

Tuna Data Collection and Processing in Mauritius

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Introduction

The Fisheries division of the Ministry of Fisheries and Cooperatives is involved in research, development, management and protection of fishery resources of Mauritius. It is divided into a Fishery Research and Development Service and a Fisheries Protection Service. The latter section is primarily concerned with the protection of fishery resources and enforcement of Fisheries Act. The Albion Fisheries Research Centre (AFRC), established in 1982, comprises the technical services of the Ministry and is responsible for research and development in the fishery sector. Its activities include resource assessment and management, development of fishing technology, fish quality inspection, studies on the marine environment, establishment of marine parks, and aquaculture research.

Tuna research activities

The AFRC has been conducting research on tuna since 1985 with emphasis on the collection of catch/effort data and length frequency data. A computer system for data collection, codification and processing similar to that which was used in the Atlantic Ocean has been set up at AFRC since 1987 by IRD (ORSTOM) scientists in particular Dr Patrice Cayré. Mauritian technicians have been trained to use the system, to collect tuna data and perform the necessary processing to produce various tuna statistical reports. The computer system is called "CHAINE THON".

Tuna data source

(I) DAILY CATCH STATISTICS OR LOGBOOK DATA

Fishing logbooks are regularly distributed to local purse seiners and licensed longliners to record daily catch statistics. The statistics include fishing position, catch by species (in tonnes), effort, (hours at sea, fishing hours, number of hooks), sea temperature, association of tuna schools and wind and current direction in degrees and knots. The logbooks are collected at the arrival of the local purse seiners and foreign longliners at the port or from the representatives of the vessels in Mauritius.

(II) LANDING STATISTICS AND TRANSHIPMENT DATA

Landing statistics (or total trip data) are collected from the tuna canning factory and fishing companies representing longliners for transshipment. These companies have the responsibility to record the weighed quantity landed by their vessels. Information obtained from the companies also include total catch landed by species and effort (in terms of days at sea, fishing hours, and number of hooks).

(III) SAMPLING ON PURSE SEINERS

A random sampling program is conducted on the catches of the local purse seiners during landings to assess both the size frequencies of each species and species composition of the catches. During the sampling, a well is selected for which the date and place of capture of its fishes are known. Fish coming from the same area during the same month which was already sampled is not measured. About 150 to 200 fishes from each selected well are measured irrespective of species and size of the fish. At least six samples are measured during each landing. Length data along with position of capture, species, data of capture, date of sampling etc. are noted in special forms. Analysis of the data collected reflects the size structure and species composition of the catch. The number of fish measured for a species corresponds to the proportion of that species in the catch.

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Data coding and entry

The daily catch statistics from logbooks, landing statistics (total trip data) from representatives of vessels and length frequency data from samplings are coded manually on special sheets using a coding system that transforms all the data into numerical entries. The filled data entry forms are then reviewed to avoid errors and the verified data are input onto a database using a data entry computer programme. The process is repeated in a double entry process to track and correct errors.

Data processing.

The data obtained from the data entry and verification stage is processed using a series of independent programmes written in FORTRAN that are collectively called the “CHAINE THON”. Logbook catch-and-effort data, which are estimated, have to be corrected for estimation errors by comparison with the actual landings submitted by fishing companies. The coded data from both sources are input as mentioned above and two different data files are produced, one from the logbook data and the other from actual landing. Both files are then subjected to a validation process and new files containing valid data are generated. Both files are used to calculate a correcting factor (which is obtained by dividing total landed catch by total catch from logbooks). This correcting factor is then applied to the logbook data. Once this process is performed, catch and effort statistics are generated using various programs.

Data obtained from size sampling during landings of vessels, is coded, verified and input into a computer database before being processed using various “CHAINE THON” programmes to generate length frequency distributions of the catches.

Conclusion

The system for data collection and processing set up at the Albion Fisheries Research Centre by ORSTOM scientists is functioning perfectly as far as the Mauritian purse seiners are concerned. It is also being used to process data of licensed longliners landing in Mauritius. During the “Groupe de Travail Statistiques” of the Indian Ocean Commission during which regional tuna data are merged and processed, a program to import data from the CHAINE THON system to ORSTHON has been devised by Dr. R. Pianet of IRD (ORSTOM).

References

- P. Cayré. Le manuel de la “Chaine Thon” de l’Océan Indien.
R. Pianet. Statistiques et Indices des Pêcheries thonières tropicales à la senne.