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The Adjustment of Taiwan, ROC, Fisheries to Coordinate with the Extending National Fisheries Jurisdiction

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THE ADJUSTMENT OF TAIWAN, ROC, FISHERIES TO COORDINATE WITH THE EXTENDING NATIONAL FISHERIES JURISDICTION

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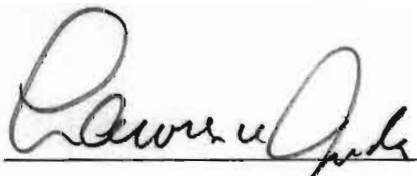
APPROVED: 

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I. INTRODUCTION

In 1982 United Nations Convention on the Law of the Sea permits coastal states to establish Exclusive Economic Zones and extend fishery jurisdiction out to 200 miles.[1] Coastal states therefore claimed jurisdiction over larger areas of the ocean, contiguous to their shorelines.[2] This "creeping jurisdiction" has brought many fish stocks under national control. The extension of 200-mile EEZs claimed by coastal states has resulted in a shrinking of the high seas which formerly had allowed for "free fishing" by any other states.

Taiwan ROC is known to many other states as a traditional fisheries country with a large number of distant-water fishing vessels. In the past her distant-water fisheries often exploited fisheries resources in the waters off other countries which are now under the jurisdiction of respective coastal states with the declaration of their EEZs.

The establishment by coastal states of 12-mile territorial seas and 200-mile EEZs or Fisheries Conservation Zones (FCZs) has resulted in tremendous impacts on Taiwan inshore fisheries and distant-water fisheries. First, the impact was seen in the traditional distant-water demersal fisheries and pelagic fisheries fishing grounds within the EEZs of the coastal states along the Southeast Asian seas and the Indian Ocean. Second, it became more and more difficult and complex to develop or exploit new fishing grounds which may be, in whole or in part, involved in

the EEZs or FCZs of coastal states. Third, problems arose with regard to specific species resources managed by the coastal states; for instance, the anadromous species--salmon. Taiwan fishing vessels operated in the North Pacific Ocean for demersal trawling or squid fishing but sometimes they happened to catch salmon. This has resulted in the United States limiting Taiwan ROC access within the U.S. EEZ.

Although there were so many impacts on Taiwan, ROC fisheries caused by the establishment of EEZs by coastal states, the ROC has made her best efforts to support its fishing industry and she has signed fisheries agreements to maintain her traditional fishing grounds and gain access to new fishing grounds within or outside the EEZs or FCZs of coastal states. As fisheries production accounted for approximately 30% of the total agriculture production value of ROC, it is very important for her economic development.[3] The ROC has to adjust its approach to fisheries in the face of the new international fisheries challenge. Through the adjusted measures, it has successfully achieved increases in her fisheries production in recent years.

The purpose of this study is to examine the problems that have occurred or may occur to the Taiwan ROC fisheries industry as a consequence of the establishment of national EEZs. An area of particular concern to Taiwan is the Western Central Pacific region, a traditional distant-water fishing ground for Taiwan fishing vessels.

II. THE BACKGROUND OF TAIWAN FISHERIES

A. General Aspects

Taiwan is an island with a 1,600 Km coastline. Along the eastern coast, the deep water abutting against precipitous cliffs forms a favorite highway for the migratory fish both from the south and the north; and the gradual inclined shelf on the west, which abounds in marine biological resources, provides excellent grounds for the habitation and propagation of many species of fish (Fig. 1).

Moreover, Taiwan has but very limited level land. Its total area is 35,961 Km^2, of which three-fifths is mountainous and only two-fifths is made up of plain and mounds. With this land limitation, coupled with the pressure of population, it is quite natural that increasing attention is being directed toward the exploration of marine and oceanic resources for which Taiwan is especially endowed with favorable requisite conditions.

In consequence of the efforts made during recent years with motorization of fishing vessels, fishing facilities, fishing gear, and industrialization of fisheries, the total fisheries production in 1987 reached 1,236,170 mt., showing an increase of 141,583 mt.[4] (12.9%) compared with the production of 1,094,587 mt. in 1986. The four categories of fisheries are shown on the following pages (Tables 1, 2 and Fig. 2).

Before 1960 the fisheries industry in Taiwan was concentrated on production. In modern industry, marketing is as important

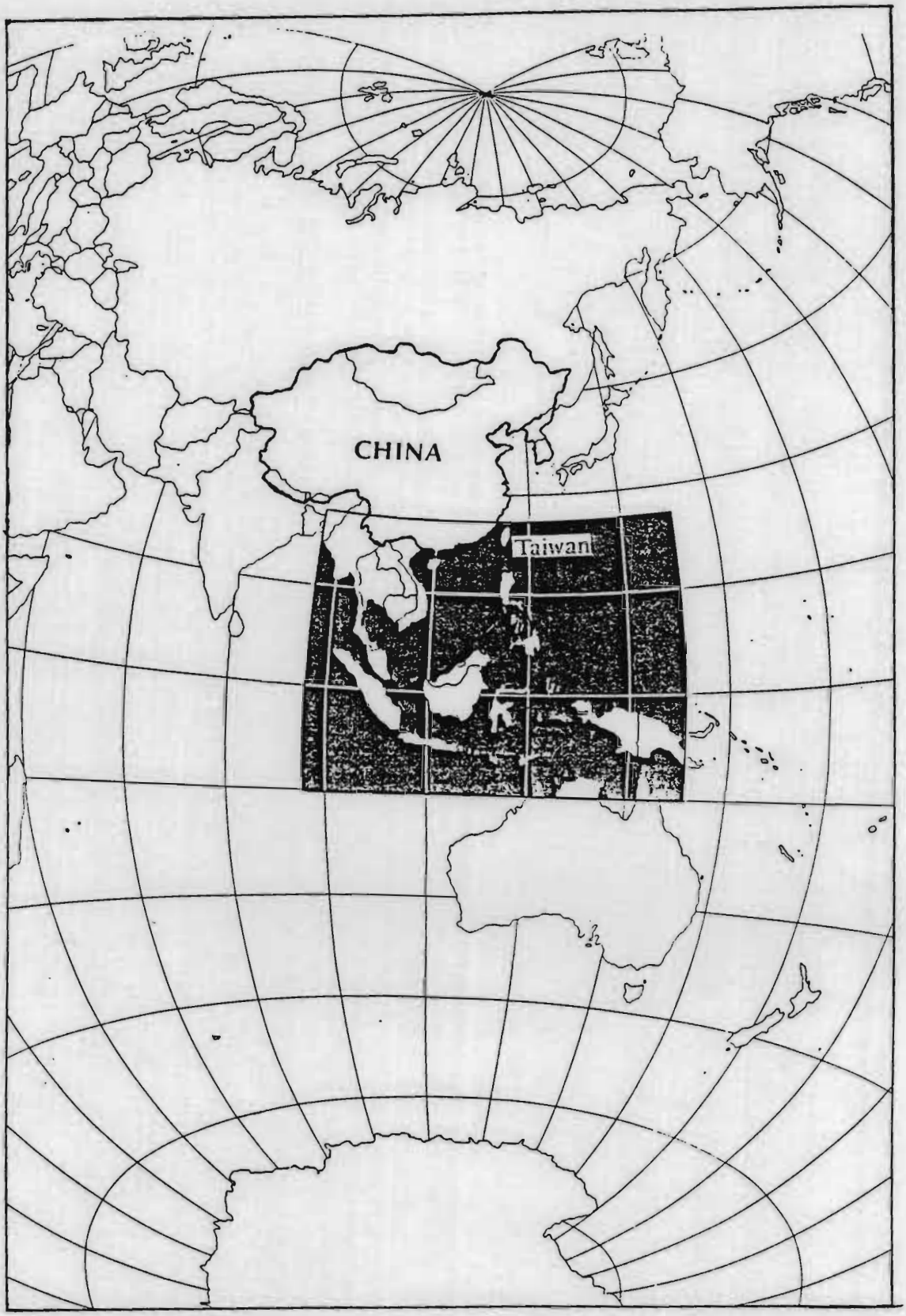

Figure 1. The location and adjacent areas of Taiwan ROC

Table 1

Fisheries Production by Year, 1968-1987 of Taiwan

	Grand Total	
Year	Quantity	Value
1968	531,170	129,836
1969	560,918	145,997
1970	613,152	178,913
1971	650,188	208,759
1972	694,280	266,140
1973	758,484	355,770
1974	697,871	382,440
1975	779,950	434,461
1976	810,600	539,085
1977	854,913	744,372
1978	885,044	837,041
1979	929,326	1,025,635
1980	936,334	1,184,780
1981	911,678	1,325,030
1982	922,520	1,476,376
1983	930,582	1,631,901
1984	1,002,599	1,788,232
1985	1,037,721	1,858,139
1986	1,094,587	2,352,502
1987	1,236,170	2,865,159

Quantity: M.T. Value: U.S. $1,000

Source: Fisheries Yearbook of Taiwan ROC 1987

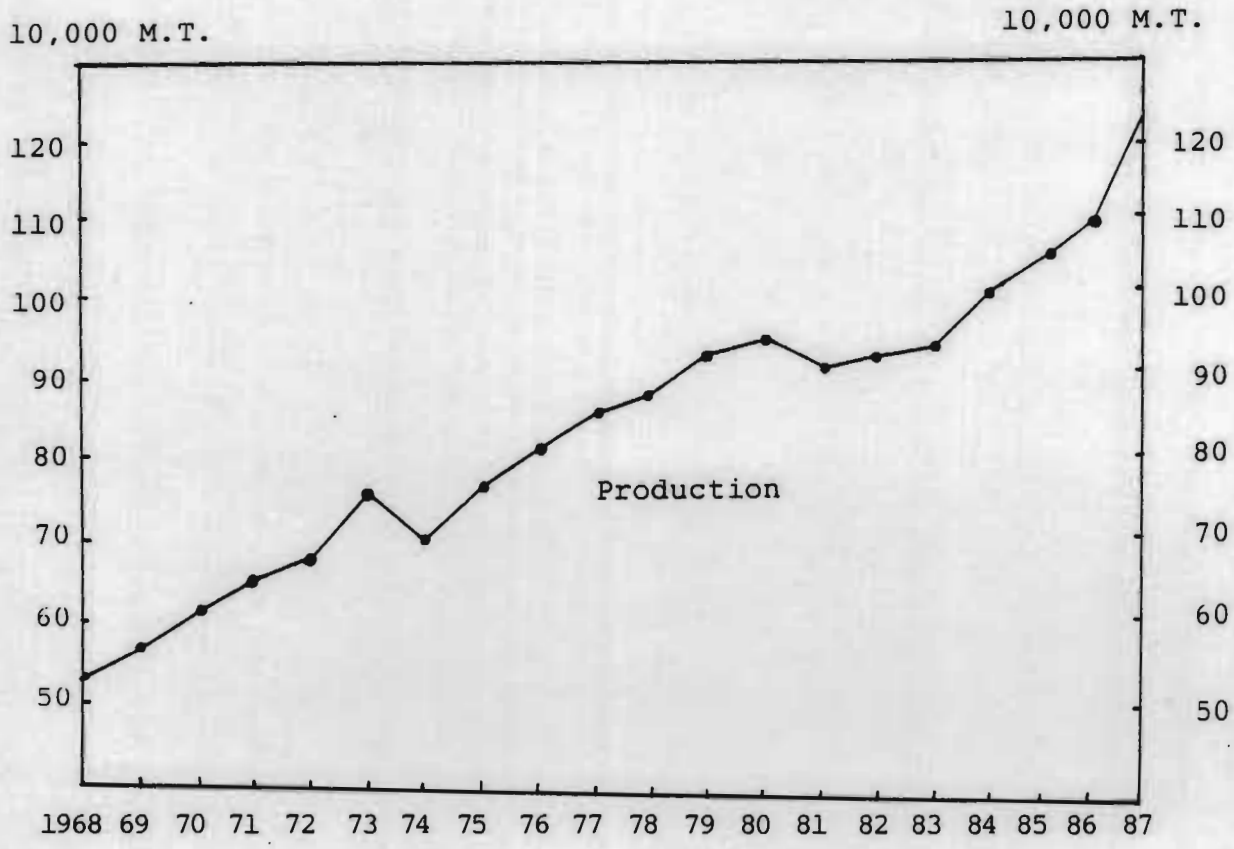

Fig. 2. The Fisheries Production of Taiwan ROC 1968-1987

Source: Fisheries Yearbook of Taiwan ROC 1987

Table 2

The Comparison of the Four Categories of

Fisheries of Taiwan ROC, 1986-1987

Fisheries	1987 (mt.)	1986 (mt.)	Increase (mt.)	Rate of Increase
Total	1,236,170	1,094,587	+141,583	+12.9%
Distant-water	596,969	497,403	+ 99,566	+20.0%
In-shore	280,500	276,479	+ 4,021	+ 1.5%
Coastal	53,273	54,593	- 1,320	- 2.4%
Aquaculture	305,428	266,112	+ 39,316	+14.8%

Source: Fisheries Yearbook of Taiwan ROC 1987

as production on utilization of the natural resources. The Government of the Republic of China has paid much attention to exploiting new fishing grounds as well as renovating the traditional marketing system. Fishing and postharvest industries of fisheries products developed rapidly in recent years.

B. The Four Categories of Fisheries

Fisheries of Taiwan are classified, on the tradition basis of type of fishing craft, gear used, and the relative distance of fishing areas, into four categories, namely, Distant-water Fisheries, Offshore Fisheries, Inshore Fisheries, and Aquaculture.

(1) Distant-water Fisheries

Distant-water fisheries are operated by fishing vessels which are over 50 gross tons in size including (a) deep-water tuna long line, (b) surface and midwater long line, (c) bottom trawls, (d) midwater trawls, (e) large type purse seining, (f) squid angling, (g) lift-nets, (h) surface and midwater gillnets. There are 115 fishing vessels over 50 gross tons in size fishing in distant-water fishing grounds.

(2) Inshore Fisheries

Inshore fisheries are operated by fishing vessels which are less than 50 gross tons and over 20 gross tons in size, including (a) shallow-water purse seine, (b) surface and midwater gillnets, (c) medium bottom trawls, (d) tuna long line, (e) skipjack pole-and-line, (f) anglings, (g) darting. There are 2,876 fishing vessels which are over 20 gross tons and less than 50 gross tons in size.

(3) Coastal Fisheries

Coastal fisheries are operated by fishing vessels which are less than 20 gross tons in size or use passive nets, including (a) small trawls, (b) surrounding nets, (c) trolling, (d) skip-jack pole-and-line, (e) set nets, (f) angling, (g) sea bream long line, (h) darting, (i) beach seine, (j) lift nets. There are 5,193 fishing vessels which are less than 20 gross tons in size.

(4) Aquaculture

Aquaculture covers (a) brackish water ponds chiefly for milkfish culture, shrimp culture, and some for mixed culture with grey mullet, talapia; (b) shallow-water for oyster and hard clam culture; (c) fresh water ponds, pools and reservoirs for raising common carp, grass carp, silver carp, talapia and mullet; (d) paddy fields in middle and southern Taiwan utilized for raising talapia; (e) seaweed culture.

C. Fisheries Production

The total fisheries production of Taiwan in 1987 reached 1,236,170 metric tons, of which distant-water fisheries amounted to 497,403 mt., shared 48.29% of the total production; inshore fisheries amounted to 280,500 mt., shared 22.69% of the total production; coastal fisheries amounted to 53,273 mt., shared 4.31% of the total production; aquaculture amounted to 305,428 mt., shared 24.71% of the total production (Table 3).

The production of major fisheries in 1987 was divided as

follows:

(1) Distant-water fisheries (Table 4).

(A) Otter trawling. The total catch was 93,896 mt., showing an increase of 2,116 mt. (2.3%), as compared with 91,780 mt. produced in 1986.

(B) Bull trawling. The total catch was 108,575 mt., showing an increase of 20,825 mt. (23.7%), as compared with 87,750 mt. produced in 1986.

(C) Tuna long-lining. The total catch was 146,414 mt., showing a decrease of 4,819 mt. (-3.2%), as compared with 151,233 mt. produced in 1986.

(2) Inshore fisheries (Table 5).

(A) Purse seine. The production was 27,910 mt., showing a decrease of 1,849 mt. (-6.2%), as compared with that of 1986.

(B) Torch light netting. The production was 20,818 mt., showing an increase of 1,888 mt. (+10.0%), as compared with that of 1986.

(C) Drag netting. The production was 148,722 mt., showing a decrease of 2,783 mt. (-2.5%), as compared with that of 1986.

(D) Tuna long-lining. The production from offshore tuna long-line boats was 34,110 mt., showing an increase of 13,871 mt. (68.5%), as compared with that of 1986.

(E) Long-lining for sea bream and miscellaneous fishes. The production was 19,325 mt., showing a decrease of

432 mt. (-2.2%), as compared with that of 1986.

(F) Pole-and-line boote. The production was 3,295 mt., showing a decrease of 1,833 mt. (-35.7%), as compared with that of 1986.

(3) Coastal fisheries.

The production was 53,273 mt., showing a decrease of 1,320 mt. (-2.4%), as compared with that of 1986. It shows that overfishing in the coastal and nearshore areas is serious.

(4) Aquaculture

The production of aquaculture totalled 305,428 mt., showing an increase of 39,316 mt. (14.8%) over the production of 1986. Of this total, brackish water ponds produced 126,614 mt., which was 30,049 mt. more than the production of 1986. Freshwater ponds produced 135,178 mt., which was 4,743 mt. more than the production of 1986. Shallow sea (nearshore) culture produced 29,520 mt., which was 1,254 mt. more than the production of 1986.

The total value of fisheries production in 1987 was approximately U.S. $2,686.9 million, or about 26% of the nation's total agricultural production value.[5]

D. Fisheries Processing and Foreign Trade

(1) Fisheries products processing

The total output of fisheries processed products in 1987 is as follows: canned fishery products totalled 12,338 mt.,

Table 3

Fisheries Production by Categories of Taiwan ROC

Fishery	Year				
	1970	1975	1980	1985	1987
Distant-water Fishery	293,780 47.8%	326,707 41.9%	370,342 39.6%	441,747 42.6%	596,969 48.3%
Inshore Fishery	250,679 40.9%	295,921 37.9%	358,207 38.3%	293,748 28.3%	280,500 22.7%
Coastal Fishery	27,940 4.6%	29,746 3.8%	32,777 3.5%	51,491 4.9%	53,273 4.3%
Aquaculture	77,789 12.7%	127,577 16.4%	175,008 18.6%	250,735 24.2%	305,428 24.7%
Total	613,152 100%	779,950 100%	936,334 100%	1,037,721 100%	1,236,170 100%

Quantity: M.T.

Source: Fisheries Yearbook of Taiwan ROC, 1987.

Table 4

Major Production of Distant-water Fishery

1987 of Taiwan ROC

Fishery	Production (M.T.)	Percentage (%)
Tuna long-lining	146,414	24.6
Squid angling	115,249	19.3
Bull trawling (pair trawler)	108,575	18.2
Otter trawling (single trawler)	93,986	15.7
Gill-netting	67,930	11.4
Purse seining	55,683	9.3
Others	9,222	1.5
Total	596,969	100

Source: Fisheries Yearbook of Taiwan ROC 1987

Table 5

Major Production of Inshore Fishery

1987 of Taiwan ROC

Fishery	Production (M.T.)	Percentage (%)
1. Small type trawling	148,722	53.0
2. Tuna long-lining	34,110	12.2
3. Purse seining	27,910	10.0
4. Torch light netting	20,818	7.4
5. Gill netting	19,314	6.9
6. Sea bream long-lining	19,235	6.8
7. Others	10,319	3.7
Total	280,500	100

Source: Fisheries Yearbook of Taiwan ROC, 1987

valued U.S. $13.79 million. Other processed fishery products for human food were 37,163 mt., valued U.S. $432.30 million. Processed fishery products not for human food were 23,997 mt., valued U.S. $16.69 million.

(2) Foreign trade

Fisheries products exports of Taiwan ROC developed rapidly during the last decade; fresh tuna, frozen shrimps, and processed eels are the major items of exports. In 1987, the value of fisheries products exports amounted to $1,425,854,000, accounting for 39.4% of the total agricultural products exports value.

(A) Exports. The exported fisheries products in 1987 totalled 273,960.4 metric tons, valued U.S. $1,425,854.5 thousand (Table 6).

(B) Imports. The imported fisheries products in 1987 totalled 29,629.2 metric tons, valued U.S. $137,339.0 thousand[6] (Table 7).

Taiwan ROC is a traditional agricultural and fisheries country. Fisheries production accounted for approximately 28 30% of the total value of agricultural production. The fishery of Taiwan ROC is divided into distant-water fishery, inshore fishery, coastal fishery, and aquaculture. In 1987, its total fisheries production amounted to 1,236,170 metric tons, making up 1.3% of the total world fisheries production. The fisheries products of Taiwan ROC not only provide sufficient animal protein for its people, but also is a significant export to foreign countries.

Table 6

Quantity and Value of Fisheries Products Exports

Year	Total	
	Quantity	Value
1978	136,170	451,091
1979	140,628	503,874
1980	154,514	561,218
1981	160,441	626,485
1982	179,852	554,971
1983	189,911	665,455
1984	200,198	682,723
1985	222,887	813,054
1986	266,727	1,170,083
1987	273,960	1,425,854

Quantity: M.T. Value: US $1,000

Source: Agricultural Trade Statistics of ROC, 1987

Table 7

Quantity and Value of Fisheries Products Imports

Year	Total	
	Quantity	Value
1978	19,336	50,356
1979	24,286	73,436
1980	29,072	78,493
1981	13,662	72,222
1982	15,779	73,040
1983	16,917	71,978
1984	17,560	82,332
1985	19,029	94,828
1986	23,139	85,655
1987	29,630	137,339

Quantity: M.T. Value: US $1,000

Source: Agricultural Trade Statistics of ROC, 1987

III. THE GENERAL NATURE OF FISHERY RESOURCES

To overview the nature of fisheries resources and collect available data of different stocks has become a fundamental need in fisheries development. Decision-makers and administrators should acquire available biological data or information while planning or making decisions. Several factors affecting the potential harvest of living marine resources are functions of natural processes which cannot be controlled by man or modified by political activities. It must be recognized that:

A. Fishery Resources are Renewable

Each population of such animals, under each set of environmental conditions in which it occurs, can produce a crop of certain size as long as:

1. fishing pressure is not permitted to exceed the level corresponding to this maximum sustainable yield, and
2. the environment does not change.

The scientific methodology is required by government for determining the level of fishing effort corresponding to the maximum sustainable yield and the producers are in agreement on their criterion of fishing for regulation of effort.[7]

In Taiwan, inshore fisheries stocks were overexploited by demersal trawling vessels; it would take a long period of time to renew those stocks. Taiwan Provincial Government has adopted a conservation program to protect and renew those stocks.

B. Fishery Resources Are Migratory

Schaefer (1970) and Kasahara (1970) have given examples of the migratory nature of marine fishery resources either in their harvestable or pre-harvestable stages. As Taiwan is located at the southeast part of the Mainland Shelf, there are two favorable oceanic characteristics that provide migratory species fishing grounds. During the winter season, Oya-Shio, a cold water current, flows from Japan and passes through the east coast of Taiwan into the South China Sea. During the summer season, Kru-Shio, a warm water current from the South China Sea, passes through both the west and east coasts of Taiwan into the East China Sea and forms an upwelling off the east coast of Taiwan. These characteristics bring considerable numbers of migratory species, such as bonito, frigate mackerel, dorado fish, mullet, and black pomfert (Figures 3, 4).

C. Fishery Resources Are Not Distributed Uniformly in the Sea

Nutrients required for nourishing the marine animals distribute according to physical and biological factors. This results in fisheries resources not being distributed uniformly; some parts of the sea are rich and some are poor, and man cannot practically change these situations. This is especially true for the demersal species. Taiwan inshore fishery trawling vessels operate in the Formosa Strait, the East China Sea, and the South China Sea and catch mixed species of demersal fish. Uniform distribution with many mixed species but a low quantity

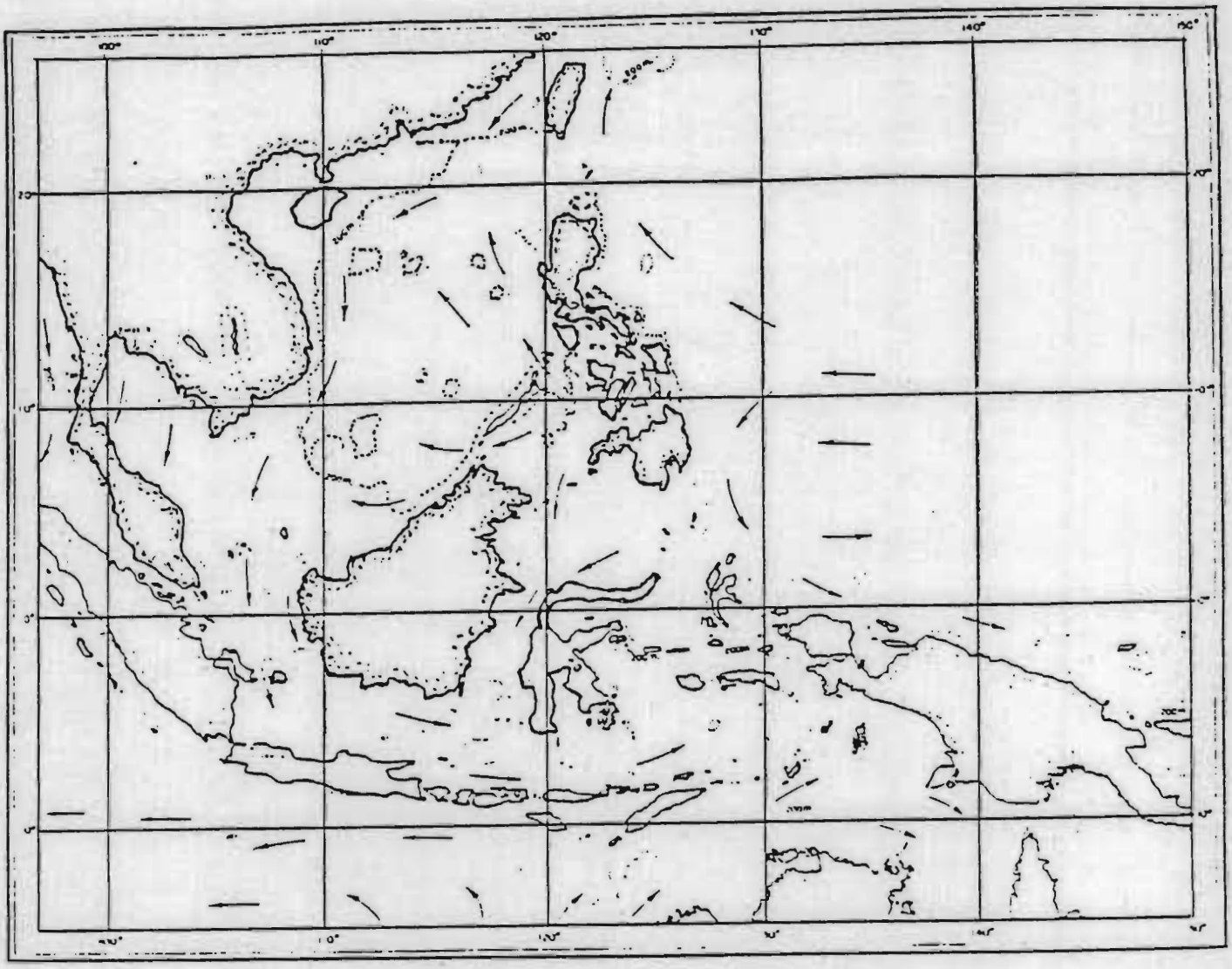

Figure 3. Surface current in the Western Central Pacific in August

Source: Fisheries Resources of the Western Central Pacific, FAO.

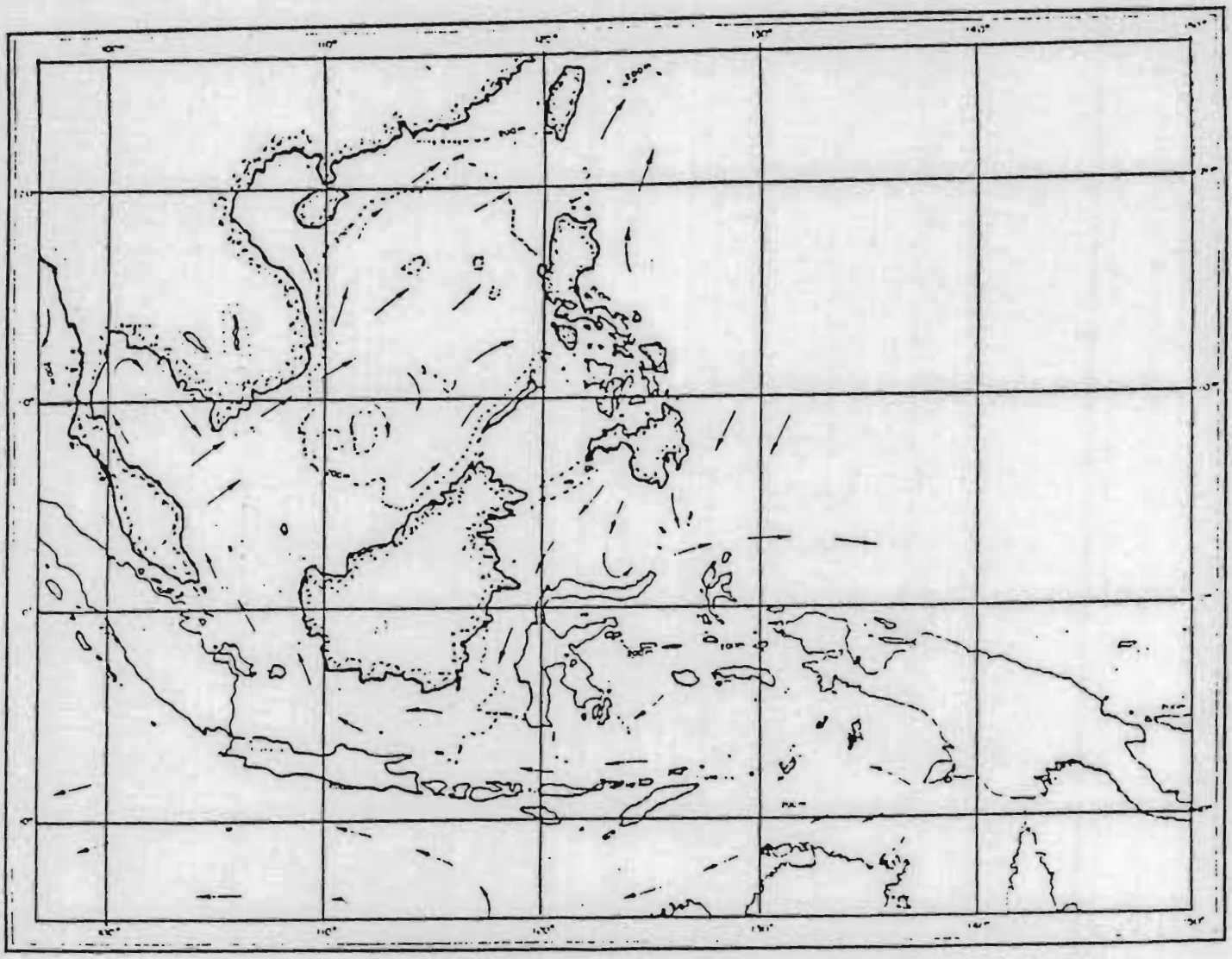

Figure 4. Surface current in the Western Central Pacific in February

Source: Fisheries Resources of the Western Central Pacific, FAO.

of each individual specie is the major characteristic of sub-tropical demersal fisheries.

D. Fishery Resources Are Often Affected Greatly by Natural Environmental Changes of a Seasonal or Longer Period Nature

The degree of fluctuation of fisheries resource abundance can be classified as:

(1) Steady or predictable stocks, such as North Sea turbot, George's Bank haddock. Taiwan is very fortunate in having several steady fish stocks that bring Taiwan fishermen big fortunes. These steady stocks include cuttlefish, silver anchovy, round herring, flying fish, mullet, frigate mackerel, Pacific mackerel, scad, and dolphin. These fisheries remain at approximately the same level year after year, with variations that generally remain within 20 to 30 percent of the long-term average yield for the level of effort exerted.

(2) Cyclical stocks, such as California dungeness crab, Bay of Fundi scallop, Baleares. These fisheries seem to show cycles, the pattern of high or low catches being repeated at regular intervals.

(3) Irregular stocks, such as Norwegian juvenile herring, Magdalen Islands lobster, and George's Bank scallop. Three main causes of irregular landing fluctuation are included here: (1) intrinsic (stock recruitment, or predator-prey fluctuations), (2) extrinsic environ-

mental effects on availability, recruitment, or carrying capacity of the environment, and (3) extrinsic effects of fluctuations in fishing effort on landing. Of course, a combination of any or all of the three would also lead to irregular fluctuations in landings.

E. Fishery Resources' Concentration into Commercially Catchable Aggregations Is Frequently Changed by Environmental Factors

Many such resources concentrate at particular times and places for particular pusposes, such as spawning or feeding, or in regular migratory routes between feeding and spawning places. It is upon these concentrations that successful fishermen work. Changes in oceanographic conditions may keep the fish spread out so they do not concentrate, shift their areas of concentration by some miles or hundreds of miles from where the fishermen expect them, or keep the school below the surface, or off the bottom where they cannot be detected or caught easily or otherwise disturb the availability of the stock of the fishery.

F. Fishery Resources Are Quickly Perishable

The fish begins to spoil immediately upon death. This will occur from growth of bacteria in or on the fish and native to it, from the effect of the natural enzymes of the fish (particularly its digestive enzymes), which keep working after death. Postharvest loss is as important as the actual fishing operation in the fisheries industry. Because Taiwan is located in a sub-

tropical region, the temperature is rather high thoughout the year, remaining between 23°C and 30°C from March to November. This high temperature characteristic has brought about the increased investment in the construction of cold storage and ice-making facilities for the maintenance of fish quality.

G. The Nutritive Value of All Fish Is about the Same

The amino-acid balance of fish muscle protein, and thus its nutritive value, is approximately the same in anchovy or sardine that bring the fishermen $10 to $20 per ton at the dock as is that of salmon, tuna, or shrimp that may bring him $2,000 to $4,000 per ton. This fact of fisheries resources is rather important for improving utilization of the resources of species which have been fully exploited, under exploited, or unexploited. Some species were previously regarded as having no economic value and were discarded as waste. Today, their utility can be increased by way of processing for direct or indirect consumption. Reduced postharvest wastes not only increase the utilization of fisheries resources, but is also an effective way of increasing the fisheries production.

The nature of fishery resources is very important in fisheries management. By gaining greater knowledge of fisheries we can be more effective in our effort to catch and to conserve those resources.

Taiwan ROC has favorable oceanic characteristics providing

for fish habitation and migration. Different fish species have various natures, for instance, demersal fish, pelagic fish, schooling fish, and highly migratory fish, etc. In order to utilize fishery resources in an economical as well as an efficient way, it is necessary to understand the natures of fish stocks which are targeted by fishing vessels.

Under the 1982 United Nations Convention on the Law of the Sea, coastal states have more power to impose regulations to control fisheries resources in their EEZs. This matter will be discussed in the following chapter.

IV. FISHERIES UNDER THE 1982 UNITED NATIONS CONVENTION ON THE LAW OF THE SEA

Under the traditional rules of international law, the sea was divided into the high seas and the territorial seas and in each case different rules and regulations applied. As for the exploitation of fishery resources, the coastal state possessed unquestioned rights to regulate any such exploitation within its territorial sea. In its territorial sea, the coastal state was free to prohibit fishing by foreigners and thus to monopolize those fishery resources. On the high seas, however, no state was allowed, at least in principle, to claim exclusive fishing rights, since fishing in the high seas constituted one of the freedoms associated with the high seas. The existence of these two disparate regimes, namely exploitation and full control by the coastal state in the territorial sea and freedom to exploit resources on the high seas, as well as freedom from interference by any country, was a fundamental presumption underlying the exploitation of fishery resources.

As the breadth of the territorial sea inherently coincided with the coastal state's monopoly of fishery resources, it was of great importance to determine just how far the territorial sea should extend from the coast. Any expansion of the territorial sea would imply encroachment on the fishing rights that other states might otherwise have enjoyed in an area previously regarded as part of the high seas. Hence, policies concerning

territorial seas have been affected by the balance of the dependence of each nation's fishery insterests on its own offshore zone on the one hand, and on the offshore zone of other nations.

A. The Establishment of Exclusive Economic Zones

The United Nations Convention on the Law of the Sea gives coastal states the right to establish an exclusive economic zone (EEZ) which extends up to 200 nautical miles from the baselines which the territorial sea is measured.[8] The coastal states have sovereign rights over all the resources to be found in this zone.

About 90 percent of the traditional, as well as most productive, fishing grounds were incorporated in the EEZ by coastal states. The creation of EEZs resulted in a new order of allocation and utilization of marine resources. For traditional distant-water fishing states, EEZs resulted in: 1) more conflict and problems with the coastal states; 2) increasing probability that fishing vessels would be seized by coastal states; 3) the loss and limitation of access to fishing grounds for those states which are traditionally fishing in the continental shelf waters of other states. For coastal states, EEZs allow them to: 1) gain the opportunity of developing its own fisheries; 2) prevent its marine resources from being over-exploited; 3) gain the economic or political profits through permitting the foreign states to exploit the fisheries resources within its EEZ. Generally speaking, the establishment of EEZs

has had a tremendous impact in the traditional fisheries of developed countries whose fishing vessels were traditionally free fishing around the continental shelf water areas before the establishment of the EEZs. After the coastal states claimed their EEZs, foreign fishermen had to obtain from the coastal state to gain access to those traditional fishing grounds.

B. The Responsibilities for Coastal States to Manage Living Resources in EEZs

The Third United Nations Conference on the Law of the Sea introduced and recognized the concept of the exclusive economic zone. This convention has entrusted the coastal states with about 1.3 hundred million square kilometers of ocean space in the form of territorial sea, continental shelf, and exclusive economic zone, occupying approximately 35.8% of the world's ocean.[9] Among all the ocean space provided for in the Law of the Sea Convention, the exclusive economic zone (EEZ) is the most recent juridical zone that has emerged from the evolution in the law of the sea. The EEZ enables the coastal states to extend their jurisdiction to 200 miles from their territorial sea baselines. In the EEZ, the coastal state has sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources. Though the Law of the Sea Convention has not entered into force, the EEZ has already become customary international law with over 76 states having established their national exclusive economic zones[10] (Table 8).

Table 8

Claims to an EEZ with Year of Claim

Total: 76

Antigua and Barbuda (1982)
Bangladesh (1974)
Barbados (1978)
Burma (1977)
Cape Verde (1977)
Chile (1986)
Colombia (1978)
Comoros (1976)
Cook Islands (1977)
Costa Rica (1972)
Cuba (1977)
Democratic People's Republic of Korea (1977)
Democratic Yemen (Aden) (1977)
Djibouti (1979)
Dominica (1981)
Dominican Republic (1977)
Equitorial Guinea (1984)
Fiji (1977)
France (1976)
Gabon (1984)
Ghana (1986)
Grenada (1978)
Guatemala (1976)
Guinea (1980)
Guinea-Bissau (1978)
Guyana (1977)
Haiti (1977)
Honduras (1980)
Iceland (1979)
India (1976)
Indonesia (1980)
Ivory Coast (1977)
Kampuchea (1981)
Kenya (1979)
Kiribati (1983)
Madagascar (1973)
Malaysia (1978)
Maldives (1976)
Mauritania (1978)
Mauritius (1977)
Mexico (1976)
Morocco (1980)
Mozambique (1976)
New Zealand (1977)
Nigeria (1978)
Niue (1978)
Norway (1976)
Oman (1981)
Pakistan (1976)
Philippines (1978)
Portugal (1977)
Quatar (1974)
Romania (1986)
Saint Christopher and Nevis (1984)
Saint Lucia (1984)
Saint Vincent and Grenadines (1983)
Sao Tome and Principe (1978)
Seychelles (1977)
Solomon Islands (1979)
Spain (1978)
Sri Lanka (1976)
Surinam (1978)
Thailand (1980)
Togo (1977)
Tokelau (1977)
Tonga (1979)
Trinidad and Tobago (1983)
Turkey (1986)
Tuvulu (1983)
Union of Soviet Socialist Republics (1984)
United Arab Emirates (1980)
United States of America (1983)
Vanuatu (1981)
Venezuela (1978)
Vietnam (1977)
Western Samoa (1977)

Source: The Exclusive Economic Zone in "Ocean Development and International Law" by Lawrence Juda.

In prescribing the rules and regulations applicable to fisheries in EEZs, the coastal states will be placed under certain obligations regarding the conservation and management of living resources (1982 UN Law of the Sea Convention Article 61).[11] Coastal states have sovereign rights to explore, exploit, conserve, and manage the fishery resources in their EEZs according to the Law of the Sea. To promote the objective of optimum utilization of living resources in any EEZ, the coastal state is to adopt the following procedure. First of all, it determines the allowable catch in the EEZ harvesting resources at a level which can produce MSY. Secondly, it determines the capacity to harvest the living resources in question. And, where the coastal state does not have the capacity to harvest the entire allowable catch, it would give other states access to the allowable catch.

C. Fisheries Regulations Applicable in the EEZ

In prescribing the rules and regulations applicable to fisheries in the EEZ, the coastal state will be placed under certain obligations regarding the conservation and optimum utilization of fisheries resources.

(1) Determination of the allowable catch. The idea of determination of the allowable catch of living resources in the EEZ appeared in the six Eastern European nation's proposal of 1974, which provides that, except for highly migratory species, the annual allowable

catch should be determined for each specie of the fish or other living marine resources.[12] The conservation measures may limit not only the annual allowable catch, but also the species that may be caught, fishing season, fishing areas, and even fishing gear. It can be argued that it is not appropriate for the coastal state always to be required to determine the allowable catch of the living resources in the EEZ and that it is extremely difficult to perform this obligation properly.

(2) Optimum utilization of fishery resources. Promotion of the optimum utilization of fishery resources is introduced in the 200-mile EEZ.[13] The 1982 United Nations Convention suggests that the coastal state shall determine its capacity to harvest the living resources of the exclusive economic zone; it shall through agreement or other arrangement and pursuant to the terms, conditions, laws and regulations, give other states access to the surplus of the allowable catch when it does not have the capacity to harvest the entire allowable catch.[14]

It is important to note that the coastal state's capacity to harvest living resources may not always be meant to depend solely on the capital and technology of its national economy. Each coastal state is free to introduce foreign capital and to obtain

technical assistance from foreign nations; and it is also free to allow any foreign nations or foreign enterprises it chooses to engage in fishing activities through concessionary agreements and to secure the maximum of the total allowable catch for itself, even though it might not wish to use this catch for the consumption of its own nation.

(3) Access of other states to the surplus. The 1982 Convention suggests that, in giving access to other states, the coastal states should take all relevant factors into account. The significance of the living resources of the area to the economy of the coastal state concerned and its other national interests should be allocated to landlocked states and geographically disadvantaged states.[15] It should also be concerned with the requirements of developing states in the subregion or region in harvesting part of the surplus and the need to minimize economic dislocation in states whose nationals have habitually fished in the zone or which have made substantial efforts in research and identification of stocks.

However, it is not clear how the significance of the living resources of the area to the economy of the coastal state and its other national interests will be relevant to the allocating of the surplus among other states. In addition, the criteria for allocating

the surplus to other states will be extremely difficult to determine. After all, how can the coastal state take these relevant factors into account, and with what "other state", and what "agreements or other arrangements" is the coastal state going to have? It is surely hard to imagine that a costal state that "does not have the capacity to harvest the entire allowable catch" will be ready and able to engage in so complex an exercise.

D. Fishery Regulations Unamenable to Dispute Settlement

It would be extremely difficult to implement the whole scheme requiring the coastal state to determine the allowable catch for the purpose of conservation and its capacity to harvest the fishery resources, and to give access to the surplus of the allowable catch to other states, in view of the fact that the ideas themselves are not always well defined in the Convention. However ideal they may appear, the coastal state's obligations in the EEZ in respect to conservation and optimum utilization of fishery resources will surely result in great difficulties when put into practice, and disputes are bound to occur if other states protest the failure of the coastal state to conserve living resources, its arbitrary refusal to determine the allowable catch or its harvesting capacity, or its refusal to allocate EEZ resources among the states concerned. Such disputes may be settled, if not by negotiation, then by recourse to any pro-

cedure agreed upon by the parties concerned or by their submission to the conciliation procedure.

The 1982 United Nations Convention on the Law of the Sea enabled coastal states to establish 12-mile territorial seas and 200-mile exclusive economic zones. This has created a new fishing order regime and reallocated marine resources. Coastal states can promulgate their own regulations to control and manage the fisheries resources in their EEZs. In addition to the right of exploiting the fishery resources, coastal states also have the responsibility to evaluate the total allowable catch, their harvest capability and allocate the surplus of total allowable catch to other states, but the provisions are rather ambiguous and not easily achieved.

The new legal fishing regime has and will influence traditional distant-water fisheries states. In the following chapter we shall mention the current marine fisheries of Taiwan ROC which were influenced by international legal fishing regulations.

V. CURRENT MARINE FISHERIES OF TAIWAN ROC

Marine fisheries of Taiwan are divided into inshore fisheries and distant-water fisheries; both of the two fisheries account for approximately 70 percent of the total fisheries production of Taiwan.

A. Inshore Fisheries

Inshore fisheries is operated by the vessel which is below 50 gross tons and above 20 gross tons. The main fishing grounds of inshore fisheries fishing vessels are along the Mainland Shelf including the Yellow Sea, the East China Sea, the Formosa Strait, and the northern part of the South China Sea.

The natural environment of those seas are extremely favorable for fishing. The river systems of China's mainland, particularly such major ones as the Yellow River in the north, the Yangtze River in the east, and the Peral River in the south, bring a great amount of nutrients into the coastal waters. Ocean currents, such as Oyashio, a cold water current, travel through the Yellow Sea and the East China Sea into the Formosa Strait during the winter season. Kuroshio, a warm water North Equatorial current, travels through the east and west coast of Taiwan into the East China Sea and the Yellow Sea during the summer season. Rich fishing grounds are formed at the area where warm water and cold water intermix. There are more than ten fishing grounds along the coast of the Mainland Shelf and the Formosa Strait (Figure 5).

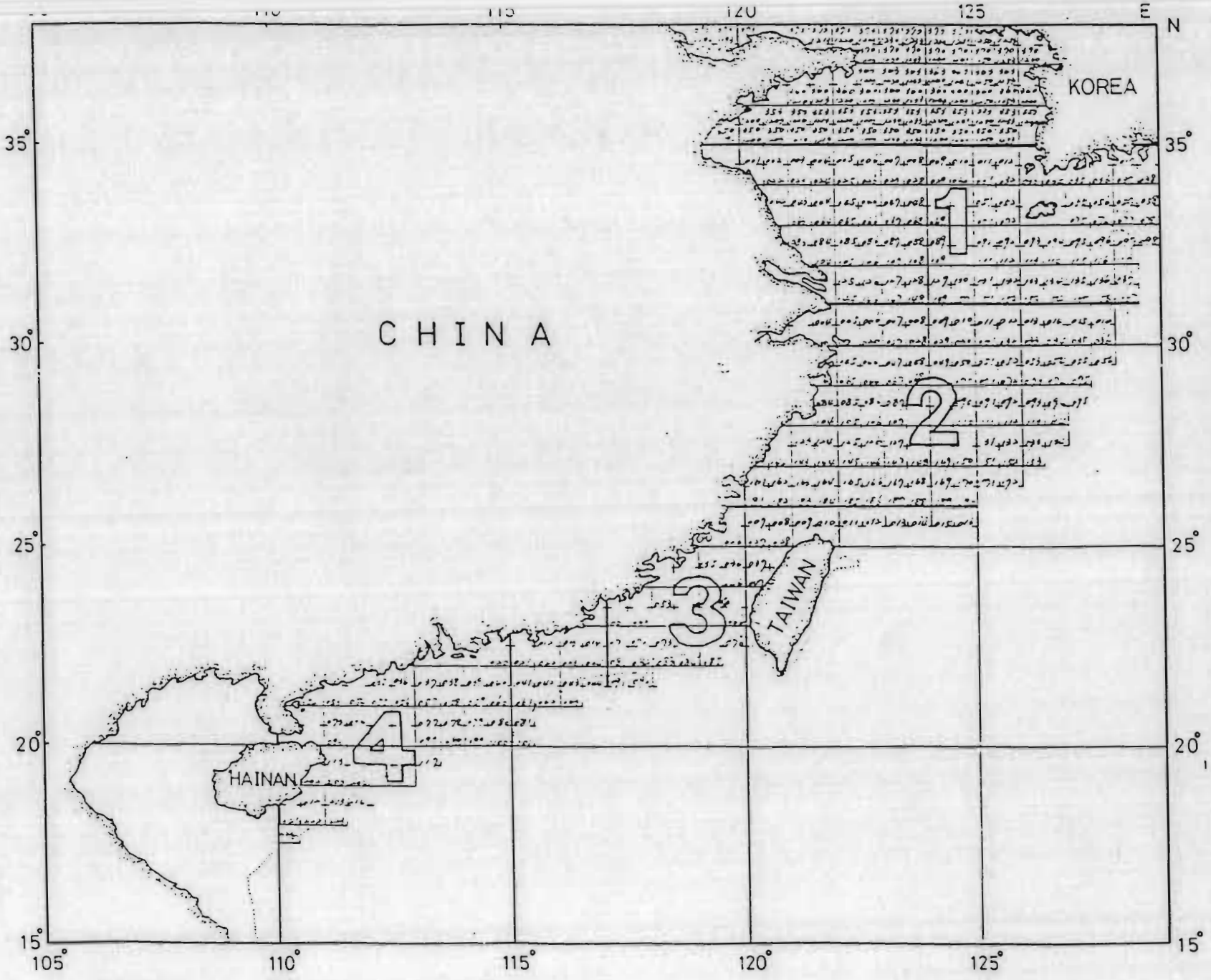

Figure 5.

Fishing regions of Taiwan otter trawlers in the East and the South China Seas.

Source: Taiwan Fisheries Bureau

The inshore fisheries of Taiwan include: 1) shallow-water purse seine, 2) surface and midwater gillnets, 3) mid-bottom trawls, 4) tuna long-line, 5) shipjack pole-and-line, 6) trolling, 7) angling, 8) darting.

There were 3,009 fishing vessels over 20 gross tons and less than 50 gross tons in 1987. Trawl vessels should be kept 5 Km out off the coastline in order to avoid fishing conflicts with coastal fisheries. According to the statistical data, there were 88,073 fishermen participating in inshore fisheries in 1987 in Taiwan.[16]

From 1978 to 1987, the catch of inshore fisheries decreased from 353,528 metric tons to 280,500 tons (Table 9), whereas the operating fishing vessels increased from 2,015 vessels to 3,009 vessels.[17] It indicates that the capture per unit effort (CPUE) of fishing vessel has decreased. Apparently the inshore fisheries resources have been overexploited. Most of the inshore fisheries catches were caught by mid-bottom trawl vessels and long-line vessels, of which trawl vessels shared approximately 55 percent of the catch; long-line vessels shared approximately 15 percent of the catch. The major fishing grounds of trawl fisheries involved the Taiwan Strait, the East China Sea; tuna long-line vessels mainly fish the water area between Taiwan and the Philippines, including Bashi Channel.

B. Distant-water Fisheries

Distant-water fisheries played the most important role of

Table 9

The Catch, Value, and Operating Vessels

of Inshore Fisheries from 1970 to 1987

Year	Quantity	Value	Vessels
1970	234,704	60,157	1,248
1971	250,679	70,709	1,438
1972	242,529	74,034	1,529
1973	262,994	104,011	1,773
1974	240,616	113,860	1,841
1975	295,921	136,859	1,816
1976	317,737	179,799	1,768
1977	342,753	242,368	1,799
1978	353,528	255,244	2,015
1979	350,801	319,139	2,135
1980	358,207	416,970	2,679
1981	334,851	459,422	2,768
1982	326,509	461,425	2,700
1983	305,489	493,994	2,623
1984	309,934	491,872	2,585
1985	293,784	475,812	2,828
1986	276,479	551,626	2,954
1987	280,500	624,727	3,009

Quantity: M.T. Value: U.S. $1,000

Source: Fisheries Yearbook of Taiwan ROC, 1987

Taiwan fisheries. During the last two decades, distant-water fishery production was higher than that of other fisheries. In 1987 the distant fisheries amounted to 596,969 metric tons and accounted for 48 percent of the total fisheries production. The distant-water fisheries includes: 1) large type single trawling (one boat operating), 2) large type pair trawling (two boat operating), 3) large type purse seining, 4) large type tuna long-lining, 5) large type squid angling, 6) draft gill netting. The production of each individual fishery is shown in Table 10.

After most of the coastal states claimed their 200-mile exclusive economic zones, the distant-water fisheries were forced to adjust their management style. In addition to strengthening the fisheries cooperation, building larger fishing vessels to exploit pelagic fisheries resources in the high seas is one of the most important measures for developing the distant-water fisheries. Distant-water fisheries of Taiwan ROC remains a steady increase in production and number of powered crafts (Tables 11, 12).

(1) The distant-water demersal trawling fishery of ROC includes large trawls, medium trawls of one boat operation, medium trawls of two boats operation, shrimp trawls, and small trawls. The main demersal trawling fishing grounds were traditionally located at the continental shelf of the Southeast Asian Seas region which involve the Mainland Shelf of the South China Sea and the East China Sea; the central, southern, and eastern

Table 10

The Distant-water Production by Individual Fishery

Fishery	Quantity	Value
Large type single trawling	93,896	174,761.35
Large type pair trawling	108,575	163,320.78
Large type purse seining	55,683	43,862.07
Large type tuna long-lining	146,414	322,646.00
Large type squid angling	115,249	206,961.07
Draft gill-netting	67,930	114,609.85
Other	9,222	5,984.54
Total	596,969	1,032,100.66

Quantity: M.T. Value: U.S. $1,000

Source: Fisheries Yearbook of Taiwan ROC, 1987

Table 11

Number of Powered Craft by Tonnage

Year	Tonnage					Total
	50-99.9	100-199.9	200-499.9	500-999.9	1,000+	
1978	369	634	508	11	2	1,524
1979	472	591	535	14	2	1,614
1980	536	567	563	17	2	1,685
1981	530	566	594	19	3	1,712
1982	541	531	610	20	3	1,705
1983	599	570	615	20	4	1,808
1984	565	540	683	36	10	1,834
1985	619	500	718	56	10	1,903
1986	687	470	747	81	12	1,997
1987	832	522	756	138	16	2,264

Source: Fisheries Yearbook of Taiwan ROC, 1987

Table 12

The Production of Distant-water Fisheries

Year	Quantity	Value
1978	335,142	302,045.93
1979	362,268	364,741.16
1980	370,342	457,423.03
1981	338,780	519,952.46
1982	340,136	586,076.43
1983	340,320	588,893.55
1984	399,745	707,034.93
1985	441,747	768,942.89
1986	497,403	879,229.17
1987	596,969	1,032,145.60

Quantity: M.T.

Value: U.S. $1,000

Source: Fisheries Yearbook of Taiwan ROC, 1987

Sunda Shelf; the Arafura Shelf; the shelf of the eastern Bay of Bengal and the Andaman Sea; the central portions of the Strait of Malacca, the Gulf of Thailand, the Gulf of Tonkin, and the Java Sea; and many of the shoal areas of the central South China Sea such as the Macclefield Bank, Pratas Reef, Scarborough Shoal; and the Paracel Islands. Catch from such areas generally include a higher proportion of commercially valuable fish. Snappers, groupers, bigeyes, lizardfish and threadfin bream are among the demersal fishes most frequently caught at these regions. The total catch of distant-water demersal trawling fisheries reached 202,461 metric tons in 1987 by 1,048 trawlers.

(2) The squid fishery developed rapidly after 1983 along with the successful exploitation of the Southwestern Atlantic squid fishing grounds around the Falkland Islands. The squid fishery production amounted to 115,249 metric tons, shared 19.3 percent of the distant-water fisheries production, and 9.3 percent of the total fisheries production of Taiwan in 1987. There are three major squid fishing grounds: 1) New Zealand squid fishing ground located within longitude from 165°-175°E, latitude 40°-50°S. The fishing season is from December to the following May. 2) North Pacific squid fishing ground, located within longitude 150°-175°E latitude 35°-45°N. The fishing season is

from July to November. 3) Southwestern Atlantic squid fishing ground, located within longitude 55°-65°W, latitude 42°-47°S (north to the Falkland Is.).

The fishing activities concentrated on the Patagonian Shelf where water depth is less than 200 m. The Basil Warm Current flow from the north and the Falkland cold current flows from the south; the warm and cold water mass intermix at this region to form a good fishing ground.

Because the Patagonian Shelf prolongation exceeds the 200 miles of Argentina's jurisdiction, this results in the same fishery resources occurring within both of the Argentina 200-mile territorial sea and the 150-mile fishery conservation zone around the Falkland Islands. Thus, the fishing activities within the area proved rather complicated (Fig. 6, 7).

(3) The gill netting fishery production amounted to 67,930 metric tons and shared 11.38 percent of the distant-water fisheries. The catches of draft gill netting includes Spanish mackerel, skipjack tuna, sailfish, swordfish, striped marlin, black marlin, and sharks.

The gill netting fishing grounds include Arabian Sea (March to July), Bay of Bengal and Andaman Sea (February to April), Timor Sea (January to February), Banda Sea (year round), Celebes Sea (February to March), the South China Sea (October to the following March).

There are 80-100 tuna fishing vessels using Singapore as their overseas operating base to fish albacore by deep-water gill netting, and the average vessel's tonnage is 300-700 tons. The major fishing area is in the Indian Ocean and fishing season is between November and May. Catches are exported directly at Singapore or sold to a cannery.

(4) Large type purse seine fishery was developed not more than ten years ago. This fishery production amounted to 55,638 metric tons and shared 8 percent of the distant-water fishery production. The catch of large type purse seine fishery includes skipjack tuna and yellowfin tuna. The fishing vessels operate around the Western Central Pacific including Palau, Truk Islands, Koror, Mariana Islands, and Guam. This fishery established overseas fishing operation base at Guam; all of the catches were landed at Guam and sold directly to processing plants (tuna cannery).

Large type purse seine fisheries belongs to capital and technique intensive fishing industry. There are 13 purse seiners, whose gross tonnage is between 500 and 1,000 tons. The average price of construction of a new purse seiner in Taiwan is approximately 5 million U.S. dollars per vessel. However, new purse seiners are being built at the rate of one vessel every two months, and new orders for construction have been

scheduled to the beginning of 1989. It is estimated that to the end of 1990, there will be 30 purse seiners in Taiwan, and the total tuna production will increase over 200 thousand metric tons. It is effective for fishing the pelagic species on the high seas and will become more and more important for the future fisheries development to operate beyond the jurisdiction of the coastal states.

(5) Tuna long-line fishery plays the most important role of the distant-water fisheries as well as the whole fisheries of Taiwan. This fishery production amounted to 146.414 metric tons and shared 24.5 percent of the distant-water fisheries, and also 11.8 percent of the total fisheries production of Taiwan in 1987.

There were 3,134 tuna long-line vessels in 1987. There were 2,207 vessels defined as inshore long-line fishing vessels which are under 50 gross tons. Those vessels operate at fishing grounds including the Bashi Channel, the South China Sea, and within the EEZ of Palau and eastern waters of Luzon Islands. Those vessels using domestic ports in Taiwan as operating bases to fish yellow tuna. Annual production was about 34,000 metric tons in 1987. Half of this production goes to domestic canneries, and the other half is exported to Japan for Sashimi. The other 927 vessels are defined as distant-water tuna long-line vessels

which are above 50 tons. Those vessels operate throughout the Pacific Ocean, the Indian Ocean, and the Atlantic Ocean.

The production of distant-water tuna long-line fisheries reached 146,414 metric tons in 1987; the yearly distribution of catch in numbers is shown in Figures 8 through 14.

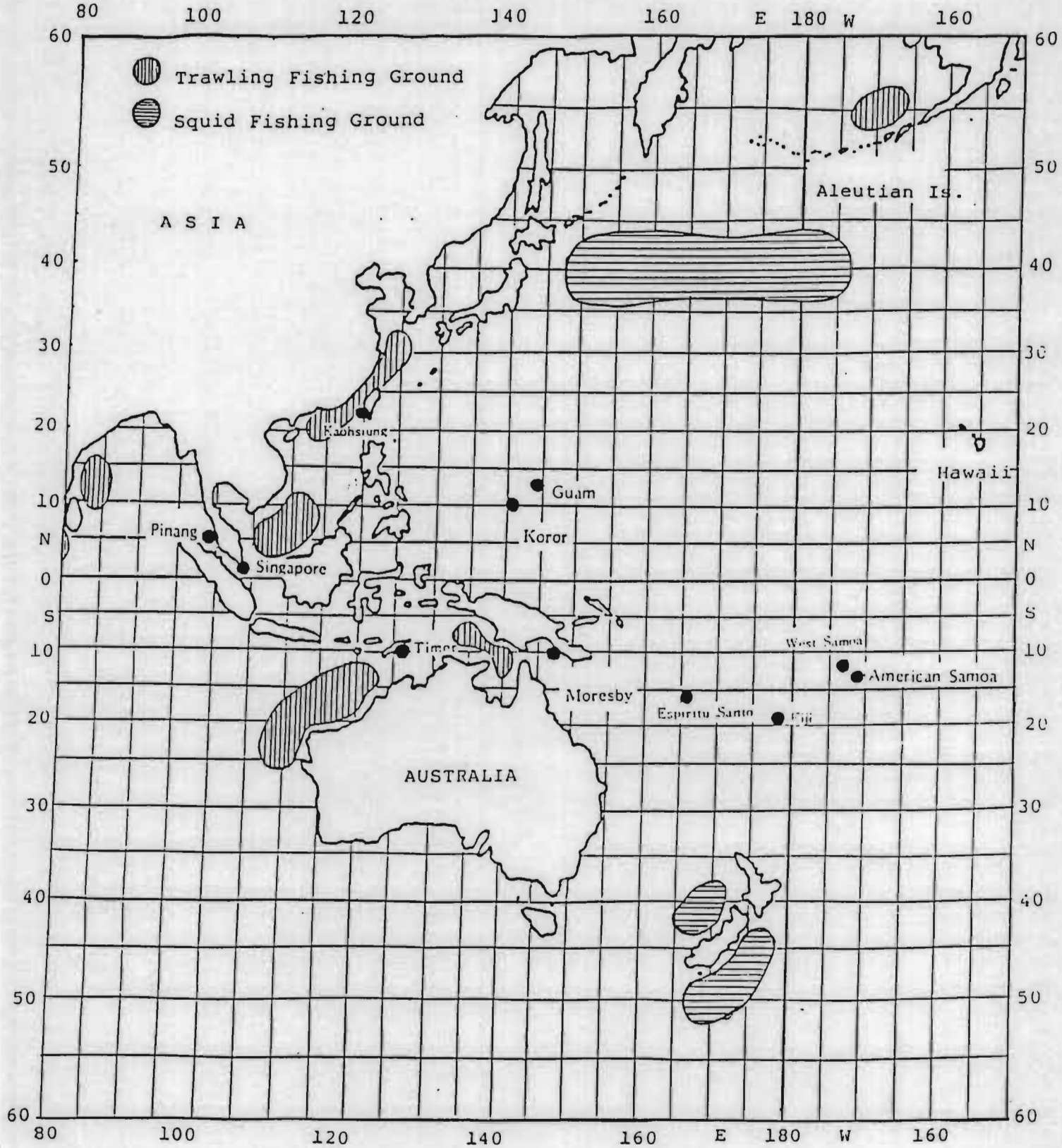

Fig. 6. Distant-water Trawling and Squid Fishing Grounds

Source: Taiwan Fisheries Bureau

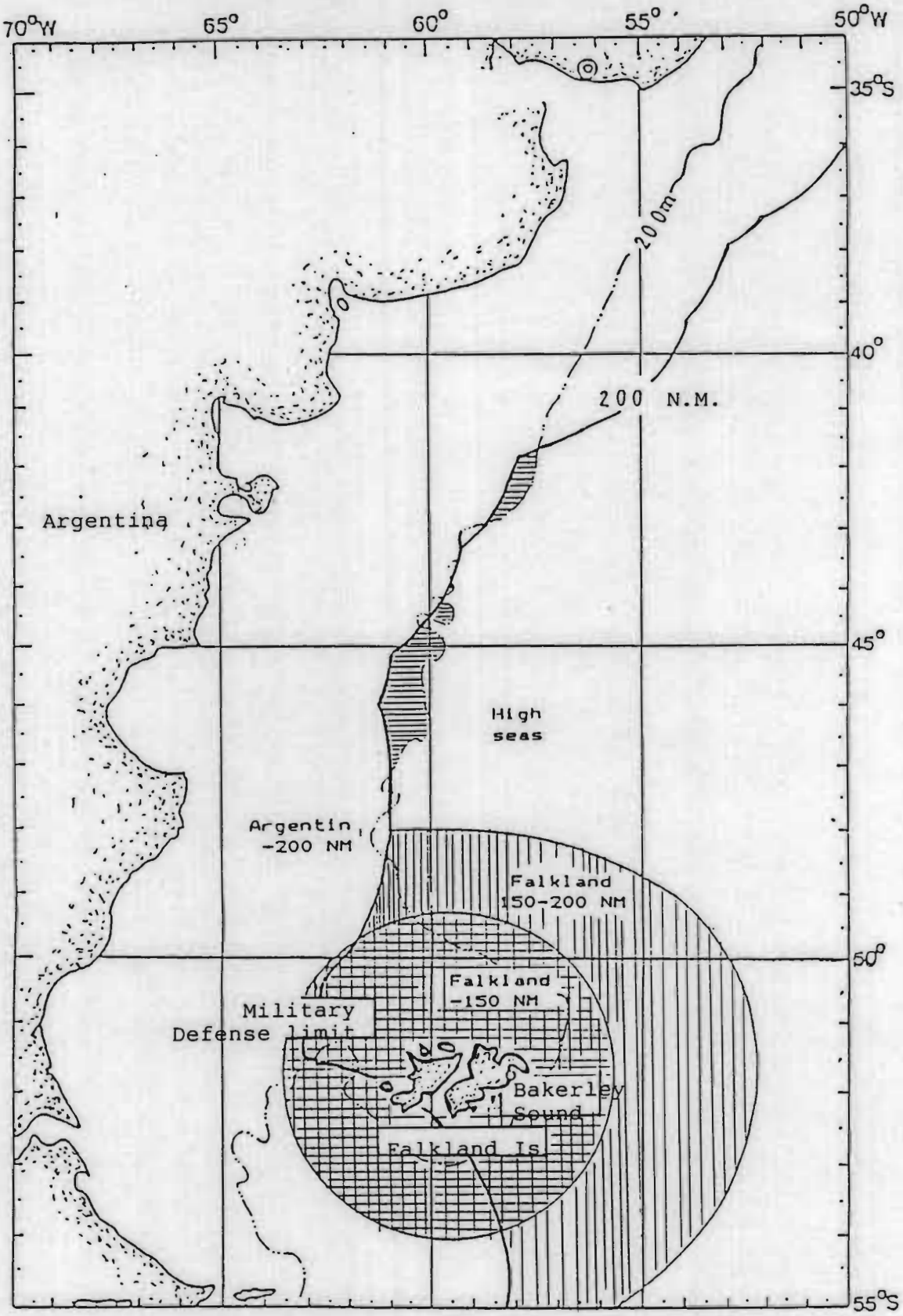

Fig. 7. Southwest Atlantic Squid Fishing Ground

Source: Council of Agriculture ROC

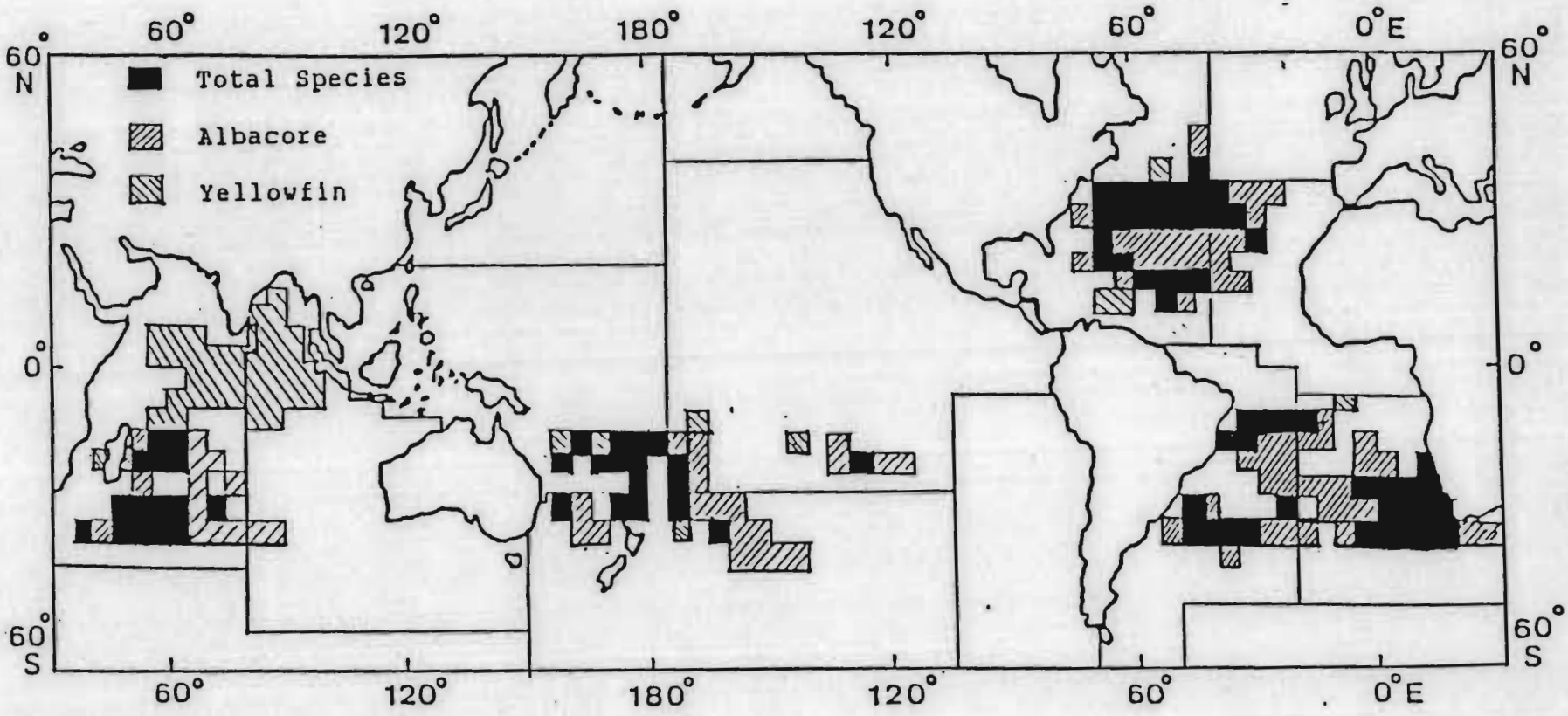

Figure 8 The Major Fishing Grounds of ROC Tuna Longlining Fisheries

Source: Annual Report of ROC Tuna Distant Water Longlining Fisheries, 1986.

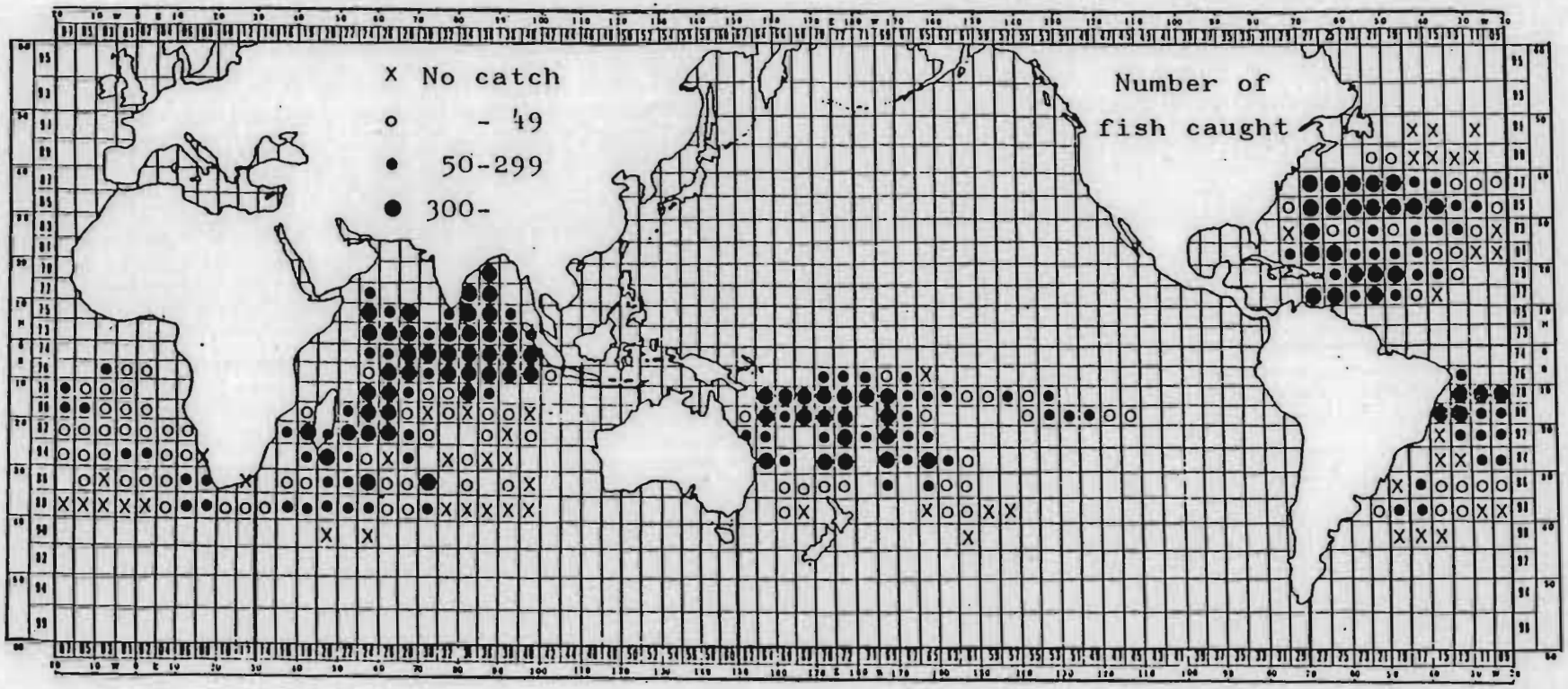

Figure 9 Yearly distribution of catch in number. (Yellowfin)

Source: Annual Report of ROC Tuna Distant-water Longlining Fisheries, 1986.

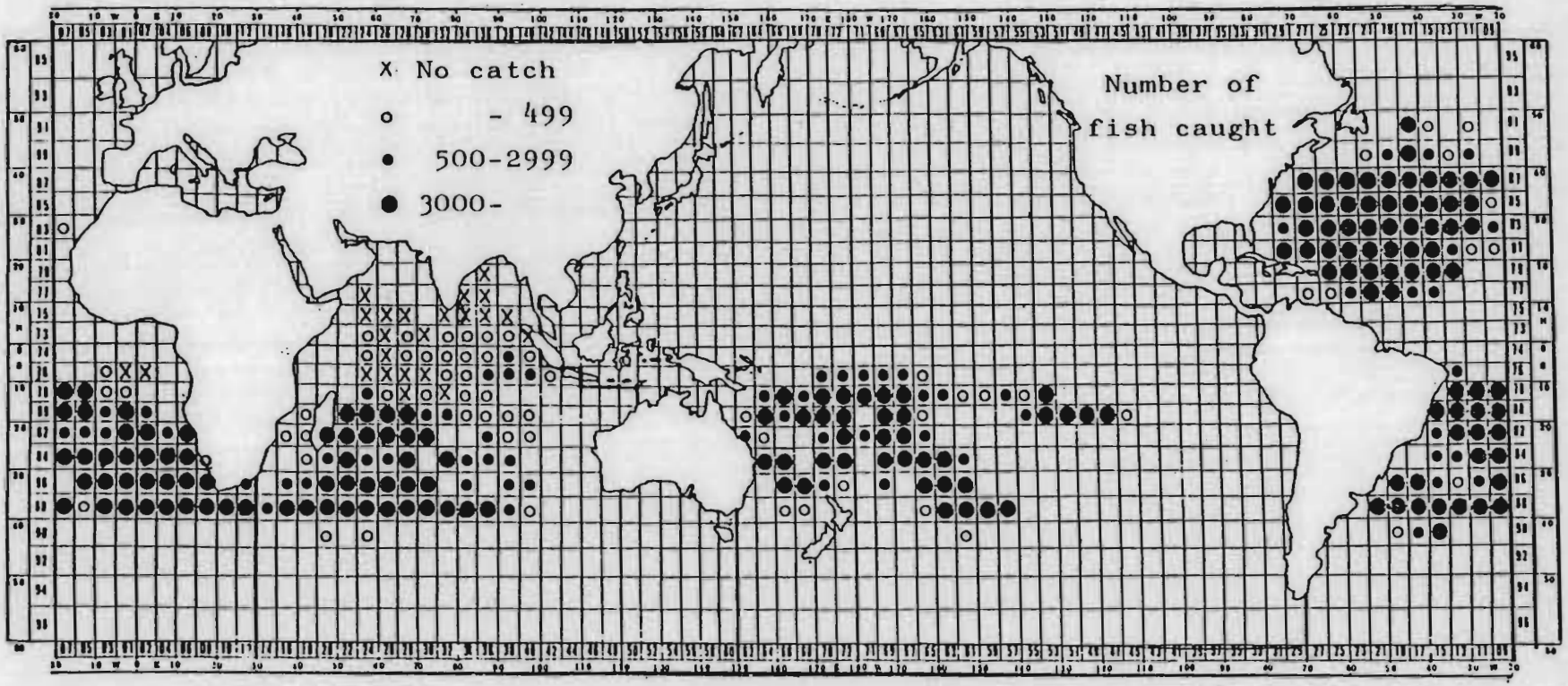

Figure 10. Yearly distribution of catch in number. (Albacore)

Source: Annual Report of ROC Tuna Distant-water Longlining Fisheries, 1986.

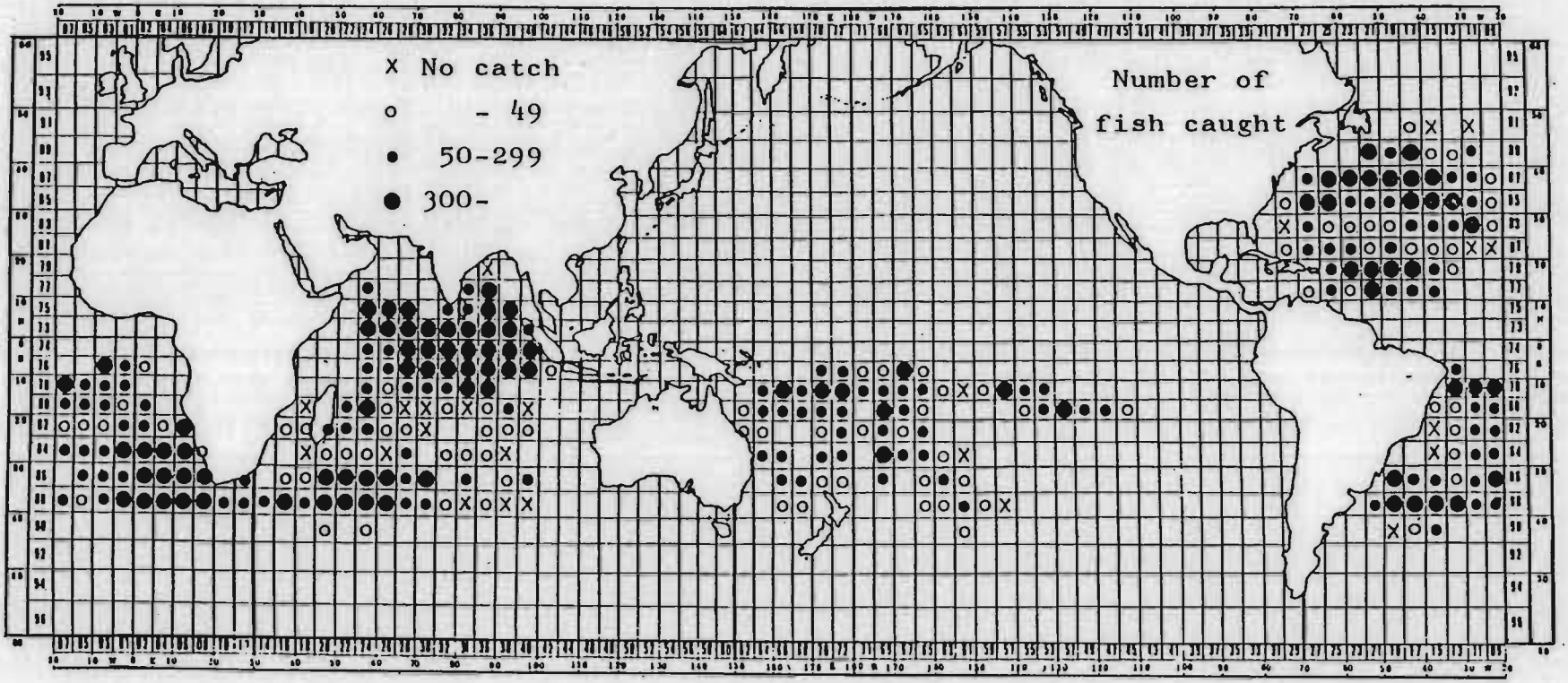

Figure 11. Yearly distribution of catch in number. (Bigeye)

Source: Annual Report of ROC Tuna Distant-water Longlining Fisheries, 1986.

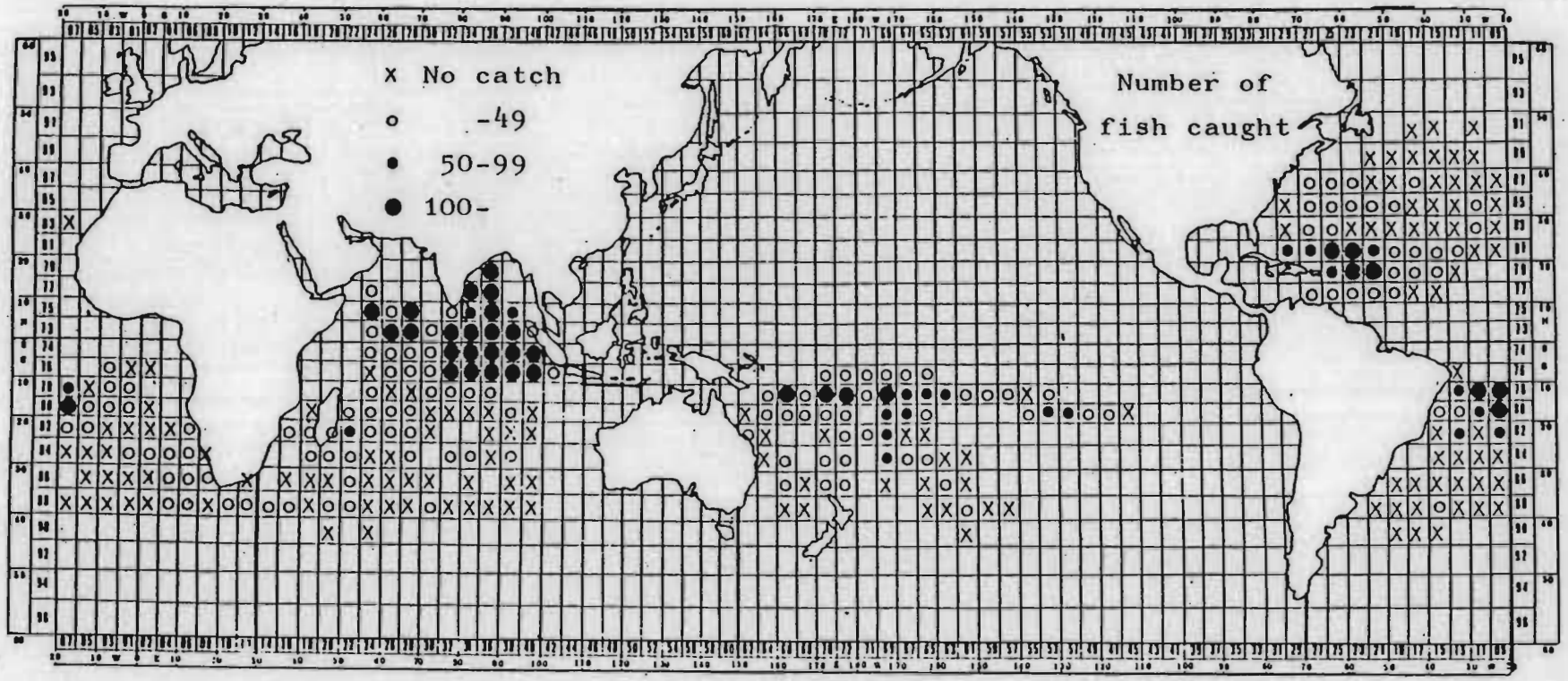

Figure 12. Yearly distribution of catch in number. (Blue marlin)

Source: Annual Report of ROC Tuna Distant-water Longlining Fisheries, 1986.

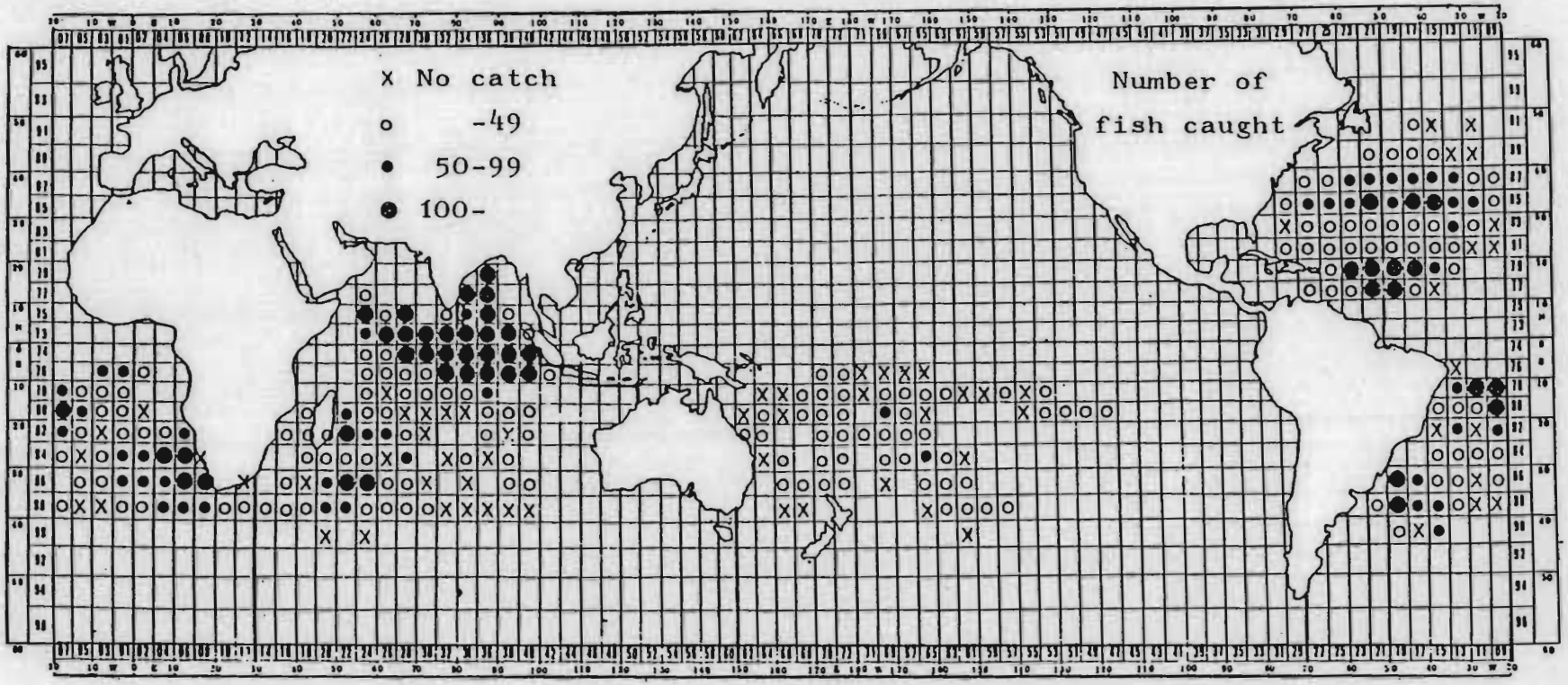

Figure 13. Yearly distribution of catch in number. (Swordfish)

Source: Annual Report of ROC Tuna Distant-water Longlining Fisheries, 1986.

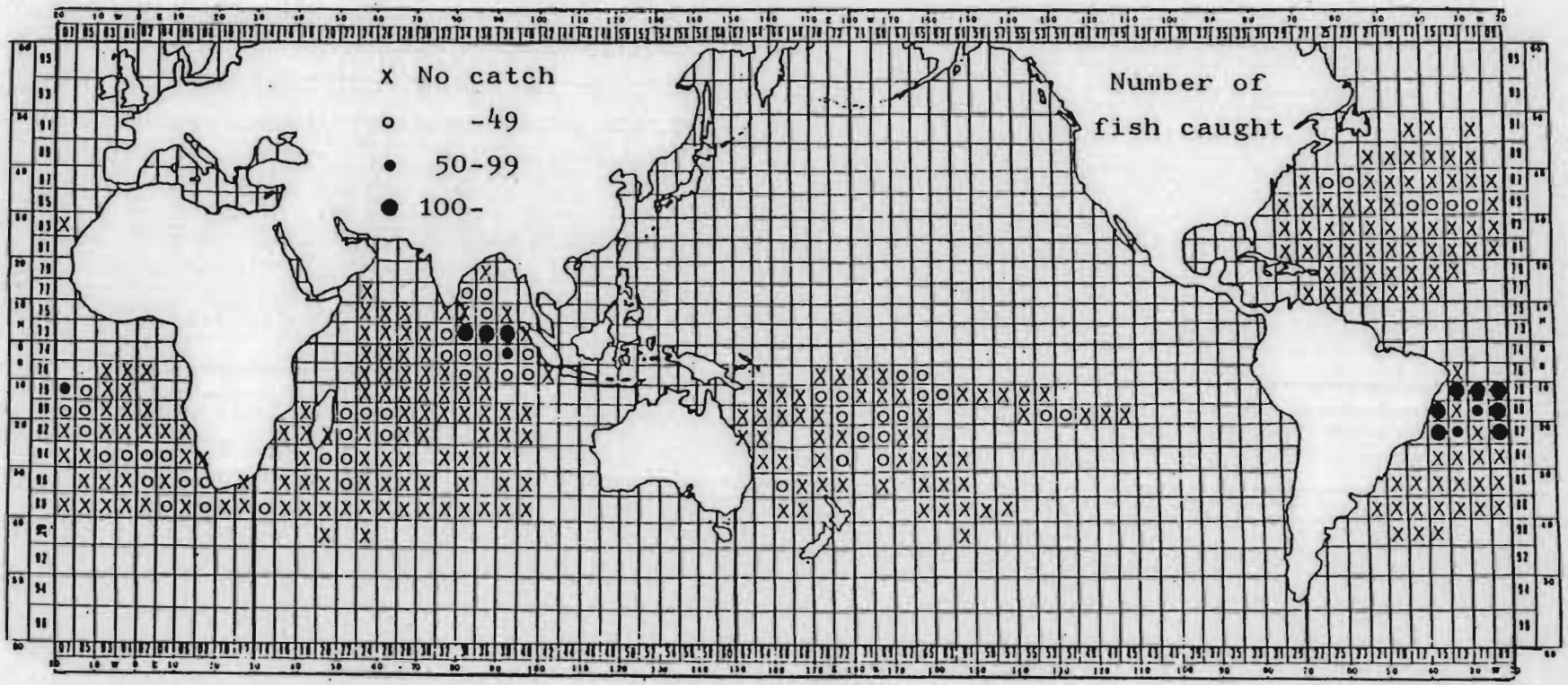

Figure 14. Yearly distribution of catch in number. (other billfishes)

Source: Annual Report of ROC Tuna Distant-water Longlining Fisheries, 1986.

C. Overseas Fishing Operation Bases

Overseas operation bases play a very important role for distant-water long-line fisheries. The ROC government or fishermen's association appoint a supervisor at each overseas base to service and supervise the fishing vessels and crews. Fisheries agencies also establish branch offices at each base to deal with the catches and provide supplies for the vessel. There are 58 overseas bases and are described by region as follows:

(1) The Pacific Ocean Region

There are seven overseas fishing operation bases in the Pacific Ocean of which Tahiti, American Samoa, Fiji, Guam, and Koror are the most important (Fig. 15).

(2) The Indian Ocean

There are 18 overseas fishing operation bases in the Indian Ocean of which Pinang, Singapore, Reunion, and Bangkok are the most important (Fig. 16).

(3) The Atlantic Ocean

There are 33 overseas fishing operation bases in the Atlantic Ocean of which Cape Town, Law Palonas, Saint Martin, Port of Spain, Montevideo, Bakerley Sound, and Castries are most important (Fig. 17).

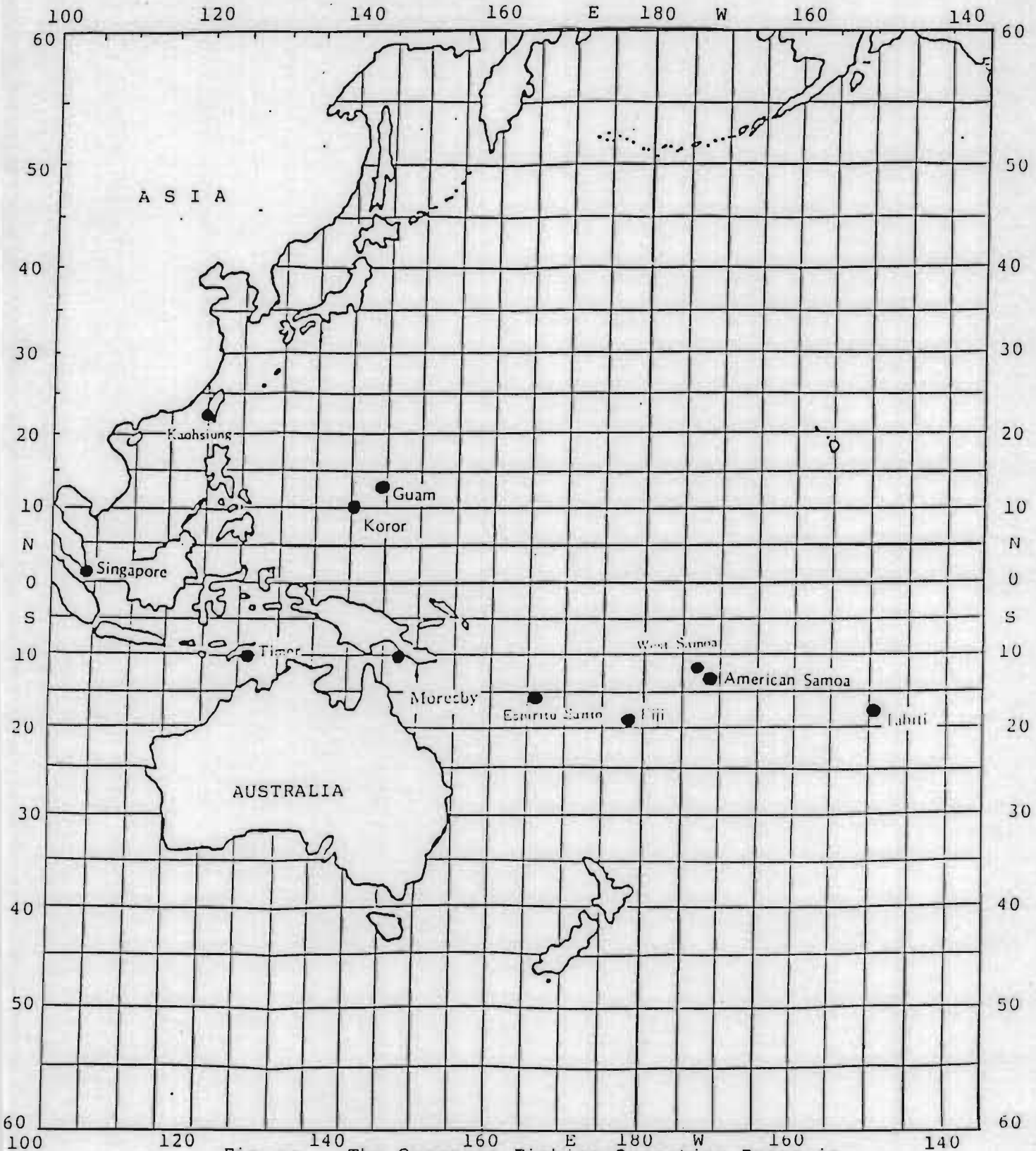

Fig. 15. The Overseas Fishing Operation Bases in The Pacific Ocean Region

Source: Taiwan Fisheries Bureau

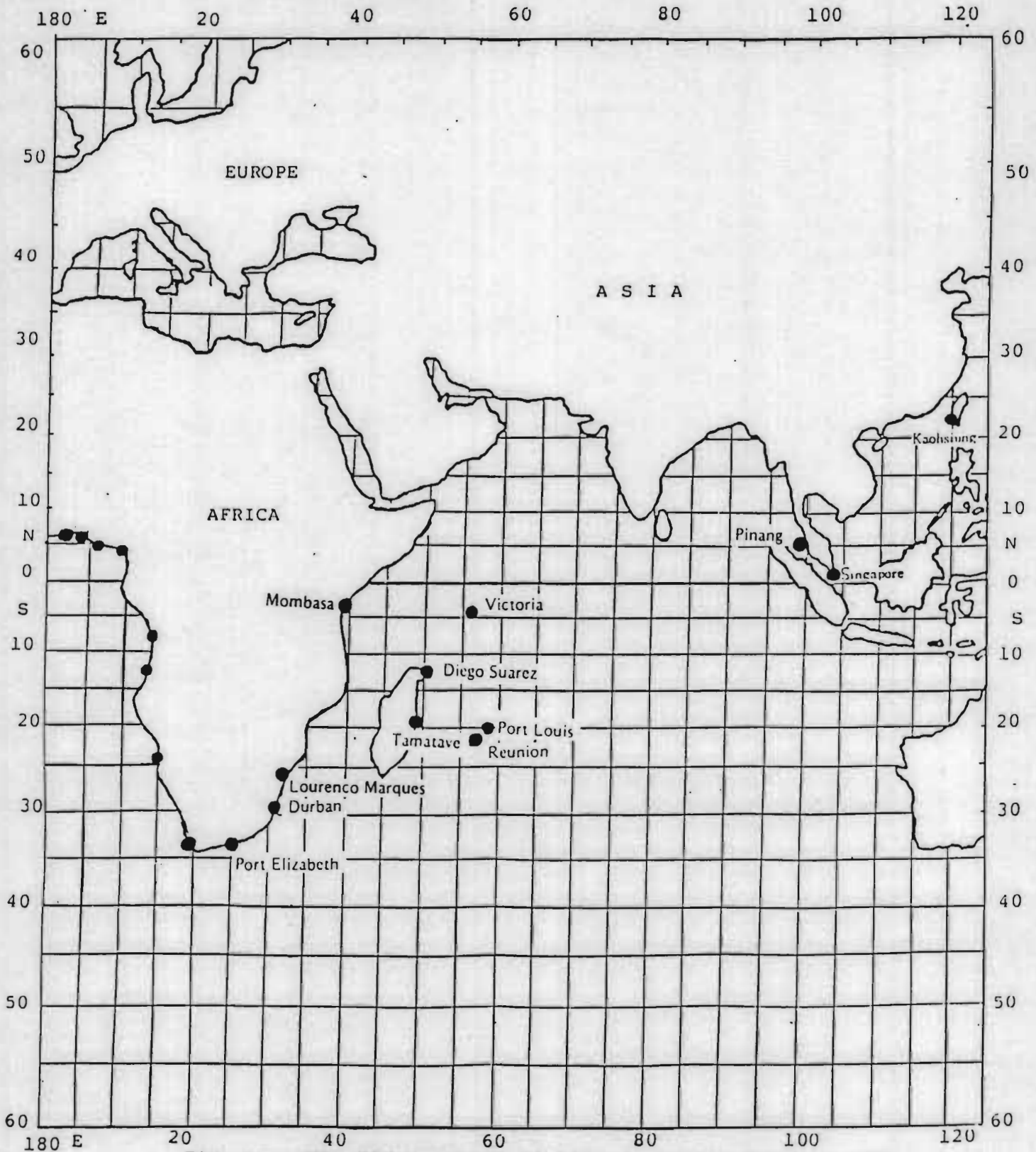

Fig. 16. The ROC Overseas Fishing Operation Bases in the Indian Ocean Region

Source: Taiwan Fisheries Bureau

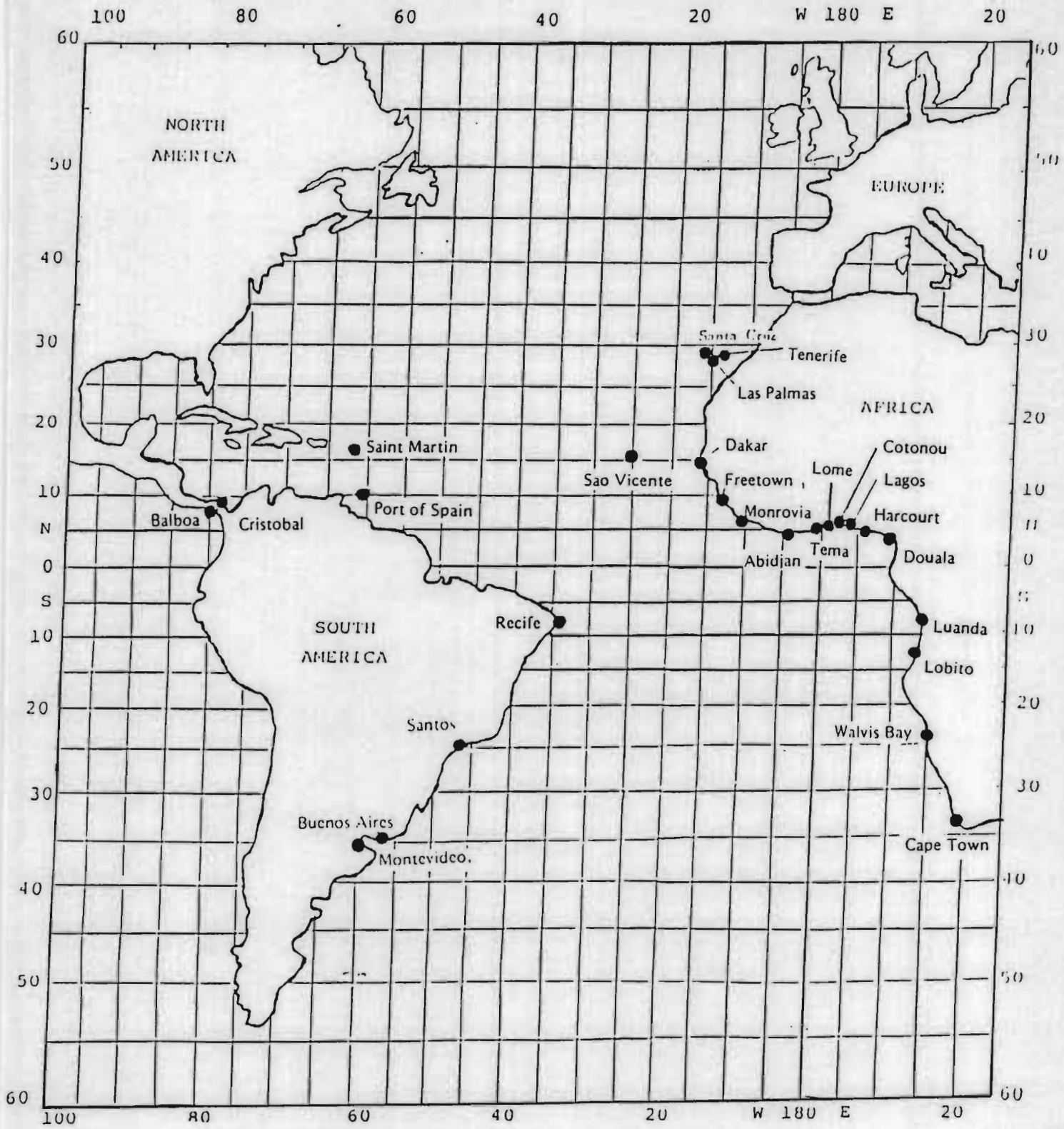

Fig. 17. The ROC Overseas Fishing Operation Bases in the Atlantic Ocean Region.

Source: Taiwan Fisheries Bureau

The current marine fisheries of Taiwan ROC includes distant-water fishery and inshore fishery, and the production of the two fisheries separately reached 596,969 metric tons and 280,500 metric tons in 1987. The production of the two fisheries accounted for 70% of the total production of Taiwan ROC in 1987. Most of the distant-water trawling fishing grounds were involved in the continental shelves out of coastal states, tuna long-lining and gill netting fishing grounds are out of EEZs of coastal states or partly involved in their EEZs.

Overseas fishing operation bases are vital to Taiwan ROC distant-water tuna long-lining, purse seining, squid angling fisheries.

Because most of the traditional distant-water fishing grounds were involved in the EEZs of coastal states, the establishment of new international fishing regulations would impact very significantly on the marine fisheries of Taiwan ROC.

VI. THE IMPACT ON TAIWAN FISHERIES OF THE ESTABLISHMENT OF EEZs

The United Nations Convention on the Law of the Sea permits the coastal state to establish its EEZ and extend fishery jurisdiction out to 200 miles. Coastal states therefore began to claim larger areas of the ocean, contiguous to their shoreline, as under their jurisdiction. This "creeping jurisdiction" has brought many stocks of fish under national control. The extension of 200-mile EEZs claimed by most coastal states results in shrinking of the zone of high seas which formerly had been open for fishing by any other state. The extensions changed the open-access regime and provided the coastal states with the opportunity to control fishing and actually manage the stocks of fish in their newly claimed fishery zones. In principle, under extended jurisdiction, the coastal states have the authority to eliminate economic waste and to reduce excessive fishing pressure; on the other hand, the distant-water fishing states will have to curtail their fishing activities in traditional fishing grounds off the coastal states. The Republic of China (ROC) is a typical distant-water fishing state, and is seriously impacted by the new regime of fisheries jurisdiction.

Comparing her two major distant-water fisheries, trawling and tuna long-lining fisheries, the ROC recognized that her trawling fisheries, which has traditionally fished grounds in the Southeast Asian Seas, would be affected much more seriously

than her tuna long-lining fisheries, because almost all of demersal fish were caught at continental shelves within the 200-mile EEZs of the coastal states.

A. The Loss of Access to Traditional Fishing Grounds in The Western Central Pacific and its Adjacent Waters

The traditional distant-water fishing grounds of Taiwan ROC are located in the Western Central Pacific and the adjacent waters, including the South China Sea, the Gulf of Thailand, Celebes Sea, Andaman Sea, Banda Sea, Arafura Sea, Timor Sea, and the water areas around Palau, Solomon Islands, Tuvalu (Ellice Islands), and Marianas Islands (Figure 18). In 1987 the distant-water tuna long-lining, purse seining, trawling, and gill netting fishing production from those water areas reached 385,000 metric tons, which accounted for 64.5% of its total distant-water fisheries production.[18]

The various zones in the Western Central Pacific and its adjacent waters have been proclaimed to preserve the security of a state and to give authority to regulate economic activities in offshore water and the seabed. These zones, proceeding seaward from the coast include internal waters, archipelagic waters, territorial seas, the contiguous zone, the exclusive economic zone, and the continental shelf. All nations in the region make claims to territorial seas, and all are either 3 or 12 nautical miles wide with the exception of the Philippines. Only Vietnam, Kampuchea, and Burma claim contiguous zones.

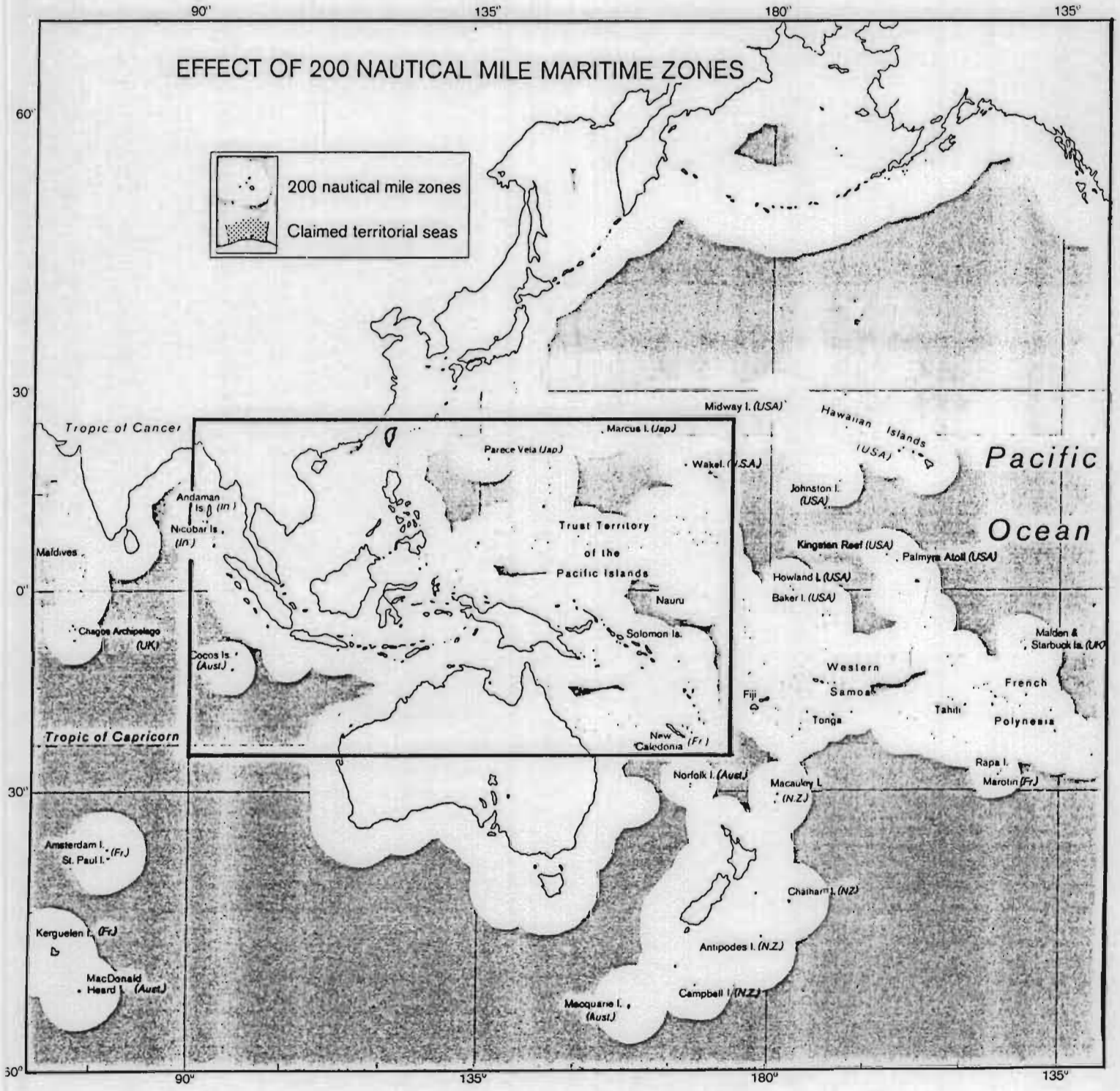

Figure 18. The Traditional Fishing Grounds in the Western Central Pacific and its Adjacent Waters.

Source: Navigational Restriction within the New LOS Context.

There are five characteristics to explain the exclusively national nature of these waters and underlying seabed. First, the coast of continental Asia is deeply embayed by the Gulfs of Thailand and Tonkin. Second, offshore islands enclose a series of marginal seas such as the South China Sea, the Andaman Sea, the Celebes Sea, and the Timor Sea that are bordered by more than one country. Third, the fragments of land in this region, varying in a scale from continental Australia to tiny Naurua, are never more than 400 nautical miles apart, ensuring that claims to EEZs overlap. Fourth, some of the island groups are politically organized as archipelagic states, permitting claims to archipelagic waters on a wider scale than any other region in the world. Finally, there are wide continental margins throughout this region from India to Vanutu. Claims encompass most of the South China Sea and adjacent seas, forming part of the most extensive area of claimed waters in the world, stretching from India in the west to Pitcairn Island in the east, and from Australia's Macquarie Island in the south to the United States' Wake Island in the north. Areas of high seas overlying the deep seabed beyond claimed continental margins are found only south of Australia's Christmas Island and east of the Philippines. Australia, Indonesia, Malaysia, the Philippines, ROC, and Thailand each have claimed an EEZ 200 n. mi. wide with the exception of Australia, which claims only a fishing zone of that width.

There are myriad claims to a continental shelf and EEZs

based on the baseline and island claims in semi-enclosed seas surrounded by many nations. These claims have produced numerous controversies and disputes of many origins involving a continental shelf or EEZ separately or in combination.

The claims made by coastal states resulted in a tremendous impact to Taiwan, ROC, fisheries. First, the loss of access to traditional distant-water demersal fisheries and pelagic fisheries fishing grounds within the EEZs of the coastal states along the Western Central Pacific and its adjacent water region. Second, the disputes of overlap claimed areas, such as the water area between Taiwan and the Philippines, the islands of central parts of the South China Sea were claimed by the Philippines, Malaysia, Mainland China, and Taiwan ROC. Those disputes have discouraged Taiwanese fishermen from fishing in these areas.

B. Fishery Disputes

Extension of national jurisdiction has resulted in a complicated network of international agreements in some parts of the world. International fishing problems are not new; most of the disputes concerned the rights of the nationals of a state to conduct fishing activities in the inshore waters of another state. Problems of this nature are now of relatively minor importance, except for those of historical rights resulting from the extension of national jurisdiction.

International disputes over fishery matters have a rather long history; most fisheries problems resulted from political

or economical factors. Conservation has indeed been a basic theme for most of the international fishery agreements concluded in recent years. But other features, such as the allocation of resources or catch, or the special rights of coastal states, have also been just as important in most cases, whether or not they are explicitly written in the provisions of the convention concerned. For example, various nations are utilizing the resources of the South China Sea and adjacent waters, a chaotic situation would arise if they should extend national jurisdiction in all directions without making a regional agreement. Another case of the main feature of the North Pacific fishery treaty is "abstention", which is a form of "resources allocation." The establishment of quotas for Japanese high seas fisheries is at least as important as conservation in the Northwest Pacific fishery treaty. The Japan-Korea fishery treaty, too, concerns itself with the allocation of resources and catch, as well as the distribution of fishing effort.[19]

Most of those fishery treaties are adopted to eliminate fishery disputes among countries whose territorial seas and EEZs are adjacent. Equitable and mutual allocation of fishery resources and establishing the fishing order are the goals of settling fishery disputes. ROC remains the EEZ boundary problems between both Japan and the Philippines which are now still suspended, for instance, the water between Taiwan and the Batan Island of the Philippines, and the Tao-Yu-Tai Island between Taiwan and Japan.

C. The Increased Fishing Cost Result in Fisheries Marketing Problems

Any international agreement to extend national jurisdiction over marine fisheries will have an impact to traditional distant-water fishery states. Those impacted states have to regain their access to traditional fishing grounds by way of obtaining fishing permission or investment on joint venture cooperation. These measures inevitably increase their fishing costs. After all, it would impact on the marketing and distribution cost of the fisheries industries.

In economic terms, fisheries industry structure, conduct and performance may be altered. Extended jurisdiction may affect the economic efficiency of individual vessels, plants and ports, and the efficiency of the current system of capture, transformation, sale and consumption of individual fishes. It may alter established trade patterns and the interface between fishery products and competing foods and feeds, and between fisheries and alternative users of capital, labor and other resources. In the previous stage before 1982, approximately 60 percent of exported fishery products from ROC were raw material or semi-processed products.[20] After the impact of new international fisheries regulation, the fisheries industry of ROC was concerned deeply on upgrading the fisheries processing to produce high quality and high value products in order to strengthen their competing capability among international markets.

In this chapter it is seen that traditional distant-water fisheries states are impacted under the new international fishing regulations. Extended national jurisdiction has caused disputes on the overlaped claimation of EEZs which might interfere in the fishing operation of other traditional fisheries states. Fisheries cooperation is the most important legal way for traditional fisheries states to regain or obtain the access of fishing in the EEZs of coastal states. But international fisheries cooperation would result in increasing fishing industry costs which may influence fisheries marketing and distribution capabilities.

As Taiwan ROC is a traditional distant-water fishery state, the next chapter will illustrate how it eliminates the new international fishing impacts by way of international fisheries cooperation.

VII. MEASURES FOR IMPROVING THE PROSPECTS OF THE TAIWAN ROC FISHING INDUSTRY

After the coastal states were given the right to establish their 12 nautical mile territorial seas and 200 nautical mile exclusive economic zones (EEZ) or fisheries conservation zones (FCZ), coastal states have sovereign rights over the resources within their EEZs or FCZs. With the increasing extension of jurisdiction of sovereign states over their fisheries, it has resulted in a tremendous impact to Taiwan, ROC fisheries. First, the loss of access to traditional deep-water demersal fisheries and pelagic fisheries fishing grounds within the EEZs of the coast along the South China Sea to the Indian Ocean. Second, it became more complex and difficult to develop or exploit a new fishing ground which may be wholly or partly involved in the EEZ or FCZ of the coastal states. Third, the confliction of specific species resources management by the coastal states, for example, the anadromous species--salmon. Taiwan fishing vessels operating in the North Pacific Ocean for demersal trawling or squid fishing sometimes caught salmon. This resulted in the argument with the United States to delay permitting the "Governing International Fisheries Agreement" (GIFA) to Taiwan ROC fishing vessels in 1986.

Although there were so many impacts on Taiwan ROC fisheries caused by the establishment of EEZs by coastal states, the ROC has made her best efforts to improve fisheries management and

achieved the fisheries agreement to maintain ROC traditional fishing grounds and create new fishing grounds within the EEZs or FCZs of coastal states. For example, ROC has achieved with Australia, New Zealand, Indonesia, India, and Sri Lanka for her trawling fisheries and gill netting fisheries along the South-east Asian Seas region. The trawling fisheries has increased from 179,530 tons in 1986 to 202,417 tons in 1987. Yet, the ROC found that it was in a more difficult situation for trawling fisheries than other distant-water fisheries to achieve fishing agreements because of her poor political position in the international community.

As fisheries shared approximately 30 percent of the total agricultural production value, it is very important for the economic development of the ROC. The ROC has attempted to adjust fisheries policy to face the international fisheries challenge.

A. Strengthen the Aquaculture

Aquaculture of ROC developed rapidly during the last decade, and has become the most technique intensive cultural fisheries over the world. For example, shrimp culture production has reached 6-10 tons per hectare. The production has increased from 139,640 tons in 1977 to 305,428 tons in 1987. Aquaculture production accounted for 25 percent of the total fisheries production of the Taiwan ROC in 1987.

Technique and feeds industry for aquaculture are still developing in Taiwan. But the most serious problem which might

influence aquaculture is the lack of water resources. This should be taken into account as the priority over other factors.

An ample supply of water is a critical factor to ensure successful development of pond culture of fish. The water resources used for aquaculture are either freshwater or seawater. The surrounding coastal lines in Taiwan provide the constant supply of seawater for coastal aquaculture which include the brackish water ponds for marine species. However, the source of freshwater for freshwater pond culture is mainly restricted by the limited water resources supply by reservoirs and rivers which are reserved mainly for rich field irrigation. It is rather difficult to reallocate the available water resources for aquaculture use under such keen competition among other users. Some of the pond culture areas are located adjacent to polluted areas as a result of industrial and municipal waste disposal making the surface water in most areas of Taiwan not suitable for aquaculture use.

The pumping of underground water, therefore, is becoming the only reliable water sources. The over-use of underground water to adjust salinity of water of shrimp ponds and the resulting serious subsidence in some coastal areas of Taiwan is now critical and has brought tremendous public concern. Some economic studies have shown that the collective cost of subsidence to society exceeded the collective benefit to these individuals. Because it has changed the feature of the coastal zones, destroyed the isostatic balance of underground water and subsoil

of underground water and subsoil of fishing pond areas, the Taiwan ROC government has to allocate a huge budget to build jetties to prevent the back-fluxing of seawater. The most serious implicit problems is that there will be fewer coastal land resources and underground water resources for future Taiwan generations.

In order to ensure the rational water use and make the aquaculture industry economically viable, besides legal and economic methods implementation, the government has set up directions by readjusting the industry in various way supported by governmental plans:[21]

(1) To promote coastal aquaculture and marine species cultivation by using seawater.

(2) To promote integrated regional development and make rational and effective use of land and water resources, which will include the planning in areas where existing fish ponds are concentrated and the construction of public facilities need for aquaculture.

(3) To establish a centralized water distribution and management system for aquaculture, to control underground water not to exceed the recharge of the subsidence area for aquaculture use.

(4) To develop techniques for mass production of marine seeds for coastal aquaculture.

(5) To encourage more efficient water use by developing a recycled culture system which will greatly lessen water demand for aquaculture.

B. Protecting the Inshore Fisheries Resources

Previously, there were so called "wild fish" in the water area around Taiwan Island by Taiwan fishermen. As time passed, fishing has been mechanized and commercialized, more and more fishing vessels competed in exploiting those fish stocks, there were no more fish that can be called "wild." Those stocks today have to be protected and managed for the purpose of maintaining the optimum sustainable yield and preventing those stocks from collapsing. As bottom trawling fisheries has been regarded as the most harmful to the demersal fish stocks of inshore fisheries, Taiwan Provisional Government has adopted several technical measures to slow down the exploitation rate of demersal fish stocks. These measures enable those stocks to recover to an available stock concentration in order to provide optimum sustainable yield.

There are several direct and indirect management measures applied by the government on protecting the inshore fisheries resources.

(1) Limited entry

(A) Fishing license control

Fixed the trawl fishing vessel license, froze authorizing new trawl vessel contruction permission, new trawl vessels can be constructed only by replacement of old trawl vessels. This approach has been in effect for nearly 12 years. In July 1988 the regulation was released by the government.[22]

(B) Closed area

Mid-bottom trawl vessels are limited to 5 Km out of the coastline in order to protect the coastal demersal fish stocks and avoid fishing conflicts with the coastal fisheries.

(c) Closed period

Taiwan Provisional Government and individual county governments have established regulations on closed fishing season for some specific fish species. These regulations were enforced by Taiwan Provisional Government. The government allocated budgets to aid each county government to build cruising boats for executing the management regulations. Anyone who violates the regulation would have his license suspended for three months to one year.

(2) The demand for limited entry

The disparities between the many and varied fisheries of Taiwan, ROC, are so great that generalizations about the adoption of a limited entry system are difficult to make. This is, however, one generalization that holds true for all fisheries as long as the condition of free and open access is maintained and as long as demand for the production increases, a fishery will inevitably attract excessive units of capital and labor, and will inevitably become economically

wasteful. Some system for changing the condition on free and open entry is absolutely essential in order to achieve efficient allocation of capital and labor and prevent the dispation of economic rent. In some cases, the socioeconomic costs and difficulties of adopting and maintaining a limited entry management system may outweigh the benefit that can be expected.

The perception of a limited entry management system by the fishermen, administrators, and legislators are more important than academic judgment. These receptions, with regard to the need for, and effects of, a limited entry system are largely unexplored. To limit entry, first, by providing the authority to determine the shares of the yield of stock off oasts and, second, by permitting the adoption of unified measures over the fishermen from different counties of the island.

(3) Government loans

In order to encourage fishermen to exploit pelagic species, the government established low-interest and long-term loans to fishermen to construct surface water purse seine vessels, gill-net fishing vessels, and other multi-use fishing vessels, except for bottom trawling vessels.

(4) Artificial reef

Artificial reefs played an important role in pro-

tecting demersal fish stocks during the past seven years. Taiwan Provisional Government has established 15 sites as demersal fish stocks conservation zone, and built large volume artificial reefs on the bottom of each site. Artificial reefs provide good shelters for demersal fish species, gathering fishes which accumulate to a significant amount of stocks. It has been very successful by using artificial reefs for recovering demersal fisheries resources. Besides, artificial reefs form a barrier to bottom trawling gears, because artificial reefs would damage trawl fishing gear. Therefore, trawl vessels must stay away from those sites, thus only angling, bottom long-line, gill net, and other available gears can be operated within those water areas. Because those fishing gears are selective, they will not destroy demersal fisheries resources by overfishing.

(5) Minimum size regulation

Regulation of minimum sizes are imposed on lobster fisheries and abalones fisheries. The fishermen's associations were authorized to inspect the catch to check if they were above the required minimum size or not. If the size does not meet the requirement, fishermen have to put them back into the water. Anyone who violates the regulation would be strictly fined.

(6) Prohibit illegal fishing methods

Taiwan Provisional Government has established regulations on prohibiting illegal fishing methods. For instance, the use of dynamite, electricity or poisons to kill fish in prohibited. Those illegal fishing methods are not selective; they might kill all of the animals within the water column and may terribly harm the fisheries resources. The violators should not only have their license suspended, but also be subject to other penalties.

C. Encourage Innovation in the Fishery Industry

The fishery industry is dynamic; it should be changed along with the economic, social, technological and political developments. In other words, fishery production should change into effective as well as commercial production structure. There are several approaches to achieve the goal.

(1) To change from fishing single species into multispecies. The fishing industry is flexible; it is available to fish different species by using different fishing gear. The ROC government encouraged the fishermen to build multiusage fishing vessels and improve their fishing techniques by fisheries extension programs.

(2) To change from year-round fishing to seasonal fishing. According to the biological research and the past fishing experience, to guide fishing vessels to measure

out the favorable season and routes of different species of fish to aggregate and migrate. Fishing vessels would fish at the exact available season to achieve the most efficient and economical operation.

(3) To renovate and mechanize the fishing vessels and related fishing equipment.

(A) Motor vessels--high horse power engines, high speed and well equipped in order to increase the effect of catching pelagic and migratory species.

(B) Mechanized gears--hydro-steering fishing gear operation in order to increase fishing efficiency and save manpower.

(C) Artificial fiber industry--providing strong, durable and effective fishing gears.

(D) Improving navigation aids--encourage fishing vessels to equip with satellite navigation, faxmile and other facilities to increase the safety of fishing vessels on the sea.

(E) Introduction of acoustic equipment--encourage fishing vessels to equip with effective acoustic fishing facilities such as fish detectors, fish finders, sonar fishing finders, gear nets, locality detectors.

(F) Improving the refrigeration technology--encourage new-built fishing vessels to equip with freezing facilities to maintain the fish quality, for

instance the ultra-low temperature tuna fishing vessels for high value sashimi tuna fishery.

(4) To improve the production structure, encourage small scale fishery into large scale fishery by joint investment or cooperation in order to change artisanal fisheries into commercial fisheries. This may increase their fishing capability of offshore fishing.

Where there is a need for increased fishing effort, the government must give financial and technical assistance. The most important projects to be financed will be those concerned with infrastructural investment (e.g., constructing new harbors and improving port facilities). Improved shore facilities, especially communications, will help to reduce waste and improve marketing prospects. These considerations apply to a portion of small-scale traditional fisheries where often limited marketing opportunities, waste and poor quality result in low returns and give little incentive to fishermen to increase their catch. Without such improvements to the shore-based infrastructure, attempts to improve vessels (i.e., through motorization, schemes) have often failed, because without better marketing opportunities and thus higher prices, motorization merely adds more to costs than revenues. Requirements to improve the situation are much the same as for more industrialized fisheries, for example,

facilities to handle and dispose of the catch, and facilities for the repair and maintenance of fishing craft.

The investment in new vessels is complex, but additional vessels would seem to be required despite the excess capacity already existing throughout the world. Additional vessels will be required to exploit opportunities in some recently established EEZs, for instance, those having unexploited potential or stocks previously exploited by coastal states.

(5) To improve the utilization of fish already being exploited.

In addition to an attempt to increase the total catch, the improvement of utilization of fish already being exploited requires attention--to reduce the waste of postharvest. It has been estimated that as much as 20 percent of all fish taken from the sea and fresh waters never reach the consumer; thus there are considerable possibilities for increasing the supply of fish through improving the utilization. The ROC government has established "Strengthen the Postharvest of Agricultural Products" program in 1985.[25]

There are two main situations where waste can be prevented or reduced, namely in the utilization of by-catch of fish caught by demersal trawling vessels and by reducing losses of cured fish. Part of the

remedy in both cases lies in providing the necessary economic incentives. But an important element in any program to avoid waste is improvement in the on-shore handling and storage facilities. The ROC government annually allocates budgets to support county governments or fishermen's associations to construct cold storages, landing machines, and related marketing facilities.

D. Strengthen International Fisheries Cooperation

Because Taiwan, ROC, is not a party of UNCLOS III and with her poor political position in the international community, there will be many difficulties and obstacles in solving the disputes and establishing fisheries cooperations with coastal states. From the beginning, the ROC strictly adopted and obeyed the international law or regulations making every endeavor to improve the mutual relationship with other coastal states and establish fisheries cooperations. The ROC has made many efforts to achieve fisheries cooperation or agreement by way of:

(1) Negotiating and signing the fishing agreements or contracts with foreign country governments, for instance, the fishing agreement signed by ROC government and the South Africa government.

(2) Negotiating and sign fishing agreement contract with private organizations or associations of foreign countries, whose organizations or associations are

authorized or supported by their governments.

(3) Negotiating and signing fishing agreements or contracts between Taiwan fishermen's associations and foreign private organizations or associations which are authorized or supported by their own government.

(4) Negotiating and signing fishing agreements or contracts by the ROC government authorized or supported private organizations and the organizations or associations of foreign countries.

(5) Engaging in fisheries cooperation through joint ventures or invest in the host countries.

For the fisheries cooperation, at the beginning, the host countries (most are developing countries) simply permit foreign country vessels to fish in their EEZs through collecting fishing fees by vessel, by vessel tonnage, or by production. But gradually, the host country has attempted to increase its own fishing capability by introducing fishing techniques, fishing technology and capital into its own fisheries. Thus, joint investment should be more and more important in international fisheries cooperation. As fisheries joint ventures are very complicated, we shall discuss it in the next chapter.

E. Strengthen Education of Fishermen in International Fisheries Law and Regulation

All of the fisheries disputes and problems come from the activities of fishing vessels, crews, and fishing operations

because of the ignorance and lack of knowledge of related laws and regulations. Thus, it is important for the ROC to collect international and municipal laws and rules and regulations concerning international fisheries and to educate and train its fishermen as well as the administrators.

Generally speaking, the regulations and rules related to fisheries promulgated by coastal states are dynamic; they may be changed all the time. On the other hand, most fishermen think that all they need is a strong body and patience at work, not necessarily higher education and the knowledge concerning the foreign or international fisheries regulations. The general conception has become an obstacle of fisheries management, especially for the distant-water fisheries. Training and raising the quality of fishermen to accommodate themselves to the international fisheries development should become an important responsibility of the ROC government. The ROC government has strengthened and reorganized the "Distant-water Fisheries Crews Training Center" in order to train and level up the fishing techniques and skills. But the training courses on international law and fisheries regulations are still weak; this should be improved as soon as possible.

F. Improve Communications with and Participate in International Fisheries Organizations

International organizations have traditionally been used to solve international problems that a sole nation cannot achieve

on its own. The rapid progress in technology and communication in the twentieth century has increased the interdependence of sovereign nations. In addition, foreign affairs daily affect domestic policy and force nations to recognize the need to interact with the international community. International organization is an effective structure for collecting and analyzing scientific information regarding the regional fisheries, for instance the highly migratory species of eastern Pacific yellowfin tuna. However, effective management and enforcement of the fishery should remain with the coastal states in a decentralized structure with active industry participation. Coastal states should ultimately have the responsibility to manage highly migratory stocks within their exclusive economic zones.

Although the ROC has a poor position among the international political community and is not a member nation of any of the existing international tuna conservation and management organizations, none of them can neglect the fact that ROC is one of the most important tuna fishing nations in the world, catching over one-fourth of world production of albacore.[23]

There are five major international organizations concerned with scientific study and management of tuna: Inter-American Tropical Tuna Commission (IATTC), International Commission for the Conservation of Atlantic Tunas (ICCAT), Indian Ocean Fishery Commission (IOFC), Indo-Pacific Fisheries Commission (IPFC), and South Pacific Forum Fishery Association (SPFFA). The ROC provides all the tuna catch information to the related inter-

national fishery organizations annually and has been invited to participate in the important conferences of those organizations with an observational participant status. In addition to participating in the regional organization activities, ROC provides her annual fisheries production, processing, and foreign trade information to FAO in detailed statistical reports to support FAO to fulfill the statistics of the global fisheries production.

G. Improve International Relations with Foreign Countries

Taiwan, ROC has been very generous in sharing her techniques and experiences with other countries interested in improving their agriculture and fisheries. Fishing operation and aquaculture experts of Taiwan Fisheries Research Institute or fisheries authorities were provided to other countries to help them develop their fisheries. As of May 1987, ROC maintained 32 agricultural and fisheries technical missions in 32 countries.[24] It is indeed ROC's privilege to continue providing services in this area. On the other hand, ROC also helps to train foreign technicians. From 1949 to 1985 there were 7,165 persons sent by different countries to Taiwan to receive agricultural or fisheries technical training. These good relationships have become favorable factors in establishing fisheries cooperations between ROC and foreign countries.

H. Strengthen Fisheries Research

The fisheries environment is dynamic; it can be influenced and changed by the coastal states all the time. Coastal states may impose and adopt more and more strict regulations and requirements on the fishery management of their EEZs, and should ask for more benefits from foreign states who wish to fish in their EEZs. The most urgent and guaranteed measure for the long-term development of ROC fisheries is to explore and exploit new fishing grounds in the high seas in order to fish pelagic and migratory fish stocks such as mackerel, tuna, skipjack, etc. The pelagic fishing operation is rather technique intensive to face the mobility of fishing grounds. ROC government has paid much attention to fisheries research and exploring new fishing grounds. It has allocated budgets to construct modern fisheries research vessels and marine science research vessels. New fishing techniques and fishing facilities were experimented with and transferred to the fishing industry for innovation in purse seining, mid-water or surface water trawling, gill netting, squid angling in order to increase fishing capability to achieve economic efficiency. Taiwan Fisheries Research Institute has achieved many fishing ground explorations around the high seas including the demersal fish resources on sea-mountains and the krill resources in the Antarctic waters. Fisheries research activities will be strengthened and kept on-going.

In response to the new legal fishing order, Taiwan ROC has

attempted to adjust its fishery policy to maintain fishing capacity, regain the access to its traditional fishing ground and explored new fishing grounds.

Several effective measures have been applied by Taiwan ROC in managing its fisheries including strengthening aquaculture efforts, protecting inshore fisheries resources, introducing innovations in the fishing industry, strengthening international fisheries cooperation, improving education on international fisheries cooperation, improving education on international fisheries regulations, improving fisheries research, and improving its international relationships. These measures have effectively enhanced the fisheries environment of Taiwan ROC and have achieved an increase in its fisheries production. As the fisheries environment is dynamic, Taiwan, ROC has to strengthen and modify its fishery policy for the long-term, steady fisheries development.

VIII. FISHERIES JOINT VENTURE COOPERATION

As coastal states established their EEZs, most traditional distant-water fishing states lost their free access to traditional fishing grounds. In order to maintain their fisheries development, these fishing states have to regain their access of fishing in the EEZs of coastal states. International fisheries cooperation is the best legal way for these traditional fishing states to do so.

Fisheries joint ventures have become the most favorable as well as profitable way for the coastal (host) states to benefit from their fisheries resources. Fisheries joint ventures are based on the concept of mutual benefit. Under fisheries joint venture, the distant-water fishing state can obtain fishing opportunity, and the coastal state can obtain economic profits and gain the fishing technology and techniques through transfer to increase its own fishing capability.

A. Evolution of Fisheries Joint Venture Cooperation

The Taiwan ROC fisheries authority has encouraged Taiwan fishermen's associations and fisheries industries to engage in fisheries cooperations with foreign coastal countries through joint ventures. During the past several years there were several fisheries joint ventures established. But there still remained some problems: the contracts, agreements or regulations concerning joint ventures were ambiguous or not fully understood

by either or both the ROC and a host country. This has resulted in several Taiwan fishing vessels and crews being seized by the host country navy. For example, the cooperation contracts between Taiwan ROC and Indonesia were approved by the agriculture and fisheries government authority of Indonesia, but there were some additional regulations required by its navy which was not involved in the contract. The lack of internal coordination among Indonesian government departments on international fisheries cooperation policy has resulted in several cases of Taiwanese fishing vessels being seized by the Indonesia navy for reason relating to security.

Nevertheless, fisheries joint ventures is a main trend in international fisheries cooperation, and will dominate the ROC's distant-water fisheries. Thus, it is necessary to describe the joint venture factors in more detail.

Fisheries joint ventures not only exist between distant-water fishing nations and developing coastal nations, but also between the former and the developed coastal nations such as the U.S. Developing countries have also established fisheries joint ventures among themselves. The needs, desires, policies, and ideologies of the countries concerned determine the types of joint venture cooperation between them. In developing countries there is a growing awareness of the necessity of national sovereignty over natural resources and sensitivity to foreign domination over the exploitation of resources without local participation. However, they have inadequate capital and lack the

technical expertise to develop their fisheries resources fully without outside assistance. At the same time, long-range fishing fleets find it more and more necessary to enter into joint venture arrangements in fisheries in the EEZs of coastal states. These and other factors have led to an increase in the number of joint venture arrangements in the fisheries sector throughout the world.

B. Regime of Fisheries Joint Venture

The establishment of fisheries joint ventures may be looked at as one of the alternatives, especially for the distant-water fishing nations, in facing the restrictions ensuing from the EEZ of coastal states in traditionally exploited fishing grounds. For traditional fisheries states, joint ventures with foreign partners are useful as a means to develop coastal resources which cannot be used by local fishermen, mainly for economic reasons. Such cooperation can ensure a good future for traditional fisheries states, especially in the development of lower market value species. For develcping coastal countries, joint ventures can offer an opportunity in an interim period to develop their fisheries. The recent trend is toward more technical cooperation between the developing countries themselves.

For developing host countries, joint ventures may be of direct as well as indirect benefit. Direct benefits that interest the developing countries include transfer of technology, employment and training of locals, activation of coastal zone

industries related to fisheries, exploitation of partially utilized or nonutilized species and marketing of fish to provide local food supply and foreign exchange earnings. The lack of information on the stock which the country hopes to fish and the desire to make the production primarily export-oriented, because of the limited absorption capacity of domestic markets, may prompt a developing country to seek foreign cooperation. The direct benefits are related to data collection, observation of and learning about advanced fleet management techniques, administrative procedures, and management and control of stocks.

C. Obligations Involved in Fisheries Joint Ventures

The objectives for a developing country in entering into joint ventures are directly related to developing its fishery with the ultimate goal of achieving full exploitation of the resources by its own capabilities. The fisheries development has to be integrated with the development goals to be achieved in the various sectors of the economy. Experience with the multinational corporations has had its bitter side. National interests of developing countries had been injured by actions (or failure to act) of overseas partners. These include breaches of the terms of the joint venture agreement, failure to include elements essential for effective operations and to make clear to the host country the cost implications of such factors as procurement of spare parts abroad, repairs which cannot be carried out in the country, etc. Reluctance of foreign crews

to train local men, provision of equipment unsuitable for local operations (e.g., vessels that could not be accommodated in existing port facilities or equipped with unserviceable engines), and making unrealistic charges for services or equipment are among the practices followed by several foreign partners to hinder the transfer of technology. Besides their readiness to enter into extracontractual "deals" with local officials, the foreign partner makes an unfair exploitation of the lack of experience of the host country partners. Exploration prior to commercial activity may take a long time and under the "guise" of "survey" the foreign partner undertakes commercial activity and escapes sharing with the local partner. The joint venture operation often interferes with the local traditional fishery and competes with an already established local business in certain operations.

On the other hand, the foreign partner may face several constraints that hold back entry into joint ventures. These include political and economic instability, lack of social capital and infrastructure, risk of nationalization and foreign exchange restrictions, and the difference of institutions and customs. Other factors discouraging a foreign partner's interest in entering joint ventures in fisheries relate to the high cost of preliminary surveys to establish feasibility of operations, limitation on fishing areas, delays and excessive cost associated with the importing of equipment, obtaining permits, licenses and compliance with local regulations. The restrictions by the

host government of activities of direct commercial interest to the joint venture, the local food habits which inhibit development of markets for fishery products and the difficulties in local procurement of essential equipment are also hindering factors that discourage foreign partners from entry into joint ventures.

Nevertheless, interest in joint ventures continues to grow because the sum of a foreign partner's capital and skills, plus the abundant and less costly labor and the natural resources of a developing country equals net benefits in the form of a more efficient use of productive factors. The problem of distribution of benefits of a jointed investment fishing company remains the key issue in joint ventures. For developing coastal countries, there should be sufficient safeguards in joint venture agreements to protect their interests.

D. Types of Joint Ventures

A fisheries joint venture is an association of two or more parties, in order to undertake a commercial project in the fisheries sector and to share in its risks and profits. The parties may be individuals, corporate bodies or government agencies. The term covers a multitude of different arrangements of varying magnitude and scope. Such arrangements often entail the setting up of a separate company in which each of the parties holds a proportion of the capital shares. In this case the arrangement is called an "equity joint venture." In other cases, no such

independent company is formed and the relationship between the parties is governed solely by contract.[25]

(1) Equity joint ventures are the most common form of industrial joint ventures involving foreign investment in developing countries. They occasionally involve participation by two or more partners in the equity capital. Formation of a new company may be the more practical method, because it is often more convenient to obtain new documents of incorporation with the desired provisions than to adapt an existing structure to the new way of business.

(2) Contractual joint ventures are often used where the laws of the country in which the business operations are to be conducted do not recognize the concept of private ownership of property, such as in a number of countries with centrally-planned economies. They are temporary in nature and may lead to the establishment of a joint company. In fisheries, contractual joint ventures may be made for the supply of equipment, technical assistance and foreign exchange by the foreign partner in return for fishing depending on production, types of species, etc. Other contractual joint ventures may involve only licensing and know-how or marketing arrangements. Some licensing agreements, where obligations of training, localization of labor and establishment of shore facilities are

involved, may also be described as contractual joint ventures although the element of sharing risks and profits is less predominant.

E. Objectives of Contractual Joint Ventures

To avoid any source of dissension, the objectives of the contractual joint ventures should be clearly and precisely defined as well as the means to achieve such objectives. These may include:

(1) type of operation to be carried out including the number and type of vessels to be used. A detailed annex of the specification of vessels has to be attached to the agreement;

(2) type of processing of catch whether it will be carried out on board or on land-based processing plants;

(3) types of species to be harvested and/or processed;

(4) number of local employees and their job descriptions;

(5) number of local trainees on the job and in the foreign partner's country;

(6) substitution of local employees for foreigners should be programmed, and a schedule to that effect should be made and attached to the agreement;

(7) quantities of species to be harvested and/or processed if the host country wishes to make a ceiling on the catch based on previous experience and knowledge of the stocks;

(8) types of fishing gear to be used (a separate schedule may be added as an annex to the agreement with details of the gear, mesh size of nets, prevention of use of explosives, or other harmful means, etc.). This has to be carefully evaluated with regard to the economics of the techniques used versus their impact on local employment and possible damages to the stocks.

F. Payment

For developing countries, payment of fees for species harvested may be best made based on types, sizes, and quantities of species caught and their international market value. This assumes that the host country has knowledge of and access to international markets. Often, the foreign partner aims at fishing high market value species that are best sold in its own country. If the host country has the ability to store, process and handle the species caught for selling to the foreign partner, it may be made with price comparable, but not necessarily less than those offered in the international market. Part of the payment may be made in kind, etc. Taxes applicable according to the law of the host country should be stipulated.

G. Supervision and Control

The local host country government corporation involved in a contractual joint venture must insure sufficient supervision and overall control of the performance of the foreign partner

in abiding by the terms of the agreement, without jeopardizing the economic efficiency of the fishing operation. Supervision is necessary to ensure that:

(1) Data and information requested by the local fishing research centers and other authorities are made in the proper forms and are true. (Some foreign captains, for example, give wrong positions of the vessels during trawling.)

(2) Quantities and sizes of the species caught are reported accurately for the purpose of calculating payments. The tendency is that foreign partners report less quantities than actually caught by using different methods such as putting much excess weight in the supposedly standard cartons than required for marketing. This extra weight is made use of when the product is sent outside the local host country to the foreign partner's subsidiaries in the foreign market.

(3) Damage to fishing gear belonging to local fishermen is reported immediately.

(4) Training of local crew and other local personnel on board is made according to the terms of the agreement.

(5) No violation of the terms and conditions of agreement is made, especially with regard to fishing in the limited areas.

(6) Observation of conservation rules issued by the local fisheries management bodies is strictly made during

the fishing operation.

(7) Good treatment of the local crew and cooperation between all crew members is observed to ensure smooth and efficient operation.

Detailed description of the functions of the supervisors, as well as detailed job descriptions, privileges, duties and rights of all local persons on board the fishing vessels should be annexed to the agreement. It is advisable to have more than one supervisor on board each vessel so that they can cover all shifts of the work in order to avoid "extra deals" and corruption. Special technical training is necessary for the supervisors (ability to locate position of vessel, use of radio, knowledge of species caught, checking gear and other equipment, etc.).

H. The Prospect of Fisheries Joint Venture

The restraints on increased production and sea food supply to the consumers are many and complex involving economic, sociological, political and legal factors as well as technology. For the developing countries, directing current development strategies toward enhancement of marine food production is, perhaps, the first basic requirement for making use of the jurisdiction over the EEZ. This presupposes: (a) acquiring sufficient knowledge of the nature of the stocks; (b) economic and social priorities for utilization of the stock on a full-fledged pattern including fishing, processing, marketing and subordinate industries (boat building, repair workshops, landing sites, etc.);

(c) technical ability involving both machine equipment and human requirements.

The basic problems of joint ventures arise from a mixture of harmonies and conflicts of interests. Generally speaking, multinational corporation introduce into a host country a package of resources and capabilities which they continue to own or control. They also tap resources on a worldwide basis and syphon them off to market where profitable possibilities exist. Their impact, on the one hand, depends on the environment in which they operate and, on the other hand, the nature of the package and the attitude and strategies of the multinational corporations. For example, foreign capital may augment the resources of the host country and relieve bottlenecks in foreign exchange; but it may also cause a serious large outflow in dividends and service payments. New technology may improve the utilization of resources, but may not always be appropriate for local needs such as creating new employment.

It is not only what is actually brought into the host country that counts; the potential access to the capital, technology, skills, and market of the global network of the multinational corporation is equally important. It is not only the number of people that are employed in the joint venture that is important, but also the possibility of employment creation or labor displacement elsewhere in the economy. It is not only the increment of national income that is relevant, but also the possible effect on the direction and depth of development. Multi-

national corporations may serve as carriers of modernization or they may place the host countries in a situation of even greater dependency. The noneconomic impacts are frequently as important as, or even more important than, the economic impact.

Some host countries attempt to tackle such problems by insisting on participating in the decision making. Local ownership through joint ventures does not always affect the control mechanism. On the other hand, if the multinational corporation loses effective control over the affiliate, some of the benefits stemming from its multinational character may be lost; technology may be reduced, made too costly or made subject to export restriction clauses. Or again, if a host government tries to exert a measure of control over the decision making, it may see its efforts frustrated by evading behavior on the part of the corporations or by the lack of coordination of policies among the different host countries.

For developing countries, the development problem is to evolve a production structure that simultaneously makes optimal use of available inputs and yields the maximum flow of usable outputs both for current consumption and for ensuring future capacity to produce. To influence the nature of structural change and adjustment and to accelerate its pace in the interest of economic and social development, government may become directly involved in the production process or use various policy instruments to encourage or deter private decision making. In most countries both forms of influence are exercised. Among the most

important requirements for achieving success in development, in this sense, is thus the extent to which governments are seriously committed toward planning and development.

Fisheries joint ventures provide the optimal legal measure for Taiwan ROC to gain fishing opportunties for its distant-water fishery. Fisheries joint ventures cooperation enable the host states to benefit from fishing technology and techniques transfer so as to increase their own fishing capability. Fisheries joint ventures cooperation should be based on mutual benefit among host states and foreign states. Taiwan ROC has achieved in joint venture cooperation with Australia and many other states through investment in establishing fishing company or providing techniques training to maintain and extend its distant-water fishing grounds. Although there were disputes or misunderstanding among Taiwan ROC and host cooperation states about joint venture contracts, after mutual communication and understanding, most problems were solved. Fisheries joint venture cooperation has enabled Taiwan ROC to maintain its distant-water fishery development.

IX. CONCLUSION

As the United Nations Convention on the Law of the Sea gave coastal states the right to extend their territorial sea up to 12 miles and establish an exclusive economic zone up to 200 miles from their baselines, it has established a new fishing order over the world. It is estimated that approximately 94 percent of the current world catch is taken from within the 200-mile EEZs or FCZs of coastal states. But UNCLOS is concerned only with establishing a framework for a new fisheries regime; details of fisheries management were left incomplete.

Extension of national jurisdiction over fisheries has resulted in an even more complicated network of international fisheries. The complexity of technical factors involved in the regulation of fisheries, domestic or international, is often underestimated. Fishing is still largely an activity to harvest wild stocks of highly mobile animals which cannot be fenced in a limited area or marked for ownership. It is extremely difficult, under these circumstances, to find social justification for establishing ownership for fishery resources. Fishery matters have become entangled with other issues more intimately connected with political and power considerations so that the outcome of a fishery dispute jurisdiction has such implication for power that the state with superior strength in terms of force will seek to make that strength determinative. This could occur if territorial limits become exaggerated and supersede any notion

of a separate limit.

The establishment of EEZs would link up the relationship and activities among the traditional marine fisheries states and costal states. But on the other hand, it has resulted in more complicated disputes and jurisdictions over the EEZs among them. Negotiation, communication, mutual understanding, fishing agreements, and fishery cooperation will be the best ways to eliminate the conflicts and disputes among states in order to achieve a new fishing order regime.

Although Taiwan ROC is not a party to the 1982 U.N. Convention on the Law of the Sea, and with its poor political position, there were obstacles lying ahead of it on solving fishery disputes and establishing fisheries cooperations among the coastal states. ROC has strictly adopted and obeyed the international law regulations.

ROC has attempted her utmost to adjust fisheries management policy to face the international fisheries impact. Several practical measures have been adopted including strengthening aquaculture, protecting inshore fishery resources, innovating the fishing industry, strengthening international fisheries cooperation, strengthening fisheries research, etc. These measures have successfully improved ROC's fisheries development, especially for her distant-water fisheries. ROC has gotten more and more fishing permission from coastal states by way of fishing agreements or fishery cooperation. The fisheries production increased from 922,520 metric tons to 1,236,170 metric tons between 1982

and 1987; the fisheries production value increased from 1,476,376 thousand U.S. dollars to 2,865,159 thousand U.S. dollars. ROC fisheries production shared approximately 1.3 percent of the world total fishery production in 1987. On the other hand, the cases of fishing vessel and crew seized by coastal states have apparently decreased. Anyway, the ROC will not be satisfied with current achievements. The fisheries environment is dynamic; ROC has to endeavour to face the future fisheries challenge.

From 1982 to 1987, most coastal states established EEZs encompassing many traditional fishing grounds of Taiwan, ROC. By way of international fisheries cooperation and improvement of fishing efficiency, the distant-water fishery production of Taiwan ROC, nonetheless, increased year by year. The increase in production may be maintained in the next several years, but there remains a potential problem. As those developing states in whose EEZ Taiwan ROC vessels fished increase their own fishing harvest capabilities, the available surplus of fishing decreases, thus, Taiwan ROC distant-water fishery will face another impact. With this potential problem in mind, it is urgent for Taiwan ROC to increase its exploration for new fishing grounds beyond the EEZs of coastal states.

Taiwan ROC has planned to build new fisheries research vessels, processing plant vessels, bigger multi-purpose fishing vessels, all in order to target highly migratory, pelagic stocks. Besides, Taiwan ROC has also created an "Aquaculture Development Program" to strengthen its mari-culture, brackish pond culture,

freshwater culture, and is constructing water resources control and supply system. It has also established a Fish Disease Prevention Center. The policy of strengthening aquaculture and high seas fishing production will be helpful to lessen the impact and may maintain the level of ROC fishing production.

ENDNOTES

[1]1982 Convention on the Law of the Sea (LOS), Article 57, "Breadth of the exclusive economic zone."

[2]1982 LOS, Part II, Territorial Sea and Contiguous Zone.

[3]Agricultural Statistic Yearbook, 1987, Department of Agriculture and Forestry, Taiwan Provincial Government, ROC.

[4]Fisheries Yearbook, 1987, Taiwan ROC.

[5]Ibid.

[6]Agricultural Trade Statistics of Republic of China, 1987.

[7]An economic view of optimum sustainable yield, in "Optimum Sustainable Yield as a Concept in Fisheries Management," 1974, American Fishery Society.

[8]1982 LOS, Article 56, "Rights, jurisdiction and duties of the coastal state in the exclusive economic zone."

[9]1982 LOS, Article 61, "Conservation of the living resources," and Article 62, "Utilization of the living resources."

[10]Lawrence Juda, The Exlusive Economic Zone in "Ocean Development and International Law."

[11]1982 LOS, Article 56.

[12]1982 LOS, Article 61(1). The coastal state shall determine the allowable catch of the living resources in its EEZ.

[13]1982 LOS Article 62(1). The coastal state shall promote the objective of optimum utilization of the living resources in the EEZ.

[14]1982 LOS, Article 62(2). The coastal state shall determine its capacity to harvest the living resources in the EEZ.

[15]1982 LOS Article 62(3). Giving access to surplus of total allowable catch to other states.

[16]Powered Fishing Crafts, in Fisheries Yearbook, 1987, Taiwan ROC.

[17]Ibid.

[18]Distant-water Fishery Production, in Fisheries Yearbook, 1987, Taiwan ROC.

[19]In International Aspects, in "Extended Fisheries Jurisdiction," The North Pacific Fishery Management Council presented "the public interest" of the U.S. through allocating quota of allowable catch.

[20]Fisheries Products Exports, in "Agricultural Trade Statistics of the Republic of China," 1987.

[21]The "Fisheries Development Program," of Council of Agriculture (COA), ROC. The over-use of underground water for shrimp ponds has resulted serious subsidence, ROC government has set up directions for adjusting aquaculture development.

[22]In 1976, Department of Agriculture of Ministry of Economic Affairs, ROC proclaimed to stop licensing of building new trawl vessels (limited trawl vessel number). Trawl vessel can be built by displacement of old vessel.

[23]In 1985, the Council for Agriculture Planning and Development, ROC created a program of "Strengthen the Postharvest of Agriculture Products."

[24]Briefing Material, Agriculture in the Republic of China. ROC provides agricultural technical missions or technical training to foreign countries.

[25]Khaled I. Hariri. "Fisheries Joint Venture and the Developing Countries" (1975). Developing countries also engaged in joint venture to exploit the transboundaries fish stocks.

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