

Estimation of tuna fishing capacity from stock assessment-related information

Workshop to Further Develop, Test and Apply
a Method for the Estimation of Tuna Fishing Capacity
from Stock Assessment-Related Information

14–16 May 2007

La Jolla, California, United States of America



Cover photograph:

A view of a purse-seine operation.

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Preparation of this document

These Proceedings present an outcome of the highly-technical Workshop to Further Develop, Test and Apply a Method for the Estimation of Tuna Fishing Capacity from Stock Assessment-Related Information. The Workshop was hosted by the Inter-American Tropical Tuna Commission (IATTC) in La Jolla, California, USA, from 14 to 16 May 2007.

FAO's Japan-funded Project on the "Management of Tuna Fishing Capacity: Conservation and Socio-economics" organized the Workshop in collaboration with and with in-kind support from several international and national fisheries institutions involved in tuna fisheries research and management.

Shortly after its commencement, the Project established an external Technical Advisory Committee (TAC) composed of experts affiliated with the tuna agencies and programmes and some other institutions involved in tuna fishing, fisheries research and fisheries management to foster the collaboration with these institutions.

At the First Meeting of TAC, which took place in Rome, Italy, from 26 to 28 March 2003, the Project was organized to:

- review methods for the estimation of fishing capacity and their data requirements;
- determine the applicability of these methods for tuna fisheries; and
- finalize proposals of the Studies to be carried out by the Project.

The subjects of these Studies were to be:

- tuna resources and fisheries;
- the quantification of tuna-fishing capacity;
- the demand for tuna raw materials and products and their prices; and
- the management of tuna fisheries, particularly through controlling fishing capacity.

From 15 to 18 March 2004, the Second Meeting of TAC was held in Madrid, Spain, to:

- review the outcome of the Studies implemented by the Project and
- make recommendations on tuna fishing capacity management and future activities of the Project.

The papers resulting from the Studies were published in 2005 as FAO Fisheries Proceedings No. 2, which was entitled "Proceedings of the Second Meeting of the Technical Advisory Committee of the FAO Project Management of Tuna Fishing Capacity: Conservation and Socio-Economics".

As a result of recommendations of the Second Meeting of TAC, the Project organized the Workshop on Methodological Workshop on the Management of Tuna Fishing Capacity: Stock Status, Data Envelopment Analysis, Industry Surveys and Management Options. It was hosted by the Inter-American Tropical Tuna Commission (IATTC) in La Jolla, California, United States of America, from 8 to 12 May 2006. Its objectives were to:

- develop a method for the estimation of tuna-fishing capacity from stock assessment-related information;
- determine the feasibility of: (i) routinely collecting input data for the so-called Data Envelopment Analysis (DEA); and (ii) performing industry surveys of tuna fishing capacity utilization;
- relate DEA estimates of fishing capacity utilization to traditional estimates of fishing capacity;

- review the factors affecting fishing capacity (such as the number of vessels and their physical characteristics) that could be regulated by fisheries authorities;
- review the existing measures for managing tuna fishing capacity and, possibly, to identify additional options for such measures in the context of the outcome of addressing the above-mentioned objectives;
- prepare a Statement of participants of the Workshop; and
- formulate recommendations of the Workshop to the FAO Project on the Management of Tuna Fishing Capacity, FAO and the other institutions participating in the Workshop.

The Statement was presented at the Meeting of Tuna Regional Fisheries Management Organizations (RFMOs), which was held in Kobe, Japan, from 22 to 26 January 2007. The Report of and the papers presented at the Methodological Workshop were published as FAO Fisheries Proceedings No. 8, which were entitled “Methodological Workshop on the Management of Tuna Fishing Capacity: Stock Status, Data Envelopment Analysis, Industry Surveys and Management Options”.

The Methodological Workshop recommended that the method for the estimation of tuna fishing capacity from stock assessment-related information, which was developed as a result of that Workshop, be tested and applied. That testing and application of the method was carried out at the Workshop to Further Develop, Test and Apply a Method for the Estimation of Tuna Fishing Capacity from Stock Assessment-Related Information, which is the subject of these Proceedings. Some of the related information is given in a prime publication (Arrizabalaga, H., Restrepo, V.R., Maunder, M.N., & Majkowski, J. 2009. Using stock assessment information to assess fishing capacity of tuna fisheries. *ICES Journal of Marine Science*).

Abstract

These Proceedings include (i) the Report of and (ii) the paper presented at the Workshop to Further Develop, Test and Apply a Method for the Estimation of Tuna Fishing Capacity from Stock Assessment-Related Information. The Workshop was hosted by the Inter-American Tropical Tuna Commission (IATTC) in La Jolla, California, USA, from 14 to 16 May 2007. It was organized by FAO's Japan-funded Project on the "Management of Tuna Fishing Capacity: Conservation and Socio-Economics" in collaboration with and with in-kind support of several international and national fisheries institutions involved tuna fisheries research and management.

The paper presented at the Workshop describes peak-to-peak (PP) and general additive modeling (GAM) approaches to estimate fishing capacity and related quantities from stock assessment information. The PP and GAM methods were applied to seven stocks of bigeye, yellowfin and skipjack tuna of the Pacific, Indian and Atlantic Oceans. The estimated trends in overcapacity with both methods were consistent across most of the stocks, showing increasing trends at the beginning of the time series and reaching maximum values during the late 1990s, followed by decreasing trends after that. For most of the stocks analyzed, overcapacity was positive during a part of the time series. Sensitivity tests revealed greater estimates of capacity output when the stock assessment data were most disaggregated. Further tests revealed that the estimates of overcapacity were lower when low variability in effort deviations was permitted in the stock assessment.

The Report of the Workshop outlines the discussions carried out at the Workshop, some proposals for further research, recommendations and conclusions of the Workshops.

Bayliff, W.H.; Majkowski, J. (eds.)

Estimation of tuna fishing capacity from stock assessment-related information: Workshop to Further Develop, Test and Apply a Method for the Estimation of Tuna Fishing Capacity from Stock Assessment-Related Information. La Jolla, California, United States of America, 14–16 May 2007.

FAO Fisheries and Aquaculture Proceedings. No. 16. Rome, FAO. 2009. 53p.

Acknowledgements

The organization of the Workshop, the outcome of which is presented in these Proceedings, would not have been possible without FAO's Project on the Management of Tuna Fishing Capacity: Conservation and Socio-Economics. This Project was financed by the Government of Japan.

Shortly after its commencement, the Project established an external Technical Advisory Committee (TAC) composed of experts affiliated with the Tuna Agencies and Programs and some other institutions involved in tuna fishing, fisheries research and fisheries management to foster the collaboration with these institutions. The TAC recommended the organization of the Workshop.

The FAO Project on the Management of Tuna Fishing Capacity organized the Workshop in collaboration with and with in-kind support from several international and national fisheries institutions involved in tuna fisheries research and management. This support included the hosting of the Workshop by the Inter-American Tropical Tuna Commission (IATTC).

Dr Haritz Arrizabalaga of the Marine Research Division of the AZTI Tecnalia (Herrera Kaia Portualdea z/g 20110 Pasaia (Gipuzkoa), Spain) has carried out substantial analyses that are reported in these Proceedings. They were the basis of discussions of the participants of the Workshop.

The editors of these Proceedings are grateful to the Government of Japan, the institutions and persons that contributed to the organization and outcome of the Workshop, the author of the paper included in these Proceedings and all the participants of the Workshop for their collaboration and support. It would not have been possible to produce these Proceedings without this collaboration and support.

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