

## AN OVERVIEW OF KOREAN TUNA FISHERIES IN THE ATLANTIC OCEAN

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### SUMMARY

The total annual catch of the Korean tuna fisheries targeting tunas and tuna-like fishes in the Atlantic Ocean reached a peak of 46,000 MT in 1977. Thereafter, the annual catch by the Korean tuna fisheries has been decreasing year by year and about 1,900 MT were recorded in 1994, which corresponds to only 4.1% as compared to that of 1977. It was analyzed that the significant decrease in the Korean tuna fisheries in this ocean for the past 20 years has been due mainly to: the decreases in CPUE and the number of tuna fishing vessels, the increase in fishing operation costs, the closure of the skipjack pole-and-line fishery, the transfer of tuna fishing to the north Pacific and southwest Atlantic squid fisheries, and the introduction and investment to tuna purse seine fishing in the Pacific Ocean.

### RÉSUMÉ

Les captures annuelles totales des pêcheries coréennes de thonidés et poissons d'espèces voisines dans l'Atlantique ont atteint un maximum de 46000 TM en 1977. Par la suite, la capture annuelle coréenne a diminué progressivement pour atteindre 1900 TM en 1994, soit 4,1% de la capture de 1977. On pense que la diminution significative des captures de thonidés observée dans cet océan au cours des vingt dernières années est due principalement aux facteurs suivants : diminution de la CPUE et du nombre de thoniers, augmentation du coût des opérations de pêche, fermeture de la pêcherie de listao à la canne et à l'hameçon, déplacement des thoniers vers les zones de pêche au calmar du Pacifique Nord et de l'Atlantique Sud-Ouest, introduction et développement de la pêche à la senne dans le Pacifique.

### RESUMEN

La captura total de las pesquerías atuneras coreanas que persiguen túnidos y especies afines en el océano Atlántico alcanzaron un pico de 46.000 t en 1977. A partir de entonces, la captura anual de las pesquerías coreanas de túnidos han venido descendiendo año tras años, registrándose 1.900 t en 1994, lo que corresponde a sólo el 4,1% en comparación con la de 1977. Se analizó que el importante decremento producido en las pesquerías coreanas de túnidos en este océano durante los últimos 20 años se debía principalmente a: descenso en la CPUE y el número de barcos dirigidos a los túnidos, incremento en el coste de las operaciones pesqueras, cierre de la pesquería de caña-liña dirigida al listado, transvase de la captura de túnidos a la de calamar en el Pacífico norte y Atlántico sudoeste, e inicio e inversiones en la pesquería de cerco en el océano Pacífico.

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### Introduction

The Korean tuna fisheries for the Atlantic Ocean tuna and tuna-like species began in the mid-1960s with small fleet size of longliners. The annual catch by the Korean tuna fisheries in the Atlantic reached a peak at 46,000 MT in 1977 with 137 vessels but thereafter decreased year by year to about 1,900 MT in 1994 with 4 vessels, which corresponds to only 4.1% compared to that of 1977. The declining trend of catch from Korean tuna fisheries since 1977 have provided a good contrast to the major Atlantic tuna fishing countries such as Spain, Japan and USA, which maintained relatively stable trend in catch during the same period.

### Purpose

The present study was to describe some aspects of influencing the Korean tuna fisheries in the Atlantic Ocean, based on the fisheries statistics accumulated for the past 30 years and additional information on economic balance for running the vessel obtained from a tuna fishing company.

### Materials and Methods

Fishery data on catches and vessels used in the present study were based on the annual statistics issued by the Ministry of Agriculture, Forestry and Fisheries during 1964-1994. The catch per unit effort (CPUE) expressed the number of fish caught per 100 hooks on the basis of sampling data on catch and fishing effort statistics collected by the National Fisheries Research and Development Agency (NFRDA). For the comparison of the operation cost, a statement of profit and loss for a tuna longliner operated in both years 1977 and 1994 was obtained from a fishing company. The operation cost was divided into 4 categories and each category was given in percentage to the total cost due to domestic legal problems.

### Results and Conclusions

Korean tuna fisheries were very active in the Atlantic Ocean until 1977, exceeding 40,000 MT of annual catch. From 1978 onwards, however, annual catches have shown a year after year decrease to less than 20,000 MT in 1980s and further decrease to less than 3,000 MT in 1990s. The fishing area of the Korean tuna fisheries has become narrower concentrating in the central tropical Atlantic in recent years compared to the 1970s; for example, in 1977 longline fishing operation was area between 40° N-40° S whereas in 1992 was between 10° N-10° S. The explicit explanation for this remarkable wane is the decrease in the number of vessels operating. However, there have been more various factors contributing to the decrease in fleet size of the Korean tuna fisheries in the Atlantic Ocean.

Among the main reasons that fishing companies withdrew their fishing vessels from fishing grounds in the Atlantic, the decrease in CPUE and increase in operating cost were ranked first unanimously by fishing companies. In practice, CPUE of the Atlantic longline fishery showed a declining trend since 1977, with fluctuation between 0.8 and 1.9 fishes/100 hooks. In addition to the decrease in CPUE, the increase in fishing operation cost caused by the sharp increase in oil price (called 'oil shock') broken out in 1979 was the beginning in the withdrawal of fishing vessels from this ocean. Considering far-distant fishing grounds from home port to Atlantic Ocean, oil price has been a major matter of concern to fishing companies. The oil price at Las Palmas, Spain, used as main overseas fishing base by the Korean tuna fishing vessels operating in the Atlantic Ocean was nearly doubled from \$ 113-120/kl in 1977 to \$ 322/kl in 1980. Consequently, the number of vessels decreased from 137

in 1977 to 70 in 1980, showing a decrease of 49%. The oil price decreased since then but until recent years has maintained higher level than in 1977.

According to a statement of profit and loss for one tuna vessel of a Korean tuna fishing company, the operating cost increased from 82.3% in 1977 to 89.3% in 1994 and conversely the profit decreased by 7% compared with that of 1977. Economically speaking, the decrease in profit on fishing operation would be a most conducive reason that resulted in the decrease in Korean tuna fisheries.

The closure of tema-based pole-and-line fishery targeting for skipjack tuna also caused the decline in Atlantic tuna fisheries. Despite the relatively short period of operation during 1975-1985, the pole-and-line fishery contributed substantially to the total Atlantic catch; during 1977-1980 the catches made 14-46% to the total catch with 15-20 vessels. This fishery, however, began to decrease from the late 1970s just before the onset of the tuna purse seine fishery in the Pacific Ocean.

Another important aspect to be considered is the development of distant-water squid fisheries initiating in 1979 in the north Pacific and in 1985 in the south-west Atlantic. It is not known exactly how many tuna longliners were transformed into squid drift fishing vessels or jigging vessels. But it is assumed that a substantial portion of tuna longliners withdrawn from the Atlantic have participated in squid fisheries. The squid driftnet fisheries in the north Pacific stopped their operation in 1993 following the UN resolution, whereas squid jigging fisheries have been operating for neon-flying squid until recent years.

There have not been any direct evidences that the introduction of tuna purse seine fishery to the Pacific made any effect to the decrease in Atlantic tuna fisheries. However, considering investment on this fishery and huge amount of supply of skipjack and yellowfin tunas for the canned foods, the Atlantic tuna fisheries originally aiming at fishing tunas for the same purpose might have been decreased because of less profit gaining on the tuna fisheries from Atlantic fishing grounds than from the Pacific.

Besides above mentioned reasons, strengthening of fisheries regulation by international fisheries bodies, increase in access fee to coastal fishing grounds or other socio-economic aspects within the country would be among factors influencing Korean tuna fisheries in the Atlantic Ocean.

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Table 1. Percentage composition of operating cost and return from tuna catches in 1977 and 1994

YEAR	1977		1994			
GROSS SALES	100 %		100 %			
OPERATING COST	82.3%	SUB-TOTAL	100	89.3%	SUB-TOTAL	100
		DIRECT EXPENSES	57.4		DIRECT EXPENSES	68.9
		CREW WAGES	17.2		CREW WAGES	17.0
		INDIRECT EXPENSES	12.9		INDIRECT EXPENSES	9.5
		DEPRECIATION	12.5		DEPRECIATION	4.6
PROFIT	17.7%		10.7%			

\* DIRECT EXPENSES : fuel, bait, fishing gear, food, tax, brokerage, articles of consumption, communication, harborage, repairing, carriage  
 INDIRECT EXPENSES : management, insurance, welfare  
 • Data from a Korean tuna longliner operated in the Atlantic Ocean.

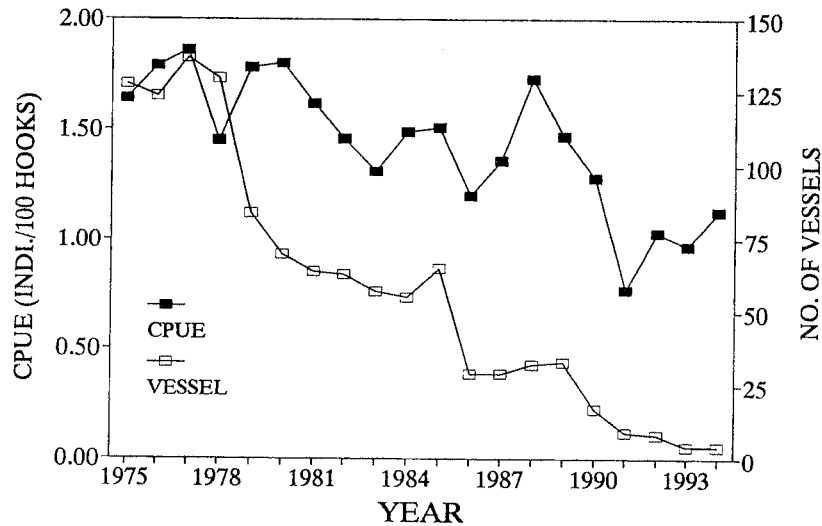


Fig. 1. Annual trends of CPUE (indi./100 hooks) and number of vessels of the Korean tuna longliners in the Atlantic Ocean, 1975-1994.

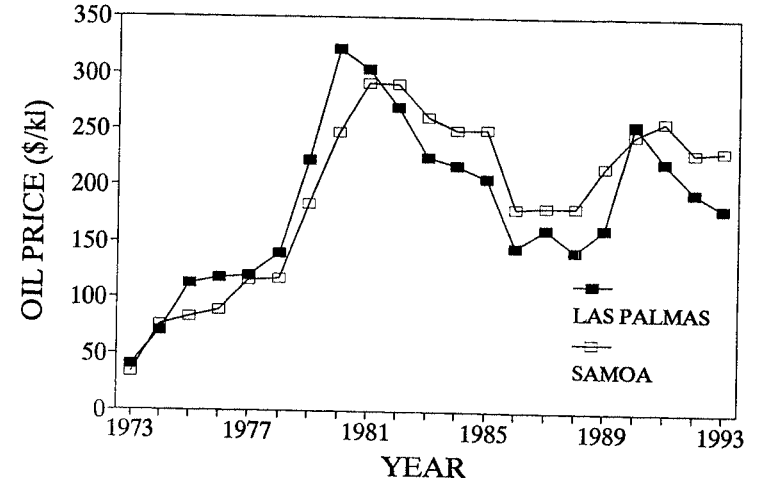


Fig. 2. Annual variation of the oil price in Las Palmas and Samoa which are used as main fishing base by the Korean tuna longliners during 1973-1993.

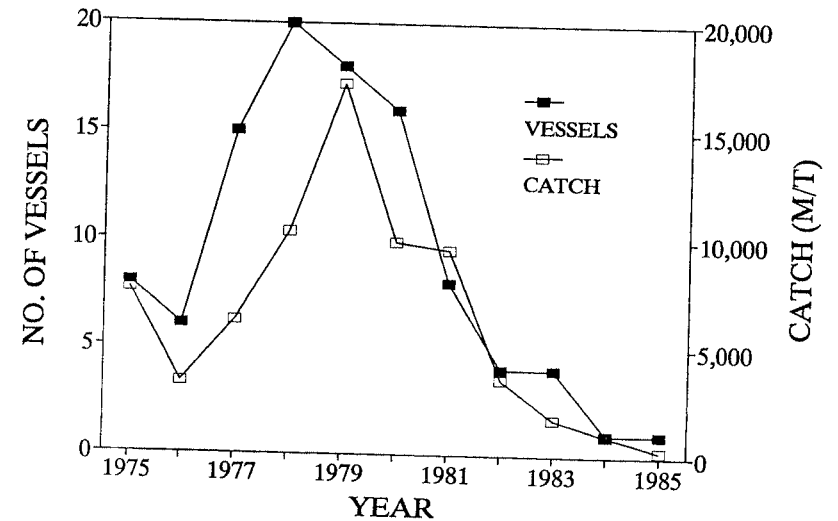


Fig. 3. The relationship between annual catch and number of vessels operated by tema-based Korean pole-and-line fishery in the Atlantic during 1975-1985.

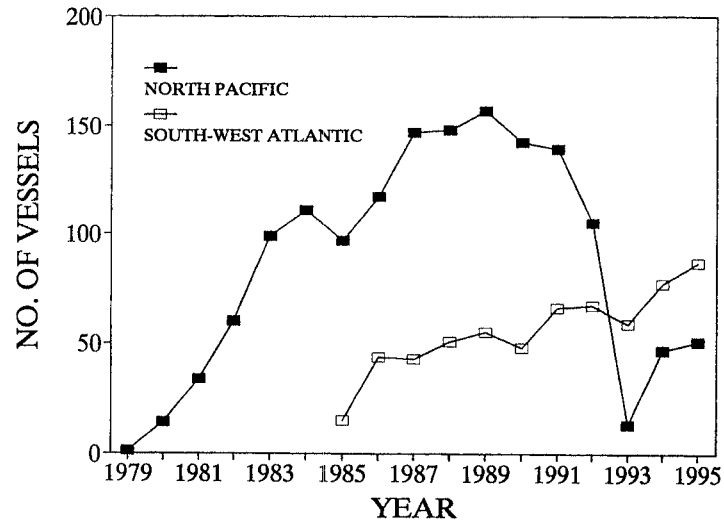


Fig. 4. Annual variation of the Korean squid vessels by ocean during 1979-1995.

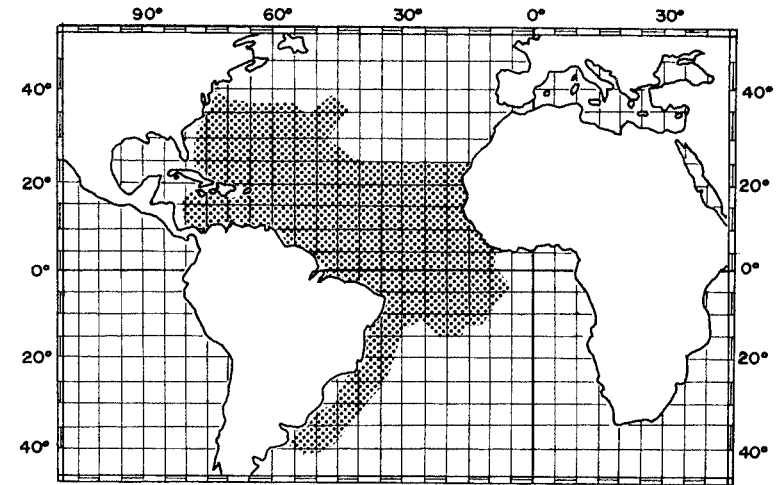


Fig. 6. Map showing fishing area of the Korean tuna fisheries. (Top : 1977, Bottom : 1992)

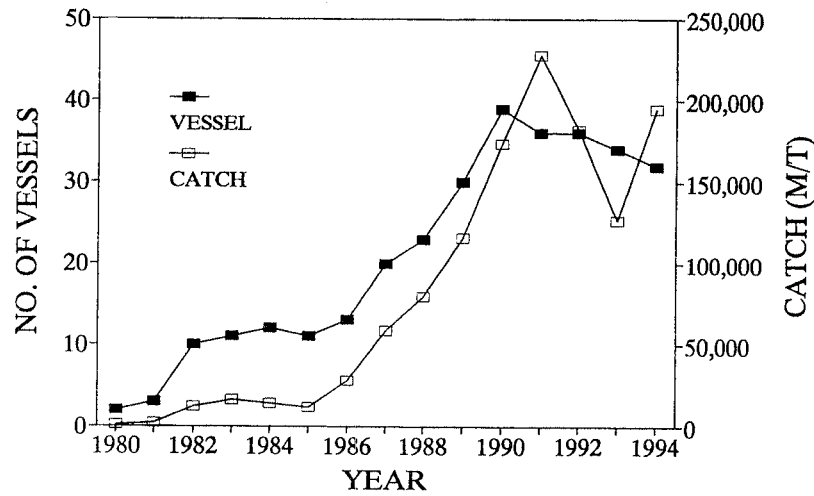


Fig. 5. The relationship between annual catch and number of vessels operated by Korean tuna purse seine fishery in the Pacific during 1980-1994.

