development of aquaculture in cold regions by allowing aquaculturists to control the temperature in ponds. Raising water temperatures can increase growth of some fish species and solar power is cheaper than conventional fuels.

The Japanese heating system will cost approximately \$17,500 in initial investment, but start-up costs are expected to be offset in 2 years by anticipated savings in normal fuel expenditures required for operation. Conventional fuel costs would average \$35 per day to raise the temperature of 100 tons of

water from 16°C to 25°C. For an average 8-month period, fuel costs would amount to about \$8,500. The solar heating system, which consists of a heat-absorbing panel, a hot-water circulator, and a water tank, is capable of raising water temperatures to 80 degrees centigrade on cloudless days even in the winter. The system can also be used to aid the growth of organic feeds needed in the rearing of fish.

A pilot project of similar design has been used in culturing tropical fish. The engineer responsible for the system intends to construct a model plant using the system in Mishima, Shizuoka, Japan. (Source: IFR-77/47.)