PERSIAN GULF FISHERIES

David K. Sabock and James A. Gurr

Lands of fabled mystery and adventure, the countries bordering the Persian Gulf are rich not only in "black gold" (oil) but in fish and shellfish, especially shrimp.

Several Persian Gulf countries are developing fisheries as additional sources of income to oil--with some success. Such modern techniques and methods that exist generally are found in the shrimp trade. Saudi Arabia, Kuwait, and Bahrain have had the most successful fishery developments and, with Iran, ship large quantities of shrimp to the U.S. Iran has the longest coastline and a large share of the Gulf fishery resources within her territorial waters, but she has done little to exploit them. The Trucial States and Qatar also have resources that could be developed, but projected plans have not yet been fully realized. Iraq has a very short and unproductive coastline and has shown little interest in developing a marine fishery. As a whole, however, the Persian Gulf has virtually unlimited potential for expanded fishery production. A conservative estimate is that the total yield could be increased at least tenfold.

Private companies from the U.S., U.K., Italy, Greece, and Japan have participated in the area's shrimp fisheries. The USSR also fishes in the Gulf.

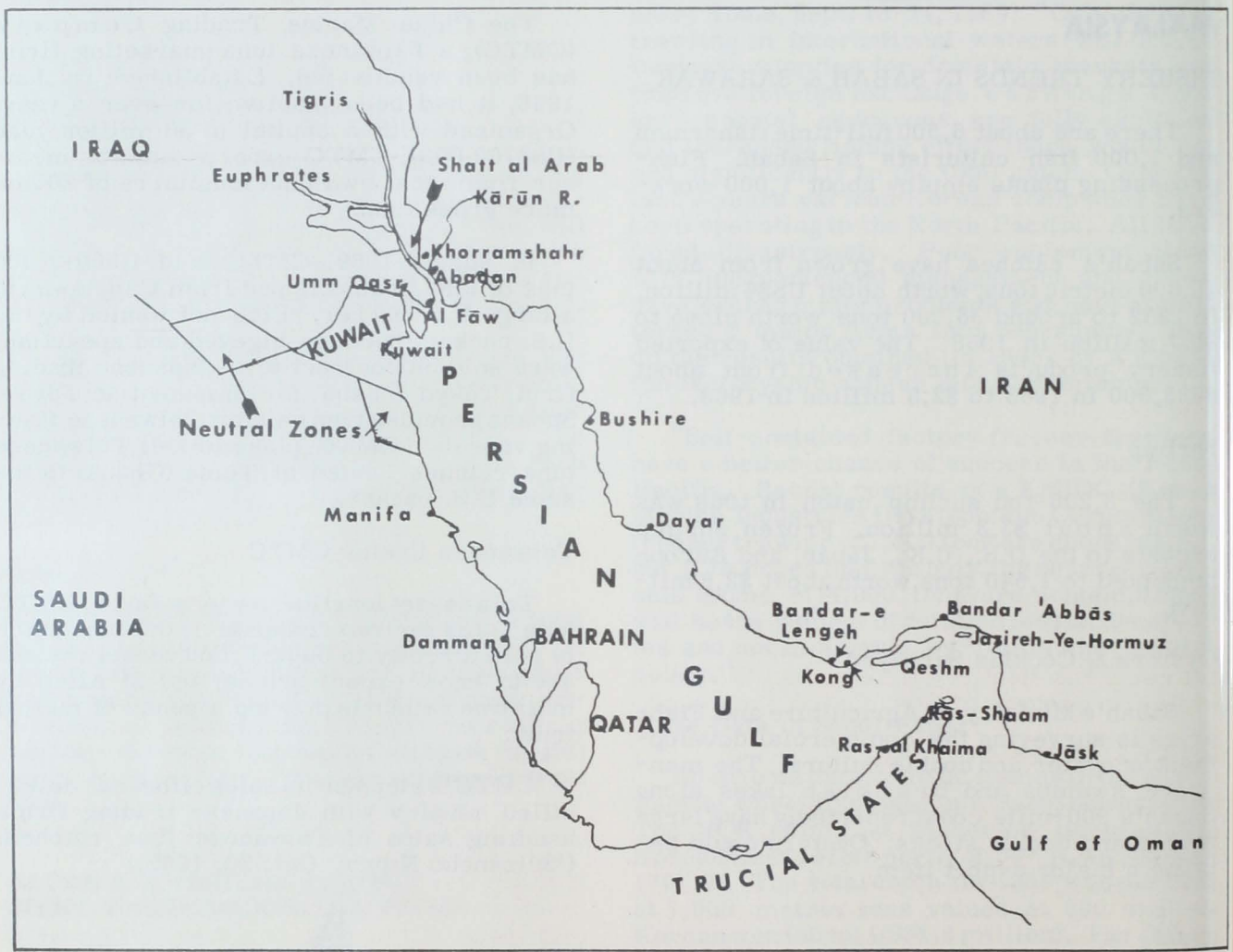

Fig. 1 - Fishing ports in the Persian Gulf.

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CATCHES INCREASING

Total fishery landings in the region are estimated at 75,000-100,000 metric tons (live weight), perhaps up to one-third higher than the total catch in 1960 (table 1). Official statistics are not available on individual species; historical data are fragmentary. The catch is fairly evenly divided among Iran, Kuwait, Iraq, and Saudi Arabia, although it is not known what proportion of Saudi Arabia's catch is taken in the Gulf compared with the Red Sea and Arabian Sea. Relatively small amounts are landed in Qatar, Bahrain, and the Trucial States, a loose-knit group of 7 shiekdoms on southeastern coast of Persian Gulf.

Table 1 - Persian Gulf: Total Fish Landings, 1963-67

	1967	1966	1965	1964	1963
	(1,000 Metric Tons)				
Iran[1/]	22.4	21.0	NA	NA	NA
Saudi Arabia	21.6	19.9	18.6	20.2	19.6
Iraq[2/]	NA	18.3	12.5	19.2	11.3
Kuwait[3/]	13.0	11.0	11.0	10.0	9.0
Qatar[3/]	NA	NA	NA	0.6	0.6

1/Includes landings of foreign vessels licensed to fish in Iranian waters.
2/Data refer to wholesale markets only.
3/FAO estimates.
NA - Data not available
Source: FAO Yearbook of Fishery Statistics, vol. 24, 1967.

Although many species of fish and shellfish are caught, shrimp has attracted worldwide attention. Shrimp landings totaled 17,900 metric tons (live weight) in 1967--66% more than in 1964.[1/] Saudi Arabia, Kuwait, and Iran, in that order, are the primary producers. Despite a large increase in world catch from 1964 to 1967, Persian Gulf countries have increased their share of world total from 1.8% to 2.6% (table 2). Industry estimates for 1968 indicate landings of about 20,000 tons, with 1969 results running at a comparable level. In 1965, catch per vessel peaked at 260 tons. Since then, the per-vessel catch has declined to less than 160 tons, while the number of vessels has increased.

MANY SPECIES AVAILABLE

Many species of demersal and pelagic fish abound in the fertile waters. Generally, the species are marine coastal types and include sea breams, snappers, pomfrets, mackerel, skipjack, spadefish, croakers, groupers, grunt, threadfin, gizzard shad, shad, yellowfin, shrimp, and many others. The shrimp is generally "pink," with a life cycle of 12-14 months.

Table 2 - Shrimp Landings (Live-Weight), 1964-67

	1967	1966	1965	1964
	(1,000 Metric Tons)			
Iran	4.1	4.6	-	-
Kuwait	6.0	4.0	4.0	3.8
Saudi Arabia	7.8	7.1	6.6	7.0
Total	17.9	15.7	10.6	10.8
World Catch	690.0	626.0	587.0	590.0
Percentage of World Catch	2.6%	2.5%	1.8%	1.8%

Source: FAO Yearbook of Fishery Statistics, vol. 24, 1967.

PRIMARY FISHING AREA OFF IRAN

Fish and shrimp are found over a wide range, although more surveys are required to pinpoint additional commercially exploitable concentrations. The primary fishing area is off Iran. There, the Gulf's deepest part exists, and the flow of numerous streams into the Gulf results in much food.

The entire Gulf is rich in marine resources, but emphasis is on fishing in nearby, shallow coastal waters. This is only because sufficient vessels are not available to conduct distant fishing operations. Distant-water vessels are usually employed in shrimping.

Large concentrations of tuna, Spanish mackerel, sardines, and others, occur during September-March in the southern area from the Straits of Hormuz to Qatar. An influx of colder, less saline, more fertile water from the Gulf of Oman into the Persian Gulf carries with it large numbers of these fish. The primary fishery in this area occurs between Ras-Sha'am and Ras-al-Khaima. It is there that the deepest part of the Persian Gulf is close to the Trucial States. During the remainder of the year, fishing is conducted for shallow-water or bottomfishes for local markets.

Good catches are also made in the northern end, near Shatt al Arab, where the waters are enriched by the Tigris, Karun, and Euphrates rivers. The fishing grounds off Bushire and the island of Jazireh-Ye-Hormuz are among the best.

Shrimp are the principal off-shore species taken and are widely distributed. Main concentrations are in the northern, eastern, and southern sections and in the extreme northern part of the Gulf of Oman. The Iranian coast harbors the most valuable shrimp concentrations. Iranian shrimping centers are in the Shatt al Arab and Bandar 'Abbas regions.

1/The total shrimp catch probably is higher than that reported by official sources. Some catches are directly off-loaded and transshipped at sea and, therefore, are not recorded as landings.

PERSIAN GULF 1969

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Much of Saudi Arabia's and Kuwait's shrimp catch is taken near the coast of Iran. The Trucial States are not near the major shrimp fishing grounds. Fair quantities are harvested in Bahrain's coastal waters. The species Penaeus semisulcatus is found in the Gulf's northern part down to Qatar. Penaeus merguensis are centered on the Gulf's eastern shore, generally near Iran's Bandar 'Abbas region.

FISHING SEASONS VARY

Large-scale fishing is conducted throughout the Gulf from September through June. September-May is the main shrimp season. From September-March, mackerel, sardines, tuna, sailfish, kingfish, and marlin are readily available; a peak is reached in November-January. Pelagic fishing is at a low ebb during the hot summer. Fishing then is based on shallow-water and bottomfishes, such as rockcod, seabream, snapper, grunts, and horse mackerel.

FISHING VESSELS: CANOES TO MOTHERSHIPS

Standard fishing vessels are small rowboats, canoes, and sailboats. Although no exact data are available, it is reasonable to assume that these number in the thousands. Despite the heat, most vessels do not carry ice.

About 200 modern shrimp trawlers, with 6 large motherships, work the Gulf. Shrimp trawlers have been built or ordered from Norway, Pakistan, W. Germany, France, Mexico, USSR, and the U.S. Most are about 55'-62' length overall (l.o.a.) of many tonnages; the average likely is about 150 GRT. The motherships are as large as 4,000 GRT. About half the shrimp trawlers are based in Kuwait as a result of that country's early concern for developing a viable shrimp industry. Iran has not developed a large motorized fleet despite its long coast (800 miles) or nearness to the richest Gulf fishing area.

The same types of native vessels are common throughout the Gulf, although the names vary. Iranian names are used in this article. The smallest are the huris, dugout canoes 19 to 22 feet long with 1 to 3 fishermen. They are used to tend traps and to fish with hand lines. Next in size are the small sailing boolams (29-32 ft.) with removable coverings made of palm-leaf ribs. These carry 6 or 7 men and are used to set drift and seine nets for smaller fish. The shah-restan-e minab boats are larger (up to 49 ft.) and have removable decks of wooden boards. They carry 12 to 30 men and are used to fish for tuna and sardines with drift gill nets. Largest native boats are the chah bahar, broad-beamed, 32-96-foot sailboats. They carry 12-15 men and are used in gill-net

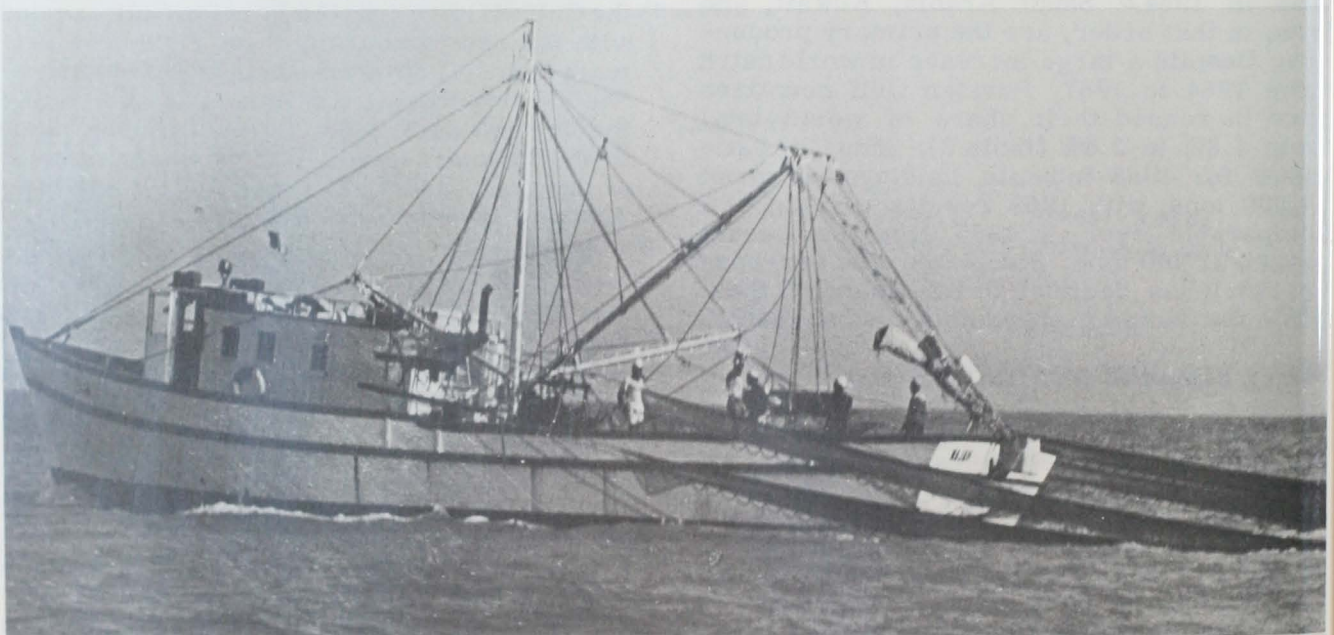

Fig. 2 - Saudi Arabian trawler.

fishing for tuna and kingfish. Except for the small huris, most boats are well constructed and seaworthy. The larger ones are suitable for mechanization.

MANY FISHING PORTS

Numerous fishing ports exist but none is well developed. Lack of fresh water and ice-making facilities and inadequate storage and distribution facilities are several principal deficiencies. In many instances, fish are landed at protected areas along beaches.

Primary Persian Gulf ports in Iran include Bushire, Abadan, Khorramshahr, Dayar, Bandar-e Lengheh, Kong, and Bandar 'Abbas.[2/] Bandar 'Abbas, where Persian Gulf and Gulf of Oman meet, is probably the most modern Iranian port. Located near the important shrimp, tuna, and sardine fishing grounds, it is developing quickly. Some 50 vessels are berthed at this port. The only fish-processing plant in Iran is the Southern Fisheries Co. canning plant in Bandar 'Abbas. There is a highway link to interior cities.

Kong is Iran's only boatbuilding yard. Most vessels constructed there are about 30' l.o.a., with small engines, however, vessels up to 200 GRT have been built.

Abadan and Khorramshahr are on the Karun River, about 100 km. inland from the Gulf. Both have good harbors and rail and highway access to other areas. A large cold-storage facility (capacity 160-180 tons) is located in Khorramshahr. Shrimp vessels are provisioned from it by small coastal freighters.

Bushire (or Bushehre) is an important shrimp and finfish port; 90 vessels fish out of it. Large landings support the 3 local ice-making plants. Only about a dozen vessels operate from Dayar, a small port with few facilities. Bandar-e Lengheh has declined in importance and its facilities are inadequate. Over 200 vessels fish tuna and sardines from Jask, a major port on the Gulf of Oman.

Iran has a very short coastline and very few port facilities. Except for the river towns of Al Faw and Umm Qasr in the Shatt al Arab region, beaches are the only places for landing fish.

The city of Kuwait is the largest and most highly developed port on the Persian Gulf. It handles more fishing commerce than any coastal city in the other countries.

Damman and Manifa are the chief fishing bases along the coast of Saudi Arabia's Eastern Province. The shrimp processing and freezing installations there are expanding rapidly with commercial success. The poor handling facilities of the port of Damman has hindered the industry somewhat, but efforts are underway to improve the situation.

Encouraged by the Saudi shrimping success, the shiekdoms of Bahrain and Qatar are also developing commercial shrimping industries. Foreign capital has been invested in developing modern fleets and processing facilities on the island of Bahrain and on the Qatar peninsula.

Commercial facilities along the 300-mile Trucial coastline, from Qatar to the Straits of Hormuz, remain rather primitive. The vessels are similar to native craft used along the corresponding Iranian coast. Most fish are used locally, but some are dried for export to Ceylon and Singapore.

FISHING METHODS MOSTLY PRIMITIVE

Gulf fishermen use a wide variety of fishing gear. Modern trawlers, introduced only recently, were first used extensively by Kuwait. Saudi Arabia and Bahrain followed with imported mechanized vessels. However, the most prevalent methods are still primitive. Fish traps, shore seines, drift nets, gill nets, cast nets, and handlines are common. Dynamiting and poisoning are also used.

Shore seines, drift nets, and gill nets are used along the beaches for catching sardines and herringlike fishes. These nets are fairly large, frequently up to 320 meters long.

Cast nets and handlines are used by individual fishermen for many varieties of fish, but yields are smaller than the others.

Occasionally, fishermen use a "fish poison" of toxic lilac-tree seeds pounded up with dead crabs and small fish. This is spread over shallow water when the tide is bringing in fish. After eating this mixture, the fish come near the surface and go into spasms. The fishermen then go into the water and catch them by hand. Actually, this is not a destructive practice because the drug's effects do not last long.

2/Andersskog, Bjorn. 'Report to the Government of Iran on the Southern Co.', FAO, Rome, 1968.

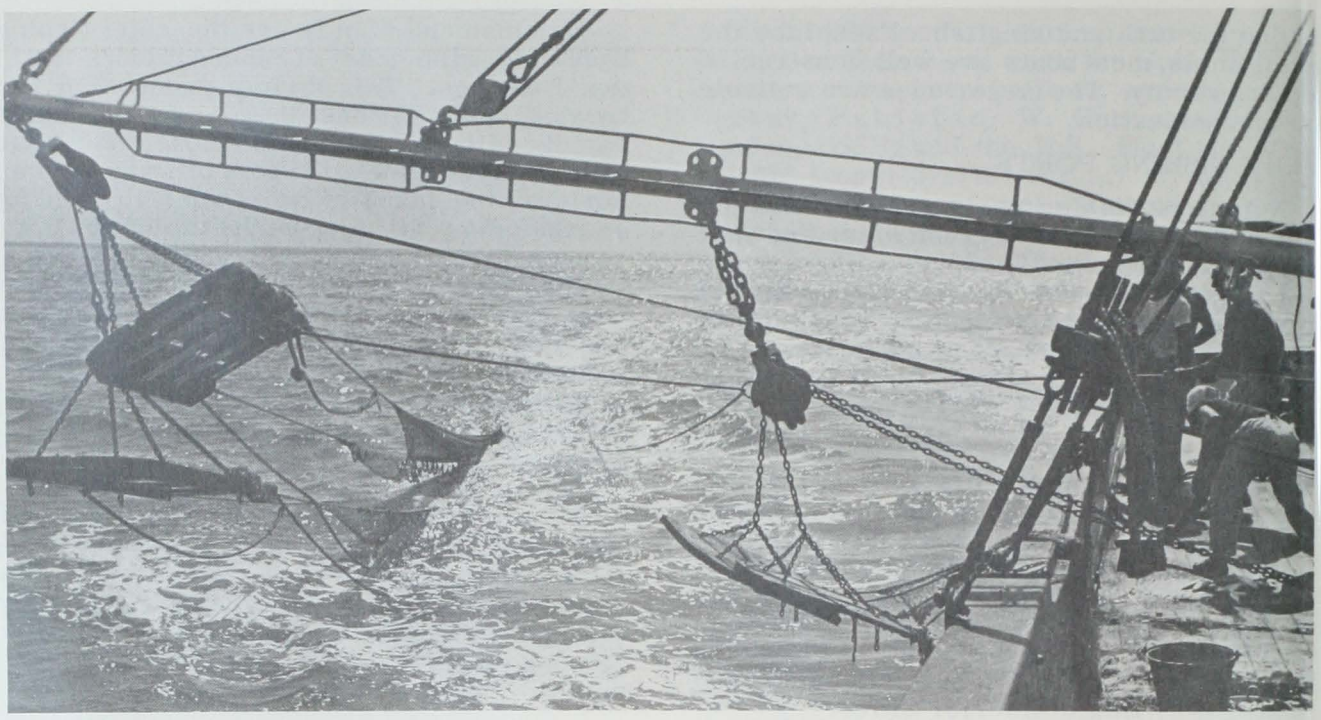

Fig. 3 - Hauling the nets.

Fig. 4 - Man at winch guides net onto deck.

Fig. 5 - Emptying the net.

Fig. 6 - Homeward bound fisherman mending nets. (Photos: Ali Khalifa)

PROCESSING & MARKETING PROBLEMS

Processing and marketing techniques in Persian Gulf countries are modern only for the shrimp export industry. Fishery development plans all have as important objectives the modernization of processing facilities (i.e., ice production, cold-storage facilities) and better marketing methods. At present, however, marketing and processing are primitive, equipment old, and hygienic conditions suspect.

Fish is not an important item in the diet of Persian Gulf countries. Fresh fish and dried fish are popular forms for domestic consumption; fish is an important food only in coastal areas. Frozen fish are not an important market form. Some fish are smoked or salted for marketing.

Relatively little fish canning, if any, is done in any Persian Gulf Country except Iran. There, the plant at Bandar 'Abbas operated by the Southern Fisheries Co. cans tuna and sardines for domestic use and export to nearby countries. Its output has reached 33 tons a day. It has a 180-ton cold-storage area and plans to expand this. The plant closes from June through August because of extreme heat.

The most modern processing and distribution techniques and facilities are in the shrimp business, oriented primarily towards the U.S. Most of the processing--grading, cleaning, freezing, and packing--is done on board factory ships in the Kuwaiti and Iranian fisheries. Shrimp are not deveined until processed in the U.S. Sanitation methods and quality are reported to be equal to U.S. standards. In both countries, however, shore-based plants and cold-storage facilities are in operation. In Saudi Arabia, most processing is done at Manifa and Damman. However, there is a factoryship operation with packing, freezing, and storage.

FOREIGN TRADE SMALL

Foreign trade in fishery products, including imports and exports, is not significant. The notable exception is shrimp exports to the U.S. These have increased from 1.4 million lbs. in 1960 to 19.2 million lbs. in 1968 (table 3). Shrimp exports were 10% of total U.S. shrimp imports in 1968 and worth US$14.4 million. This area ranks only behind Mexico and India as leading supplier of shrimp to the U.S. Japan also is becoming an important market.

Kuwait is the area's main U.S. supplier. She increased shipments from only 146,000 pounds in 1960 to almost 9 million pounds in 1968. Saudi Arabian exports to the U.S. increased from 77,000 pounds to 3.7 million during the same period. Shrimp exports from Bahrain, which began with a modest 51,000 pounds in 1962, totaled 4.4 million pounds in 1968. Iranian shrimp exports have been erratic. These varied between 87,000 lbs. in 1963 and 9.1 million pounds in 1966--but fell to 2 million pounds in 1968.

Table 3 - U.S. Shrimp Imports from Persian Gulf Countries, 1960-64 Average, 1965-69

Country	1960-64		1965		1966		1967		1968		1969 (Jan.-Aug.)	
	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value		
	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000
Iran	934	496	6,800	4,400	9,106	7,371	1,674	1,212	2,016	1,680	1,603	1,597
Kuwait	1,968	1,330	5,818	3,829	5,744	4,203	8,053	6,229	8,960	6,653	1,660	7,748
Saudi Arabia	121	60	1,201	677	1,622	1,026	2,427	1,347	3,709	2,320	1,444	1,163
Bahrain	10	8	-	-	126	98	1,640	709	4,430	3,684	96	96
Arabian Peninsula	7	2	61	30	12	8	-	-	68	45	973	1,006
Total	3,040	1,896	13,880	8,936	16,610	12,706	13,794	9,497	19,183	14,382	5,776	5,610

SHALLOW & WARM PERSIAN GULF

The Persian Gulf is an area of about 70,000 square sea miles with a coastline of 1,740 sea miles. The coastlines of bordering countries are: Iran, 720 miles (260 of them on Gulf of Oman); Iran, 30 miles; Kuwait, 80; neutral territory, 40; Saudi Arabia, 240; and Trucial Oman, 630.

The Persian Gulf is a shallow, warm, salt-water body. Its average depth is about 35 meters. Near Shatt al Arab, at the northern end, the water is extremely shallow and there are extensive tidal flats. There also are mud flats east and west of Al Qatar, north and west of Qeshm Island, and at the northern end of the Straits of Hormuz. The Gulf's channel, ranging in depth from 40-50 fathoms, is along the Iranian coast. The bottom there, and in the delta of Shatt el Arab, is soft mud and clay. Along coastal regions, sand, coral, shell, and gravel interspersed with numerous coral reefs make up the bottom sediments. Coral reefs are especially numerous along the shallow southern coast.

WEATHER WINDS & HOT

Strong winds and hot temperatures characterize the weather. During winter, winds are generally light except for unexpected squalls. Squalls become more frequent in March and April when south and southwesterly winds come in. From gentle breezes early in the day, the winds freshen in the afternoon. It is hot in June and July, with winds variable from west and southwest. A swell caused by southerly monsoon coming from Gulf of Oman can result in turbulent seas that make fishing difficult even in calm weather. Later in the year, strong southeasterly winds arrive, and these support the monsoon swell. The weather calms after mid-August with light breezes in afternoon. From mid-September, weather clears, winds are light, and the southerly monsoon swell decreases.

In the summer, land temperatures are consistently over 100° F., water temperature varies from 90° F.-100° F. These conditions affect fishing in many ways. The techniques used to catch and store the fish, and the machinery aboard vessels, must be adequate to cope with extremely high temperatures.

Note: Information sources for this article include reports from U.S. Embassies and consulates, articles in trade journals, FAO reports, and other sources. A 49-entry bibliography is available on request from Office of Foreign Fisheries.

IS THERE ANY DANGER OF OVERFISHING?

In some areas of the world, overfishing is already a problem for some species. Stocks have been depleted in heavily fished areas such as the continental shelves of Europe, particularly the North Sea. Cessation of fishing during two World Wars proved that a decrease in fishing could result in an increase in the number of large specimens.

The U.S. Bureau of Commercial Fisheries has listed the following species as being seriously depleted: Pacific sardine, Atlantic salmon, Atlantic sturgeon, blue whale, fin whale, Atlantic shad, sperm whale, humpback whale, oyster, and sea otter. Depletion of these species is not caused entirely by overfishing; disease, predators, and water pollution all take their toll.

When the catch of a species reaches the point where the reproductive capacity is unable to compensate for the losses sustained, the species is headed for extinction. However, before this point is reached, operation of fisheries becomes uneconomical, and fishing of many species to extinction is thus prevented.

There is little agreement among fisheries experts on how much the world's fisheries could be increased. Estimates of the percentage of potential yield have varied from 1 percent to 75 percent. Undoubtedly the fish catch could be increased through exploitation of areas in the Southern Hemisphere and through fishing for species not now widely used for food. ("Questions About The Oceans," U.S. Naval Oceanographic Office.)