

DESCRIPTION OF STATISTICAL PROCEDURES FOR KOREAN TUNA FISHERIES IN THE ATLANTIC OCEAN

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SUMMARY

There are two kinds of systems for the collection of catch and effort data: one is the procedure for actual total catch and the other is the logbook system. All the data are produced entirely from fishing vessels and no extrapolations to estimate the catch and effort have been made in Korea. Considerable effort and progress have been made in improving the quality of basic data and these improvements were commended by ICCAT.

RESUMEN

Hay dos sistemas de recogida de datos de captura y esfuerzo: uno es el seguido para la captura total y el otro es el sistema de cuadernos de pesca. Todos los datos proceden de los barcos de pesca y en Corea no se ha hecho extrapolación alguna para estimar la captura y esfuerzo. Se han obtenido notables progresos en la calidad de los datos básicos, progresos que han sido reconocidos por ICCAT.

RESUME

Il existe deux méthodes de rassemblement des données de prise et effort: une d'entre elles est la procédure suivie pour obtenir la prise globale actuelle et l'autre est celle des livres de bord. Toutes les données provenaient essentiellement des navires de pêche, et toute extrapolation pour estimer la prise et effort a été effectuée en-dehors de la Corée. Un effort important et des progrès ont été faits dans le but d'améliorer la qualité des données de base, efforts qui actuellement ont été reconnus par l'ICCAT.

1. ASPECTS OF THE FISHERY

Korean tuna fisheries in the Atlantic ocean utilize basically two types of fishing gear : longline, and pole and line. In 1964, Korean tuna longliners initiated their fishing activities in this ocean. Over 100 vessels fished each year from 1972 through 1977 with a peak of 124 in 1974, operating around areas from 30° N to 20° S in the this Ocean. Since 1977, the number of vessels has decreased gradually year by year, showing 53 in 1983. Total area fished has been reduced especially in the northeast section (Lee and Yang, 1984).

Until 1981, all of the Korean tuna vessels landed their catches at the following ports ; Las Palmas and Tenerife in the eastern Atlantic, and St. Martin, Port of Spain and Kumana in the western Atlantic. From 1982, however, some have begun transshipping the catches directly to other boats at sea without entrance at the ports for unloading.

On the other hand, Tema-based bait boats began fishing operations in the Gulf of Guinea in 1972. The number of boats showed a tenfold increase from 2 in 1972 to peak of 20 in 1978, then decreased considerably each following year. There have not been any Korean flagged bait boats in this ocean after June of 1983 because the flag shifted to the other nations.

2. LONGLINE FISHERY

2.1. CATCH AND EFFORT DATA

Two systems for the collection of catch and effort data have been maintained for various purposes by different authorities. One collects total reported catch by species and the other is a logbook system.

PROCEDURE FOR REPORTING ACTUAL TOTAL CATCH : This system has been used by the Korean Deep-Sea Fisheries Association to make quick estimates of total annual production and to forecast the catch trends by species. This data has contributed to Task I data for ICCAT.

All vessels have reported only the catch records in terms of weight by species to their own companies once a week or at least by ten day periods by wireless (or telegram) at sea. The above data including total export values are provided by month and FAO's major fishing area and are sent to the Association from the companies. The Association compiles the catch data reported from all the companies and reports this data to the Ministry of Agriculture and Fisheries for the final review and the publication.

PROCEDURE FOR THE LOGBOOK SYSTEM : This system was set to supply re-search data to the Fisheries Research and Development Agency (FRDA), and has also been used as Task 2 data for ICCAT. Each fishing vessel records the following items whenever they operate : position of fishing activities, number of baskets and hooks used, catch in weight and in number by species. As usual, longline fishing effort is taken as the number of hooks used per day. In general the vessels carry about 250 to 290 baskets of longline gear, each with 12 to 14 hooks.

Total number of hooks can be obtained by 5° x 5° area per month as follows :

$$H_{tot} = \sum_{i=1}^n B_i \cdot H_i$$

H_{tot} : Total hooks used in a 5° x 5° area

B_i : Number of baskets used in a 5° x 5° area

H_i : Number of hooks in a basket

These logbook data are delivered to FRDA through the fishing companies within sixty days after landings are made. FRDA's staffs check the data in detail to determine whether or not there are any errors or false reports. If the data contain errors they are removed from the compilation and publication.

CONVERSION FACTORS : Species other than skipjack and albacore are gutted and gilled when the fish are caught, giving the classification called GG weight. The following conversion factors for species examined in 1976 have been applied to calculate round weight from GG weight.

Yellowfin : GG weight x 1.128

Bigeye : GG weight x 1.130

Swordfish and billfishes : GG weight x 1.214

2.2 MEASUREMENT OF FISH

The fork length and weight of fish are measured by fishermen when the catches are taken. In general, each fishing vessel is sampling about 30 fishes for measurement by species every month. The length is the straight-line distance from snout to fork of tail and length is measured with a tape to the nearest centimeter. This is compiled as a truncated length composition. Each fish is weighed twice giving round weight and GG weight to the nearest kilogram in order to study the relationship between them. These are compiled as a truncated weight composition.

2.3. COVERAGE RATE OF CATCH

The following method for the estimation of the coverage rate has been taken according to the field manual for statistics and sampling (ICCAT, 1978).

$$\text{Coverage rate (\%)} = \frac{\text{Sum of catches of all species recorded in logbook (Task 2)}}{\text{Total catches of all species made by that fishery (Task 1)}} \times 100$$

The calculated coverage rates of the Korean tuna longline fishery by the above expression from 1975 to 1983 are as follows ;

Year	Coverage rate (%)	Year	Coverage rate (%)
1975	19.3	1980	52.9
1976	49.8	1981	61.2
1977	35.2	1982	56.0
1978	39.4	1983	58.4
1979	38.0	-	-

3. BAIT BOAT FISHERY

The procedures for Task 1 and 2 data from this fishery are the same as those for the longline fishery as described above section 2. It is quite simple to collect the raw data from the fishery because the fishing grounds have been distributed in the Gulf of Guinea.

The boats report the daily catch records by transceiver every day or at two-day periods to Tema-based resident representatives belonging to their companies. The fish measurement and conversion factors are referred to in the above section 2.

The coverage rates of catch estimated from the method in section 2 as follows ;

Year	Coverage rate (%)
1978	59.1
1979	52.0
1980	63.4
1981	63.7
1982	62.1
1983	71.8

4. MATTERS TO BE CONSIDERED FOR TASKS 1 AND 2

As mentioned above, the data collected from the procedure of actual total catch and also the effort exerted on the fishing grounds are not included the basic unit area, 5° x 5° or 1° x 1°. Accordingly the catch proportions by species in the Task 2 data have been used to estimate the catch of ICCAT statistical area of Task 1.

Taking into account this fact, there may be introduced to errors and biases on the catch portions of statistical area of Task 1 because Task 2 data have not always covered the entire area fished by all the vessels. There might be another result that could have appeared in the course of the vessels reporting the catch records to their companies and to FRDA. Discrepancies have occurred in the species compositions between Task 1 and 2 data, especially for billfishes.

It is supposed that there are very few fish which are being consumed by fishermen or dumped in the sea. However, it is very difficult to estimate the amount and also it is assumed that the quantities do not have any effect on the total yield.

5. IMPROVEMENT OF LOGBOOK DATA

There are some ICCAT recommendations to Korea regarding the catch statistics and billfish size data from the longline fishery. In this respect, the Korean government has taken necessary steps with a view of improving the quality of basic data from the fishing vessels.

As matter of fact, SCRS recognized a marked improvement of biological and logbook data from the Korean tuna longline fishery in recent years. In addition, size data for billfish and swordfish are being collected by FRDA. In fact the length frequency data for sailfish, blue marlin and also swordfish were submitted to ICCAT this year.

6. TRAINING FOR SKIPPER

The training programme for the skippers of deep-sea fishing vessels has begun from FRDA since 1978. The purpose of training is how to collect and record the catch and effort data, and also how to sample and measure the fishes for biological survey. Besides they are informed of the regulations and recommendations made by international fisheries organizations and of the fisheries law of coastal countries through the programme. Accordingly FRDA maintains various equipments and facilities for the training to attain the goal successfully, especially the agency provides the text book for skipper's training and reporting formats.

All the skippers visit to the agency before going to the fishing grounds carrying the logbook data which have taken from the former operations so that the data are reviewed and checked by FRDA's staffs as mentioned in section 2.

If there are any problems, for example, false records and imperfections of the data, the vessels concerned are not allowed to go the sea for operation and also the skipper is punished in conformity with the regulations of the national fisheries law. This procedure is reiterating whenever the vessels enter and depart for unloading. In fact there are regulated serious limitations and conditions in the law when the vessels get a fishing license or renew the license by extinctive prescription.

REFERENCE

- ICCAT. 1978. Field manual for statistics and sampling, Atlantic tunas and tuna-like fishes, second edition. 149 p.
- Lee, J. U. and W. S. Yang, 1984. Comparison on the distribution of the fishing grounds of yellowfin (*Thunnus albacares*) and bigeye tuna (*T. obesus*) by Korean longliners, 1979-1982. ICCAT collective Vol. XX (SCRS-1983) (1) : 41-48 p.