Work Plan Implementation
(Working Paper)

IPTP/82/GEN/1
SCS/GEN/79/24

This document forms part of publications of the Indo-Pacific Tuna Development and Management Programme and was carried out during the first phase of the project while it was located in Manila under the South China Sea Fisheries Development and Coordinating Programme (SCSP) from 1979 to 1982.

Manila, Philippines
September 1982

IPTP/82/GEN/1
SCS/GEN/79/24

September 1982

REPORT OF THE CONSULTATION MEETING ON MANAGEMENT OF TUNA RESOURCES OF THE INDIAN AND PACIFIC OCEANS

Manila, Philippines
26-29 June 1979

INDO-PACIFIC TUNA DEVELOPMENT AND MANAGEMENT PROGRAMME
Colombo, Sri Lanka

PREPARATION OF THIS REPORT

This report presents the rapporteurs report and various background documentation for the Consultation On Management of Tuna Resources convened by the South China Sea Fisheries Development and Coordinating Programme.

This report was submitted to the 6th Joint Meeting of the IPFC Special Committee on Management of Indo-Pacific Tuna and IOFC Committee on Management of Indian Ocean Tuna in Perth, Australia, in February 1980.

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INTRODUCTION

Under FAO auspices, an informal meeting was held in Manila from 26-29 June 1979 to discuss possible future arrangements for collection of data and for management of Pacific and Indian Ocean tuna stocks. Whereas, the principal purpose of the meeting was to address a number of specific questions within the framework of IOFC and IPFC, the participants included representatives of a number of southwestern Pacific countries and of non-FAO sponsored organizations (see List of Participants appended). The purpose of the broadened participation was to encourage the widest possible exchange of view on common problems being faced by all nations with an interest in the highly migratory resources of the Pacific and Indian Ocean area. The fast-changing nature of the tuna fisheries in the area and extensions by coastal states of their fisheries jurisdictions have increased the need to improve the basic flow of fisheries information and to find better means for international cooperation. Because of the highly migratory nature of the tuna and billfishes, the organizers of the meeting believe that cooperation in the area must be on the broadest basis and that regardless of which organizations may have responsibility for considering management problems in particular regions or sub-regions, all must work together in the interests of preserving the resource and of developing the fisheries in an orderly manner. The large turn-out of invited guests indicates that the organizers' sentiments were reciprocated.

1. Opening of the Meeting

The meeting was opened by the Chairman, Mr. A.G. Woodland, Programme Leader, South China Sea Fisheries Development and Coordinating Programme. Copies of his opening address and of other background documents were distributed at the meeting.

2. Agenda

A copy of the Annotated Agenda and the Provisional Timetable containing both the names of the persons introducing and those leading the discussion of each topic is attached.

3. Knowledge of Tuna and Tuna Fisheries in the Region

From 13-22 June, scientists from a number of Pacific countries met in Shimizu, Japan to review available information on the fisheries and on the status of stocks for Pacific and Indian Ocean tuna (excepting skipjack) and billfishes. An FAO staff member briefly reviewed the present knowledge of the state of these tuna stocks considered at the Tuna Stock Assessment Workshop held in Shimizu as well as that for skipjack tuna. Some general conclusions drawn from his presentation are included in item 5 below. It is understood that a full record of the Shimizu workshop will be available in the relatively near future.

Participants from all countries represented at the meeting provided brief oral accounts of tuna fishing activities in their areas. Representatives of international organizations provided additional brief accounts of fishing activities in a number of countries that were not represented at the meeting. The exchanges revealed increasing interest by many coastal states in initiating tuna fisheries or in expanding existing tuna fisheries.

4. Elements of a Management System

As background, a FAO staff member presented an outline of potential elements comprising a comprehensive management system (see the Annotated Agenda). In discussion it was pointed out that the elements in the system were heavily weighted toward consideration of biological and conservation aspects of management and did not emphasize developmental aspects. The view was also expressed that item iv (economic and social studies) should address the important subjects of allocation and economic rent and that the choice of management measures (item v) would, to a considerable extent be influenced by the need to develop allocation formulae and measures associated with economic and social requirements.

5. Objectives of Management and Needs for Management in the Pacific and Indian Ocean Regions

In considering requirements and possible objectives for tuna management in the Pacific and Indian Oceans, the meeting took into account the results of the recent scientific workshop in Shimizu and the informal appraisal of the status of skipjack tuna stocks presented in Manila. The scientists concluded generally that information on tuna migrations, stock structure, catches, and age and size composition of tuna in the area was very incomplete. They concluded that, on the basis of available data, there was no evidence that past fishing practices had endangered the stocks. Despite substantial increases in fishing effort particularly for longline fishing, total catches for most fisheries had remained fairly stable. In some fisheries, however, recent increases in intensity and decreases in sizes of fish in the catch due to the development of surface fisheries were of some concern. Because the effects of present fishing activity might not become apparent for several years, there is some reason for caution. In considering the conclusions of the scientists, the consensus of the meeting was that despite of lack of clear-cut evidence of biological danger to most stocks, the paramount objective of any management scheme should be to ensure that future fishing practices do not threaten the productive potential of the stocks.

Although there appeared to be little evidence of biological danger, the meeting noted the observation of the scientists that, for a substantial number of fisheries, present levels of effort were much higher than required to fully exploit the stocks and that increases in effort had not provided increases in catch. Under such circumstances, catch rates for individual vessels had fallen drastically, greatly reducing their economic effectiveness. This poses serious economic problems for both well-developed fleets of distant-water fishing nations and for fleets of developing countries aspiring to enter the tuna fishery on an industrial basis for the first time. Management regimes, whether on a national or international basis, would have to take such problems into account.

Establishment of 200-mile exclusive economic or fishing zones by many countries in the past year or two and anticipated extensions of fisheries' jurisdiction over the next few years, are drastically changing the circumstances of world tuna fisheries. Actions by some coastal states to control distant-water fishing activities in their zones and plans for cooperative control measures by certain groups of coastal states are altering the opportunities of the distant-water fishing fleets. At the same time, the initiation or expansion of coastal state fisheries, facilitated by extensions of jurisdiction, are expected to increase world tuna fishing capacity. Faced with a limited resource and with total catches for many stocks approaching maxima, the question of allocation among users will be a major issue to be addressed in development of future management approaches.

A number of participants, representing developing coastal states, emphasized their view that any management system would have to take into account the need to facilitate development of locally-based fisheries by coastal states. In this regard, not only would stocks have to be protected from overfishing, from the biological point of view, but would also have to be managed to ensure that tuna populations are abundant enough to provide catch rates that would make initiation or expansion of fisheries by developing countries economically practical.

The meeting considered the spectrum of benefits that might be extracted from the tuna resource and discussed how the emphasis of management programmes might change depending on which groups within national or international communities were to be favoured. Should tuna be fished to provide food for local populations, to maximize economic returns to fishermen, to ensure supplies to processors serving the international market, to create export earnings, to provide economic benefits through levying of fees, etc.? One participant from a developing coastal state expressed the view that measures adopted by coastal states for control of fleets of other countries in their zones should not be so onerous as to decrease the economic viability of the operation. Otherwise, the ability of such fleets to pay fees would be jeopardized to the disadvantage of coastal states.

Taking into account that the aspirations of countries differed and were often competitive, a number of participants believed there would be great difficulty in developing objectives on a broad international or ocean-wide basis. Some representatives from developing countries outlined the difficulties they face in attempting to formulate options for fisheries development. They believed that any international management programme must assist such developing countries in defining their development programmes.

It was a common view that a basic prerequisite for establishment of management objectives, whether on a national or international basis, was more complete and accurate reporting of catches and effort statistics and increased collection of associated biological data. Fullest opportunities should be afforded for sharing of information and experience.

After the foregoing general consideration, the meeting examined the problems that would be faced in setting objectives for four different stocks and fisheries situations. The first was the case of highly migratory southern bluefin tuna. The fishery for this species is presently shared mainly by a coastal and a distant-water fishing state and involves surface and longline gear which tend to take fish of different sizes and different market values. The second was the case of a hypothetical stock of yellowfin tuna whose distribution was limited largely to the waters of a single state where a variety of fisheries, both artisanal and industrial, took fish in a wide variety of sizes. The third example was the moderately highly migratory bigeye and yellowfin tuna of the Indian Ocean. Fished by the multi-national longline fishery, yellowfin were much more heavily exploited than bigeye. The fourth example was western Pacific skipjack tuna where there was no evidence that the stocks were fully exploited and where the availability of the fish to the gear varied greatly from year to year in different ocean areas; the stocks were fished mainly by a distant-water surface fleet but a number of coastal states had initiated fisheries in their own waters.

Explorations of how to set objectives for such fisheries proved to be very difficult because of the competing interests of different groups of fishermen and of different nations. How does one establish fair shares for distant-water fishermen and coastal state fishermen when the resource is fished both inside and outside national waters? How do adjacent coastal states share a resource that migrates between their respective zones? How does one go about adjusting fisheries when one fishery provides a much higher economic return than another on the same stock? How does one arrange allocation between artisanal and industrial fisheries within the waters of a single country? How can multispecies fisheries be regulated when they harvest a mixture of stocks, some of which are heavily exploited, while others could provide substantial increases in catch if effort were increased.

There are obviously no easy formulae for resolving such problems. The discussion revealed the complexity of interrelationships that would have to be unravelled if cooperative measures were to be found which would ensure preservation of the resource while at the same time providing for its orderly allocation among user groups.

6. Geographic Area to be Covered

The meeting noted the conclusion of the scientists at the Shimizu Workshop that, with the exception of southern bluefin tuna and with some uncertainty about the relationship of tuna in the Banda Sea, there appears to be little mixing of tuna stocks between Indian and Pacific Oceans. Within the Indian Ocean the meager scientific evidence does not suggest the desirability of further subdivision into separate stock areas. For the Pacific, the situation is considerably more complicated. The vastness of the Pacific area would suggest from the practical point of view the desirability of some subdivision for management purposes. However, because of the overlapping of species stocks, there does not seem to be any logical break-down which would not seriously cut across the distribution of at least some important species stocks.

On the basis of these findings, there was general agreement that it would be appropriate to treat the Indian ocean as a separate unit from the point of view of data collection, assessment of the stocks and management. No subdivisions could be suggested for the Pacific.

7. Options for Fishery Statistics

The need for improvement in the collection, compilation and reporting of catch and effort statistics and associated biological information was stressed throughout the meeting. It was noted that the proceedings of most international fisheries meetings contained pleas for improvements in collection of such statistics and that such appeals had become pro forma. In the case of Pacific and Indian Ocean tuna, however, the problem was particularly acute because of the absence of any system for compilation and cross-checking of the data. The participants of the meeting felt that positive and immediate steps should be taken to improve the collection, tabulation and dissemination of information throughout the area. Pacific and Indian Ocean fisheries were undergoing rapid changes as the countries participating in certain fisheries changed. For example, in the Indian Ocean, Japanese longliners were being replaced by Korean and Taiwanese vessels. Fisheries in a number of coastal states were undergoing active expansions, e.g. in the Philippines and Solomon Islands. Whereas, there were some encouraging developments with respect to collection of basic statistics (e.g. a more comprehensive system for collecting statistics from "municipal" fisheries in the Philippines and moves toward a standard reporting format for countries in the SPC area), the scientists at the Shimizu meeting expressed grave concern over a possible deterioration in the quality of information available that could seriously hamper their efforts to assess the status of the stocks. This was already occurring in respect of detailed data for the Indian Ocean longline fisheries where as the proportion of the catch taken by the Japanese fishery declined, the Japanese catch and effort data has become less representative of the entire fishery. Data for the other fishing nations are not readily available. Reporting from a number of coastal states in the western part of the Indian Ocean area was either incomplete or inaccurate or both.

At the same time, important initiatives are afoot to strengthen international cooperation at the regional and sub-regional level, e.g. the establishment of a South Pacific Forum Fisheries Agency in the southwest Pacific and the IPFC and IOFC initiatives that led to the convening of this meeting. Representatives of countries involved in these developments stressed the need for better collection and dissemination of fisheries data to facilitate consideration of the complex international problems and opportunities created by establishment of 200-mile exclusive economic or fishing zones.

In short, as scientific and administrative requirements for basic fisheries information is increasing, the gap between what is needed and what is available is growing.

The meeting considered that there was a general need to improve the standard of data collection at the national level on a cost-effective basis. Because of the complex nature of the tuna fisheries wherein a substantial part of the catch taken by international fleets was landed at a number of transhipment ports as well as wherein vessels of one country were participating in joint ventures with other countries, there is a need to clarify and strengthen reporting requirements and to establish a system of cross-checking to avoid double reporting or failure to report.

The meeting listened with interest to an account by the Assistant Executive Secretary of ICCAT outlining procedures by which nations associated with Atlantic tuna fisheries collect and exchange fisheries data. Coordinated by the ICCAT Secretariat and in some cases with direct assistance of staff employed on a temporary basis by the Commission for port sampling, standards and completeness of reporting for Atlantic tuna catches have improved greatly in recent years. Development of a field manual, the use of standard reporting formats, and active checking on the completeness and accuracy of data supplied by national governments have contributed to the effectiveness of the Atlantic statistical system.

The meeting generally agreed that it would be most desirable to establish a standard format, preferably in the form of a standard log-book for reporting throughout the region. This would make the job of fishing captains moving from area to area easier and would facilitate processing and dissemination of information.

Great importance was placed on the desirability of establishing central repositories for catch, effort and biological statistics that could be disseminated, as appropriate, to any country in the region. Some participants expressed the view that for maximum utility, such centralized data assembly should be carried out on as broad a scale as possible, even on a global basis. Taking into account earlier discussions on possible geographic subdivisions for possible future management arrangements and the existence of present arrangements for data processing, other participants suggested that division of the area into three areas, the Indian Ocean, the eastern Pacific and the central and western Pacific might be appropriate. The need to ensure that such data assembly activities should include all fisheries was emphasized. The intention of nations in the southeastern Pacific under the Permanent Commission for the South Pacific to intensify its work on tuna was noted. This development could facilitate collection of statistics from that part of the Pacific.

In assembling information on ocean fisheries, it was felt desirable to collect and enter the data into data bases by the finest geographical and time divisions possible (perhaps 5°x 5°squares for longline fisheries and 1°x 1° squares for surface fisheries). Such breakdowns would make it possible to reconstitute the information into larger aggregations as may be required.

8. Options for Coordination of Tuna Management

Following a review of the responsibilities of nine existing international organizations involved in one way or another with Pacific and Indian Ocean tunas, a staff member outlined a proposed new FAO policy with respect to the fisheries management and development activities of IOFC and IPFC. In order to better meet the requirements of coastal countries with shared stocks, similar fishery problems and complementary economies in the Indian and Pacific Ocean areas, it was planned to establish a series of sub-regional Committees, each of which would have associated with it a technical support unit to implement programmes developed by the sub-regional Committees in the context of the overall framework of the parent Commissions. On this basis, it was envisaged that, in addition to the existing Committee for the Gulfs, new Committees would be formed for East Africa plus adjacent island states, the Bay of Bengal, and the South China Sea. With respect to tuna, each Committee would be able to consider problems and opportunities in its area and to arrange for an appropriate amount of effort to be expended on tuna programmes by its support unit. Such effort could include the important function of improving collection of statistics.

In addition, following up on recommendations of the IPFC and IOFC tuna management committees, endorsed by IPFC at its Eighteenth Session in March 1978, FAO had already taken steps to strengthen the IPFC and IOFC's tuna programme at the regionwide level by employment, on a one-year term, of a tuna specialist. Recognizing that many tuna problems extended beyond the areas of interest of any one of the proposed sub-regional Committees, FAO was considering the possibility of strengthening such regionwide support on a longer-term basis. UNDP support was being sought for provision of funding to support the prospective sub-regional Committees and for the strengthened regionwide function.

Participants from Indian Ocean and South China Sea nations were supportive of the proposal to establish sub-regional Committees with technical support units and of the proposal to strengthen the IPFC/IOFC regionwide tuna activity. Some participants expressed the concern that because so many of the tuna problems in the area were oceanwide, both from the viewpoint of stocks and distribution of distant-water fishing effort, too much concentration of tuna work at the sub-regional level might divert attention away from the efforts to strengthen regionwide activities. The FAO staff member noted that while the sub-regional Committees would concern themselves with all fishery resources in areas primarily made up of developing coastal states, this would in no way prevent the oceanwide management problems from being considered by the IOFC/IPFC tuna management committees. Nor would it affect the provision of technical support for the oceanwide activities.

For the Pacific, the situation was considerably more complicated. Several international organizations are actively involved in tuna work while other organizations are showing increasing interest in tuna problems, and still other organizations interested in tuna are in the process of formation. Following brief presentations by representatives of various organizations on the work of their bodies (SPFFA, SPC, FAO and SEAFDEC), considerable discussion ensued concerning institutional arrangements for collection, processing, and dissemination of statistics ("data management"), development activities and resource management.

Virtually unanimous agreement was reached that tuna fisheries data for the entire Pacific area, regardless of how collected, should be provided to a central repository or repositories where they would be readily available to all. The greater the degree of centralization the better, although from the practical point of view, it might be necessary to separate out the eastern Pacific. There was also agreement that any mechanism for aggregation of data should provide for checking to be sure that catches in all tuna fisheries are included in the compilation, that relative completeness of reporting is taken into account and that double reporting is avoided. The pros and cons of various institutional arrangements (such as ICCAT, IATTC and "Article 64" type organizations) were discussed. A consensus could not be reached, however, on a preferred approach. In this regard, it should be noted that very active consideration was being given by many Pacific countries to their positions with respect to international cooperation and that from their points of view expressions of firm opinions on the precise form of future arrangements for centralized data assembly could not be expressed at this time.

With respect to cooperative management, it was noted that the South Pacific Forum countries were soon going to meet to consider their approach to development of new international arrangements in their area. The FAO staff member emphasized that IPFC had expressed no desire to extend its activities beyond the area in which they were presently concentrated.

With respect to the specific question of arrangements within IPFC, participants concerned did not express any desire to change existing mechanisms wherein consideration of tuna problems are centered in joint meetings of the IPFC and IOFC tuna management committees. In light of the proposed formation of sub-regional Committees, some participants emphasized the importance of ensuring that a close linkage be maintained between the new Committees and the more broadly based IPFC/IOFC tuna management committees. The desirability of IPFC maintaining a close link with whatever institutional arrangement developed in the Southwest Pacific was also emphasized.

9. Options for Financing

Following a review of existing arrangements for financing IOFC and IPFC, the question of funding the increased support for activities of sub-regional Committees and the strengthened regionwide activity were discussed. The meeting recalled the recommendation of the 1978 meeting of the IOFC and IPFC tuna management committees that FAO prepare options for short- and long-term tuna management programmes with options for funding. Participants found it difficult to comment on questions of funding without further clarifications of the developing FAO policy with respect to establishment of sub-regional Committees and without resolution of uncertainties with respect to future international arrangements for the Pacific. Nevertheless, it was generally accepted that, in the immediate future, continued UNDP support as well as possible support from other donors should be sought for the proposed increased activity. In the long run, however, it was hoped that participating countries would be able to bear an increasing part of the costs. The possibility of the principal users of the resource (mainly distant-water fishing nations at present) being required to provide the principal support for the added costs remains an option.

TC/79/2

TUNA CONSULTATION MEETING
(26-29 June 1979)

DRAFT ANNOTATED AGENDA
and
EXTRACTS FROM THE LETTER OF INVITATION

Annotated Agenda

1. Opening of Meeting and Welcome by Programme Leader

The opening will include a statement of the purpose and proposed method of work of the meeting.

2. Adoption of Agenda

Formal

3. Knowledge of tuna and tuna fisheries in the Region

Results of the Shimizu Stock Assessment Workshop will be presented as well as a summary of the current knowledge on skipjack tuna. Participants will be invited to provide recent information on the tuna fisheries in their countries.

4. Elements of a Management System

(i) data collection and centralized data storage;
(ii) consolidation of processing and reporting services;
(iii) assessment of stocks and formulation or biological advice;
(iv) economic and sociological studies;
(v) choice of management measures;
(vi) implementation, surveillance and enforcement of measures;
(vii) monitoring the efficacy of the management programme;
(viii) other activities.

5. Objectives of management, and needs for management in the Pacific and Indian Ocean regions.

This agenda item will provide a brief review of whether management is needed in the view of the IOFC/IPFC Tuna Management Committees and the IPFC (conservation of stocks, improved economic or social performance, better distribution of benefits, etc.), with particular reference to the current status of the tuna stocks and fisheries of the region. It is not intended that discussion under this agenda item would determine which objectives <u>should</u> be pursued, but only to identify which might be pursued in the region, so that provision for them is made within any suggested arrangement.

6. Geographic area to be covered

No other arrangements for tuna management exist in the geographical area of interest to the IOFC and IPFC, and this area is enormous, approaching half of the world ocean. Consideration should be given to whether the area should be treated in its entirety or divided into more homogeneous units based on stock structure, geography, or fishery units, in light of the differing needs of fishery administrators, biologists, and economists.

7. Options for fishery statistics

Basic to both stock assessment and resource management is the collection and availability of fishery statistics. Subjects that could profitably be discussed at this meeting include the kinds of data required, commonality of data formats, centralized or dispersed data storage systems, centralized or dispersed data processing capability, and exchange of data or distribution of data reports. Discussion on these topics will be used to prepare a document or proposal for the next joint tuna management committee meeting.

8. Options for coordination of tuna management

There are a number of alternative management arrangements that could be implemented for tuna in the IOFC/IPFC region. While some of these arrangements were discussed at the 5th Joint session of the tuna management committees, it would be beneficial to continue these discussions, including an evaluation of the advantages and disadvantages of the alternatives. These discussions will be used to formulate topics for subsequent discussions and for preparing a proposal for the next IOFC/IPFC meeting in Perth.

9. Options for financing

All bodies need money to operate. Consideration should be given to the likely overall costs, which may be estimated from the activity discussed under (7), and how financing should be done. A number of IOFC and IPFC member countries expressed the view that financial support should come largely from the principal users of the resource. Many existing commissions have found it convenient to base contributions in three parts - a basic flat rate, equal for all members, a contribution proportional to the number of panels or similar bodies to which a country belongs and a contribution proportional to catches. This last may account for the major part of the total budget.

10. Outcome of meeting

It is not intended that decisions should be reached at the meeting or that a formal report result. Rather, the proceedings of the meeting are expected to communicate the essence of the discussions including any conclusions or a significant difficulties with respect to resource management of data handling.

EXTRACTS FROM THE LETTER OF INVITATION

26 June 1979

Dear _____,

Subject: Tuna Consultation Meeting for Asia and Pacific Region - Manila, 26-30 June 1979 - organized by the FAO/UNDP Regional South China Sea Fisheries Development and Coordinating Programme

At their fifth joint meeting held in Manila in March 1978, the IPFC Special Committee on Management of Indo-Pacific Tuna and the IOFC Committee on Management of Indian Ocean Tuna considered the present state of the tuna fisheries in the Indian Ocean and the Western Pacific, as well as the necessary administrative arrangements for tuna management. The joint meeting evaluated three alternative arrangements and initially concluded that the best short-term solution would be to strengthen the IPFC secretariat or establish a separate tuna fisheries secretariat within the IPFC. Subsequently, the joint meeting reconsidered the conclusion, felt it was far too ambitious, and concluded that it would be desirable to start on a more modest scale. It therefore recommended that a tuna specialist be appointed by FAO as an interim measure, with the following main terms of reference: to formulate options for short and long-term management of highly migratory species in the IPFC/IOFC region in consultation with all member countries of IPFC and IOFC; to initiate the collection and storage in computer accessible files of catch and effort data from the region with early emphasis on data not generally available; and to draft a series of options with budgets and suggested funding systems for IPFC/IOFC tuna fisheries secretariat, for consideration by the IPFC and IOFC.

The report of the joint meeting was considered by the IPFC at its eighteenth session which was also held in Manila in March of last year. The IPFC agreed that immediate steps should be taken towards the formulation of management regimes for those species of tuna that are considered to be possibly over-exploited or exploited to their limit or in which the effort is more intense than economically desirable. It endorsed the recommendation made by the joint meeting regarding the appointment of a tuna specialist. I am happy to inform you that the UNDP has provided the funding for this tuna specialist as well as for a meeting.

The purpose of the June meeting is to bring together senior fisheries administrators and scientists for informal consultations regarding the possible future structure of tuna management arrangements as well as possible central data storage and processing system.

I would like to emphasize that this meeting will be informal to encourage the exchange of ideas on, and discussion of, fishery and data management alternatives. The discussions and resulting proceedings of the

meeting will be useful to FAO and particularly to the tuna specialist in formulating proposals including the advantages and disadvantages of different options which will be considered by the Joint Meeting of the IOFC/IPFC Tuna Management Committees scheduled to meet in Perth, West Australia in February 1980.

Yours sincerely,

(Signed)
A. G. WOODLAND
Programme Leader

TC/79/1

TUNA CONSULTATION MEETING
(26-29 June 1979)

OPENING STATEMENT BY A. G. WOODLAND, CONVENOR OF THE CONSULTATION

OPENING STATEMENT BY A. G. WOODLAND, CONVENOR OF THE CONSULTATION

On behalf of Kenneth Lucas, Assistant Director-General (Fisheries Department) of FAO and on behalf of the FAO/UNDP Regional South China Sea Fisheries Development and Coordinating Programme, I should like to welcome you warmly to this Consultation on tuna fisheries. Mr. Lucas, who takes a personal interest in your deliberations, very much regrets that he could not be with us today but he assured me that he would be attending the next Joint Meeting of the Tuna Management Committees set up by the Indian Ocean Fishery Commission (IOFC) and the Indo-Pacific Fishery Commission (IPFC), as well as the next sessions of these two Commissions, the outcome of your discussions will be directly relevant to these meetings.

In fact, the Consultation takes place at a crucial moment in the already long series of inter-governmental efforts aimed at finding a satisfactory solution to the problem of tuna management in East Africa, Asia and the Pacific region. It was here in Manila, just over a year ago, that the Indo-Pacific Fishery Commission agreed that in view of the state of exploitation of many tuna stocks, it was essential to reach practical and concrete conclusions regarding the management of these highly migratory species. In its opinion, little effective action had been taken except for recognizing that a problem existed. The Commission, therefore, endorsed the request made by the IOFC and IPFC Tuna Management Committees, which had also met in Manila a few days before the Commission, that options should be formulated for short-and long-term management of highly migratory species in the area. In particular, the Commission agreed that short-term management schemes should be formulated for those species of highly migratory fish which are considered to be possibly over-exploited or exploited to their limit or in which the effort is more intense than economically desirable.

Both the Tuna Management Committees and the Indo-Pacific Fishery Commission recommended that the short- and long-term management schemes, including their institutional and financial aspects, should be prepared by FAO with the assistance of a tuna specialist and in consultation with all member countries of IOFC and IPFC. The various options formulated should then be submitted to the next joint meeting of the IOFC and IPFC Tuna Management Committees, scheduled to be held at Perth in February 1980 and, subsequently, to IOFC, which will also meet at Perth immediately following the Committees, and to IPFC, which will meet at Kyoto in May, also next year.

I am pleased to report that the financial support of UNDP is enabling us to recruit two tuna specialists, who are with us today. A staff member, Dr. Skillman, will look after the scientific aspects. We have also engaged Dr. Shepard as a consultant on the institutional and financial arrangements.

The Consultation is also convened, thanks to the financial assistance of UNDP. I am confident that it will provide the numerous countries represented here with a full opportunity of giving us an account of their present or planned policies regarding tuna fisheries. This is indeed an essential first step towards our consideration of the needs and prospects for inter-governmental

cooperation at the subregional, regional or even inter-regional level. I would emphasize in this respect that in view of the movements and distribution of tuna stocks, effective coordination will have to be ensured between the FAO bodies, IOFC and IPFC, and those which have been established or are being created outside its framework, especially in the South Pacific. As you are aware, no country from that area presently belongs to IPFC.

This Consultation is unusual and even unique in several respects. I would venture to say it is the first time that a meeting on tuna problems

(i) provides such a wide geographical coverage, including the Indian Ocean, the South China Sea and the Pacific;

(ii) ensures the representation of countries by scientists, administrators, policy makers and foreign affairs specialists concerned with international law matters, as well as the participation of senior officers from regional organizations dealing with tuna conservation;

(iii) ensures broad representation of developed and developing countries, whether these countries are already actively engaged in tuna fisheries or simply have a potential interest at the moment; and

(iv) provides such a wide substantive coverage of tuna problems, from data collection and analysis through formulation and implementation of management measures to institutional and financial aspects of inter-governmental cooperation in tuna fisheries.

These are strong reasons why we can expect much of this Consultation. Admittedly, as I emphasized in my letter of invitation, the meeting is essentially informal in nature. This is so to encourage a frank and thorough exchange of view. Nevertheless, there is no doubt that the result of your discussions will be of immediate interest and value to your governments and to FAO in making preparations for the forthcoming joint meeting of the IOFC and IPFC Tuna Management Committees and for the next session of both IOFC and IPFC.

I am therefore, looking forward with great interest to listening to your debate and I wish you every success in your deliberations.

TC/79/4

TUNA CONSULTATION MEETING
(26-29 June 1979)

REPORT OF THE 18TH SESSION OF THE INDO-PACIFIC FISHERY COMMISSION AND OF THE SYMPOSIUM ON FISH UTILIZATION TECHNOLOGY AND MARKETING IN THE IPFC REGION

TUNA MANAGEMENT

52. The Commission considered this item on the basis of the report of the Fifth Joint Meeting of the IPFC Special Committee on Management of Indo-Pacific Tuna and the IOFC Committee on Management of Indian Ocean Tuna (Manila, Philippines, 3-4 March 1978), as contained in document IPFC/78/5. The report was presented by the Chairman of the Joint Meeting, Mr. T.B. Curtin (Australia). All delegations which participated in the discussions stressed the increasing importance of tuna fisheries for most countries in the area, including developing coastal States. They agreed that in view of the state of exploitation of many tuna stocks, it was essential for the present session of IPFC to reach practical and concrete conclusions regarding the management of these highly migratory species. This subject had been on the agenda of several previous sessions, but little effective action had been taken except for recognizing that a problem existed.

53. The Commission shared generally the views expressed by the Joint Meeting of the Tuna Committees. Because certain stocks of highly migratory fish that move within the Indo-Pacific area are either over-exploited or exploited to their limit, it is essential to formulate and recommend measures and to initiate and carry out programmes or projects to conserve and manage resources. In this respect the Commission emphasizes that management measures for particular stocks will be ineffective unless all fleets fishing the stocks observe the agreed management measures. The form and nature of the eventual management regimes should be determined by the States directly concerned with the particular stocks.

54. The Commission also agreed that all appropriate avenues, both direct and indirect, should be taken to ensure the full participation in both the initial data collection and analysis, as well as the implementation of the finally agreed management measures, by all authorities responsible for the operation of fleets fishing the particular stocks.

55. The Commission agreed that immediate steps should be taken toward the formulation of management regimes for those species of highly migratory fish which are considered to be possibly over-exploited or exploited to their limit or in which the effort is more intense than economically desirable, such as in the southern bluefin tuna or in the longline fisheries and as anticipated, in the purse seine fisheries for yellowfin in the Indian and Pacific Oceans and the southern albacore in the Pacific.

56. The Commission therefore recommended that initially, as a matter of high priority, a tuna management specialist should be appointed by FAO as suggested by the Joint Meeting of the IOFC and IPFC Tuna Management Committees (doc. IPFC/78/5, paragraph 19 and Annex D) to undertake, in consultation with all States concerned, the collection and analysis of data and to develop proposals for specific management plans for particular species, his report to be submitted to the next Joint Meeting of the IOFC and IPFC Tuna Management Committees in 1979.

TC/79/5

TUNA CONSULTATION MEETING
(26-29 June 1979)

REPORT OF THE FIFTH JOINT MEETING OF THE
INDO-PACIFIC FISHERY COMMISSION
Special Committee on Management of Indo-Pacific Tuna Fifth Session
and the
INDIAN OCEAN FISHERY COMMISSION
Committee on Management of Indian Ocean Tuna Sixth Session
Manila, 3-4 March 1978

OPENING OF THE MEETING

1. The Fifth Joint Meeting of the IPFC Special Committee on Management of Indo-Pacific Tuna and the IOFC Committee on Management of Indian Ocean Tuna was held at the Philippine Plaza Hotel, Manila, Philippines, 3-4 March 1978. The meeting was attended by representatives from 10 of the member countries and by observers from two other members of IOFC and from two international organizations. A list of delegates and observers is given in Appendix A to this report.

2. In the absence of the Chairman, Mr. E.A. Purnell-Webb (Australia), Mr. T. B. Curtin (Australia) was unanimously elected as Acting Chairman for the period of the meeting.

ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE MEETING

3. The agenda as given in Appendix B was adopted. The documents considered by the Committees are listed in Appendix C.

PRESENT STATE OF TUNA FISHERIES IN THE INDIAN OCEAN AND WESTERN PACIFIC

4. The IPFC Working Party of Experts on Central and Western Pacific Skipjack had reviewed the available information on the state of the stocks. The Chairman of the Working Party reported that, although the available information was inadequate for precise conclusions, the Working Party believed that, except perhaps in some local waters, the stocks were under-exploited. The Working Party was unable to predict the magnitude of the potential yield, and made various recommendations for improvement of the data base. These recommendations included the establishment of a central data repository for data which should be available for general analysis and the continuation of work by correspondence until a workshop can be set up to make a detailed study of the stock situation.

5. A number of reports, which were to be discussed in more detail in the IPFC Standing Committee on Resources Research and Development on 4-7 March, gave recent information on the state of various tuna stocks in the area. It appeared from these reports that the longline fisheries for yellowfin tuna in the Indian and the Central and Western Pacific Oceans have continued to expand to a level much higher than desirable in terms of maximum physical yield. Reduction of the effort would not lead to a decrease and might increase the total catch of this fishery, and would give a substantially higher catch per unit of effort. Based on longline fishing data, the Pacific bigeye tuna stocks and the northern as well as the southern albacore stocks, also appear to have reached about their maximum production levels. The catch rates of several of these stocks have shown very considerable decreases in the last ten years or so.

6. On the other hand, surface fisheries for younger fish of some species, in particular yellowfin and to a lesser extent bigeye tuna, have developed in recent years and have led to an increase in total catch of these species.

7. The southern bluefin tuna stocks, exploited both by Australian surface fisheries and Japanese longline fleets, have shown a decrease in total landings in the last period. This stock is considered to be fully or over-exploited by these combined fisheries, and increases in Australian fishing will reduce the Japanese catch of older fish, whereas the intensive Japanese fishery of large fish may threaten the offspring and hence the recruitment of young fish to the stocks.

8. This summary would suggest that the longline fishery on several species would benefit from regulation to improve the catches. As these fisheries catch large fish only, there is no reason to introduce size limits for the fish. The only effective regulation would be through limitation of the total amount of fishing, either by directly limiting the number of boats fishing, or by a quota regulation. In the southern bluefin tuna fishery, regulation of both the surface fishery and the longline fishery may be required. Further investigations are needed to determine the expected effects of the limitations and the required balance between surface and longline fisheries. The available information does not suggest that there is a need for regulation of the other surface fisheries.

9. It was noted that the southern bluefin tuna appears to belong to one stock only, which may simplify the management considerations, but also requires management over the whole distribution area of the species. In this connection the Committees took note of the voluntary measures that had been taken by Japanese fishermen since 1971.

10. The meeting noted that although some tuna resources, e.g. yellowfin tuna, appeared from an analysis of the longline data to be presently fished at a fully exploited level, there was a possibility that the total catch could be increased substantially by an increase in surface fishing effort. This phenomenon was demonstrated in the Atlantic for yellowfin tuna. The meeting pointed out that there was a need for better understanding of the relation between surface and longline fisheries for the same species. In this respect it was mentioned that the Indonesian and Philippine surface fisheries in the waters of these countries have been expanding and are now catching substantial quantities of fish. The Committees noted that there was a need to investigate the relation between these fish and the stocks on which important high sea fisheries depend, and considered that the matter should be drawn to the attention of the governments concerned.

11. It was also noted that status of stocks analyses based on longline fishing data could be improved by the collection of detailed statistics from all longline fishing fleets.

ADMINISTRATIVE ARRANGEMENTS FOR TUNA MANAGEMENT

12. The secretariat in introducing this item drew the attention of the joint meeting to documents IPFC/IOFC:TM/78/5, IPFC/78/10, IPFC/78/Inf. 5, IPFC/IOFC:TM/78/Inf. 9 and the relevant paragraphs of the report of the seventeenth session of IPFC.

13. At the fourth joint meeting of the IPFC Special Committee on Management of Indo-Pacific Tuna and the IOFC Committee on Management of Indian Ocean Tuna held in Sri Lanka on 29-30 October 1976, it had been agreed that a central secretariat for tuna management was desirable and that in the long term the funding of such a secretariat should be on the basis of "user pays". It had been recommended that IPFC and IOFC should seek support from member countries for the programme.

14. The Indo-Pacific Fishery Commission at its seventeenth session considered the recommendations of the joint meeting and while generally endorsing the proposed programme and the principle of funding secretariat activities, recommended that the views of member countries should be solicited as to the basis of such funding.

15. In pursuance of this recommendation, the secretariat had circulated a questionnaire to the 18 member countries of IPFC, to four countries in the Indian Ocean area and five countries in the Pacific Ocean area, interested in tuna fishing. Eight replies had been received of which five were from member countries of IPFC. The basic questions related to the setting up and funding of a central secretariat. Of the member countries, three had agreed that the secretariat should be financed by a Trust Fund, four agreed that contributions should be on the principle of "user pays" and that it should be in the same proportion as the country's catch has to the total catch.

16. The joint meeting was of the opinion that the response to the questionnaire had been poor and hardly provided a basis to draw definite conclusions. It was agreed that there was no need to send a further simplified questionnaire to member countries, but member countries were urged to ensure that the formal replies were sent to the questionnaire. When sending a reminder to member countries, the secretariat should invite their attention to the present report.

17. The joint meeting then considered the following options:

(a) Have a better system of collection, analysis and dissemination of data and statistics at both the national and international levels with no additional institutional arrangements at this time.

(b) Strengthen the present IPFC secretariat or establish a separate tuna management secretariat within IPFC.

(c) Establish a separate body by treaty concluded outside the framework of FAO.

18. It was agreed that the state of development of these activities were well beyond the stage referred to in option (a), while option (c) although possibly a long-term solution involved complex political considerations that could not be addressed at this meeting. Option (b) had substantial support and it was proposed that action be taken in this regard in stages.

19. It was the consensus of the joint meeting that the original secretariat proposal was far too ambitious and that it would be desirable to start on a more modest scale. The joint meeting therefore recommended that a tuna management specialist be appointed by FAO as an interim measure. He would be stationed in the region and should be funded by FAO through either its Regular Programme budget, its regional and inter-regional programmes or its government cooperative programme, till such time as a Trust Fund was established. The terms of reference of the specialist are found in Appendix D.

20. The joint meeting was informed that the financing of IPFC activities was listed in a separate item on the agenda of the 18th session of IPFC and it agreed that the situation with regard to the long-term funding of the tuna management secretariat would have to be seen in relation to the discussions and decisions in relation to that item in plenary.

GENERAL PRINCIPLES OF TUNA MANAGEMENT

21. The Committees were informed that at its fifth session held in Cochin, India, in October 1977, IOFC had found itself in general agreement regarding the arrangements proposed for tuna management within IOFC and IPFC by the Ad Hoc Committee of Nations on the Mechanics of Tuna Research and Management. On that occasion, the importance of taking action to manage tuna stocks was stressed, both for the benefit of those already engaged in the longline fishery and of the coastal states, which were finding it difficult to enter the fishery while catch rates were at the current low levels. There were difficulties in selecting measures and regulations appropriate to the general principle, set out at a previous joint meeting of the Committees, that the total amount of fishing should be controlled without prejudice to a more equitable participation of the coastal states in the fishery. It had therefore been suggested that this matter should be placed on the agenda of the present joint meeting.

22. The Committees were also informed that the Executive Committee of IPFC, at its fifty-fifth session held at Metro Manila, Philippines, from 31 October to 2 November 1977, had noted with satisfaction that the joint meeting would study the question of general principles to be followed in formulating management measures.

23. The matter was considered by the Committees on the basis of document IPFC/IOFC:TM/78/6, entitled "Participation of coastal states in the exploitation of tuna and in management of the fisheries".

24. The Committees observed that the document had not been circulated to member countries in advance of the meeting, so that governments had not had an opportunity to examine the general questions and criteria discussed in that document. They felt therefore that it would not be appropriate to consider them in any detail. While recognizing that other criteria or principles concerning management measures, and especially the apportionment of catch quotas, could be envisaged, they agreed that the document should be brought to the attention of any other IPFC/IOFC meeting or body which

would study these problems. They also agreed that the IPFC/IOFC tuna specialist referred to in paragraph 20 above should take it into account when formulating options for further work in this area.

25. Several representatives pointed out that some of the problems mentioned in the document, e.g. methods of regulating minimum size limits, also arise in the context of fisheries carried out entirely in areas within a single national jurisdiction.

26. In connection with the references made in the document to the management measures recommended so far by the Inter-American Tropical Tuna Commission (IATTC), the observer from IATTC informed the Committees that member countries of IATTC were in the process of negotiating a new Convention. It was likely that the new Commission would be entrusted with somewhat broader responsibilities than the present one, with particular reference to the increased rights of coastal states in areas off their shores.

RELATIONS WITH OTHER BODIES

27. The secretariat informed the joint meeting of several international bodies, other than IPFC and IOFC, that have interests, directly or indirectly, in tuna management in the Indian Ocean and Western Pacific, such as the South Pacific Commission (SPC), Inter-American Tropical Tuna Commission (IATTC) and the International Commission for the Conservation of Atlantic Tunas (ICCAT).

28. The Chairman of the IPFC Working Party of Experts on Central and Western Pacific Skipjack, Mr. G.D. Waugh (New Zealand), reported on possible future cooperation between IPFC and SPC, especially on organizing meetings of skipjack tuna experts, and a future workshop on stock assessment.

29. The observer from IATTC expressed satisfaction with the cooperation between IATTC and IPFC. Because of the highly migratory nature of tuna species, and also because the boats which fish in the Eastern Pacific are beginning to fish in the Western Pacific, IATTC considered Pacific-wide cooperation to be very important and it looked forward to continued cooperation.

30. Three areas of current cooperation were:

(1) The work of the Working Party on the tagging of tunas and billfishes in the Indian and Pacific Oceans. This group convened by Dr. Bayliff of IATTC with members from countries in the Indo-Pacific region was doing valuable work on developing techniques and materials for skipjack tagging.

(2) The Marquesas Islands skipjack tagging programme. IATTC with cooperation from the Centre National pour l'Exploration des Oceans (CNEXO), the Office de la Recherche Scientifique et Technique Outre-Mer (ORSTOM) and the Service de la Peche de la Polynesie Francaise (SPPF), was undertaking a programme designed to help clarify the skipjack stock structure of the Central and Eastern Pacific.

(3) The collaboration of IATTC with organizations from the IPFC area in the collection and biochemical analysis of blood and tissue samples for stock separation.

31. The joint meeting expressed support to the principle of cooperation and coordination between IPFC and IOFC and the other regional and international organizations concerned.

ANY OTHER MATTERS

32. None.

ELECTION OF OFFICERS

33. The representative of Australia, Mr. T.B. Curtin, was unanimously elected Chairman of the joint meeting, and the representative of the U.S.A., Dr. R.S. Shomura, was unanimously elected Vice-Chairman.

DATE AND PLACE OF NEXT MEETING

34. The Committees agreed that their next joint meeting should be held in conjunction with the sixth session of IOFC at Perth, Australia, in August 1979 or on such earlier date as circumstances demanded and finances permitted.

Appendix A

LIST OF DELEGATES AND OBSERVERS

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SECRETARIAT

TAPIADOR, D.D.
Secretary
Indo-Pacific Fishery Commission

Appendix B

AGENDA

1. Opening of the meeting
2. Adoption of the agenda and arrangements for the meeting
3. Present state of tuna fisheries in the Indian Ocean and Western Pacific
4. Administrative arrangements for tuna management
5. General principles of tuna management
6. Relations with other bodies
7. Any other matters
8. Election of officers
9. Date and place of next meeting
10. Adoption of the report

Appendix C

LIST OF DOCUMENTS

IPFC/IOFC:TM/78/1		Provisional agenda
	2	Annotated provisional agenda
	3	Provisional timetable
	4	Report of the First Session of the IPFC Working Party of Experts on Central and Western Pacific Skipjack, Manila, Philippines, 1-2 March 1978
	5	Replies to questionnaires on funding an IOFC/IPFC tuna management secretariat
	6	Participation of coastal states in the exploitation of tuna and in management of the fisheries
	7	Relations with other bodies
IPFC/IOFC:TM/78/Inf.1		List of documents
	2	Information for participants
	3	List of delegates and observers
	4	Statistics of tuna catches in the Indian Ocean and Western Pacific
	5	Report of the Billfish Workshop, Honolulu, Hawaii, December 1977
	6	Recent status of the southern bluefin tuna stock
	7	Recent studies in the longline fisheries in the Indian Ocean and Western Pacific
		(i) The recent status of tuna stocks in the Indian Ocean
		(ii) The recent status of yellowfin and bigeye tuna stocks in the Pacific Ocean
		(iii) The voluntary regulation of Japanese longline fishery for southern bluefin tuna
	8	Extracts from the report of the fifth session of the Indian Ocean Fishery Commission, Cochin, India, 19-26 October 1977

IPFC/IOFC:TM/78/Inf/9 Report of the fourth joint meeting of the IPFC Special Committee on Management of Indo-Pacific Tuna (Fourth Session) and the IOFC Committee on Management of Indian Ocean Tuna (Fifth Session), Colombo, Sri Lanka, 29-30 October 1976

10 Extracts form the Report of the Fifth Regular Meeting of the International Commission for the Conservation of Atlantic Tunas (ICCAT), Madrid, Spain, 9-22 November 1977 and the Report of the Eighth Regular Meeting of the Standing Committee on Research and Statistics of ICCAT, Madrid, Spain, 9-15 November 1977

Available papers

Fishery Situation Report, Southern Bluefin Tuna, by G.I. Murphy, CSIRO, Australia

Report of the Second North Pacific Albacore Workshop, Shimizu, Japan, 17-18 May 1977

Workshop on the Population Dynamics of North Pacific Albacore, Honolulu, Hawaii, 10-12 December 1975

Recent trends in catch, fishing effort, and catch per unit of effort for the South Pacific albacore fishery based in American Samoa, 1954-1976, by Robert A. Skillman, Southwest Fisheries Center, Honolulu, Hawaii

The billfish resources taken by the longline fishery in the Indian Ocean, by P.P. Pillai, Central Marine Fisheries Institute, Cochin, India and Shoji Ueyanagi, Far Seas Fisheries Research Laboratory, Shimizu, Japan

Appendix D

IPFC/IOFC TUNA MANAGEMENT SPECIALIST'S TERMS OF REFERENCE

In consultation with all member countries of IPFC and IOFC, to formulate options for short and long term management of highly migratory species in the IPFC/IOFC region, in particular species in which effort is more intense than economically desirable such as in the southern bluefin tuna and in the longline fisheries for yellowfin in the Indian Ocean and in the Pacific and probably bigeye and southern albacore in the Pacific.

To this end account should be taken of the recommendations of the Fourth Joint Meeting of the IPFC Special Committee on Management of Indo-Pacific Tuna and the IOFC Committee on Management of Indian Ocean Tuna.

It is expected that the specialist would, inter alia:

- initiate the collection and storage in computer accessible files of catch and effort data from the region with early emphasis on data not generally available;

- draw up a series of options with budgets and suggested funding systems for the IPFC/IOFC tuna management secretariat, for consideration by IPFC and IOFC.

In fulfilling the above tasks, it is regarded as essential that the specialist familiarize himself in detail with the particular problems of member countries.

The specialist shall present a report to the next joint meeting of the IOFC/IPFC tuna management committees in 1979.

TC/79/6

TUNA CONSULTATION MEETING
(26-29 June 1979)

REPORT OF THE FIFTH SESSION OF THE INDIAN OCEAN FISHERY COMMISSION
Cochin, India, 19-26 October 1977

OPENING OF THE SESSION

1. The Indian Ocean Fishery Commission (IOFC) held its fifth session from 19 to 26 October 1977 at the Central Institute of Fisheries Technology at Cochin, India. The session was attended by the representatives of 18 members of the Commission, by an observer from one other Member Nation of FAO, by the observers from two non-Member Nations of the Organization that were applicants for FAO membership and by the representative of one inter-governmental organization. A list of delegates and observers is given in Appendix A to this report.

2. An opening ceremony was held at the Fine Arts Hall and addresses were made by Shri A.K. Antony, Chief Minister of Kerala, Shri G.V.K. Rao, Secretary to Government of India, Ministry of Agriculture and Irrigation (Department of Agriculture and Rural Development) and Mr. H. Watzinger, Assistant Director-General (Fisheries Department), FAO. The texts of these speeches are to be found in Appendices B, C and D.

ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION

3. The Commission adopted the agenda reproduced in Appendix E. The documents before the Commission are listed in Appendix F. At the suggestion of the Chairman, the Commission appointed a Nominations Committee, consisting of the representatives of Kenya, Madagascar, Qatar, Tanzania, Thailand and United States of America, to facilitate the election of officers to serve during the inter-sessional period and the Sixth Session of the Commission and to propose up to four additional members of the Executive Committee for the Implementation of the Indian Ocean Fishery Survey and Development Programme.

FISHERY STATISTICS

4. Statistics of different types are the basic data for most policy actions regarding fisheries, from investment planning to the assessment and management of fish resources, especially heavily fished stocks. The importance of adequate statistics has long been recognized in theory, but in practice the statistics available for Indian Ocean fisheries are poor, and their inadequacies are among the reasons for failing to achieve a fully rational utilization of the resources of the region.

5. A number of reasons for their inadequacies were outlined in document IOFC/77/4 and suggestions made for overcoming these weaknesses. The actions included providing greater support in terms of finance and manpower, improved methodology, training at all levels, and removal of some institutional constraints.

6. It was recognized that collection of statistics was a national responsibility, and that this would be increased by the greater responsibilities of the coastal states for management and rational utilization resulting from extended jurisdictions. Member countries were therefore urged to make appropriate provision for statistical activities. It was also noted that the allocation of adequate resources and their effective use was often made more

difficult by the administrative structure within a country, so that, for example, the ultimate user of statistics had little influence on how they were collected. The Commission then recommended that Member Nations, in recognition of their management and conservation responsibilities in areas under their jurisdiction, improve their central statistical collection machinery.

7. Countries required assistance in statistics particularly in establishing methods of collection and compilation, and in training. The methods used might vary between different types of fisheries (e.g. industrial - for which complete records were usually obtainable, and artisanal - for which sampling surveys are needed), and between different ultimate uses (e.g. for national accounts, resource management or others).

8. International assistance could help in providing standard methods or guidelines for all stages of planning and implementing the collection of statistics, and in their compilation. Direct assistance to individual countries was also needed. The Commission recommended that a post of a fishery statistician, based in the region, should be established. He could pay regular and repeated visits to countries needing assistance to help plan and implement improved methods of statistical collection, particularly the design of frame surveys.

9. Assistance through training at all levels was also needed. Regional activities would be most effective in training at higher levels, in relation to the planning and design of statistical surveys, and in their supervision. Regional training courses could be most effective in this; the proposed training course planned for 1978 was welcomed, and it was hoped that consideration would be given to further courses.

10. It was noted that despite the current weaknesses of most statistics, progress was being achieved. The delegate of Indonesia reported the improvements that were being achieved in his country, which was receiving assistance on this from FAO/UNDP. The delegate of the Republic of Korea stated that his country would be able to supply to FAO statistics of tuna fishery in the Indian Ocean with details of catch, fishing effort, and location of catch similar to those reported to the International Commission for the Conservation of Atlantic Tunas (ICCAT).

11. It was also noted that the IPFC/IOFC Joint Working Party on Fishery Statistics had done much in establishing standards of area divisions, species, gear, and vessel classifications, to be used in reporting statistics to regional or world-wide bodies. These were matters requiring attention by a group with a wide area of interest, for which a Joint IPFC/IOFC body was appropriate. The matters now requiring attention within IOFC were mainly those of more strictly regional or sub-regional interest, dealing with the improvement of statistics for specific fisheries. It was therefore agreed that, if IPFC, at its session immediately after the next scheduled session of the IPFC/IOFC Joint Working Party in March 1978, should propose the abolition of the Working Party, IOFC should agree. In that case the questions of inter-regional standardization of species, gears etc. would be appropriately looked after by FAO, possibly through the mechanism of the Coordinating Working Party on Atlantic Fishery Statistics.

STATE OF STOCKS

12. A summary review of the current knowledge of the resources in the Indian Ocean was presented in document IOFC/77/5 and a more detailed review of the tuna resources in IOFC/77/Inf. 11. These reviews revealed a large degree of uncertainty concerning these resources, even in respect of those already supporting important fisheries. The most recent information including that arising from regional resource surveys had suggested that some of the earlier figures of the potential yield of the conventional types of fish from the Indian Ocean might be too high.

13. It was stressed that it was too early and the data too scanty to be sure which estimate was closest to the actual magnitude of the annual harvest, which (ignoring technical and economic constraints) could potentially be taken from the Indian Ocean. It is clear that this figure is considerably in excess of the present catch. The catch in 1975 (the last year for which reasonably complete data are available) was some 3 million tons, an increased of 50 percent over the catch a decade earlier.

14. The resource data are therefore adequate to determine that the catches from the Indian Ocean taken as a whole can be increased, at least as far as the biological constraints are concerned. This is not the case in respect of individual resources. Some of these (e.g. shrimp in some areas) are already heavily exploited and improved and detailed resource data are needed to ensure that they can be properly managed and their productivity maintained. Many other stocks (including most shrimp stocks not already fully exploited, and many demersal stocks) are exploited to at least a moderate extent. The resource information on most of these is insufficient to determine the extent to which the fishing effort can be further expanded, and the impact that such expansion might have on the existing fishery.

15. Information on the activities of non-local vessels is very important in evaluating the state of the resources, but was not readily available in respect of many individual resources. The data available to FAO, such as that summarized in the tables in IOFC/77/5, referred to the total catches in the Indian Ocean. Several countries did not report directly the detailed location of their catches, though this could sometimes be deduced from other information. The catch by non-coastal countries, amounted in peak years to about 10 percent of the total, or around 300 000 tons. Of this about 100 000 tons was long-line tuna (much of it outside 200 miles). Most of the rest consisted of trawl catches around Kerguelen and in several parts of the eastern Indian Ocean. In other areas, non-local fishing appeared to be slight. The Commission stressed that further information on the magnitude and distribution of non-coastal fishing was urgently needed, and requested FAO to collect and compile this information on past and current activities and to distribute the information to member countries.

INTERNATIONAL INDIAN OCEAN FISHERY SURVEY AND DEVELOPMENT PROGRAMME

(a) Report of the Executive Committee (sixth session)

16. In presenting the report of its sixth session (IOFC/77/6) the Chairman of the Executive Committee for the Implementation of the International Indian Ocean Fishery Survey and Development Programme drew attention to the fact that, since the fourth session of the Commission, the Executive Committee had held its fifth session in April 1976 in Rome. The Second Phase of the Programme was completed as of 31 December 1976 and a Review and Evaluation Mission had recommended continuation of the Programme into a Third Phase which was endorsed by the Executive Committee at its fifth session in 1976. Subsequently, the United Nations Development Programme (UNDP) had approved the Third Phase of the Programme, but for financial reasons its budget was limited to U.S. $2.5 million for three years. The Programme had received additional funds from UNDP for use in 1977 to organize fish quality assurance programmes and for missions to assist participating countries in developing extended areas of jurisdiction over fisheries.

17. It was observed that the report of the Review and Evaluation Mission for the Indian Ocean Programme had been well prepared and it could serve as a model for similar interregional or regional programmes. The Commission noted with satisfaction that the activities in the Third Phase of the Programme had started in accordance with the Mission's recommendations as adopted by the Executive Committee.

18. The Commission was informed that the three major resource surveys, the Norwegian Agency for International Development (NORAD) and UNDP funded North Arabian Sea Survey with some vessel time provided by the Government of Japan was completed at the end of 1976. It had identified four main areas of small pelagic fish concentrations and over the survey area in general a relatively large biomass of mesopelagic fish. A follow-up workshop, with NORAD funding, to consider development opportunities that might arise from the findings of the survey which was originally planned by the Indian Ocean Programme to be held in Karachi just prior to the present session of the Commission, had been re-scheduled for the period 16 to 28 January 1978 with the kind concurrence of Pakistan.

19. The East Africa Fishery Resource Survey would be completed by the end of 1977 after a delay due to an engine room fire on board the survey vessel R/V "PROFESSOR MESYATSVEV", while the proposed Regional Fisheries Survey, South Indonesia/Northwest Australia, had been redesigned to consist of three independent modules to be coordinated by the Indian Ocean Programme. Funding for various modules and coordination of the Regional Fisheries Survey was under consideration by the participating and donor governments as well as UNDP.

20. The Programme was heavily involved in the preparation of a proposed operational phase of the "Project for the Development of Small-Scale Fisheries in the Bay of Bengal". The Commission noted with appreciation the information provided by the delegate of Sweden that the Project Request had already been approved by the Swedish International Development Authority (SIDA) Board of Directors and was presently under consideration for funding approval.

21. The Commission noted with satisfaction that both the Regional Fisheries Survey and Development Project (Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates) and Sub-Regional Training Centre (Kuwait) were fully operational (see Appendix H).

22. The need for a follow-up of the survey work was stressed by several delegates. Reference was made particularly to the East Africa Fishery Resource Survey. The Commission welcomed the availability of vessels from Kenya and Tanzania for a proposed inshore survey to supplement the work of R/V "PROFESSOR MESYATSVEV" and hoped that the proposed survey could be implemented in the very near future. The Commission also agreed that a Workshop on Fishery Resources and Development Opportunities similar to that for the North Arabian Sea should be held in the area following the completion of the East Africa Fishery Resource Survey.

23. The Commission noted the statement of the delegate of Madagascar on the re-establishment of the Marine Research Centre at Nose Be and plans for it to cater for regional needs. It further noted that the Indian Ocean Programme was in contact with the appropriate authorities on this subject.

24. The Commission expressed its appreciation of the work carried out by the International Indian Ocean Fishery Survey and Development Programme in its Second Phase and endorsed the activities of the Third Phase.

(b) Research and survey activities

25. The Commission emphasized that more research work was required on the fish resources so that government and industry could be supplied with the information they needed. At the same time it was stressed that the research efforts should be so oriented as to provide information that can be immediately applied. This was particularly the case in respect of resource surveys by large research vessels. While it was appropriate that these surveys should be carried out with advanced technology, such as modern acoustic equipment so as to get the most information, it was important that these surveys should be planned and directed to provide information on resources and exploitation methods that could be utilized by the fishing industry and by the local fishermen.

26. It was also emphasized that the information from resource surveys of an unexploited resource which was usually in terms of the abundance (biomass) of the stock, its distribution in time and space, and the magnitude of the possible total annual yield, needed to be supplemented before it was immediately useful for commercial development. In particular there was a need for pilot scale or test fishing to establish the probable level of the catch rates by the types of vessels likely to be used.

27. Nevertheless properly planned and selected resource surveys had proved their usefulness and there was an important role for them in the future development of Indian Ocean fisheries Areas which it was suggested should receive priority attention for future regional surveys were the Upper Bay of Bengal and the Indonesia - Australian area. Guidance on the selection of resources to receive priority in selecting future surveys, might also be provided by a review of the extent to which information from past national and regional surveys had been used on actual fishery development.

28. The Commission discussed ways to improve the required data on those resources which were already being exploited by the coastal fishermen. These included a better flow of information from the fishermen themselves, training of local scientists in resource evaluation techniques, and the holding of regional or sub-regional workshops to review available resource data.

29. It was indicated that workshops could usefully combine training of national scientists with the evaluation of local fish resources. Experience had shown that training in stock assessment techniques was most effective when data from local fisheries were used in demonstrating the methods of analysis. It was therefore suggested that FAO should identify the fisheries in the Indian Ocean for which there were data suitable for application of stock assessment methods of different levels of sophistication and organize one or more workshops to use these data, giving particular attention to stocks of rational importance.

(c) Fishery development opportunities

30. The paper (IOFC/77/8) introduced by the secretariat outlined development opportunities related to surveyed areas in the North Arabian Sea and identified locations of fish concentrations in those areas. The Commission was informed that the surveys indicated stocks of small pelagic fish of between 1.4 million and 2.2 million tons, from Ras-Hafun to the Indus River. The standing stock of demersal fish measured in the region from the Horn of Africa to the Indus River, varied from 320 000 tons to 1 360 000 tons. A stock of meso-pelagic fish composed mainly of lantern fish and cardinal fish was estimated, using acoustic methods, at about 100 million tons.

31. The secretariat stressed that any development had to be preceded by pre-feasibility and feasibility studies and that the paper presented to the Commission was for the purpose of giving a general indication of development opportunities and a rough estimation of financial returns which might be expected from two methods of catch - bottom trawling and purse-seining and three methods of processing the catch - freezing, canning and reduction. Until further work was done on fish processing technology and marketing development, it would appear that the only processing method presently suitable for handling high volume catches of small pelagic species was conversion to fish meal. There was clearly an urgent need for market development work and the use of more efficient techniques of handling and processing small pelagic fish for human consumption.

32. The Commission, in expressing its appreciation of the survey work already undertaken, noted that there were still areas which needed to be surveyed, in particular South Indonesia/Northwest Australia and the Bay of Bengal. Survey plans for these two areas which had been under discussion for some time had not yet come to fruition.

33. In the discussion which ensued, the Commission expressed the view that priority attention should be given to the exploitation and utilization of the conventional species and that the catch and processing technology adopted should insofar as possible be within the capabilities of the countries in whose waters the fish were caught. A distinction was made between the technology used on vessels for research work and on commercial vessels. As noted already in paragraph 25 the former should be as advanced as possible, but it was important that the results from the research work should be orientated to local needs. The importance of training was stressed.

34. The Commission recognized that in some instances the reduction of small pelagic fish to fish meal might be the only way at the present time of getting a viable fishery started, but enterprises should be encouraged to move as rapidly as possible to food products.

35. As for meso-pelagic fish, the Commission recognized the long-term significance of the findings of the North Arabian Sea survey. It urged caution in the interpretation of these findings in relation to the benefits that might accrue to the coastal states. Much work had still to be done to arrive at a suitable technology for utilization of this fish. In the foreseeable future, it was unlikely that the meso-pelagic stocks would be used for food purposes, but rather that they would be converted into fish meal.

36. The secretariat confirmed that in FAO's Work Programme top priority was given to the use of fish for direct human consumption and specific reference was made to projects which were already underway to improve the handling and processing of small pelagic fish.

MANAGEMENT

(a) Tuna

37. The Commission reviewed the outcome of the relevant meetings and other activities that had taken place since its last session in Mombasa. These included the Second Session of the IOFC Ad Hoc Committee of Nations on the Mechanics of Tuna Research and Management (December 1975), the Fourth Joint Meeting of the IOFC and IPFC Tuna Management Committees (October 1976), and the Seventeenth Session of the IPFC (October 1976). The Commission found itself in general agreement with the conclusions reached at these meetings regarding the proposed arrangements for tuna management within IOFC and IPFC, and the approximate level of funding required for a central secretariat, as set out in the report of the Joint Meeting of the Tuna Management Committees (IOFC/77/12). One delegation, however, believed that in the long run a treaty-based body would be needed.

38. It was noted, in relation to the detailed chart given in Appendix D of document IOFC/77/12, that IOFC, unlike IPFC, had not at present a standing committee concerned with resource reseach and the scientific review of information on the resources. In this connection some delegations felt that the IPFC/IOFC Ad Hoc Working Party of Scientists on Stock Assessment of Tuna (which, after the restructuring of IPFC, had become a purely IOFC body) should as soon as possible review the current state of stocks, since the available information was out of date.

39. As regards funding, it was noted that at the request of IPFC, the secretariat had circulated a questionnaire to member countries of IOFC and IPFC, soliciting their views on possible funding arrangements. Few countries had so far replied, and there was some diversity in the replies received, which were compiled in document IOFC/77/12, Sup.1. As yet, no consensus could be reached concerning the long term methods of funding, and the Commission recommended that FAO should take further steps to find sources of funding, at least for an interim period.

40. The importance of taking action to manage tuna stocks was stressed, both for the benefit of those already engaged in the long-line fishery and of the coastal states, which were finding it difficult to enter the fishery while catch rates were at the current low levels. There were difficulties in selecting measures and regulations appropriate to the general principle, set out at an early joint meeting of the tuna management committees, that the total amount of fishing should be controlled without prejudice to a more equitable participation of the coastal states in the fishery. It was suggested that this matter should be placed on the agenda of the next joint meeting of the Tuna Management Committees.

(b) Other stocks

41. Several other stocks, in addition to tuna, were probably heavily fished and in need of management. These included the stocks round Kerguelen, which for statistical purposes had until recently been included in the western Indian Ocean. The Commission noted that these resources were being considered by other groups, and it was therefore agreed that the Commission should not concern itself with them.

42. For most countries round the Indian Ocean shrimp is the most valuable resource, and its high export value had in many cases resulted in very heavy exploitation. The Chairman of the Ad Hoc Group of the IOFC Special Working Party on Stock Assessment of Shrimp in the Indian Ocean Area reported on the meeting of that Group in April 1976 to consider the state of shrimp stocks in the Gulf area. The work of the Group showed that most of these stocks were heavily fished, that management measures were desirable and that there was a need for better statistics and for improved and regularly revised assessments.

43. The report of the Group had been presented to the Coordinating Subcommittee of the Committee for the Development and Management of the Fishery Resources in the Gulfs and was distributed to member countries.

44. Delegates from member countries in the Gulf area reported that the meeting had served a most useful purpose, and action was being taken to follow-up the recommendations in the Group's report. Limitation on the number of vessels was being found the most appropriate method of controlling the total amount of fishing.

45. It was also noted that the shrimp stocks on the west coast of India were generally heavily fished and that, while those on the east coast had until recently received little attention, fishing on these, especially in the northern part of the Bay of Bengal, was now increasing rapidly. Steps should be urgently taken to review the information on both groups of resources so as to determine the state of the stocks, and the possible need for measures to manage these fisheries. This might be done by holding a workshop at an early date to review all the information relating to shrimp in the central part of the Indian Ocean.

DEVELOPMENTS IN THE REGIME OF THE SEA AND THEIR IMPLICATIONS FOR FISHERIES WITH PARTICULAR REFERENCE TO IOFC

46. The Commission considered this item on the basis of documents IOFC/77/14 and IOFC/77/17 and bearing in mind that this item was closely related to item 8 dealing with the national and regional effects of an extended zone of jurisdiction over fisheries.

47. The Commission noted that the prospective convention on the Law of the Sea would most likely set out general principles to be observed in the management and use of the living resources of the oceans, but would not offer solutions to all the scientific, administrative or political questions relating to the rational management and optimum utilization of these resources. Stressing that extended zones of jurisdiction, while providing greater opportunities to coastal states in many cases, placed increased responsibilities on them for fishery management and development, it welcomed FAO's present and planned activities aimed at assisting developing coastal states in taking full advantage of these opportunities and in discharging these responsibilities. In particular, it noted with satisfaction that the Committee on Fisheries, at its eleventh session in April 1977, had requested the FAO secretariat to prepare a comprehensive programme designed to help developing countries implement their exclusive economic zones and it felt that its own discussions under items 7 and 8 might contribute to the elaboration of this programme. In this respect, the Commission heard with great interest statements made by the delegates of the United States of America and Australia to describe the technical, institutional and legislative measures adopted or envisaged by their countries to ensure the optimum utilization of fishery resources in extended zones of jurisdiction.

48. The Commission was informed that the secretariat was preparing an annotated compendium of national legislation enacted by coastal states to implement exclusive economic zones; a series of regional studies on fishery development corporations and other parastatal bodies established to accelerate the development of fisheries in extended zones of jurisdiction; a manual providing guidelines for the negotiation of fishery joint ventures; and a report analyzing bilateral agreements on fisheries concluded by coastal states as a result of the new regime of the oceans. It emphasized that these publications would be

of considerable interest and practical value to many coastal states and it recommended that they should be accorded as much priority as possible. It noted with satisfaction that in addition to compiling, analyzing and disseminating this type of information, the secretariat stood ready to assist individual countries, on request, in drafting or reviewing legislation on fisheries, in establishing institutions or other bodies for the management, development and utilization of fishery resources, and in making preparations for the negotiation of joint ventures and bilateral agreements on fisheries.

49. As regards management, the Commission heard with interest about the action taken by another FAO regional fishery body, the Fishery Committee for the Eastern Central Atlantic (CECAF). At its last session in March 1977, CECAF had identified the stocks which could be considered to be multinational; it had described the area of distribution of these stocks and indicated which countries were concerned with their rational exploitation; it had then requested FAO to organize, within the framework of CECAF itself, a series of meetings for the purpose of allowing the countries involved to define concerted management schemes. Most delegations agreed that the Commission constituted the proper forum to discuss and agree on the management of stocks that are of interest to several countries. It was suggested that the Commission should, where necessary, set up subsidiary bodies to deal with specific fisheries. If urgency so required FAO was requested to consult with officers of the Commission to take appropriate interim measures. A particular reference was made to the the tuna stocks of interest to the oceanic island states in the area. Lastly, the Commission noted that the successful management of stocks belonging to several economic zones would depend on a determination of the total allowable catch from the stock as a whole, regardless of the area of capture, followed by an agreement on how the total allowable catch can be divided. As requested by the Commission, FAO could usefully undertake a study of the various criteria that could be considered when apportioning the total catch among the countries concerned and report back to the sixth session of the Commission.

50. When considering the implications that developments in the regime of the sea would have for fisheries at the regional level, the Commission centred its discussions on its own role as a management body and on the proposed gradual decentralization of FAO activities.

51. As to the question of decentralization of FAO activities and its implications for regional fishery bodies, the Commission pointed out that this matter had been considered by the IOFC Executive Committee for the Implementation of the International Indian Ocean Fishery Survey and Development Programme, which had also discussed the related question of establishing a regional secretariat in the region in order to ensure closer links between the secretariat of the Commission and the Programme (see document IOFC/77/6, paragraphs 56-59). While endorsing the statements of some delegates about the need to maintain a strong Headquarters, the Commission welcomed the decentralization policy and further requested that early steps should be taken to implement that policy. Other delegations drew attention to the cost of the operation which was an important factor. In this latter respect, the Commission recommended that FAO should approach donor agencies to secure funding for programmes, including training centres, workshops and fellowships, designed to promote a gradual involvement of scientists and administrators from the coastal countries in the functioning of the Commission.

NATIONAL AND REGIONAL EFFECTS OF AN EXTENDED ZONE OF JURISDICTION OVER FISHERIES

52. As had been suggested by the secretariat in document IOFC/77/15, the Commission agreed to organize discussion of this item in an informal way. The main purpose of this approach was to promote a free and frank exchange of views among participants. The Vice-Chairman of the Commission Prof. P.C. George (India), presided over the deliberations, which were divided into the following topics: knowledge of resources; management; policy and planning; and development. Messrs. E.G. Silas, Director, Central Marine Fisheries Research Institute (India), B.K. Bowen, Director, Western Australian Department of Fisheries and Wildlife (Australia), A. Labon, Director, Fishery Industries Division (FAO) and J.E. Carroz (Principal Legal Officer (International Fisheries) (FAO) acted as discussion leaders for these four topics, respectively. A summary of the discussions is given in Appendix G. The purpose of the summary was to provide a Rapporteur's view of the discussion rather than an agreed Commission statement. It was, therefore, not considered formally for adoption.

RELATIONS WITH IPFC AND OTHER REGIONAL FISHERY BODIES

53. The Commission discussed cooperation between itself and other international fishery bodies on the basis of the information provided in document IOFC/77/18. It noted that this document contained information on cooperation with IPFC. This had already been discussed under other items of the agenda and particularly under item 6(a). The Commission noted that the document also contained sections on cooperation with the United Nations Environment Programme (UNEP) and with the Intergovernmental Oceanographic Commission (IOC). These were for the information of participants and called for no comment. The document also discussed a proposal to establish a Regional Fishery Commission for the Near East and the Commission devoted its attention to this proposal.

54. The proposal had emanated from the Thirteenth FAO Regional Conference for the Near East which had been held in October 1976. The proposal was for a Commission, the members of which would be the countries serviced by the FAO Near East Regional Office in Cairo.

55. The Commission on Fisheries, at its eleventh session in April 1977 had agreed to it in principle and had requested the Director-General to consult the countries concerned and to solicit their views on the way of funding the activities of the Commission and also on the ways of coordinating the work of the proposed new Commission and the activities of the General Fisheries Council for the Mediterranean (GFCM) and IOFC. The FAO Council at its seventy-first meeting in June 1977 had endorsed the report of the Committee on Fisheries.

56. On 19 August 1977 the Director-General of FAO had, in accordance with the request of the Committee on Fisheries, sent a circular letter to the FAO Member Nations serviced by the Near East Regional Office. Certain of the questions asked were of direct interest to IOFC and in particular the questions concerning overlap in work, authority and membership between IOFC and the proposed new body.

57. The coastal countries in the Indian Ocean area which were eligible for membership of the proposed new Commission were Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Oman, Pakistan, Qatar, Somalia, Sudan, United Arab Emirates, Yemen (Arab Republic of), and Yemen (People's Democratic Republic of).

58. The Arab delegates present explained that inland fisheries presented great opportunities but needed coordinated development for which there was at present no mechanism in the Near East. The new Commission would fill this gap. Marine fishery activities for the new body in the present IOFC area would be restricted to the Gulfs, the Red Sea and the northern part of the Arabian Sea. These areas had special problems and geographical obstacles stood in the way of the adoption of a 200-mile limit by most countries in the area. The Arab countries hoped that the creation of the new Commission would lead to FAO giving special attention to the problems of the area where the members considered themselves to be in a geographically disadvantageous situation.

59. The Arab delegates present did not feel that there would be any need for major changes in IOFC when the new Commission was set up, but certain adjustments would be needed. For example the existing regional fisheries projects in the Gulfs would eventually be expected to report to the new Commission. In the view of the Arab delegations, what was likely to be needed in the long run was a coordination committee between IOFC and the new body.

60. The Commission noted that the only reply so far received to the questionnaire sent by the Director-General had been from the Government of Iraq.

61. In the circumstances, the Commission felt that it was premature for it to examine all the consequences of the proposal to establish the new Commission. It did, however, express support for the proposal to establish the new Commission. It was to be foreseen that a number of practical problems would inevitably arise, even if the countries which were members of IOFC and were eligible for membership of the proposed new body, decided to belong to both. The division of responsibility between the two bodies, particularly for management measures whenever these became necessary, would need careful coordination in which FAO Headquarters would perforce be involved. There was already overlap in the eastern part of the Indian Ocean with IPFC (which body also had responsibility for freshwater fisheries). If the new body was set up for the Gulfs, the Red Sea and the northern part of the Arabian Sea, the only countries in the Indian Ocean that were not already members of IPFC and would not be eligible for membership of the proposed Near East Fishery Commission would be those down the eastern coast of Africa, south of Somalia and the Island States in the western Indian Ocean. In view of this, it was noted that the limitation of the area of responsibility of IOFC to the western Indian Ocean was just one other possible course of action.

62. It was felt that IOFC should not recommend any specific action regarding its own future until replies had been received to the questionnaire from all the countries serviced by the Near East Regional Office. If the new body was set up, the matters that would require immediate attention would be coordination between the two bodies and the general position of the Indian Ocean Programme (IOP). In this latter respect the Commission agreed that IOP should continue to report to IOFC only, while the situation would need review after the establishment of the new body, which was unlikely to become active during the present phase of IOP.

63. The Commission decided that the future of IOFC should be a major item on the agenda of its sixth session. It also recommended that this matter should be drawn to the attention of IPFC at its eighteenth session in Manila in 1978.

64. A proposal was made that a sub-regional body of IOFC should be established for the western part of the Indian Ocean and, particularly, for the island states in that area. It was, however, agreed that no action should be taken on this proposal until it was known whether the new proposed Fishery Commission for the Near East would, in fact, be set up and until IOFC had discussed its consequences at its sixth session.

SUBSIDIARY BODIES OF THE INDIAN OCEAN FISHERY COMMISSION

65. The Commission discussed this item on the basis of the information contained in document IOFC/77/19 - Activities of the subsidiary bodies of IOFC. It took note of the costs of IOFC meetings in 1976-77 as shown in Annex 1 to this document and the details of the membership and functions of the six subsidiary bodies of IOFC given in Annex 2 to the document.

66. It approved the report of the subsidiary bodies before it and decided to consider briefly the activities and future of each of them.

67. The Commission agreed that the next session of the IPFC/IOFC Joint Working Party of Experts on Indian Ocean and Western Pacific Fishery Statistics should be held in March 1978 immediately before the eighteenth session of IPFC. It noted that at that time the working party as presently constituted might well recommend to IPFC that it had completed its mandate in laying down standards for the collection of statistics and establishing statistical areas in the Indian Ocean and western Pacific areas. The type of body likely to be needed in the future was one that could deal with statistics of particular stocks on a more detailed basis and must for that reason cover a smaller and more manageable area. It seemed likely that IPFC would make recommendations along those lines. The Commission agreed that if IPFC did make such recommendations, IOFC would go along with them and would decide on appropriate action and terms of reference for its own part of the working party at the sixth session.

68. The Commission agreed that the Committee on the Management of Indian Ocean Tuna should hold its sixth session as a joint meeting with the IPFC Tuna Management Committee in March 1978.

69. IOFC agreed that the Executive Committee for the Implementation of IOP should hold its seventh session in June 1978 at the time of the twelfth session of the Committee on Fisheries.

70. The Commission noted that the Special Working Party on Stock Assessment of Shrimp in the Indian Ocean Area had met once only (29 November-2 December 1971). The report of that meeting presented a general description of the major shrimp fisheries of the Indian Ocean and drew attention to the fact that most of the stocks were each limited to the waters of a single country. There were exceptions such as the shrimp fisheries in the Gulf between Iran and the Arabian Peninsula. This same view was expressed in document IOFC/77/9 - Current management problems in the Indian Ocean area.

71. The Commission also noted that an Ad Hoc Group of the IOFC Special Working Party had been established at the fourth session of IOFC for the specific purpose of reporting upon the stocks of shrimp in the Gulf. The report of this Ad Hoc Group (IOFC/77/13) had been commended to the Gulf countries for their consideration. The Ad Hoc Group had now completed the task for which it had been set up.

72. Considering the experience gained from the meetings held to date, the Commission expressed the view that there would be merit in retaining the Special Working Party on Stock Assessment but that its function should in future be to establish Ad Hoc Working Groups of Shrimp Stock Assessment specialists from time to time to assist nations, at their request, to analyse shrimp data and prepare reports on the state of the shrimp stocks and alternate management strategies. The terms of reference of the working party should be amended to reflect this change in function.

73. The Commission noted that the Committee for the Development and Management of the Fishery Resources of the Gulfs had great potential. A meeting of this Committee was in the programme of meetings for the coming biennium. IOFC expressed the view that if the proposed Fishery Commission for the Near East was set up, the work of this Committee would then come within the purview of the new Commission.

74. The Commission took note of the fact that the IPFC/IOFC Working Party of Scientists on Stock Assessment of Tuna would in future be a purely IOFC body as the functions of the IPFC part of the Working Party had been absorbed within the framework of the newly established IPFC Standing Committee on Resource Research and Development (SCRRD) (IOFC/77/Inf. 7, paragraph 44). It was proposed that the IOFC part of the Working Party should not be abolished but its membership should be expanded to include all those member countries with an interest in the fisheries of the Indian Ocean. Expert observers from other international tuna commissions should also attend as observers. It could also be redesigned in such a way that it would become a standing committee on tuna resource research and development for IOFC and would accordingly be the scientific body shown in the diagram in Appendix 3 to the report of the IOFC Ad Hoc Committee of Nations on the Mechanics of Tuna Research and Management (IOFC/77/10). A matter that required early attention from the Ad Hoc Committee, or a future Standing Committee was the determination of the degree to which the total catch of larger tuna could be increased by increased surface fishing on the intermediate sizes of fish.

75. It was agreed that the IOFC Tuna Management Committee should at its sixth session in March 1978 study the need for IOFC to have an SCRRD for tuna. If the Tuna Management Committee believed there was such a need, the secretariat should be invited to draft new terms of reference for an SCRRD for tuna for IOFC and present them to the sixth session of IOFC for consideration.

AMENDMENTS TO THE RULES OF PROCEDURE OF IOFC

76. The Commission was informed that at its seventeenth and eighteenth sessions in 1973 and 1975, the Conference of FAO had adopted amendments to the Basic Texts of the Organization with respect to (i) the participation of non-Member States in FAO bodies and meetings and (ii) the Rules of Procedure of bodies established under Article VI or Article XIV of the Constitution. On that occasion, the Conference had invited the bodies concerned to bring their Rules of Procedure into line with those amendments.

77. Accordingly, the Commission adopted the following amendments to its Rules of Procedure:

(i) It replaced paragraph 2 of Rule VII with the following text:

"States which, while not Member Nations of the Organization, are members of the United Nations, any of its Specialized Agencies or the International Atomic Energy Agency, may, upon their request and subject to the provisions adopted by the Conference of the Organization relating to the granting of observer status to nations, be invited to attend sessions of the Commission, its subsidiary bodies, and Ad Hoc meetings in an observer capacity. The status of States invited to such sessions or meetings shall be governed by the relevant provisions adopted by the Conference of the Organization".

(ii) In the second sentence of paragraph 1 of Rule XII, it deleted the words "subject to confirmation by the Council of the Organization" and replaced the comma by a full stop after the words "upon approval by the Director-General".

ANY OTHER MATTERS

78. None

ELECTION OF OFFICERS

79. Under Rule II-1 of its Rules of Procedure, the Commission is required to elect, at the end of every session, a Chairman and a maximum of six Vice-Chairman who shall remain in office until the election of the new Chairman and Vice-Chairman.

80. Acting on the recommendation of the Nominations Committee, the representative of India, Professor P.C. George, was unanimously elected Chairman of the Commission and the representative of Indonesia, Admiral I. Sardjono, first Vice-Chairman. Australia, Bahrain, Sweden, Tanzania, and the United Kingdom were elected as other Vice-Chairman.

81. The membership of the Executive Committee consisted of the Chairman and the Vice-Chairman of the Commission as well as representatives of not more than four other countries. Acting on the recommendation of the Nominations Committee the Commission elected Japan, Kenya, Qatar, and Thailand as members of the Executive Committee.

DATE AND PLACE OF SIXTH SESSION

82. The Commission accepted with pleasure an invitation by Australia to hold the sixth session of IOFC in Perth, preferably in October 1979.

ADOPTION OF THE REPORT

83. This report was adopted by IOFC on 26 October 1977.

Appendix A

LIST OF DELEGATES AND OBSERVERS

MEMBERS OF THE COMMISSION

Australia

WALKER, R.H.
Director
Resources Management Section
Operations Branch
Fisheries Division
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Appendix B

ADDRESS BY SHRI A.K. ANTONY
CHIEF MINISTER OF KERALA

Mr. Chairman, Distinguished Guests and Friends,

It gives me the greatest pleasure to be associated with this august function here this morning. I am thankful to the Food and Agriculture Organization of the United Nations and the Ministry of Agriculture of the Government of India for choosing Cochin as the venue of this year's Conference of the Indian Ocean Fishery Commission. I heartily welcome the distinguished guests to Kerala and hope you will thoroughly enjoy your stay of one week in this State.

The optimum exploitation of the resources of the Indian Ocean is an economic problem of the highest magnitude so far as the nations lying around the ocean are concerned. I am happy to see that the Food and Agriculture Organization has fully realised the urgency and importance of this problem and constituted the Indian Ocean Fishery Commission to deal with it internationally at the highest level. It is also gratifying to note that not only the countries which have close proximity to the Indian Ocean but also other nations which have an involvement in the problems of the ocean are represented in this Commission. It is also in the fitness of things that other world organizations which are interested in the exploitation of fishery resources have also been invited to join the deliberations here.

I am told that the fishery resources in the Indian Ocean are not being fully exploited now, owing to so many reasons. If I understand correctly, only about three million tons of fish are being caught every year from the Indian Ocean at present. It is necessary that the fish landing in this area must be stepped up to at least 12 million tonnes or even more. Indian has certainly got a great stake in the matter since at present about 40 percent of the fish landing from the Indian Ocean is being made by India. Of this, I am happy to mention, a considerable portion is caught in Kerala State alone. I hope during the ensuing sessions, you will discuss in detail methods and procedures for enhancing the fishery exploitation of the Indian Ocean without detriment, at the same time, to the requirement of conservation of marine biological wealth.

When several countries are engaged in the exploitation of the wealth of the same ocean, it is very important to ensure that there is a proper understanding among them regarding the rights of each nation. As you are all aware, most of the nations of the world have already declared a 200-mile economic zone in the seas surrounding them. This would mean that the area of the oceans which can be freely exploited by all countries has now been considerably restricted. If this new situation is not handled with care and prudence, a lot of illwill can be generated. I hope that your deliberations here will lead to a proper collective understanding of long-term value in this particular field.

Even though the technology of fishing has made great strides in the advanced nations of the world, it is face that in the underdeveloped countries, including most of the States lying close to the Indian Ocean, fishing still continues to be carried on in the traditional and primitive manner which is becoming more and more uneconomical. It is necessary that the benefits of the latest developments in fisheries science should be brought nearer to the fishing communities of the backward countries also. I think it should be one of the foremost objectives of the Indian Ocean Fishery Commission to see that this goal is achieved in the shortest possible time.

I may also mention here that, apart from the maximum exploitation of the fishery wealth of the ocean in the most scientific manner, there is another aspect which should also receive urgent attention. I am referring to the plight of the actual fishermen in many underdeveloped countries. Traditional fishermen constitute one of the most unprivileged sections of the community in these countries. Even though they are engaged in the occupation of producing valuable protein food for others, they are themselves ill-fed, ill clothed and poorly housed. It is my earnest request to you all that the problem of the speedy uplift of these unfortunate brethren may also be given due importance in your discussion.

You are going to have your sessions at the Central Institute of Fisheries Technology which lies within the area of the Cochin Port. This reminds me of the fact that Cochin is one of the foremost centres of fish export in Asia. Great strides have been made by Cochin in the field of export of sea foods in the last two decades. A new well developed fishing harbour is going to be inaugurated at Cochin within another three months and it will certainly open a new chapter of effort and achievement in the history of Cochin Port.

I once again thank the organizers of this Conference in having called upon me to inaugurate it. With the consent of all assembled here, I declare the Fifth Session of the Indian Ocean Fishery Commission formally inaugurated.

Thank you all.

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Appendix C

ADDRESS BY SHRI G.V.K. RAO
SECRETARY TO GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE AND IRRIGATION, NEW DELHI

Honourable Chief Minister, Mr. Watzinger, Mr. Odero, Distinguished Delegates, Ladies and Gentlemen,

It is my pleasant duty and privilege to be present at this important session of the Indian Ocean Fishery Commission. We are grateful to the Food and Agriculture Organization of the United Nations to have agreed to host this Conference in India particularly in this beautiful city in Kerala. Kerala is one of the smaller States of India, but at the same time, is one of the most important States in fishery development. This State accounts for about 35 percent of the total marine fish production and a sizeable export of marine products also takes place from Kerala.

The deliberations of the Commission as well as its timing are important to the countries in the Indian Ocean area in general and to my country in particular. Anticipating the emerging trends of the United Nations Conference on the Law of the Sea, India has declared an exclusive economic zone of 200-miles and this has taken effect from 15 January 1977. You are aware that several countries in the Indian Ocean area as well as of other areas, have also taken similar action. As far as my country is concerned, this has brought in, among other things, the responsibility of optimum utilization of about two million km^2 of the sea. In order to avoid a vacuum being created due to the withdrawal of distant water fishing fleet, India has launched a massive programme of introduction of deep sea fishing vessels, training of technical manpower and construction of several fishing harbours and establishment of adequate storage facilities ashore, tied up with suitable marketing arrangements. By a recent public notice we have invited applications from the industry for import of deep sea fishing vessels from various sources and I am very happy to mention that this has received very favourable response from the Indian fishing industry. Similarly fishing companies from advanced fishing countries are now holding active negotiations for joint ventures with Indian industry in fishing and utilization of marine products. We have to achieve the projected target of 200 numbers of deep sea fishing vessels in a couple of years.

India's position as far as fishery development is concerned is that of a teenager. We are not in any way in our infancy as far as fishery development is concerned. At the same time, we have not reached the full stature of a deep sea fishing nation. Already 13 000 coastal mechanised fishing vessels are operating from our coasts along with 100 000 indigenous sailing vessels, bringing a catch of one and a half million tonnes of fish from our seas. Our export of marine products have reached an all-time high value of 2 000 million rupees. However, our exploitation of living resources is limited mainly to the coastal belt and we have at present only a small fleet of deep sea fishing vessels. In view of these, we have to implement an accelerated programme of fishery development for optimum utilization of all the located resources covering all activities connected with fishing, processing and marketing.

It is understood that the agenda of the Indian Ocean Fishery Commission includes several items on management and optimum utilization of resources. As you are aware, India is the largest producer of fish from the Indian Ocean. But our requirement is several times that of our present production. Per capita consumption of fish in India is only about four kg per annum when compared to 15 kg in the United States of America and 21 kg for the United Kingdom. Hence we look to our seas as an important source to fill the protein gap in the diet of our people, to provide gainful employment to the people in coastal areas and as an important source for earning foreign exchange.

It has been mentioned that the annual yield of the Indian Ocean fisheries is estimated to be about three million tonnes as against 26 million tonnes of the Atlantic and 30 million tonnes of the Pacific. It may be remembered that more than 30 percent of the global population live in the countries bordering the Indian Ocean and that about five percent of the world sea fish catch only is available to them. While these statistics call for all our efforts to be devoted to fisheries development in the Indian Ocean area, the projection that with the existing technology the yield of the Indian Ocean fisheries can be increased to four to five times, is extremely gratifying.

We have always been of the view that the Indian Ocean should serve as a zone of peace. I would wish to suggest to this august body to develop a strategy so that the Indian Ocean should not only serve as an area of peace but also as a source of prosperity for the countries of the area. There is urgent need for massive assistance by way of modern technology and various inputs to raise the capabilities of the countries bordering the Indian Ocean. I am happy to note that not only the littoral nations but also countries that have been assisting in the fisheries development in the area are also actively participating in this Conference. I also understand that the various funding and financing institutions are also represented in the meetings to assess the requirements and to assist in identifying priorities for development. I am sure that you would sit together and devise measures by which national capabilities could be adequately raised so that the fishery resources of the Indian Ocean are exploited to the optimum level for the direct benefit of the peoples of this region.

India has achieved self-sufficiency to some extent in coastal fishery management. We have also several national fishery institutions which are doing good work in the development of technology for management of fisheries. I do not know the details of the technological development in our neighbouring countries but I wish to inform the distinguished delegates from participating countries that India is ready to share with them the technology and expertise we have developed in the management of fishery resources. Similarly, we look forward to such gestures from countries with advanced technology and expertise and from the international organizations.

While I do not profess any technical competence to suggest priorities in your deliberations, I am sure, the problems and programmes of the artisanal sector will not be lost sight of as you are quite aware the traditional fishing sector is still the main backbone of the fishing industry in most of the developing countries. In India we have nearly a million fishermen engaged in fishing and ancillary industries. More than 70 percent of total fish production is contributed by them and the bulk of our raw material for export

also comes through the efforts of the coastal fishermen. In this context, the problems of the small fishermen and the small processor, particularly in updating his technology of fishing and processing, in the supply of inputs and to ensure a better return for his produce, cease to be small but gigantic and complicated, and I am sure, you will devote all the attention this sector deserves and come out with a new strategy for development of the artisanal sector along with the other sectors of the fishery industry.

I am sure that these and several other problems relating to the exploitation and management of resources both coastal and oceanic would be discussed by you in the next few days of your stay in this country. We also look forward to the new strategy you will be evolving for better utilization of all the resources. I use this occasion to reiterate our Government's best wishes for the Conference and my country's readiness to cooperate with the countries in the Indian Ocean area and with the regional and global bodies, for evolving and implementing management programmes for the optimum utilization of the living resources.

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Appendix D

ADDRESS BY MR. H. WATZINGER
ASSISTANT DIRECTOR-GENERAL (FISHERIES), FAO

Mr. Chairman, Honourable Minister, Members of the Commission, Ladies and Gentlemen,

It is my pleasant duty to address you today and to convey to you our Director General's best wishes for the success of your deliberations and to thank the Government of India and the Government of the State of Kerala for being host to this meeting.

I would like to add that for me it is a particularly happy occasion not only because we are in this area which has a long tradition as a centre of fisheries but also because it will enable me to gain first-hand knowledge of the conditions and problems of fisheries in this southern region of India and to see how you are tackling them and the progress you are making.

We meet at a time of significant changes in the world which will strongly affect not only the fishery activities of countries of this region but also the activities of the Commission itself and its future. The Indo-Pacific Fisheries Council which met in October-November 1976 examined its own functions and responsibilities in the light of world-wide developments and decided in its own interests and those of its member countries that is should modify its constitution so as to be able to play a more significant role in the development of fisheries in the region. I suggest that this Commission is faced with a similar challenge. The two most significant recent developments for fisheries are: the demand for a New International Economic Order and the Law of the Sea negotiations, the latter in fact being a manifestation of one aspect of the former. As the Director-General of FAO has stated, "The NIEO is not an empty slogan. For FAO it is very important and relevant". Indeed it has been a predominant concern behind the new policy of FAO, for, in effect, it calls for the promotion of national self-reliance through the build-up of the capabilities of the developing world, with special concern for the interests of the poorer segments of society.

The Law of the Sea negotiations have not been concluded but the principle of exclusive economic zones has been accepted and most countries have declared such zones. And FAO, in its work in fisheries, has accordingly prepared itself, through new orientations in policy and changes in the structure of the Fisheries Department, to meet the new responsibilities.

At its last session in April 1977, the Committee on Fisheries examined and endorsed the major proposals for future activities of the Fisheries Department. I shall pick out only two elements of strategy of particular relevance to your deliberations, They are to:

(1) seek to achieve the objectives of the New International Economic Order by working with developing countries. These countries should:

(i) attain self-reliance by, among other things, taking full advantage of technology transfer

(ii) increase the availability and consumption of protein from fisheries

(iii) execute developmental and management programmes, including inter-country and regional projects in close association with regional fishery bodies, giving especial attention to development of small-scale fisheries

(iv) improve the socio-economic condition of fishermen and other fishery operatives

(v) and develop as much as possible international trade in their fish and fishery products

and the second element is to:

(2) promote inter-country collaboration, on a regional basis where appropriate, by:

(i) decentralization of activities to the extent feasible, relying on regional fishery bodies located as far as possible in the areas concerned for this purpose; an increase in efforts to service these bodies, including the posting of specialist staff to them, thus increasing their competence and their self-reliance.

(ii) the establishment of agreed common practices in the conduct of industrial activities through arrangements between the countries directly concerned. The establishment of institutions relative to the new regime of the seas and their procedures is expected to extend over a transitional period of, perhaps, five years. FAO could contribute to this process as requested by Member Governments.

This strategy of self-reliance, decentralization and strengthening of regional bodies was endorsed by the Committee on Fisheries and I hope that you will examine your work and the future of this Commission in its light.

Among the matters to be discussed at your meeting are: the International Indian Ocean Fishery Survey and Development Programme; developments in the regime of the sea and their implications for fisheries with particular reference to IOFC; national and regional effects of extended zones of jurisdiction over fisheries; relations with IPFC and other regional fishery bodies; and the rules of procedure. These five items are intimately related. As I have pointed out, developments in the regime of the sea have had, and will have, profound effects on the fisheries of developing countries. Hitherto these countries had little or no responsibility in the use of these resources and now they have exclusive rights and full responsibility which presents them with problems of development, of industry and of institutions.

These changes of jurisdiction have effects on regional bodies. You are aware that proposals have been made for establishing a Near East Fisheries Commission and this and the question of relations with the Indo-Pacific Fisheries Council have relevance to the extent of your jurisdiction and the nature of your activities. The Indian Ocean Fishery Survey and Development Programme could, in a sense, be considered a development arm of IOFC. In fact, you have a special Executive Committee to oversee the implementation of the Indian Ocean Programme.

Within this complex of interrelated and interacting situations, the Commission can usefully examine how best it might assist in promoting self-reliance through strengthening of the fishery bodies as well as establishing their secretariats in the region concerned.

We, in FAO, have considered it very important that fishery administrators and others from the region should be given facilities for access to the work of regional fishery bodies, both those established under FAO and thos independent of the Organization.

Indeed, in order to build up administrative and secretariat strength in the region, we should like to see provision made for practical training in this field of work towards which we, in FAO Headquarters, would contribute. The need is for a continuing effort in such training, a scheme calling for modest financing, yielding results of lasting value to the regional bodies and to the Governments concerned.

Relative to the question of the future of the Indian Ocean Programme you should keep in mind the possibility that it could provide services to the Commission. It could accept seconded local personnel to be trained in the Programme work and it perhaps could assume a secretariat role even as an interim measure. But whereas this programme will not continue indefinitely we may reasonably expect that the Commission will, and could assume its functions.

Mr. Chairman, I have given you a brief statement of FAO's policy regarding fishery commissions and of some critical issues requiring consideration. In the final analysis, the responsibility for these regional bodies will rest with member countries. FAO as you know played a pioneering role in setting up these regional fishery bodies. As participating countries have acquired greater experience, this has become a supporting role, particularly at the technical level, and in the secretariats. With the assumption of even greater responsibilities by the member states in the future, FAO's role should, in our view, be consultative, that is to provide professional and expert advice, when requested and to act as a service organization to the member countries, while the role of the Indian Ocean Programme will continue to be oriented to the high priority areas in the region. It is my earnest wish, therefore, that you give serious consideration to the issues I have raised to provide a clear picture of how you would wish IOFC to function in the future.

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Appendix E

AGENDA

1. Opening of the session

2. Adoption of the agenda and arrangements for the session

3. Fishery statistics

4. State of stocks

5. International Indian Ocean Fishery Survey and Development Programme

   (a) Report of the Executive Committee (sixth session)

   (b) Research and survey activities

   (c) Fishery development opportunities

6. Management

   (a) Tuna

   (b) Other stocks

7. Developments in the regime of the sea and their implications for fisheries with particular reference to IOFC

8. National and regional effects of an extended zone of jurisdiction over fisheries

9. Relations with IPFC and other regional fishery bodies

10. Subsidiary bodies of the Indian Ocean Fishery Commission

11. Amendments to the Rules of Procedure of IOFC

12. Any other matters

13. Election of officers

14. Date and place of the sixth session

15. Adoption of the report

Appendix F

LIST OF DOCUMENTS

IOFC/77/1	Provisional agenda
2	Annotated provisional agenda
3, Rev. 1	Provisional timetable
4	Action needed for improvement of national fishery statistical systems in the Indian Ocean
5	Review of the state of exploitation of the fish resources of the Indian Ocean
6	Report of the Sixth Session of the IOFC Executive Committee for the Implementation of the International Indian Ocean Fishery Survey and Development Programme, Cochin, India, 17-18 October 1977
7	Regional cooperation in resource research
8	Fishery development opportunities in the Indian Ocean
9	Current management problems in the Indian Ocean area
10	Report of the Second Session of the IOFC Ad Hoc Committee, of Nations on the Mechanics of Tuna Research and Management, Bangkok, Thailand, 12-13 December 1975
11	An immediate management programme for tuna in the IPFC/IOFC region
11, Sup. 1	Comments on the management programme by Japan
12	Report of the Fourth Joint Meeting of the IPFC Special Committee on Management of Indo-Pacific Tuna (Fourth Session) and the IOFC Committee on Management of Indian Ocean Tuna (Fifth Session), Colombo, Sri Lanka, 29-30 October 1976
12, Sup. 1	Replies to the questionnaire on the proposed establishment of a trust fund for an IOFC/IPFC tuna management programme
13	Report of the Meeting of the Ad Hoc Group of the IOFC Special Working Party on Stock Assessment of Shrimp in the Indian Ocean area, to consider the stocks in the area covered by the UNDP/FAO Regional Fishery Survey and Development Project (REM/71/278)

	14	Developments in the regime of the sea and their implications for fisheries with particular reference to IOFC
	15	Effects of extended jurisdiction - Explanatory notes
	16	Distribution and migration of major fishery resources in the IOFC area
	17	National legislation and bilateral agreements related to extended zones of jurisdiction in the IOFC area
	18	Cooperation between the Indian Ocean Fishery Commission and international bodies
	19	Activities of the subsidiary bodies of IOFC
	20	Proposed amendments to the Rules of Procedure of IOFC
IOFC/77/Inf.1		List of documents
	2	Information for participants
	3, Rev.1	List of delegates and observers
	4	Bibliography of Indian Ocean fisheries
	5	Report of the Fourth Session of the Indian Ocean Fishery Commission, Mombasa, Kenya, 21-25 July 1975
	6	Report of the Eleventh Session of the Committee on Fisheries, Rome, Italy, 19-26 April 1977
	7	Report of the Seventeenth Session of the Indo-Pacific Fisheries Council, Colombo, Sri Lanka, 27 October-5 November 1976
	8	Functions, methods of operation and financing of secretariat and committees
	9	[This document was not issued]
	10	Report of the Fourth Session of the IPFC/IOFC Joint Working Party of Experts on Indian Ocean and Western Pacific Fishery Statistics, Colombo, Sri Lanka, 25-28 October 1976
	11	The tuna stocks of the Indian Ocean and their fisheries

IOFC/77/Inf.12 Report of the IPFC Ad Hoc Committee to Review the Functions and Responsibilities of IPFC, Bangkok, Thailand, 8-11 December 1975

13 Extracts from the Report of the Ninth Session of the
13,Corr.1 Coordinating Working Party on Atlantic Fishery Statistics, Dartmouth, Canada, 17-23 August 1977

14 Address by Mr. H. Watzinger, Assistant Director-General (Fisheries), FAO, at the opening ceremony of the Fifth Session of the Indian Ocean Fishery Commission

15 Presidential address by Shri G.V.K. Rao, Secretary to Government of India, Ministry of Agriculture and Irrigation, New Delhi, at the opening ceremony of the Fifth Session of the Indian Ocean Fishery Commission

Appendix G

NATIONAL AND REGIONAL EFFECTS OF AN EXTENDED ZONE OF JURISDICTION OVER FISHERIES

Summary of discussions

(i) KNOWLEDGE OF RESOURCES

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The extension of limits of jurisdiction is a milestone in fishery history, affecting all elements from research through administration and planning, to the industry and the individual fisherman. In some cases the impact is direct and traumatic, as when long range fishermen no longer having uncontrolled access to the grounds they have been accustomed to fish. In other cases, the impact is more psychological, making countries aware of the possibilities in the resources off their coasts, and of their responsibilities for the conservation and rational utilization of these resources. The latter is generally the situation in the Indian Ocean. Fishing by non-coastal countries accounts for a much smaller proportion of the total catch than in most other regions. Also fishing by countries from outside the Indian Ocean is mainly confined to long-lining for tuna, which is or can be largely carried out outside 200 miles. The practical obstacles (poor knowledge of the resources, and of the appropriate catching and processing technology, poor markets, high costs of capture, etc.) which have inhibited development of fisheries on the off-shore resources will not be reduced as a result of the change in jurisdiction. At the same time the fact of extended jurisdiction is providing the incentive to seek solutions to these problems. Similarly there are few, if any, management problems in the Indian Ocean that will be immediately made easier by extended jurisdiction (unlike the situation in the North Atlantic), but the fact of extended jurisdiction gives a boost to the consideration of management problems, including those of the coastal fisheries within the narrow territorial limits.

The extension of jurisdiction thus makes few essentially new demands on the knowledge of resources, but does make it more likely that this knowledge will be used, and therefore more important that the research on the resources is properly matched to the type of knowledge that is required by the ultimate users. These requirements are more closely related to the state of development of the fishery, than to the position of the resources inside or outside the narrow limits of jurisdiction.

When a resource is unexploited the resource information needed may be very little, though the details needed are related to the way in which development takes place. In developed countries the main growth has in the past taken place in small steps. New stocks usually became exploited through the activities of one or two more adventurous skippers in existing fisheries making trial voyages somewhat further afield. If these were successful they were followed by others from the existing fisheries; later new vessels, possibly modified in size or type or gear used might be constructed specially for the new resource.

Developments were seldom the result of carefully worked out plans based on resource surveys, test fishing, etc. More recently, partly because of the greater costs involved in trial voyages even of only one or two commercial vessels away from the well-known grounds, there has been greater governmental involvement in exploratory and trial fishing. Also, with the expansion of general scientific knowledge of the oceans, even trial voyages by commercial enterprises involving the use of scientific resource information to a greater extent.

The history of the blue whiting fishery in Atlantic north-west of the British Isles illustrates several of the stages. The existence of this large resource was first established from the occurence of eggs and larvae in samples collected for purely scientific purposes. Its magnitude and distribution were then mapped by acoustic surveys by fishery research vessels. Commercial vessels fishing for fish meal in the North Sea took advantage of this information to develop a successful fish meal fishery, but government sponsored trial voyages for fish from this stock for human consumption have so far not been successful.

The existence of a resource, and knowledge of its magnitude and distribution is no guarantee that a viable fishery can exist. For example there is a substantial jack mackerel resource off south-eastern Australia, with a potential yield of some tens of thousands of tons. Attempts to develop a purse-seine fishery on jack mackerels have been a failure because the small school size did not allow daily catch sufficient for the vessels being used.

The basic minimum needs for resource information about a stock that is not yet exploited are therefore usually simple.

(a) An assurance that the resource is at least big enough to support the scale of exploitation planned for the initial phase of development.

(b) Information on catch rates by the vessels being planned, including the seasonal patterns, and the likely magnitude of year-to-year fluctuations.

(c) The likely price for the fish caught - this is not strictly a resource question, but is linked to the question of the species, size, and quality of the fish caught.

Of these (b) requires the greatest precision, (a) need not be known at all precisely. It is usually enough to know that the lower limit of the potential yield is above the size of the initial harvest, which is usually small except for fish meal operations. Sometimes, if catch rates or possible uses (and hence prices) are not well known, it will be necessary to carry out extensive studies to establish them. In that case one should know that the resource is big enough to make this study worthwhile. For example, the present value of knowing that the potential yield of Antarctic krill is nearer to 50 million tons than one million tons, is that the larger figure makes it very worthwhile to study ways of economically catching and processing krill.

When a resource is already being exploited the information needs are different. So far as further development is concerned, the required information on potential catch rates etc. can largely come from the existing fishery. The policy makers need information on the level of exploitation so that they can decide on the degree of encouragement to be given to further development. If the current catches are a small fraction (less than say 10-20 percent) of the estimated potential yield, then development can be actively encourage; at higher levels further development, though quite feasible, will begin to affect the catch rates in the existing fishery and the government may wish to be neutral towards development; when the catches approach the limit set by the resource, further development will need to be actively discouraged.

The basic information is therefore the degree of exploitation, expressed perhaps as the percentage of the possible catch that is currently being taken; the precision required will increase with the level of exploitation, being initially fairly low. Important additional information concerns the distribution and migration of the fish, so that the identity or separation of individual stocks can be established. From this, it is possible to determine whether or not a new fishery in one area will affect existing fisheries in other areas.

The most detailed information is required when stocks are heavily fished, and management measures have to be introduced. The most important information is merely the establishment of the fact that the stock is indeed heavily fished. What other information is needed, mostly concerning the effects of different possible management measures (catch quotas, closed seasons, etc.) will depend on the type of measures that are politically and legally feasible, and on the range of social and economic effects that may have to be taken into account in addition to the effects on total catch.

Resource information will only be fully utilized if there are adequate arrangements for the flow of information from those carrying out resource studies to the ultimate users. Even within the Government structure there is very often inadequate communication between administrators and research workers. The former do not know what the others can provide, and the latter do not know what the others need. Outside the government, large commercial undertakings are usually aware of where they can obtain the resource information they need but this is not true of smaller enterprises. These may have difficulty in finding information, or even becoming aware that it exists. Advantage should be taken of the new atmosphere resulting from extended jurisdiction to improve communication regarding resources both within and outside government.

This communication should be in both directions; much of the most valuable information on resources come from the fishermen themselves. In the Indian Ocean, the small-scale coastal fishermen are particularly important. Arrangements need to be made to ensure that they can be helped and trained to supply the information from which the status of the resources they exploit can be assessed, and that they, as well as policy makers, are informed of the results of such assessments.

Where a stock occurs within more than one national jurisdiction, or on the high seas, arrangements need to be made for the information and reserach results from all countries interested in the resource to be combined. Where only two or three countries, especially adjacent coastal states, are concerned the arrangements can be informal though, as has been the case for discussions between Japan and Australia on southern bluefin tuna it can be convenient for these to be carried out within the structure of a body life IOFC. Where more countries are concerned a more formal structure, especially for central data compilation, and discussion between scientists to reach a clear agreement on the state of the stocks, may be necessary.

(ii) MANAGEMENT

Rapporteur: Mr. B.K. Bowen
Director
Western Australian Department of Fisheries and Wildlife
(Australia)

Some participants noted that in accordance with the provisions of the Informal Composite Negotiating Text now before the Conference on the Law of the Sea, the coastal States should determine the allowable catch of the living resources in their exclusive economic zones, as well as their capacity to harvest these resources, and, under prescribed conditions, give other States access to the surplus of this total allowable catch (TAC). The difficulty in applying the simple formula - TAC minus coastal state catch equals surplus available for foreign vessels - is that the TAC is not uniquely defined. Different objectives (high total yield, high catch rates, high net economic return, etc.) will lead to different points on the yield curve being determined as optimum, and hence to different values of fishing effort and of TAC. In practice, the choice of TAC, and hence of any surplus, will be made by the coastal state in the light of national objectives.

Whenever a stock occurs within the jurisdiction of more than one country the management policies of the countries concerned should be closely coordinated. This may take the form of setting an overall TAC for the stock, and then agreeing on the proportions of that TAC to be taken within each jurisdiction.

Highly migratory species like tuna present special problems. Allocations of shares have to take account of catches on the high seas as well as those within national jurisdiction. It was suggested that some aspects of this problem could be placed on the agenda of the next joint meeting of the IOFC/IPFC Tuna Management Committees. Where small island states have contiguous areas of jurisdiction which together cover large ocean areas, especially when the distribution of tuna in these areas is highly variable, there could be advantages in joint systems of fishing as well as cooperation in management.

While the limits on the amount of fishing will often be expressed as an allowable catch, for enforcement purposes there are advantages in expressing limits in terms that are more readily observed and controlled, e.g. as numbers of vessels. In either case, there are operational advantages in having the

permits to operate a vessel or to take a given annual catch valid over as long a period as possible. However, for short lived fish, e.g. sardine or anchovy, year to year changes in the stock abundance make it difficult for management controls to be set for periods longer than a year.

Surveillance and enforcement are essential for successful management. Surveillance, which is most often carried out by the coastguard, is expensive but, because vessels are usually concentrated in certain favoured areas, it is not as difficult as the size of the 200-mile zone might suggest. It can be made easier by requesting radio reports at regular intervals, or when entering and leaving the EEZ. A requirement to put into port is not usually needed, except possibly where a check on the compliance with the regulations, e.g. on species caught, makes a physical inspection of the catches desirable. In any case, checking on compliance will be helped by a requirement to use a standard log-book, such as that suggested for the North Atlantic.

(iii) POLICY AND PLANNING

Rapporteur: Dr. A. Labon
Director
Fisheries Industries Division (FAO)

Current national fisheries policy will, in many cases, have to be reviewed and probably revised in the light of extended jurisdiction zones. Countries which as a result of introduction of extended zones have the responsibility to manage and exploit the resources within their jurisdiction, will have to define the time frame within which they want to expand their fisheries so as to meet the policy objectives. Fisheries policy has to be viewed as a part of the government's overall economic policy and would therefore embrace amongst others the following important objectives:

the contribution of fisheries to national food production
the role of the fisheries industry as a foreign currency earner/saver
(exports or reduction/elimination of imports)
employment opportunities
socio-economic aspects of existing fishing communities

Economic viability of fisheries development on a national scale has to be analyzed. This includes not only viability of the industry in monetary terms, but also socio-economic impact of the fishery and its spin-off effect on the country's economy. Planning of fisheries development should be considered as a translation of the governments policy into specific action programmes aimed at the implementation of the policy. The countries' fisheries policy should also define the government's inputs required for the implementation of the policy, as well as the extent to which the government wished to be directly involved in commercial operations in addition to its responsibilities for the creation of essential infrastructure like harbours and roads, as well as well-designed fisheries administration including credit facilities.

In the discussion which ensued, it was pointed out, that the needs for a review and possible revision of the countries policy will largely depend upon the changed responsibilities of the countries for management and utilization of resources. In some countries the introduction of EEZ has not resulted in significant changes in the resources situation, while others have acquired significant responsibility due to substantial resources available within their EEX. Several speakers pointed out, that there was a need for resources abundance

estimation prior to working out national policy and development plans for the utilization of the resources. On the other hand, however, development work in most instances could start immediately as there were sufficient indications that resources available would warrant such a development.

The introduction of EEZ's has strengthened the interest and commitments of governments towards accelerating the development of fisheries. In some countries this increased interest is expressed by larger funds which have been allocated to fisheries development. The contribution that fishery can make to food supplies for the countries has become clearer in many cases. It was generally felt that the small-scale fisheries sector would also clearly benefit from the impact the changed legal regime of the sea had on the policy of the countries. Caution was expressed with respect to possible adverse effects which the development of offshore fisheries could have on the small-scale fisheries sector. Examples were quoted as to how individual countries had separated areas of operations for offshore vessels from areas reserved for small-scale fisheries. This was done by having delimitation of inner limits within which larger vessels were not allowed to operate, while at the same time no outer limits were defined for small-scale fisheries to allow the traditional fishermen to expand the area of their operations. Another measure taken to protect the interests of small-scale fishermen was to oblige the offshore operators to market their products beyond traditional outlets of the small-scale fishermen. Promotion of training was considered an important factor for encouraging small-scale fishermen to upgrade their skills and enable them to participate in the more modern offshore fishing.

Several speakers pointed to the need for strengthening necessary institutional mechanisms and it was felt that until recently fisheries had been exclusively a domain of fisheries departments and the respective ministries under which the latter were established, while the extension of the range of operations unavoidably involved several other ministries. The need for coordination of responsibilities between ministries was stressed. Some countries which relatively well established administrative structures would not require any substantial assistance in this field from outside, but were anxious to receive information on legal steps related to EEZ taken by other countries, model joint venture agreements, models of agreements pertaining to transfer of technology. Several speakers, however, emphasized the need for external assistance, possibly from FAO, in setting up adequate institutional structures for fisheries development. It was felt, that in many instances in the past planning had not received the attention it deserved and countries felt, that they would need assistance in carrying out this task, which at the present time was one of the more urgent. The need for training of fisheries administrators as well as managers and operatives was emphasized.

Countries which were adversely affected by the introduction of economic zones would have to reconsider their policy and orientate this towards coastal aquaculture projects. Some countries had a general idea as to the time-span required for making full use of resources within their EEZ, while others felt, that this needed to be determined on the basis of detailed planning.

(iv) DEVELOPMENT

Rapporteur: Mr. J.E. Carroz
Principal Legal Officer (International Fisheries) (FAO)

The participants started consideration of this sub-item by recalling that there were two basic policy approaches to securing the optimum utilization of resources in extended zones of jurisdiction and that these approaches were or could be adopted either as alternative policies or, more normally, in some form of combination. The first one was based essentially on self-reliance and consisted of encouraging local fishing efforts and the development of local fishery industries. The second one was to rely, at least in a first stage, on foreign vessels or firms to help accelerate the transfer of technology and skills in all sectors of fisheries from production to marketing.

In both cases, the principal objective was to increase the capability of coastal states to take advantage themselves of the resources available in their economic zones. In view of the time limitation, participants found it necessary to concentrate discussions on selected ways of increasing this capability and it was agreed to consider more particularly fishery development corporations and joint ventures and bilateral agreements.

Fishery development corporations

It was recognized that traditional fishery administrations were not particularly suited to the needs of accelerating local fishery development, since their main functions were directed rather towards research, conservation and regulation. In fact many countries in the area were now experimenting new forms of institutions, such as development corporations or other parastatal bodies, to stimulate fishery development and operate commercial enterprises or infrastructure facilities. However, the experience so far was not altogether encouraging and very few participants were in a position to report that corporations had been successful in their countries.

Participants identified a number of causes that seemed to be responsible for these disappointing results and they suggested solutions to remedy this situation.

In the first place, it often happened that the objectives assigned to corporations were ill-defined and impractical. It was essential that these functions should be clearly formulated and should be consistent with the national fishery policy. In this respect, it was felt preferable to avoid combining commercial with administrative and regulatory responsibilities. The need to distinguish clearly commercial and socio-economic functions was stressed.

Shortcomings were also due to the lack of personnel with the necessary technical and managerial qualifications. Some participants noted that corporations were sometimes used as a source of employment irrespective of the skills required. It was stressed that where corporations were entrusted with commercial or technical operations, the staff should be commercially or technically orientated; it should also enjoy fairly flexible working methods and remain free of political interference. However, it was recognized that it was essential to avoid having corporations competing with private sector enterprises.

Another difficulty faced by corporations was the lack of sufficient capital. In this respect, several participants considered that adequate financial support was all the more necessary since corporations were often expected to engage in operations, such as fishing for new fish species or providing marketing facilities and outlets for artisanal fisheries, that were not attractive to the private sector but useful for the community as a whole. Several participants emphasized the role that corporations should play in ensuring that fishermen get good prices for their products and that consumers can buy fish at reasonable conditions.

Lastly, it was suggested that corporations might prove more effective if their objectives and responsibilities were defined on the basis of an integrated approach to fishery development.

Joint ventures and bilateral agreements

It was generally recognized that joint ventures and bilateral agreements, provided the latter were not merely licensing arrangements, could contribute to the transfer of technology and skills, and thus help increase the capability of coastal states. The length of the transition period during which developing coastal states would seek the cooperation of foreign vessels and firms, would depend on the objectives of national policy in each particular case.

Some participants pointed out that with extended zones of jurisdiction over fisheries coastal states were or would be in a more advantageous negotiating position. It was also noted that the new regime for the oceans would bring about a certain dislocation of fishing fleets and new uses would have to be found for excess vessels in several countries. Marketing arrangements would also be affected. At any rate, it was agreed that complementarity of interests of all parties was essential for the success of joint ventures and similar arrangements.

It was also recognized that incentives were an important factor. More perhaps in the case of joint ventures than for bilateral agreements, which often included a technical cooperation component at the government level, it was necessary to ensure that the prospective operations would be profitable. The importance of careful preparatory work, including feasibility studies, was therefore emphasized. This work should also cover consideration of the socio-economic situation prevailing in the host country.

Several participants indicated that their countries would entertain on a priority basis applications for foreign collaboration in fishery sectors where local equipment, expertise or capital did not exist. It was stressed that the relevant agreements and arrangements should include detailed provisions on transfer of technology and training, together with a calendar for the gradual replacement of expatriates with local personnel.

It was recognized that joint ventures or bilateral agreements could also be particularly useful to explore new fishing grounds or to exploit species for which there was no domestic market. In this regard, attention was drawn to the need for avoiding any conflict with local fishermen who might resent better foreign vessels or equipment. Some participants described the experience gained in delimiting areas or describing types of fishing reserved for local fishermen.

Lastly, discussions were held on the factors that should be taken into account when determining the duration of joint ventures or bilateral agreements. Placing too much emphasis on short-term arrangements might sometimes prove detrimental to the interests of the host country and lead to its missing opportunities.

Appendix H

STATEMENT BY THE REPRESENTATIVE OF IRAQ, RELEVANT TO PARAGRAPH 21 OF THE REPORT, AS HE WAS NOT PRESENT AT THE TIME OF DISCUSSION OF THE ITEM IN THE COMMISSION

The delegate of Iraq made the following statement which he requested should be attached to the report of the session as an Appendix:

1. The implementation of the Gulf Survey Programme had been delayed by some 15 months. This delay could have been avoided if serious steps had been taken to hasten implementation

2. The expected shortage in the project budget could be avoided by eliminating some of the posts provided for in the Project Document

3. The analysis of data of the survey could be carried out in centres in Iraq which have computer time available. At the same time Iraqi personnel could be trained in data analysis as a basis for the subsequent establishment of a regional centre for the analysis of fishery statistical data from the Gulf region

4. The Gulf Survey project administration should take serious steps to complete the Survey Programme as soon as possible

5. More Arabic speaking instructors are needed for the Sub-Regional Fishery Training Centre (Kuwait) to reach the stage where training would be completely in the Arabic language.

TC/79/7

TUNA CONSULTATION MEETING
(26-29 June 1979)

EXTRACTS FROM THE DRAFT REPORT OF THE SHIMIZU TUNA ASSESSMENT WORKSHOP CONCERNING STATISTICS AND RELATED DATA

by

J. A. GULLAND

Note: The Shimizu Workshop was not concerned with skipjack, nor with the billfishes in the Pacific. However, the comments in the following extract from the draft report of the meeting are probably equally valid for these species. It should be noted that the present version is only a preliminary draft, and has not seen approved in its final form by the participants in the workshop.

STATISTICS AND RELATED DATA

1. General Remarks

A reliable and comprehensive data base, including information on total catches, catches and corresponding fishing effort, size composition and similar biological data is essential for stock assessment studies, and for many related activities. Unlike the situation for the tuna fisheries of the Atlantic and eastern Pacific, such a data base does not exist for the fisheries of the western Pacific or Indian Ocean.

The workshop, therefore, paid attention to reviewing the existence and quality of the data available in various national and international institutions. The results are summarized in Table 1. The implications of the strengths and weaknesses revealed in the table to the study and assessment of the individual stocks are discussed in the relevant parts of this report dealing with each species. In general, it may be noted here that while there are some obvious and serious shortcomings, the standard of statistics is moderately satisfactory. However, there are common problems which arose for most species in respect of different classes of fisheries as discussed below.

Particular attention needs to be paid to the indices of abundance in the longline fisheries of the Indian Ocean. Up to the present, these indices have been derived solely from the data of the Japanese fisheries. These now form only a very small proportion of the total Indian Ocean fisheries - except for those on southern bluefin - and their coverage by area and time is becoming increasingly incomplete and uneven. As a result, the indices of abundance derived from them are subject to a high variance, as shown for example by the very high figure for adjusted c.p.u.e. for bigeye tuna in 1977.

The workshop, therefore, strongly recommended that priority attention should be given to obtaining indices of abundance from the other longline fleets. In particular, countries with series of detailed catch and effort data (particularly by 5° squares) for past years were urged to exchange these with other institutions, national and international, concerned with the Indian Ocean tuna, with a view to obtain better c.p.u.e. indices.

2. Problems of Different Types of Fisheries

2.1 Small-Scale or Artisanal Fisheries

Catches by these fishermen, who used a wide variety of gears, are individually small but in a big country with a large member of scattered fishermen, the total catch can be substantial, e.g. in Indonesia and Philippines. Data from these fisheries are usually difficult to obtain. Total catch is often known only very imprecisely, with little details of species composition.

The workshop noted with appreciation that an improved system of statistical collection had been introduced in 1976 in the municipal fisheries of the Philippines (carried out by vessels of 3 GRT or less). This had led to greatly improved estimates of the total catch of tunas and tuna-like fishes, and their species composition. This improvement is responsible for much of the reported increase in Philippine catch apparent for yellowfin.

Much of the catch of small-scale fisheries, if not all, is consumed locally, so there is little opportunity of checking on catch statistics from other records, e.g. exports, or production of canned tuna. Improvements in national fishery statistics as has been the case in the Philippines. The input from tuna interests, whether national or regional, will particularly concern assistance in determining the species composition of the catches.

2.2 Local or Medium-Range Industrial-Scale Fisheries

These fisheries, such as the Australia bluefin fishery, present least problems. Some of the necessary data on catches, species composition and some types of fishing effort normally exist in commercial records. The main need is for a proper national system to collect the missing information not available from commercial records, and to compile the data. There may be problems in interpreting effort data, e.g in the live-bait or purse-seine fishing, but these are problems of analysis rather than data collection as such. Another problem that can occur is the failure to distinguish between species, especially in small tuna, e.g. the Japanese 'meje' catches or possibly, small yellowfin in the skipjack bait-boat fishery. Biological sampling may then be necessary to supplement the commercial records.

Regional agencies have an important role in encouraging the adoption of standard data formats in respect of stocks fished by several countries. They can also provide facilities for processing data collected by countries with limited capacities.

2.3 Long-Range Fisheries Landing in Home Ports

A major problem here is to determine where the fish have been caught and, for long voyages, when it was caught. Properly kept standardized log-books supplemented by interviews at the time of landing, should deal with this. There are also problems in the delays in obtaining data from these fisheries, and of determining the place of origin and time of capture of fish sampled, e.g. for size composition, at the ports.

2.4 Transshipments

Several countries can be concerned with these catches; the flag country of the vessel; the home country of the company controlling it, or of its crew (which is not always the flag country); the country in which

the fish is first landed or transshipped, and the country of ultimate destination. Each of these countries may or may not include these catches in its national statistics, so that the catches may be reported several times, or not at all. This can make nonsense of attempts to compile statistics of total catch by all countries. The currently recommended international standard to avoid double-reporting is that catches should be reported to FAO, or other international agency, by the flag state only. Not all flag states may do this. It is known for example, that in the Atlantic there are a number of vessels whose catches are not reported by the flag state. The alternative is for a central agency responsible for information on this fisheries of a region to be supplied with full details of individual landings (vessel name, date and place of landing or transshipment, etc.), from flag state and state of transshipment (and possibly others), and sort through these data to eliminate duplications and detect possible omissions.

These fisheries also face similar problems of date and place of capture as the long-distance vessels landing in home ports. Again, log-books are highly desirable. Further, since several countries - the flag state, and one or more transshipment ports - are concerned with the records of the same vessel, it is clearly highly desirable that the format of the log-book should be standardized on at least a regional basis. Indeed, taking account of the movements of many tuna vessels between regions, a common global standard (or at least comparable regional standards) would be desirable. It is known that some countries in the southwest Pacific are moving towards the use of a standard form, based largely on the existing Japanese log-book, which will be required by all vessels fishing under licence in the waters under their control. It is believed that such log-books should be more generally adopted.

2.5 Joint Ventures

The risk of double reporting, or that neither country may report, again exists, but is easier to correct. With greater control being exercised by the coastal state, it is possible that in future, statistics of joint venture operations will be collected and compiled by the coastal state, and reported by it to the appropriate regional or global authority. However, the need remains for careful checking by such authorities that statistics of joint venture operations are being properly reported without omission or duplication.

2.6 Sports Fishermen

These can have considerable importance in some areas, and take significant catches of some stocks, but their technical problems of collecting data (e.g. from sampling surveys) are very similar to those of small-scale fisheries.

3. Changes in the Law of the Sea

These changes, and especially the extension of jurisdiction over fisheries by coastal states, have led to increased interest in fisheries and fisheries statistics. Ultimately, this should lead to better data.

In the short run, however, there is no doubt that the application of additional controls of one kind or another has resulted in a drop in the quality of the information available from many fisheries, with possible deliberate misreporting of position of capture, quantity taken, etc. There is no easy answer to this problem. Collection of reliable data on effort, location, etc. depends on the cooperation of the fishermen, and systems of control should as far as possible maintain the goodwill of the fishermen, and minimize the incentive for misreporting.

4. Priorities

The first priority should be in respect of statistics of total annual nominal catch by gear (Task 1 statistics in the terminology of the International Commission for the Conservation of Atlantic Tunas, ICCAT), with data on effort, corresponding catch and detailed position of capture and corresponding size frequency data (Task 2 statistics) receiving in the first instance rather lower priority. This is not to say that Task 2 should be ignored, and in practice there are advantages, in terms of improving data on total catch, in establishing a single system for both types of data.

5. Action Needed

5.1 Nationa

Table 1[1/] shows clearly that there are a number of countries landing (or believed to land) substantial quantities of tuna for which the statistical information is inadequate. The meeting recommended strongly that these countries should take action to improve these data. The specific actions needed will depend on national conditions, and were not discussed in detail, but are likely to include some or all of

(i) general improvement in the national statistical system;

(ii) better identification of small tunas; and

(iii) use of log-books by the larger vessels.

5.2 Regional

The statistics for tuna in the western Pacific and Indian Ocean will not be readily available in a convenient form, nor is it likely that their standard will be improved greatly, until there is a regional institution (or institutions) responsible for the compilation of data from national sources, and especially, the regular checking on the quality and completeness of the data submitted. The activities of such a body would be similar to that of ICCAT[2/], and the workshop heard an interesting report from ICCAT

1/ (Not included here)

2/ The Shimizu meeting did not consider here the management or regulatory functions of ICCAT.

on its work. The staffing and other requirements would presumably be roughly the same (two part-time and three full-time staff, not including secretarial support, plus computer facilities, etc.).

Such a regional institution should, as far as possible, cover the whole range of the major stocks of interest, and receive data from all countries fishing these stocks. The workshop, therefore, considered to what extent the vast region covered by the different stocks discussed during the meeting could be divided into smaller regions, each served by a separate institution. Interchange of fish between the Pacific and Indian Oceans is believed to be small, though the situation in the Banda Sea is unclear. The southern bluefin is an exception, though since only two countries have significant fisheries, and each has a good data base with a regular bilateral exchange system, the data problem for this species is relatively slight. Therefore, the statistical and related data for the Indian Ocean could be handled by an institution separate from any body or bodies in the Pacific, though there could be some savings in operational and staff cost from a joint body. Within the Pacific, there is considerable movement by many of the tuna species. It is not possible to suggest any dividing line that could be used to separate areas of interest of different institutions that would not cut across the area of distribution of one or more major stocks. From the technical point of view, a single institution for the whole Pacific, at least outside the area of IATTC[3/], would therefore be most appropriate.

5.3 Inter-regional Cooperation

Whatever regional institutions are set up, there is bound to be some interchange of fish between their areas of responsibility, e.g. migration of northern bluefin between the eastern and western Pacific, or of albacore between the Atlantic and Indian Oceans. Also many tuna vessels fish on various occasions in two or more oceans. Therefore, there is a strong need for collaboration between the institutions handling regional data in all parts of the world, especially between those responsible for the eastern and for the western Pacific.

One form of collaboration which would be particularly convenient for countries operating long-range tuna vessels and which would lead to better and more reliable detailed data would be the adoption of standard log-books for each major type of vessels. Collaboration could also be useful in producing field manuals or other detailed guides for the procedures and standards to be used when collecting statistics, carrying out biological sampling, and for the methodology of data compilation, recording and reporting formats, species identification, etc. The workshop noted that the ICCAT field manual had proved useful, and had recently been revised and considered that, with appropriate modifications, a similar manual could be very useful in the Pacific and Indian Oceans.

3/ Inter-American Tropical Tuna Commission

TC/79/8

TUNA CONSULTATION MEETING
(26-29 June 1979)

OVERALL REVIEW OF THE ICCAT STATISTICAL SYSTEM

by

P. M. MIYAKE

OVERALL REVIEW OF THE ICCAT STATISTICAL SYSTEM

by

P.M. Miyake
Assistant Executive Secretary

I. Status of statistics at the time the Commission was established

The International Commission for the Conservation of Atlantic Tunas (ICCAT) was founded in 1969 based on the Convention signed in 1966 in Rio de Janeiro, Brazil. The conservation of all tuna and tuna-like species in the Atlantic Ocean and its adjacent seas is the goal of the Commission. In order to complete its tasks, the Commission decided that adequate and accurate statistics on the tuna fisheries in the Atlantic were essential. When the Commission actually started its work in 1970, the only reliable statistics for the Atlantic tuna fisheries were those collected by FAO. Those were only nominal annual figures by FAO areas. Besides, there have been several scientific publications carrying fragmental information on tunas in the Atlantic. However, the part of the fisheries covered by those detailed statistics was very minor compared to all the Atlantic fisheries, and even the nominal catch statistics were not adequate nor accurate enough for stock analyses. A lot of double reporting of the same catches occurred between various countries, species were misclassified, flag countries were misidentified, the catches were reported to the area of transhipment or the destination of transhipment rather than to the area of the catches, etc.

II. Initial work of the Commission concerning statistics

The Sub-Committee on Statistics, which is a part of the Standing Committee on Research and Statistics (SCRS), set up criteria for collecting statistics. The Committee made it obligatory for the member countries to submit the following statistics on their tuna catches:

1. Task I statistics - nominal annual catch statistics

All the catches should be reported by gear, flag country, by species in round live weight in metric tons. Also, the effort in terms of boats should be reported by the type of vessel and by size category.

2. Task II statistics - catch and effort

Catch and effort should be reported by 1°x 1°square and by month for the surface fisheries and by 5°x 5°square and quarter period for the longline fisheries. Those should also be reported by gear, flag country, and by species.

3. Task II statistics - biological data

All the major fisheries should be sampled. The size frequencies should be reported in actual frequencies and should be raised (weighted) by the catch by areas and by month/quarter period.

Since then, only a few slight modifications were made on the required criteria but the same basic policy has been maintained and all the statistics are collected based on these criteria.

The non-member countries who are fishing in the Atlantic for tuna are also requested to send us the aforementioned information inasmuch as possible, based on the same criteria. At the same time, the Secretariat reviewed all past statistics (in terms of gears, flag countries and species) and found manay mis-reportings of species, flags, etc. The pertinent countries were informed and effort to correct these discrepancies continues.

During this initiation period of the Commission, the Assistant Executive Secretary (who spends about 50% of his time on statistics) and one full-time statistical assistant were engaged in this work. Improvement of statistics required a lot of traveling by the staff of the Secretariat to discuss the problems with the local authorities of each country.

III. Major problems encountered

1. Foreign-based fleets.

Because of the nature of the tuna fisheries, 40-60% of the total catch in the Atlantic is made by fleets which fish far from their home countries. For those fleets, it is quite difficult to enforce a logbook system and to carry out biological samplings. Consequently, very little, if any, data can be collected from those fleets.

2. Coastal countries which are developing fisheries very quickly.

In those coastal countries where the fisheries are developing rapidly, the development of a statistical system does not coincide with that of the fisheries. As a result, as the fisheries develop more, the statistical coverage becomes less.

3. Artisanal and/or sports fisheries.

The artisanal and/or sports fisheries involve many dispersely located ports, and many small boats which not only fish tuna but other species as well. The collection of statistics from them becomes increasingly difficult. Very well developed countries are no exception to this problem.

4. Flag countries.

In tuna fisheries very often the flag countries are different from the country of the crew or owners, etc. Besides, the flag of one boat changes from time to time. To keep track of these situations is very difficult. These also cause a lot of duplicate reporting of the same catches by the country of flag, by the country of the owners, by the country of the captains, etc. and sometimes some of the catches by these boats do not show up anywhere.

5. Other problems.

Other problems such as the mixup of the species due to reporting them in vernacular names, misunderstanding in translation, etc. are very frequent.

IV. Solution to these problems

1. Foreign-based fleets.

The ICCAT Standing Committee on Research and Statistics has been constantly reviewing the statistical work done by the Secretariat. One of the major outcomes of these reviews has been the initiation of port sampling by the Secretariat. The SCRS authorized the Secretariat to start this project in 1974. Accordingly, five ports were chosen in the Atlantic where the Oriental longliners transship their catches. A local person was hired by the Secretariat at each of these ports. Their job is to abstract the logs from all the longliners entering the ports and to carry out the biological sampling of the major species unloaded. The results are compiled at the Secretariat and published in the "Statistical Series". This project has proved very successful and as a result 90% of the total longline catches by Korea and Panama have been logged and sampled and about 60-70% of the Taiwanese catch is also logged and sampled. The cost of such a project is on the average about $10,000 per year.

2. Coastal countries developing fisheries.

As a solution to this problem, the ICCAT publication "Field Manual for Statistics and Sampling Atlantic Tunas and Tuna-like Fishes" has proved to be very useful. The Manual, initially published in 1972 and revised in 1978, contains instructions for the collection of catch statistics and biological sampling and describes the way in which to compile the data. It also contains the species identification keys, illustrations of each species and a very short description of biological characteristics of these fish, a list of vernacular names used by various countries and instructions to be followed when tags are recovered.

The Commission held several training courses for establishing and improving statistical systems. Various scientists from developing countries have been invited at Commission expense to attend these courses.

From time to time, the Secretariat staff visits the problem areas and discusses the matter with the local technicians, scientists and statistical officers.

3. Artisanal and/or sports fisheries.

For this no solutions have yet been found. It seems that this is the most difficult among all the problems to solve. Biological sampling can be done with relative ease, but to get the total catch estimates is sometimes impossible. In some of the problem areas (e.g. the Mediterranean bluefin tuna fisheries), the Secretariat is now trying to cooperate with the regional scientists to solve the problem by sending a special mission team to these areas.

4. Flag countries.

For this problem the port sampling mentioned in Section IV-1 has helped a lot. Through port sampling we can identify the landings by boats and consequently by flag. Therefore, double reporting or any lack of reporting can easily be found. Another solution adopted by the scientists has been to combine and treat a few flag fleets as a unit fleet (e.g. "FISM", which signifies France, Ivory Coast, Senegal and Morocco). Since all these boats fish in exactly the same manner and same gear and very often the captains are interchanged, for the sake of analysis of fisheries, they should be considered as one unit fleet. This is also the same for the Korean and Panamanian longliners.

5. Other problems.

In this respect, the "Field Manual" published by ICCAT has proved very helpful in solving the various problems encountered. Often the problem lies in the national statistical offices, since the officers there are not particularly familiar with tuna or fisheries. Generally, for this reason, ICCAT tries to use the scientists' estimates rather than the official statistics. Also, all ICCAT scientific publications usually adopt the scientists' best estimates rather than the official statistics, except for those statistics which are used for the calculation of contributions for the ICCAT budget.

V. ICCAT data base

In 1976, the Commission decided to create a common data base at the Secretariat for all Atlantic fisheries. In 1977, the Secretariat sought several alternative data management systems available in Madrid and chose the INFONET system for its data management. The ICCAT data base can be divided into three categories of bases and files:

Category 1: Task I data base -- This contains all the nominal catch information by country, gear, species, year.

Category 2: This refers to several bases and files which contain the catch and effort data by gear, area, time, country, etc.

Category 3: This includes a data base and several files which contain size frequencies by country, gear, area, time.

The file and data base formats and codes adopted are attached herewith as Appendix 1. All the data sent to ICCAT in the form of Task I, Task II catch and effort and biological data are input into the files and data base. Very often the data for the major fisheries are received on magnetic tape, but for

the minor fisheries they come on hand-written forms. Some countries present the raw data (e.g. measurements at the ports) to the Secretariat. Those, as well as the data from the ICCAT port sampling program have to be verified, input and processed at the Secretariat. At present, all the data are input in the finest time-area strata so that no matter what sampling areas have been adopted or changed, they can be easily recompiled. The catalogues for those data are circulated once or twice a year. Any member country scientist who is interested in obtaining any of these data can ask the Secretariat for the hard or soft copies of the data which is supplied free of charge.

The Secretariat publishes these data in a uniform format this is explained in the next section of this report. The data catalogue serves also as a check list for completing the tasks by each country. A sample of the catalogue is attached herewith as Appendix 2. Now under discussion by the scientific committee is the matter of what the Secretariat is required to do with these data bases. If more processing is required by the Secretariat, the purchase of a mini-computer might be more economical than to keep on with the present data management system.

VI. Dissemination of information

The following series, relating to statistics, have been published by the Secretariat:

a. Statistical Bulletin -- This series includes the annual nominal catches by country, gear, species by major Atlantic areas for the last 11 years. This publication is yearly but actually each year three versions are made: preliminary, revised and final.

b. Data Record -- This series is published twice a year, and generally contains Task II catch and effort and size frequency data. Up to Volume 11 of the series, the data were presented in their original form. However, subsequent volumes have been reprocessed by the Secretariat and published in a uniform format. Catch and effort data are generally reported in 1°x 1°area for the surface fisheries and by 5°x 5°for the longline fisheries. Size frequencies are for the ICCAT sampling areas. Catch and effort are also summarized by the ICCAT sampling areas to match the size frequency data.

c. Statistical Series -- This series contains the data generally collected by the Secretariat or that sent to the Secretariat in raw form and processed in the ICCAT data management system.

VII. Staff engaged in the ICCAT statistical system

As of the writing of this report, the following are the staff members engaged in the statistical assignments:

a. Assistant Executive Secretary -- supervises and coordinates all the statistical work. One half of his time is devoted to this assignment.

b. Biostatistician -- Checks and verifies the statistics, improves the statistical systems in the problem areas, reviews the sampling schemes in the Atlantic and gives the proper advice to the national offices for adequate and accurate sampling schemes, etc.

c. Systems analyst -- Maintains the data base, updates, creates files, properly manages the systems, processes data, offers processing services to the national offices, etc.

d. Statistical Assistant -- Assists in the verification of statistics, cross checks data, prepares input data, checks the output, and prepares the publications.

e. Key puncher -- (Part-time work) - Helps to verify statistics, prepares the input form, input data, etc.

TC/79/9

TUNA CONSULTATION MEETING
(26-29 June 1979)

THE STATE OF TUNA FISHERIES AND TUNA STOCKS IN THE PACIFIC AND INDIAN OCEAN

by

J. A. GULLAND

THE STATE OF TUNA FISHERIES AND TUNA STOCKS IN THE PACIFIC AND INDIAN OCEAN

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Introduction

The state of most the tuna and billfish fisheries, (excluding skipjack and small tuna-like species) was most recently discussed at a workshop in Shimizu, Japan, 13-22 June 1979. The statistical data and summary conclusions concerning the state of the fisheries of those stocks have been extracted from documents presented to that meeting, and its draft report.

The fisheries

About 1.4 million tons of tuna and billfishes (excluding the smaller species of tuna) were taken in the Pacific and Indian Ocean in 1977. Of these, a little less than half a million were taken in the longline vessels (almost exclusively from three Asian countries), fishing for the larger individuals of the bigger species (albacore, bigeye, yellowfin, bluefin, southern bluefin and billfishes). A little less than one million tons was taken by the surface fisheries for skipjack, and for the other species (mostly at sizes smaller than these taken by longline). Of these, the biggest fishery is the Japanese baitboats in the western Pacific (nearly 300,000 tons), followed by the fishery for yellowfin in the eastern Pacific, of which U.S. purse-seiners take the largest share (over 100,000 tons). Of the longline catches, a little over one quarter was taken in the Indian Ocean, and the rest in the Pacific, whereas less than 5 percent of the surface catch was taken in the Indian Ocean.

State of stocks

The state of exploitation of the group of fish taken by the longliners is comparatively clear, though there are a number of questions that require careful examination before a fully reliable assessment of the stocks can be made. Some of these are outlined in Annex 1, which is an extract from the draft report of the Shimizu workshop. In all the longline fisheries, the catch rate, in numbers and weight, has declined since the start of the fisheries in some cases very drastically. The general shape of the relation between total longline catch and the total amount of fishing (standardized number of hooks) seems to be much the same for all species - a gradual flattening out to a level of catch that can be maintained at around the same magnitude over quite a wide range of fishing efforts - though the development of the fishery along these curve varies. For bigeye in Indian Ocean catches have probably not yet approached the maximum level, and increased fishing can be expected to give increased total catches, though at the expense of reduced catch rates. For albacore in both oceans, bigeye and yellowfin in the Pacific, and most bilfishes the maximum level of catch has been approached, and increased longline fishing would not increase the total catch. Yellowfin in the Indian Oceans, southern bluefin, and the new billfish stocks are even more heavily fished, and the effort could be decreased without any loss of sustained catch, and possibly (in the case of southern bluefin) even some increase.

Among the surface fisheries, even rough assessments are available only for the yellowfin in the eastern Pacific, and the southern bluefin. These are heavily fished, and no increase in sustained catch can be expected. Elsewhere, the biological potential for considerably increased catches of the small-to-medium sized fish exists, except possibly for skipjack in some parts of the Pacific, though it is not certain whether conditions always exist for a practical and economically viable fishery.

Studies of the interaction between surface and longline fisheries suggest that, except probably for southern bluefin, development of a surface fishery where only a longline fishery has previously existed will increase the total catch, though at the cost of decreased longline catches.

Need for regulations and management

The most recent analyses do not suggest that there is any biological need for management, in the sense that the stocks are depleted, or that appropriate regulations could increase the total weight caught. There do seem to be some opportunities for increasing the economic benefit, either by reducing the fishing effort (and potentially the costs) in some of the longline fisheries, or increasing the gross value of the catch for those species (e.g. southern bluefin) for which the values of different sizes of fish varies greatly.

ANNEX 1

GENERAL PROBLEMS OF STOCK ASSESSMENT

In discussing the individual stocks, a number of problems were raised on several occasions. Some of the more stricking of these common problems, and suggestions for ways in which they may be tackled, are as follows:

Effort

The discussions on effort and catch per unit effort in the workshop dealt almost exclusively with longline data. There are also problems in determining the correct measure of effort in most surface fisheries, and it was noted that where there have been successful tagging experiments, especially over a period of years, the rate of return of tags per unit fishing intensity can in principle be used to calibrate the fishing effort data. This might well be possible for the Australian southern bluefin fishery; to allow for uneven result in the season of tagging, the second year returns of fish tagged as two or three years old should, it was suggested, he used.

In the longline fishery, four points were examined -

(1) The use of deep longlines

(2) Change in preferred species or area

(3) The reliability of cpue at high stock densities at the beginning of a fishery

(4) Possible competition or interference at high fishing intensities

The use of deep longline - especially omitting every other float - definitely increases the catch rate of bigeye. The effect on other species is unknown. The proportion of deep longlines can be estimated from the frequency distribution of hooks per basket (see for example Figure 13 of SAWS/BP/6). The increase in efficiency has been estimated as 1.79 for the west equatorial Pacific, but is believed to vary from area to area according to the depth of the thermocline (SAWS/BP/6, Table 2). Nominal effort data can then be corrected by using the efficiency factor and the percentage of deep longline gear. The workshop felt that more studies on this would be desirable, especially to estimate directly the efficiency factor for the Indian Ocean, and the possible effects on other species.

Methods to correct the shifts in area or target species are well established (e.g. Honma, 1974) and the workshop felt that provided the data were well spread over the ocean, these methods worked well. Since the abundance indices used up to the present have been based wholly on the data from the Japanese fleet which is now mainly concentrated in a few areas (e.g. for southern bluefin) there is an urgent need to make available and use the detailed 5° square data from the other longline fleets.

The possible error in hook rate as an index of abundance in the initial years of a fishery are illustrated in Figure A. This shows the hook rate (kg/100 hooks) for Indian Ocean yellowfin plotted against the average effort in the current year and the previous year. While the points for efforts above 10^7 hooks lie on a reasonably smooth curve, the earlier points lie far above any smooth extrapolation of this curve. Similar discrepancy occurs in several other stocks (e.g. Indian Ocean albacore). On the other hand, the points for Indian Ocean bigeye (Figure B) all lie on the same curve, with no abnormal points in the early years. The explanation may be that in an unexploited stock, there are local concentrations that can be found by a directed fishery, and catch rates are in no way typical of the stock as a whole. These were not significant for bigeye since it was at least lightly exploited as an incidental catch for some time before it was a principal target species. The implication for stock assessment are that the short initial period of very high catch rates may have to be ignored in the analysis.

The problem of interference or competition between vessels at high concentrations raises more serious question over a wide range of data. It was suggested that the remarkably small change on total longline catch over a wide range of effort values in some stocks (e.g. Indian Ocean yellowfin) is because the true fishing mortality changes much less than the nominal effort, because the effectiveness of a given number of hooks was reduced where fishing was intense. The workshop saw no way of testing this hypothesis immediately, though it is a question of some importance. A possible approach which should be followed up would be to examine detailed data of catch rates from logbooks of vessels fishing at the centre and at the fringes of major concentrations of fishing effort to see if there are differences in average values, or changes in time.

Stock Structure

Considerable doubt surrounds the degree to which several species of tuna in the Pacific and in the Indian Ocean form separate stocks. Even when a division into two or more stocks has been assumed for yellowfin, the assumption made are often not well established. This uncertainty is probably not serious when the main fisheries on the stocks concerned are the longline vessels, which range widely over the whole distribution of the species. The question will become more serious as more localized fisheries, such as the yellowfin fishery in the Philippines, develop and it becomes necessary to know to what extent they interact with other local fisheries, and with part or all of the longline fisheries.

A number of techniques exist to study stock separation, including tagging, biochemical and serological studies, and examination of the length and age compositions (especially the occurrence of strong or weak year classes). Each has its own advantages and disadvantages, and the workshop, while recognizing the importance of understanding more about stock structure, could not unreservedly recommend any particular approach. Most will require international collaboration. The present need is for a basic critical review of methods of separating stocks, with a view to the possible preparation of specific proposals for cooperative programmes (e.g. of tagging, or of blood collection and serological examination) appropriate to the species concerned.

Age, Growth and Mortality

In the absence of direct and reliable routine methods of aging individual tuna, these parameters are not known well. The implications of this poor knowledge depends on the use of the information. The increment of length per year among small-to-medium fish, which is important in assessing the impact of surface fisheries on the longliners or of a change in age at first capture, is reasonably well known. However, small uncertainties at these ages can result in large differences in the estimates of L_{oo} or K. These in turn can seriously affect estimates of age composition, particularly among the older fish.

The workshop noted that there were difficulties in estimating age-compositions from length composition data, either using an age-length key in the narrow sense (i.e. estimates of the percentage of each age in a length class), or by direct dissection of the length data (e.g. assigning all fish between 105 & 112 cm to age 4). In particular, both methods are likely to under-estimate the changes in mortality that occur, unless a separate age-length key is computed for each period. The workshop, therefore, urged that a careful examination should be made of the theoretical problems involved.

For southern bluefin, the pattern of recaptures of Australian tagged fish in the longline fishery showed that the mortality in this fishery is low, and that the ages of large fish are probably considerably under-estimated. The workshop believed that the phenomenon of a low total and natural mortality among large fish and a higher mortality among smaller fish may be quite general among tunas, even though the direct evidence is slight. It should certainly be taken into account when assessing the impact of surface fisheries on the longline fisheries.

The workshop believed that great benefits could be obtained if techniques could be developed for aging tunas, and that there had been a number of advances in methodology for other fish (burning or sectioning otoliths, counting of daily rings) that might be usefully developed for application to tunas. It felt that a series of indiscriminate activities on different tunas in different oceans would be wasteful, and instead, efforts should be concentrated on a few stocks that seem to offer more favourable opportunities - e.g. regular availability of material, ability to cross-check with other data such as tagging, etc. The southern bluefin - which is the tuna more likely to show clear annual marks - would be one possibility.

Assessment of the Effort of Fishing

This was mainly done by applying production models to the catch and effort data of the longline fishery. Within the known constraints, and allowing for the possible need to ignore the high catch rates of the main target species in the early years of a fishery, this was believed to give reliable results. It is, however, very desirable to obtain independent evidence of the effect of fishing on the stocks, such as changes in total mortality. Lacking good age-data, this is difficult to do. Results were presented for Indian Ocean yellowfin (SAWS/BP/17, Fig. 9), showing an increase in apparent mortality, as estimated from length composition data, with increasing fishing intensity. Though doubts were experienced about the possible bias introduced by the method of estimating ages, the nature of the bias would be to under-estimate

the changes in mortality. The fact that some change was observed in this stock and in others (e.g. Indian Ocean bigeye, SAWS/BP/18, Fig. 11) suggests that the real change in mortality may be considerable. A cruder estimate of changes can be obtained by looking at changes in average weight. In nearly all longline fisheries, these have decreased, in close correlation with increased effort (see Fig. C, showing mean length for Indian Ocean yellowfin). There are obvious dangers that some of such changes could be due to changes in the position of fishing, especially for albacore and bigeye. The workshop recommended that this question should be more carefully examined, especially to analyze changes in size composition within small areas, and to determine better theoretical procedures for estimating changes in total mortality from changes in length composition. Greater problems concern the estimation of the impact of surface fisheries on longlining. This has been the subject of considerable discussion (see SAWS/BP/4), and the effect certainly depends inter alia on the following factors:

(1) The extent to which the two gears take different sizes of fish;

(2) The natural mortality during the period between the major exposure to the surface fishery, and recruitment to the longline; and

(3) The difference in area, and in 'stocks' or groups of fish exploited by the two fisheries.

The absence of any observed interaction in some cases can usually be ascribed to one or other of these factors (different areas, a large difference in size, or a high natural mortality between the two fisheries). It was noted that the effect of the surface yellowfin fishery on the longline fishery in parts of the central and eastern Pacific seemed to become noticeable after the expansion of the surface fishery offshore, and onto larger fish, though the relative importance of these two factors is unknown.

Few explicit yield-per-recruit calculations were presented. In the absence of reliable estimates of growth and mortality, a single yield-per-recruit curve is of doubtful value. Nevertheless, the workshop believed that an examination of a set of yield-per-recruit curves, for different values of input parameters, including higher values of natural mortality for small fish (i.e. those in the surface fishery) than for large fish, would be very useful in providing insight into the likely response of the stocks to different patterns of fishing, including the interaction between surface and longline fishing. In particular, such calculations could show whether the observation in several longline fisheries is of approximately constant catch over a wide range of effort is reasonable, or is due to an artifact such as interference between gears reducing the real changes in fishing mortality.

Several papers discussed the possibility of recruitment being affected by changes in adult stock. There is no good evidence of this occurring in any of the stocks considered, at least over the range of abundance so far experienced. The very high individual fecundity of tunas suggests that a pronounced stock-recruitment relation is less likely than for many other fish species. However, in view of the serious impact that such a relation could have on the catches at high rates of fishing (see for example SAWS/BP/8, Fig. 12), the matter deserves careful attention. In particular, series of estimates of recruitment - e.g. from cpue of young fish, or from cohort analysis - should be obtained for all the major stocks.

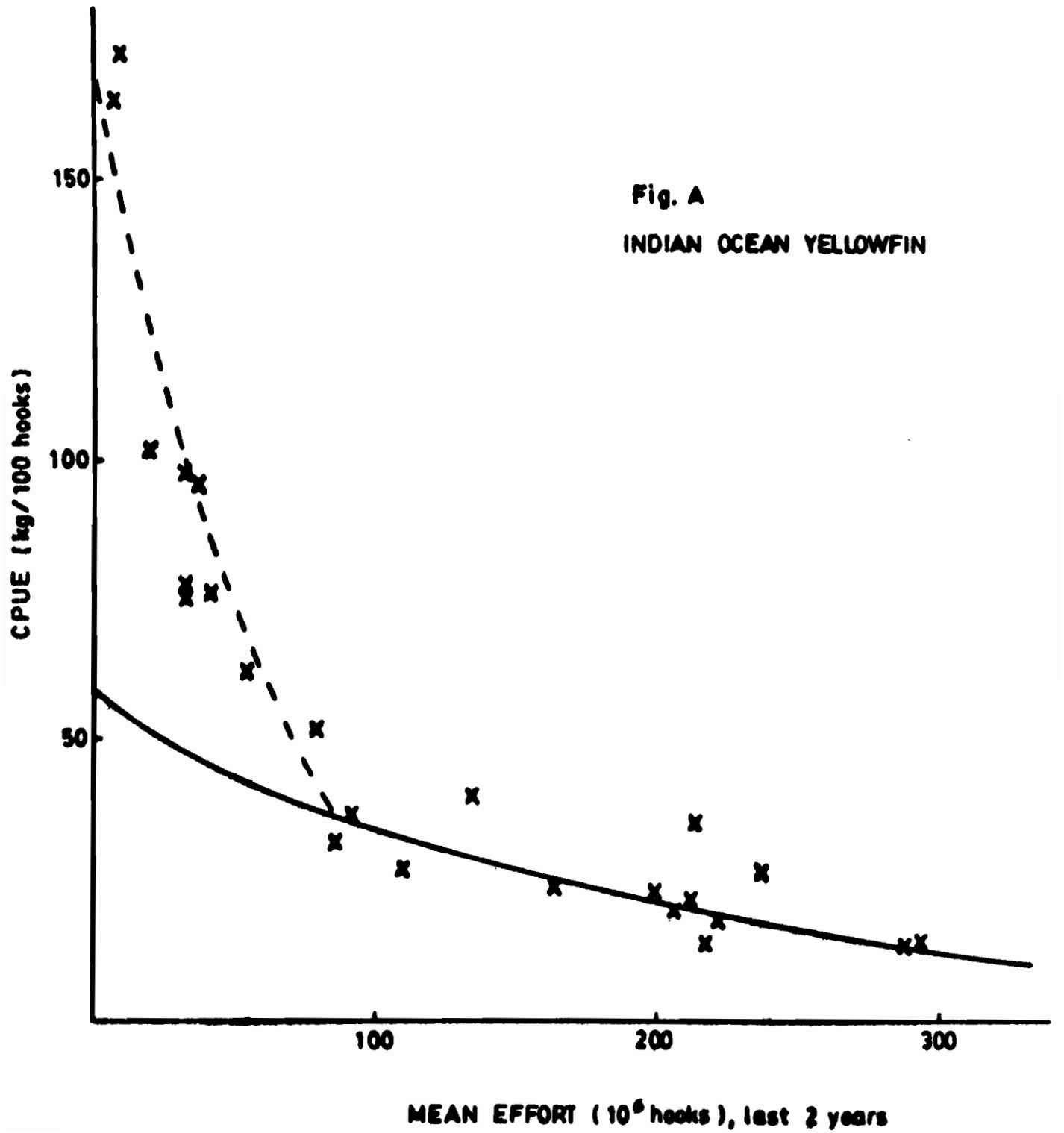

Fig. A

INDIAN OCEAN YELLOWFIN

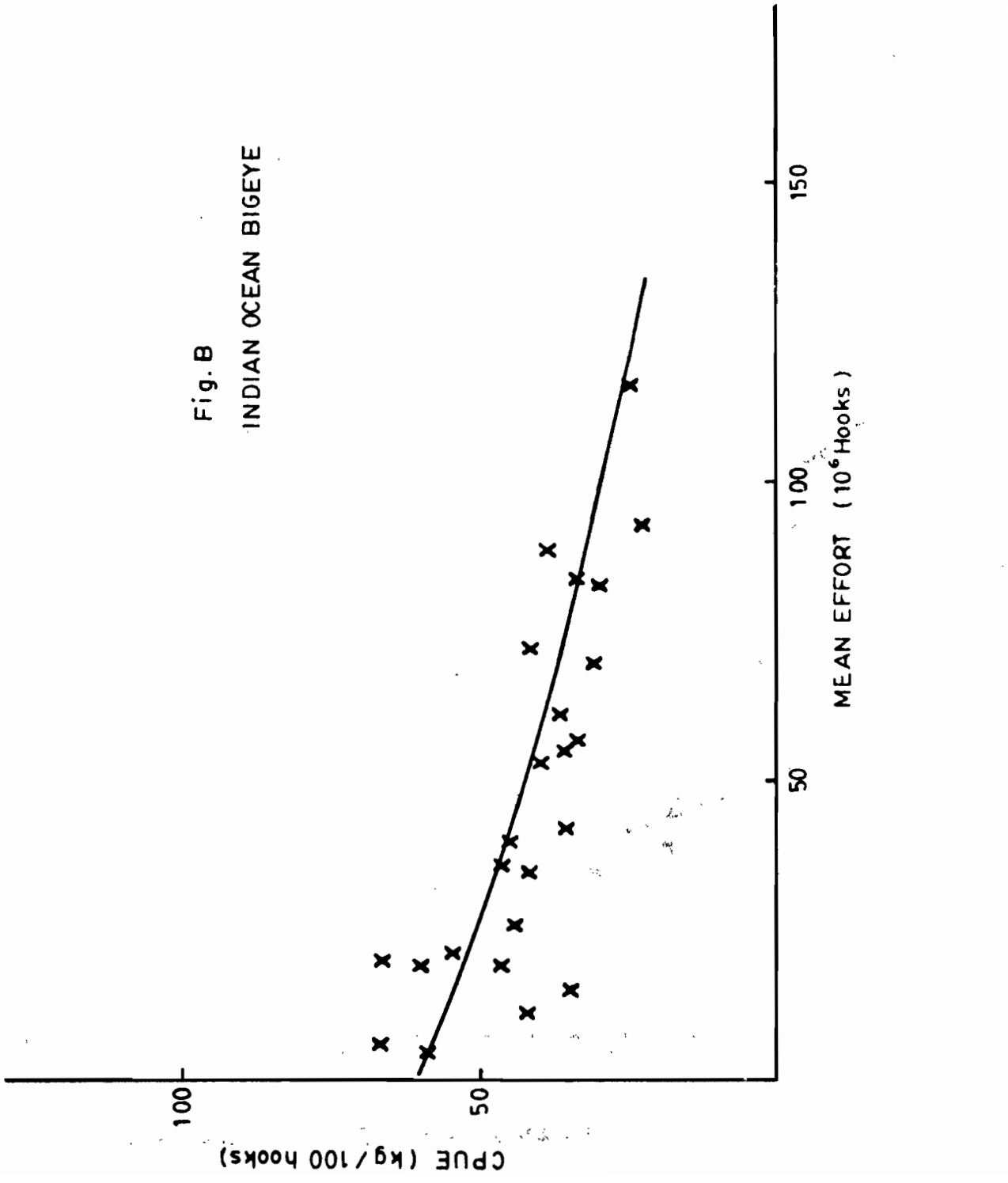
Fig. B
INDIAN OCEAN BIGEYE
CPUE (kg / 100 hooks)
100
50
MEAN EFFORT (10^6 Hooks)
50
100
150

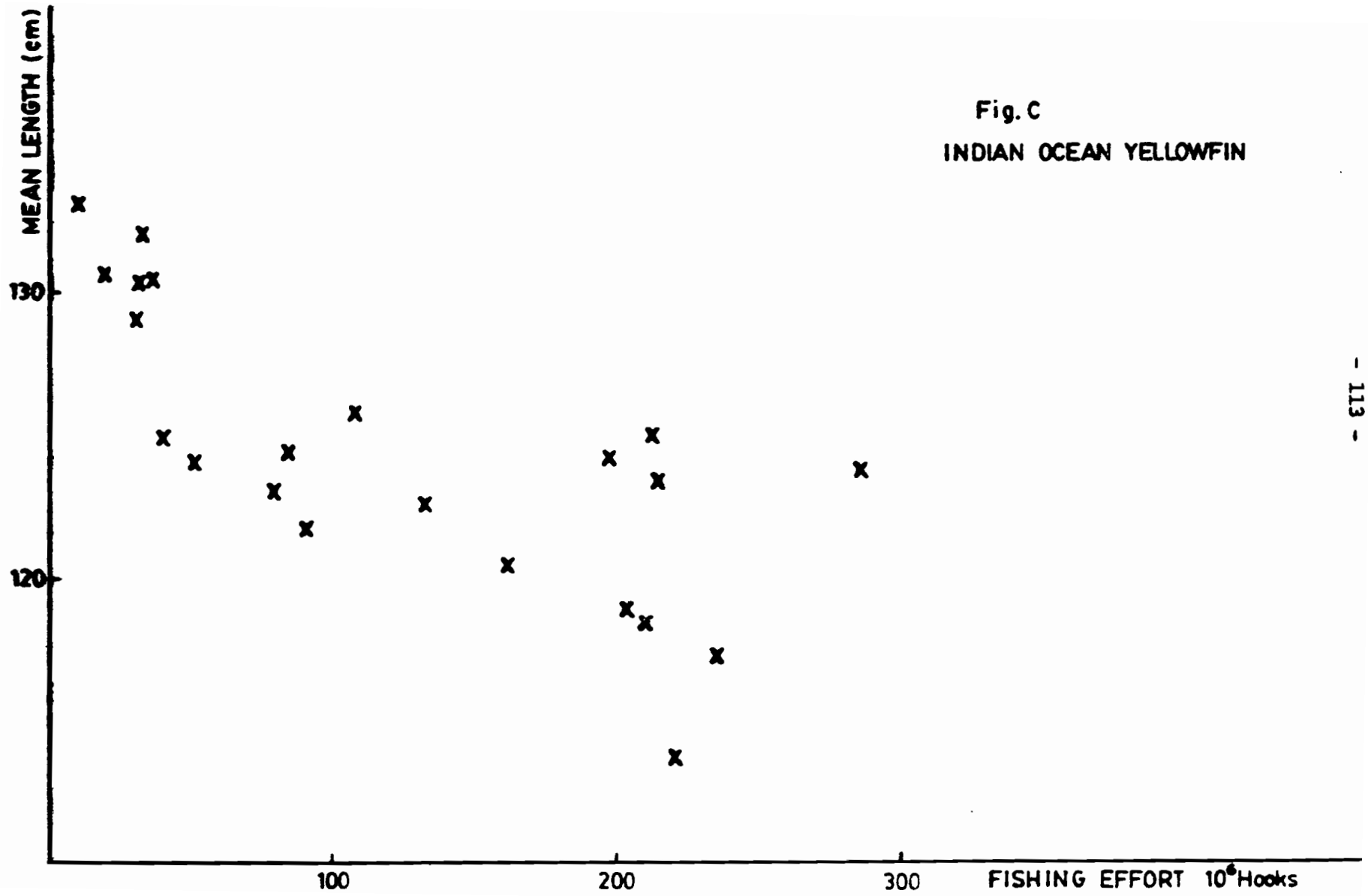

Fig. C

INDIAN OCEAN YELLOWFIN

TC/79/10

TUNA CONSULTATION MEETING
(26-29 June 1979)

INSTITUTIONAL AND FINANCIAL ASPECTS OF TUNA MANAGEMENT IN THE IPFC AND IOFC AREAS

Notes by

J. E. CARROZ

INSTITUTIONAL AND FINANCIAL ASPECTS OF TUNA MANAGEMENT IN THE IPFC AND IOFC AREAS

Notes by

J. E. Carroz
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1. The purpose of these notes is to provide factual information on the discussions held so far within the Indo-Pacific Fishery Commission (IPFC) and the Indian Ocean Fishery Commission (IOFC) on the institutional and financial aspects of tuna management in the geographic areas covered by these two Commissions. Summary data on the establishment, functions, eligibility for membership, composition and structure of IPFC and IOFC are given in Annexes A and B.

Institutional aspects

2. At its very first session in September 1968, IOFC agreed that the setting up of special committees was the best approach to its tasks with regard to heavily exploited stocks and it decided to establish a Committee on Management of Indian Ocean Tuna[1/]. Summary information on the Committee is provided in Annex C.

3. Two years later, at its fourteenth session convened in November 1970, IPFC considered proposals made by a technical-scientific meeting on the management of common use resources and the development of fishing potential which had just been held. On the basis of these proposals and recognizing the importance of the rational exploitation of tuna resources, IPFC established a Special Committee on Management of Indo-Pacific Tuna[2/]. Summary information on the Committee is to be found in Annex D. From 1971 onwards, the IOFC Committee on Management of Indian Ocean Tuna and the IPFC Special Committee on Management of Indo-Pacific Tuna have been holding joint meetings.

4. Detailed discussions on the type of international machinery that would be most suitable for the formulation, adoption and implementation of management measures took place at the first session of the IOFC Committee on Management of Indian Ocean Tuna in October 1970, at the second session of IPFC in October 1970, at the first and second joint meetings of the IOFC and IPFC

1/ Report of the first session of IOFC, Rome, 19-20 September 1968, paragraphs 56-59.

2/ Report of the fourteenth session of IPFC, Bangkok, 18-27 November 1970, Recommendation 8, paragraph 138.

Committees in April 1971 and October 1972, respectively, and at the third session of IOFC in October 1972[3/]. The views expressed on the occasion of these meetings, particularly at the meetings held in 1972, may be summarized as follows:

(i) Two delegations were of the opinion that it was necessary to create a new body similar to the Inter-American Tropical Tuna Commission (IATTC) and the International Commission for the Conservation of Atlantic Tunas (ICCAT). It was essential that all countries concerned with tuna fisheries should become full members of the management body. This would be possible in the case of an independent body, while certain of the countries concerned were not Member Nations of FAO and therefore could not become members of IOFC. They also stated that it was not the role of FAO and of its subsidiary bodies to concern themselves directly with the adoption and implementation of management measures.

(ii) One delegation felt that interim and temporary measures could be discussed and recommended by existing bodies and that FAO should be requested to take steps to convene a conference of plenipotentiaries that might adopt a convention providing for the establishment of an independent tuna management body.

(iii) The other delegations were of the opinion that the unnecessary proliferation of management bodies should be avoided. As IOFC and IPFC had been entrusted with the task of examining management problems, they constituted the most appropriate forum to discuss and recommend management measures. As bodies established within the framework of FAO, IOFC and IPFC were well equipped to fulfill the Organization's role to ensure that fishery resources were utilized for the maximum benefit of the international community and that development and management would be considered as complementary aspects of the single aim of rational utilization of the tuna resources in the areas under review. The composition of the two bodies would enable them to take better account of the interest of countries intending to enter the fishery or to increase their participation in the fishery. In this connection, they pointed out that countries which were not or could not become full members of IOFC and IPFC might take part as observers in the formulation of the management measures, and then could agree to implement any recommendation adopted by these bodies. They also stressed that an independent body set up by treaty would not have greater powers and authority than bodies established within the framework of FAO.

3/ See report of the first session of the IOFC Committee on Management of Indian Ocean Tuna, Rome, 22-24 October 1970, paragraphs 11-16; report of the second session of IOFC, Rome, 26-29 October 1970, paragraphs 9-13; report of the first joint meeting of the IPFC and IOFC Committees, Rome, 22-23 April 1971, paragraph 12; report of the second joint meeting of the IPFC and IOFC Committees, Colombo, 5-6 October 1972, paragraphs 14-16; report of the third session of IOFC, Colombo, 9-13 October 1972, paragraph 28.

In the final analysis, it would be necessary to rely on the good will and sense of cooperation of all countries concerned[4/].

5. In the following years, delegations maintained essentially the same positions and apart from discussions on financing secretariat activities which will be reviewed below, institutional aspects were not given special attention again until 1978. By that time, the 1948 Agreement establishing IPFC had been substantially amended to redefine and strengthen the management and development responsibilities of IPFC[5/]. It may also be noted that as a result of the ongoing negotiations at the Third United Nations Conference on the Law of the Sea, the practice of States had already changed considerably as regards national jurisdiction over fisheries.

6. At their fifth joint meeting held in Manila on 3-4 March 1978, the IPFC and IOFC Tuna Management Committees reviewed the situation and felt that the three following options could be considered.

(a) to provide for a better system of collection, analysis and dissemination of data and statistics at both the national and international levels with no additional institutional arrangements at this time;

(b) to strengthen the present IPFC secretariat or establish a separate tuna management secretariat within IPFC[6/];

(c) to establish a separate body by treaty concluded outside the framework of FAO.

7. The Committees agreed that the state of development of tuna management activities was well beyond the stage referred to in option (a), while option (c), although possibly a long-term solution, involved complex political considerations that could not be addressed at that meeting. Option (b) had substantial support and it was proposed that action be taken in this regard in stages[7/].

8. Within the purview of option (b), the Committees recommended that FAO should prepare short- and long-term tuna management schemes, in consultation with all member countries of IOFC and IPFC and with the assistance of a tuna management specialist. The relevant proposals should be submitted to the

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4/ See in particular the report of the second joint meeting of the IPFC and IOFC Committees, Colombo, 5-6 October 1972, paragraphs 14-16.

5/ The Agreement was amended by IPFC at its seventeenth session held in Colombo from 27 October to 5 November 1976.

6/ Presumably the same would apply to IOFC.

7/ Report of the fifth joint meeting of the IPFC and IOFC Committees, Manila, 3-4 March 1978, paragraphs 17-19.

sixth joint meeting of the committees scheduled to be held at Perth, Australia, in February 1980 and, subsequently, to IOFC and IPFC which will meet in February and May 1980, respectively.

9. The recommendations made by the Committees were reviewed and endorsed by IPFC at its eighteenth session in March 1978[8/].

10. It may be worth noting that during discussions on the institutional aspects of tuna management, particular emphasis was placed on the need for cooperation by all the States concerned. For example, IPFC agreed at its last session in March 1978 that all appropriate avenues, both direct and indirect, should be taken to ensure full participation in the initial data collection and analysis, as well as in the implementation of the finally agreed management measures, by all authorities responsible for the operation of fleets fishing particular stocks[9/]. It is also important to mention that both the IPFC and IOFC Agreement and Statutes provide for such cooperation as may be required or desirable with other international organizations. This is particularly relevant to the activities of the South Pacific Forum Fisheries Agency, IATTC and ICCAT in view of migration of stocks, the mobility of fleets and the similarity of problems.

Financial aspects

11. The question of financing the statistical and other activities required to allow for the rational management of tuna resources was first discussed at the second joint meeting of the IPFC and IOFC Tuna Management Committees in October 1972. No conclusion was reached as the Committees did not have sufficient details about the magnitude of the statistical tasks. The Committees noted with satisfaction that the International Indian Ocean Fishery Survey and Development Programme would be able to devote a small amount of time to facilitate a better definition of the statistical problems[10/].

12. The matter was taken up again at the third joint meeting of the Committees in July 1975. It was emphasized at that meeting that the development and introduction of management measures would require the expenditure of money but that the amount involved would be far exceeded by the cost of failing to manage. The Committees agreed that whichever structure for management decision would be finally adopted, it was necessary to prepare detailed proposals for financing that structure in the short- and long-term. They recommended,

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8/ Report of the eighteenth session of IPFC, Manila, 8-17 March 1978, paragraphs 52-56.

9/ Ibid., paragraph 54.

10/ Report of the second joint meeting of the IPFC and IOFC Committees, Colombo, 5-6 October 1972, paragraph 21.

therefore, the establishment of a small ad hoc Committee of Nations which would prepare statements on the functions, methods of operation and financing of a joint IOFC/IPFC secretariat. They also recommended that FAO should seek funds for carrying out urgent work pending the completion of the proposed arrangements[11/].

13. The ad hoc Committees of Nations held an organizational meeting at Mombasa in July 1975 and a substantive one at Bangkok in December 1975. As far as the financing of the management structure was concerned, the Committee felt that the figure of US$300,000 annually presented by the Secretariat for an "austerity" budget for central technical support, was reasonable and could be used as a general guideline as to the magnitude of the continued support that could be required. Views differed as to how the costs should be shared. There was some support for the opinion that countries directly concerned should accept direct responsibility for financing. In that case, it was generally felt that the respective shares of the total costs should be determined by the volume of the tuna catch taken by each country[12/].

14. The detailed proposals submitted by the ad hoc Committee of Nations concerning the secretariat functions and financing were considered by the fourth joint meeting of the IPFC and IOFC Tuna Management Committees in October 1976. The Committees suggested some modifications, but agreed that the total costs could not be expected to be substantially less than US$300,000. In their view, it would be virtually impossible to operate an effective secretariat with less than an executive secretary and a statistician. The Committees also considered the question of how the necessary funding should be obtained. Although some countries expressed the opinion that funding should be provided by FAO or UNDP, there was general agreement that, in the long term, funding should be on the principle of "user pays". That is, the total costs would be divided among countries in proportion to their interest in the tuna fisheries as judged by, for example, the weight caught, the tonnage of tuna vessels, the number of stocks exploited, etc. The Committees recommended to IPFC and IOFC that they should actively seek support from member countries for a tuna management programme[13/].

11/ Report of the third joint meeting of the IPFC and IOFC Committees, Mombasa, 18-19 July 1975, paragraphs 30-33.

12/ Report of the second session of the ad hoc Committee of Nations on the mechanics of tuna research and management, Bangkok, 12-13 December 1975, paragraphs 12-18.

13/ Report of the fourth joint meeting of the IPFC and IOFC Committees, Colombo, 27 October - 5 November 1976, paragraphs 19-20.

15. At its seventeenth session in October-November 1976, IPFC endorsed the suggestion that funding of the secretariat activities relatint to tuna management should be on the basis of "user pays". It was recognized that countries could not enter into firm commitments at this stage and IPFC recommended that the views of member countries should be solicited by means of a questionnaire. It urged FAO to provide immediate short-term support[14/].

16. When it held its fifth session in October 1977, IOFC also found itself in general agreement with the conclusions reached so far regarding the proposed arrangements for tuna management within IOFC and IPFC, and the approximate level of funding required for a central secretariat. It noted that at the request of IPFC the secretariat of FAO had circulated a questionnaire to all member countries of IPFC and to selected countries in the Indian Ocean and the Pacific Ocean, soliciting their views on possible funding arrangements. Few countries had so far replied and there was some diversity in the replies received. It was apparent that as yet no consensus could be reached concerning the long-term method of funding and IOFC recommended that FAO should take further steps to find sources of funding, at least for an interim period[15/].

17. At their fifth joint meeting in March 1978, the IPFC and IOFC Tuna Management Committees considered that the response to the questionnaire had been poor and hardly provided a basis to draw definite conclusions. They agreed that tuna management activities should be carried out within the framework of IPFC and IOFC, but considered that the original proposal for a budget in the order of US$300,000 was far too ambitious. Recognizing that it would be desirable to start on a more modest scale, they recommended that FAO should prepare, in consultation with all member countries of IPFC and IOFC, and with the assistance of a tuna specialist, options for short- and long-term management of highly migratory species. They indicated that this should include a series of options with budgets and suggested funding systems for the IPFC/IOFC tuna management secretariat[16/]. These options will be submitted to the sixth joint meeting of the IPFC and IOFC Tuna Management Committees (Perth, February 1980) and, subsequently, to the sixth session of IOFC (Perth, February 1980) and to the nineteenth session of IPFC (Kyoto, May 1980).

18. The Consultation may wish to bear this background information in mind when discussing the items on its agenda.

14/ Report of the seventeenth session of IPFC, Colombo, 27 October - 5 November 1976, paragraphs 19-20.

15/ Report of the fifth session of IOFC, Cochin, 19-26 October 1977, paragraphs 37-39.

16/ Report of the fifth joint meeting of the IPFC and IOFC Committees, Manila, 3-4 March 1978, paragraphs 13-19.

ANNEX A

INDO-PACIFIC FISHERY COMMISSION (IPFC)

Establishment

Established under an Agreement drafted in Baguio, Philippines, in February 1948 under the provision of Article XIV of the FAO Constitution. Approved by the 4th session of the FAO Conference in 1948 and entered into force on 9 November 1948 following the submission of the required number of instruments of acceptance by countries.

Area of competence

The Indo-Pacific area.

Terms of reference

To promote the full and proper utilization of living aquatic resources by the development and management of fishing and culture operations and by the development of relateo processing and marketing activities in conformity with the objectives of its Members, and to these ends it shall have the following functions and responsibilities:

(a) to keep under review the state of these resources and of the industries based on them;

(b) to formulate and recommend measures and to initiate and carry out programmes or projects to:

  (i) create new fisheries and increase the production, efficiency and productivity of existing fisheries;

  (ii) conserve and manage resources;

  (iii) protect resources from pollution;

(c) to keep under review the economic and social aspects of fishing and aquaculture industries and recommend measures aimed at improving the living and working conditions of fishermen and other workers in these industries and otherwise at improving the contribution of each fishery to social and economic goals;

(d) to encourage, recommend, coordinate and, as appropriate, undertake training and extension activities in all aspects of fisheries;

(e) to encourage, recommend, coordinate and, as appropriate undertake research and development activities;

(f) to assemble, publish or otherwise disseminate information regarding the living aquatic resources and fisheries based on these resources;

(g) to carry out such other activities as may be necessary for the Commission to achieve its purpose as defined above.

Eligibility for membership

Member Nations and Associate Members of FAO which deposit an instrument of acceptance of the Agreement. Non-Member States of FAO which (i) are Members of the United Nations, any of its Specialized Agencies or the International Atomic Energy Agency, (ii) deposit an instrument of acceptance of the Agreement, (iii) are admitted to membership by a two-thirds majority of the members of the Commission, and (iv) assume a proportionate share in the expenses of the Secretariat, as determined by FAO.

Present membership (as of 15 June 1979)

Australia	Indonesia	Pakistan
Bangladesh	Japan	Philippines
Burma	Korea, Rep. of	Sri Lanka
Democratic Kampuchea	Malaysia	Thailand
France	Nepal	United Kingdom
India	New Zealand	U.S.A.
		Viet Nam

Sessions

1st session:	Singapore,	1949	11th session:	Malaysia,	1964
2nd session:	Australia,	1950	12th session:	U.S.A.,	1966
3rd session:	India,	1951	13th session:	Australia,	1968
4th session:	Philippines,	1952	14th session:	Thailand,	1970
5th session:	Thailand,	1954	15th session:	New Zealand,	1972
6th session:	Japan,	1955	16th session:	Indonesia,	1974
7th session:	Indonesia,	1957	17th session:	Sri Lanka,	1976
8th session:	Sri Lanka,	1958	18th session:	Philippines,	1978
9th session:	Pakistan,	1961	19th session:	Japan,	1980
10th session:	Korea, Rep.of,	1962			

Subsidiary bodies

Executive Committee

Established on 9 November 1948, date on which the Agreement came into force.

Members: Chairman, Vice-Chairmen and immediately retired Chairman of IPFC, and two members elected by IPFC. Presently: Japan, Malaysia, Philippines, Bangladesh and New Zealand.

Special Committee on Management of Indo-Pacific Tuna

Established by the 14th session of IPFC, 1970

Members: (1979) Australia, Indonesia, Japan, Korea (Rep.of), New Zealand, Philippines, Thailand, United Kingdom, U.S.A.

Coordinating Committee for the South China Sea Fisheries Development and Coordinating Programme

Established by the 16th session of IPFC, 1974.

Members: The membership consists of the members of the IPFC Executive Committee and of a representative of each participating country that is not already represented on the Executive Committee. Presently: Hong Kong (United Kingdom), Indonesia, Malaysia, Philippines, Singapore, Thailand.

Standing Committee on Resources Research and Development

Established by the 17th session of IPFC, 1976

Members: All members of IPFC

IPFC/IOFC Joint Working Party of Experts on Indian Ocean and Western Pacific Fishery Statistics

Established by the 13th session of IPFC, 1968

Members: Experts

Working Party on Aquaculture and Environment

Established by the 15th session of IPFC, 1972

Members: Experts

Working Party on Fish Technology and Marketing

Established by the 16th session of IPFC, 1974

Members: Experts

Working Party of Experts on Central and Western Pacific Skipjack

Established by the 17th session of IPFC, 1976

Members: Experts

Working Party of Experts on Inland Fisheries

Established by the 17th session of IPFC, 1976

Members: Experts

ANNEX B

INDIAN OCEAN FISHERY COMMISSION (IOFC)

Establishment

Established by Resolution of the Council of FAO at its Forty-Eighth Session (1967, Res. 2/48) under Article VI-1 of the FAO Constitution

Area of competence

The Indian Ocean and adjacent seas but excluding the Antarctic area

Terms of reference

(a) To promote, assist and coordinate national programmes over the entire field of fishery development and conservation;

(b) To promote research and development activities in the area through international sources, and in particular international aid programmes;

(c) To examine management problems with particular reference, because of the need to take urgent action, to those relating to the management of offshore resources.

Eligibility for membership

Membership in the Commission is open to all Member Nations and Associate Members of FAO. Member Nations and Associate Members of FAO shall be considered as Members of the Commission upon receipt by the Director-General of notification of their desire to be so considered.

Present membership (as of 15 June 1979)

Australia	Iraq	Mauritius	Spain
Bahrain	Israel	Netherlands	Sri Lanka
Bangladesh	Japan	Norway	Sweden
Cuba	Jordan	Oman	Tanzania
Ethiopia	Kenya	Pakistan	Thailand
France	Korea, Rep.of	Poland	United Arab Emirates
Greece	Kuwait	Portugal	United Kingdom
India	Madagascar	Qatar	U.S.A.
Indonesia	Malaysia	Seychelles	Viet Nam

Sessions

1st session: Rome, 1968
2nd session: Rome, 1970
3rd session: Sri Lanka, 1972
4th session: Kenya, 1975
5th session: India, 1977
6th session: Australia, 1980

Subsidiary bodies

Committee on the Management of Indian Ocean Tuna

Established by the 1st session of IOFC, 1968.

Members: (1979) Australia, France, India, Indonesia, Japan, Kenya, Korea (Rep. of), Sri Lanka, Tanzania, U.S.A.

Committee for the Development and Management of the Fishery Resources of the Gulfs (Gulf of Oman and the Gulf lying between Iran and the Arabian Peninsula)

Established by the 3rd session of IOFC, 1972

Members: All member nations of the Commission coastal to or fishing in the Gulfs. Present members: Bahrain, Iraq, Kuwait, Oman, Qatar, United Arab Emirates.

Coordinating Sub-Committee of the Committee for the Development and Management of the Fishery Resources of the Gulfs

Established by the 1st session of the Committee, 1975

Members: All the Gulfs countries participating in the Regional Fishery Survey and Development Project (Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates)

Executive Committee for the Implementation of the International Indian Ocean Fishery Survey and Development Programme

Established by the 2nd session of IOFC, 1970

Members: Chairman and Vice-Chairman of IOFC as well as representatives of not more than four other member countries (1979): Australia, Bahrain, India, Indonesia, Japan, Kenya, Qatar, Sweden, Tanzania, Thailand, United Kingdom.

Ad Hoc Working Party of Scientists on Stock Assessment of Tuna

Established by the 1st session of IOFC, 1968

Members: Experts

Special Working Party on Stock Assessment of Shrimp in the Indian Ocean Area

Established by the 2nd session of IOFC, 1970

Members: Experts

ANNEX C

IOFC COMMITTEE ON MANAGEMENT OF INDIAN OCEAN TUNA

Establishment

First Session of IOFC, 16-20 September 1968, Rome, Italy
(FAO Fish. Rep. (6), Para. 21)

Terms of reference

To assist IOFC in its consideration of the steps required to introduce management measures for heavily exploited stocks of tuna when these measures are found necessary.

Membership

(1979) Australia, France, India, Indonesia, Japan, Kenya, Korea (Rep. of), Sri Lanka, Tanzania, U.S.A.

Sessions

1st session: 22-24 October 1970, Rome, Italy. Subsequently the Committee met jointly with the IPFC Special Committee on Management of Indo-Pacific Tuna.

1st joint meeting of the Committees:	22-23 April 1971, Rome, Italy
2nd joint meeting of the Committees:	5-6 October 1972, Colombo, Sri Lanka
3rd joint meeting of the Committees:	18-19 July 1975, Mombasa, Kenya
4th joint meeting of the Committees:	29-30 October 1976, Colombo, Sri Lanka
5th joint meeting of the Committees:	3-4 March 1978, Manila, Philippines
6th joint meeting of the Committees:	21-22 February 1980, Perth, Australia

Officers of the Joint Meeting

T.B. Curtin (Australia) Chairman
R.S. Shomura (U.S.A.) Vice-Chairman

ANNEX D

IPFC SPECIAL COMMITTEE ON MANAGEMENT OF INDO-PACIFIC TUNA

Establishment

Fourteenth Session of IPFC, 18-27 November 1970, Bangkok, Thailand
(Proc. Fourteenth Session IPFC, Section I, para. 138)

Terms of reference

(a) To review the state of the stocks of tuna in the Indo-Pacific area, in relation to the present level of exploitation and likely future development

(b) To consider the boundaries of the area that have to be taken into account in any future management of tuna in the Western Pacific, considering the movements of fish and fishing vessels

(c) To review, for purposes of discussion and information, measures that might be considered for management and development planning of the tuna fisheries in the IPFC area, and to suggest the administrative and other actions that would be required to put such measures into effect

(d) To consider arrangements for ensuring the continuation and coordination of the necessary research and the continuing re-assessment of the state of the stocks.

Eligibility for membership

The membership of the Committee is designated by the Director-General of FAO in consultation with the Chairman of IPFC from member nations of IPFC who have an interest or have indicated to FAO their present or future interest in tuna fisheries in the region.

Present membership: Australia, Indonesia, Japan, Korea (Rep. of), New Zealand, Philippines, Thailand, United Kingdom, U.S.A.

Sessions

1st session: 21-23 April 1971, Rome, Italy. Subsequently the Committee met jointly with the IOFC Committee on Management of Indian Ocean Tuna.

1st joint meeting of the Committees:	22-23 April 1971, Rome, Italy
2nd joint meeting of the Committees:	5-6 October 1972, Colombo, Sri Lanka
3rd joint meeting of the Committees:	18-19 July 1975, Mombasa, Kenya
4th joint meeting of the Committees:	29-30 October 1976, Colombo, Sri Lanka
5th joint meeting of the Committees:	3-4 Marth 1978, Manila, Philippines
6th joint meeting of the Committees:	21-22 February 1980, Perth, Australia

Officers of the Joint Meeting

T.B. Curtin (Australia) Chairman
R.S. Shomura (U.S.A.) Vice-Chairman

TC/INF/79/2

TUNA CONSULTATION MEETING
(26-29 June 1979)

COLLECTION AND PROCESSING SYSTEMS OF JAPANESE TUNA FISHERIES STATISTICS

by

TAMOTSU YONEMORI

COLLECTION AND PROCESSING SYSTEMS OF JAPANESE TUNA FISHERIES STATISTICS

Tamotsu Yonemori

Far Seas Fisheries Research Laboratory
Fisheries Agency of Japan

1. General Statistical Survey System of the Japanese Fisheries

Statistical surveys covering all types of marine and fresh water fisheries as well as aquacultures have been conducted by the Statistics and Information Department of the Ministry of Agriculture, Forestry and Fishery. The statistics, which are basically based on the interviews with fishermen, the statement from fishermen and the sales bills at fish markets, include the following items:

(1) Annual fishing efforts in terms of the number of fishing unit, crews, trips, days at sea and fishing days shown by vessel class, gear type and also by area (prefecture). Total catch of all species combined is also given for each categories.

(2) Annual total landing by species and gear type.
(3) Annual sales by gear type.

The statistics have been published by the Statistics and Information Department in the form of a statistical yearbook, in which the data on the above items are available for consecutive years dating back to 1951 for all the items and to early 1910's for catches broken down to major species groups such as tunas, billfishes and skipjack.

Various types of gear are used in the Japanese tuna and billfish fisheries. According to the yearbook, 1977, the tuna and billfish catches by gear type are as shown in Table 1.

Table 1. The 1977 Japanese tuna, Billfish and Skipjack Catches by Gear

Gear	Catches (MT)		
	Tuna	Billfish	Skipjack *
Tuna longlines			
Offshore	237,570	29,879	178
Coastal	16,836	1,838	61
Pole-and lines			
Offshore	54,833		265,584
Coastal	1,434	6	15,626
Purse seines			
One-boat type	15,978	25	24,299
Two-boat type	56		5
Drift nets	1,599	8,164	1,864
Trap nets	2,398	466	5,664
Harpoon	14	683	13
Miscellaneous	5,812	487	9,409
Total	336,530	41,548	322,703

* Figures include a portion of frigate mackerel.

Since the statistics are expressed in terms of landing amount, they do not necessarily represent where the fish were caught. It is desirable, therefore, to break down the data into smaller time and area strata from the viewpoint of fishery researches, especially, in the case of the high seas fishery such as the tuna longline which covers an extensive area on a long period of operation.

2. Efforts and Catch Statistics by Area of Tuna Longline Fishery

Japanese tuna longline boats are now classified into four categories as follows, based on the size and the license issued:

(1) Distant sea tuna longliner (more than 80 tons in size)
(2) Adjacent sea tuna longliner (20 - 80 tons)
(3) Mothership type tuna longliner
(4) Coastal water tuna longliner (less than 20 tons)

Boats belonging to the categories (1) to (3) are licensed by the Minister of Agriculture, Forestry and Fishery and are assigned the duty to submit their daily catch reports (log books) to the Fisheries Agency within one month after finishing their trips. The (4) is licensed by the prefectural governors and has no obligation to submit the detailed catch report.

The catch report contains the fishing date, location, effort (number of hooks), catch (in number) by species and kind of bait (Appendix Table 1). The report collection and data processing systems are shown in Fig. 1.

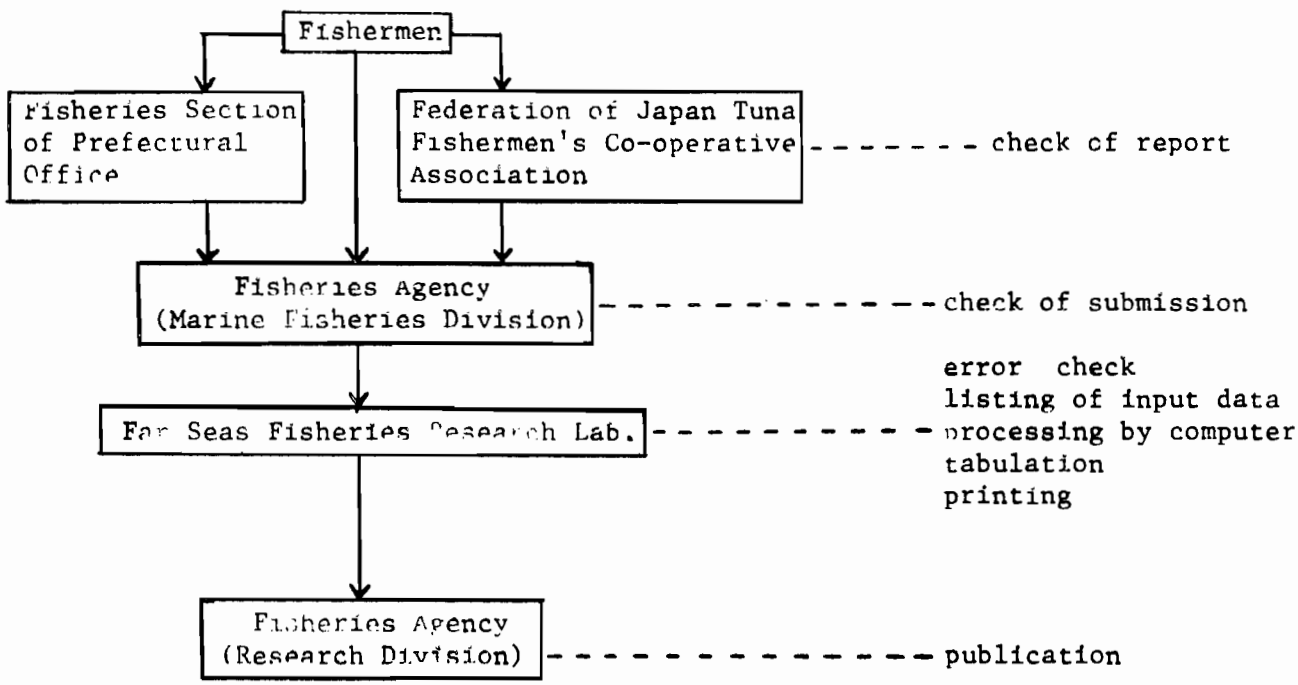


Fig. 1 Collection and processing systems of longline catch reports

That recovery rate of the catch reports has been increasing year after year. That in 1977 is shown in Table 2, indicating a tendency that the rate increases in proportion to the size of boat. Because the figures obtained from the catch reports would always be smaller than the actual ones, it is needed to enlarge the individual figure using the raising rate in Table 2. The results estimated in this way are published under the title of "Annual Report of Effort and Catch Statistics by Area of Japanese Longline Fishery", which is consisted of the contents shown in Appendix Table 2. This publication series is available for 1962-1977 period.

Table 2. Total number of trips and number of trips Reported in 1977, by size of boat

Size of	Total No of trips (A)	No of trips reported (B)	Recovery rate (C)	Raising rate (D)
20 - 50 ton	469	381	81.2	1.23
50 - 100 ton	2,821	2,347	83.2	1.20
100 - 200 ton	159	128	80.5	1.24
200 - ton P & I*	511	491	96.1	1.04
A**	178	175	98.3	1.02
Mothership type	1	1	100.0	1.00
Total	4,139	3,523	85.1	

(A) based on the data from the Statistics and Information Department of the Ministry of Agriculture, Forestry and Fishery
(B) based on the catch reports submitted
(C) (B)/(A)
(D) Factor to estimate total numbers

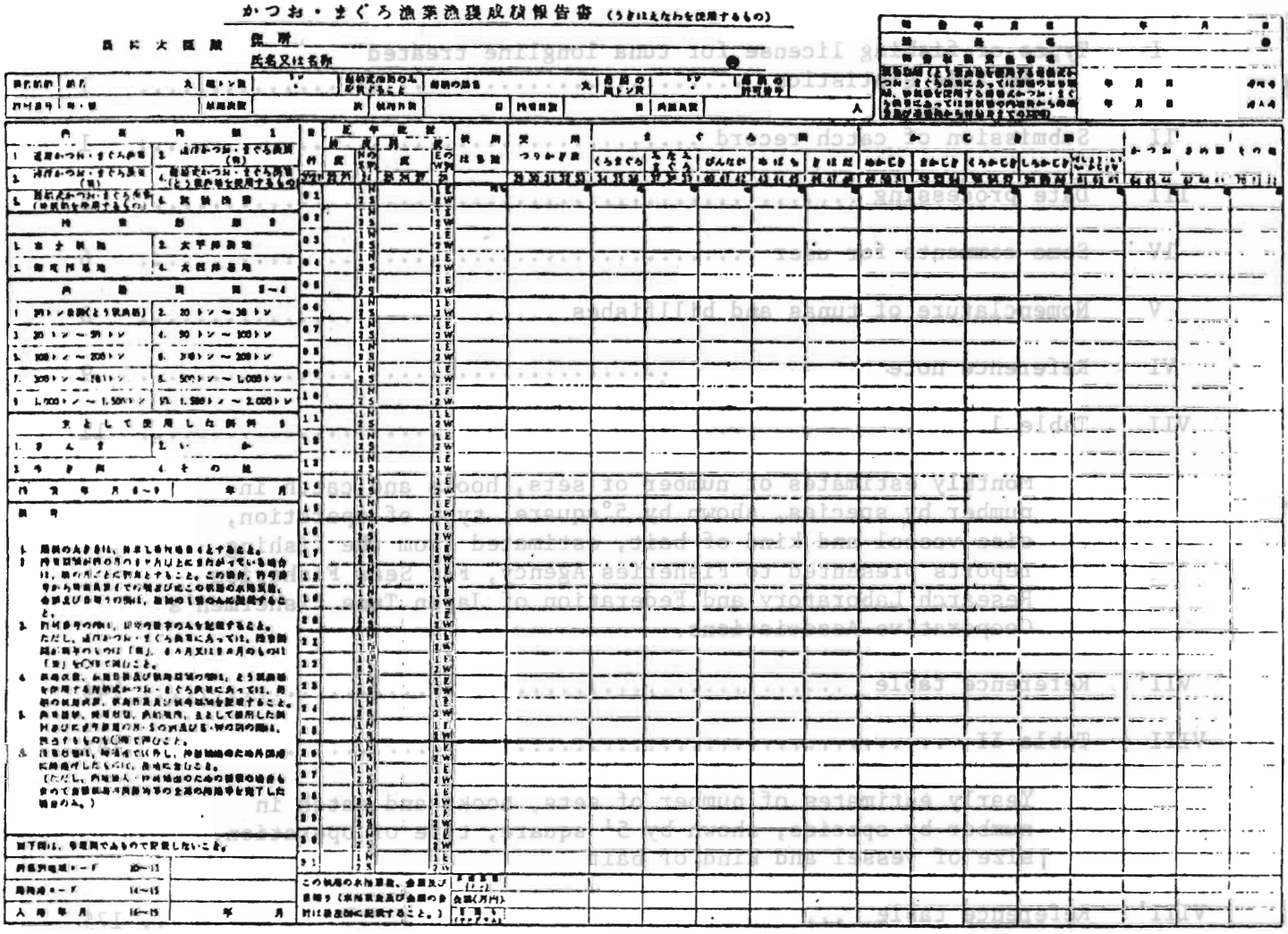
* Pacific and Indian Ocean
** Atlantic Ocean

3. Size Data

There are three sources of size data of tuna and billfish: (1) length measurement aboard research or training boats, (2) length measurement aboard commercial fishing boats, (3) length or weight measurement at fish markets.

About fifteen research boats, most of which belong to the prefectural fisheries research stations, and about forty training boats which belong to fisheries high schools are engaging in the tuna longline and pole and line fisheries research, mainly in the Pacific Ocean. They all carry out length measurement as one of the basic research items. In the more distant seas such as the Atlantic and southern bluefin waters, commercial longline boats are requested to measure the length of fish caught. For the fish which are not covered by the above surveys, the size (length or weight) of fish are measured at the major six fish markets (Shiogama, Tokyo, Shimizu, Yaizu, Katsuura and Kagoshima). The size data of the catches by various fisheries, especially in the coastal waters are covered by this survey. Thus, the number of fish measured amounts to some hundreds of thousand annually. Those data are now computerizing dating back to earlier years.

Appendix Table 1. The form of Catch Report for Tuna Longline Fishing


かつお・まぐろ漁業漁獲成績報告書 (うきはえなわを使用するもの)

Column

1- 4	Gear type, Size of boat
5	Bait
6- 9	Period of operation
10-19	Landing port, Date of entry etc.
20-21	Date of fishing
22-28	Fishing location
29-33	Number of hooks used
34-72	Species

Appendix Table 2 The contents of "Annual Report of Effort and Catch Statistics by Area of Japanese Longline Fishery"

A P P E N D I C E S

TC/79/3

TUNA CONSULTATION MEETING
(26-29 June 1979)

PROVISIONAL TIMETABLE

Consultation Meeting on Management of Tuna Resources
Organized by the SCSP

Provisional Timetable

Tuesday, 26 June

Provisional Agenda Item		
1	Opening of meeting and welcome by Convenor Mr. A.G. Woodland, Programme Leader, SCSP	0900 hours
2	Adoption of agenda	
3	Presentation of Knowledge of tuna and tuna fisheries in the region by Mr. John Gulland, FAO, Chief, Marine Resources Service. Discussion leader, Mr. Richard S. Shomura.	
	COFFEE BREAK	1000 hours
4	Presentation of Elements of a management system by Mr. John Gulland. Discussion leader, Mr. Richard S. Shomura.	1015 hours
	LUNCH	1200 hours
	Elements of a management system continued.	1330 hours
	COFFEE	1530 hours
5	Presentation of Objectives of management, and needs for management in the Pacific and Indian Ocean regions by Mr. Peter Wilson, FAO Fishery Advisor. Discussion leader, Mr. Ray Walker.	1545 hours

Wednesday, 27 June

	Objectives of management continued.	0800 hours
	COFFEE	0930 hours
	Objectives of management continued.	0945 hours
	LUNCH	1200 hours
6	Presentation of Geographic area to be covered by Mr. Harry Sperling, FAO South Pacific Regional Coordinator. Discussion leader, Mr. Inocencio Ronquillo.	1330 hours
	COFFEE	1530 hours
7	Presentation of Options for fishery statistics by Mr. John Gulland. Discussion leader, Mr. David Ardill.	1545 hours

Thursday, 28 June

	Fishery statistics continued	0800 hours
	COFFEE	0930 hours
	Fishery statistics continued	0945 hours
	LUNCH	1200 hours
8	Presentation of Options for coordination of tuna management by Mr. Jean E. Carroz, FAO Principal Legal Officer. Discussion leader, Mr. Edward Miles.	1330 hours
	COFFEE	1530 hours
	Options for coordination continued	1545 hours

Friday, 29 June

9	Presentation of Options for financing by Mr. Jean E. Carroz, Discussion leader, Ambassador Hiran Jayawardene.	0800 hours
	COFFEE	0930 hours
	Options for financing continued.	0945 hours
	LUNCH	1200 hours
10	Outcome of meeting. Discussion leader, Mr. A.G. Woodland.	1330 hours
	COFFEE	1530 hours
	Outcome continued	1545 hours

TUNA CONSULTATION MEETING FOR ASIA AND PACIFIC REGION
Manila, 26-29 June 1979

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SCS/80/WP/95 WHEELAND, H.A. and P.J. HOOKER. Organizational implications of a fisheries information system for the Philippines; specific recommendations regarding BFAR's statistics program; and a plan for implementation. Manila, South China Sea Fisheries Programme, 1980. 33p.

SCS/80/WP/96 HECHANOVA, R.G. Technical assistance on the design of government coastal aquaculture projects in Peninsular Malaysia. (A pattern for planning and design of aquaculture facility). Manila, South China Sea Fisheries Programme, 1980. 78p.

SCS/80/WP/97 LISAC, H. Some aspects of fish utilization in small-scale fisheries. Manila, South China Sea Fisheries Programme, 1980. 32p.

SCS/80/WP/98 HECHANOVA, R.G. Indonesia — The engineering aspects of selected aquaculture projects. Manila, South China Sea Fisheries Programme, 1980. 79p.

SCS/80/WP/99 HOOKER, P.J. and E.J. SAVARIRAJ. A fisheries information system for Peninsular Malaysia. Manila, South China Sea Fisheries Programme, 1981. 40p.

SCS/80/WP/100 HECHANOVA, R.G. Engineering aspects of selected aquaculture projects in Thailand. Manila, South China Sea Fisheries Programme, 1981. 15p. (Annexes A to D)

SCS/81/WP/101 Malaysia — A new fisheries bill — 1982. Malaysia. Manila, South China (FL/WPSCS/82/1) Sea Fisheries Programme, 1981. 15p. (Confidential and restricted)

SCS/81/WP/102 Fishpen and cage culture development project in Laguna de Bay, Philippines. Manila, South China Sea Fisheries Programme, 1981.

SCS/82/WP/103 The feasibility of oyster and mussel farming by municipal fishermen in the Philippines. Manila, South China Sea Fisheries Programme, 1982.

SCS/82/WP/104 Regional compendium of fisheries legislation. Vol. I. (Regional Fisheries (FL/WPSCS/82/1) Law Advisory Programme Western Pacific and South China Sea region). Manila, South China Sea Fisheries Programme, 1982. 42p.

SCS/82/WP/105 Regional compendium of fisheries legislation. Vol. II (Legislation) **(FL/WPSCS/82/1)** (Regional Fisheries Law Advisory Programme Western Pacific and South China Sea region). Manila, South China Sea Fisheries Programme, 1982. 585p.

SCS/82/WP/106 Draft fisheries regulation — Malaysia. Manila, South China Sea Fisheries **(FL/WPSCS/82/3)** Programme, 1982. 9p.

3SCS/82/WP/107 Draft bilateral access agreement Malaysia. Manila, South China Sea **(FL/WPSCS/82/4)** Fisheries Programme, 1982. 8p.

SCS/82/WP/108 Law of the sea and Fiji. Manila, South China Sea Fisheries Programme, **(FL/WPSCS/82/5)** 1982.

SCS/82/WP/109 EEZ — Malaysia legislation. Manila, South China Sea Fisheries Pro- **(FL/WPSCS/82/6)** gramme, 1982. 5p.

WORKSHOP REPORTS

SCS/GEN/74/1 Report on the workshop on planning and coordinating of resources survey and evaluation in the South China Sea. 28 August to 4 September 1974. Manila, South China Sea Fisheries, Programme, 1974. 197p.

SCS/GEN/76/2 Report of the workshop on the fishery resources of the Malacca Strait. Part I. Jakarta, 29 March to 2 April 1976. Manila, South China Sea Fisheries Programme, 1976. 89p.

SCS/GEN/76/3 Report of workshop on legal and institutional aspects of fishery resources management and development. 5-8 April 1976. Manila, South China Sea Fisheries Programme, 1976. 95p.

SCS/GEN/76/4 Report on the training workshop for field enumerators of the Bureau of Fisheries and Aquatic Resources — Philippines. 22-31 March 1976. Manila, South China Sea Fisheries Programme, 1976. 32p.

SCS/GEN/76/5 UNDP/FAO Training course on the management of small-scale fishery enterprises. Kuala Trengganu, Malaysia. 25 August to 26 September 1975. Rome, FAO, 1976. 14p.

SCS/GEN/77/6 Report of the workshop on the fishery resources of the Malacca Strait — Part II. Jakarta, 29 March to 2 April 1976. South China Sea Fisheries Programme, 1976. 85p.

SCS/GEN/76/7 Report of the BFAR/SCSP workshop on the fishery resources of the Visayan and Sibuyan Area. Tigbauan, Iloilo, Philippines. 18-22 October 1976. Manila, South China Sea Fisheries Programme, 1976. 26p.

SCS/GEN/76/8 Philippines — Report seminar on the fisheries statistics survey of the Bureau of Fisheries and Aquatic Resources. 23 July 1976. DNR/BFAR/SCSP, Manila, South China Sea Fisheries Programme, 1976. 17p.

SCS/GEN/76/9 Report of the consultative group meeting on small-scale fisheries development in the South China Sea Region. 13-15 December 1976. Manila, South China Sea Fisheries Programme, 1976. 140p.

SCS/GEN/77/10 Report on the training workshop on fisheries statistics, Malaysia, 12-21 October 1976. Manila, South China Sea Fisheries Programme, 1977. 27p.

SCS/GEN/77/11 Report on the BFAR/SCSP workshop on fishery resources of the Sulu Sea and Moro Gulf areas, 25-29 April 1977, Cagayan de Oro. Manila, 1977. 58p.

SCS/GEN/77/12 Report of the workshop on the demersal resources, Sunda Shelf. Part I. November 7-11, 1977. Penang, Malaysia. Manila, South China Sea Fisheries Programme, 1978. 58p.

SCS/GEN/77/13 Report of the workshop on the demersal resources. Sunda Shelf. Part II. November 7-11, 1977. Penang, Malaysia. Manila, South China Sea Fisheries Programme, 1978. 120p.

SCS/GEN/77/14 Joint SCSP/SEAFDEC workshop on aquaculture engineering (with emphasis on small-scale aquaculture projects) Vol. I — General Report. Manila, South China Sea Fisheries Programme, 1978. v.p.

SCS/GEN/77/15 Joint SCSP/SEAFDEC workshop on aquaculture engineering (with emphasis on small-scale aquaculture projects) Vol. II — Technical Report. Manila, South China Sea Fisheries Programme, 1978. 463p.

SCS/GEN/77/16 A layout of standard tables of fishery statistics in the Philippines. Manila, South China Sea Fisheries Programme, 1978. 162p.

SCS/GEN/77/17 Report of the workshop on the biology and resources of mackerels (*Rastrelliger* spp) and round scads (*Decapterus* spp) in the South China Sea. Part I. Manila, South China Sea Fisheries Programme, 1978. 70p.

SCS/GEN/78/18 Report of the workshop on management of resources of the Sunda Shelf, Malacca Strait and related areas. Manila, South China Sea Fisheries Programme, 1978. 14p.

SCS/GEN/78/19 Report of the BFAR/SCSP workshop on the fishery resources of the Pacific Coast of the Philippines. 18-22 September 1978. Manila, South China Sea Fisheries programme, 1978. 48p.

SCS/GEN/79/20 Report of the workshop on demersal and pelagic fish resources of the Java Sea. 5-9 December 1978. Semarang, Indonesia. Manila, South China Sea Fisheries Programme, 1979. 60p.

SCS/GEN/79/21 Report of the workshop on the tuna resources of Indonesia and Philippine waters. Jakarta, 20-23 March 1979. Manila, South China Sea Fisheries Programme, 1979. 35p.

SCS/GEN/79/22 Report of the BFAR/SCSP workshop on the fishery resources of the north Luzon and western coasts of Luzon. 18-20 April 1979, Manila, Philippines. Manila, South China Sea Fisheries Programme, 1979. 57p.

SCS/GEN/79/23 Report on training course in fishery statistics. 2 October-10 November 1978, Manila, Philippines. Manila, South China Sea Fisheries Programme, 1979. v.p.

SCS/GEN/79/24 Report of the consultation meeting on management of tuna resources of the Indian and Pacific Oceans. 26-29 June 1979, Manila, Philippines. Manila, South China Sea Fisheries Programme, 1979. 155p.

SCS/GEN/80/25 Report of the workshop on application and results of acoustic methods for resource appraisal surveys in the South China Sea. Manila, South China Sea. Manila, South China Sea Fisheries Programme, 1980. 19p. Annexes 1 to 4.

SCS/GEN/80/26 Report of the workshop on the biology and resources of penaeid shrimps in the South China Sea area. Part I. 30 June-5 July 1980. Kota Kinabalu, Sabah, Malaysia. Manila, South China Sea Fisheries Programme, 1980 162p.

SCS/GEN/80/27 Report of the workshop on application and results of acoustic methods for resource appraisal surveys in the South China Sea. Part II. 19-22 November 1979. Manila, South China Sea Fisheries Programme, 1980. 102p.

SCS/GEN/81/28 Report of the training course in prawn farming for Asia and the Pacific. Jepara, Central Java, Indonesia. 5 October — 15 November 1980. Manila, South China Sea Fisheries Programme, 1980. 138p.

SCS/GEN/81/29 Report on the training course on *Gracilaria* algae. (A training subproject under FAO/UNDP Project RAS/79/041 implemented through RAS/74/013). Manila, Philippines, 1-30 April 1981. Manila, South China Sea Fisheries Programme, 1981.

SCS/GEN/81/30 Report of the workshop on the biology and resources of penaeid shrimps in the South China Sea area. Part II. 30 June — 5 July 1980. Kota Kinabalu, Sabah, Malaysia. Manila, South China Sea Fisheries Programme, 1981.

SCS/GEN/82/31 Report of the regional seminar on monitoring, control and surveillance of fisheries in exclusive economic zones. 30 November — 4 December 1981. Jakarta, Indonesia. Manila, South China Sea Fisheries programme, 1981. v.p.

SCS/GEN/82/32 Report on training course on fishery statistics. 1 September — 9 October 1981. Samutprakarn, Thailand. Manila, South China Sea Fisheries Programme, 1982.

SCS/GEN/82/33 Working party on small-scale shrimp/prawn hatcheries in Southeast Asia. Vol. I — General report. Manila, South China Sea Fisheries Programme, 1982. 30p.

SCS/GEN/82/34 Report of the training course on small-scale pen cage culture for finfish. 26-31 October and 1-12 November 1981. Laguna, Philippines. Manila, South China Sea Fisheries Programme, 1982.

SCS/GEN/82/35 Training on assessment of coastal aquaculture potential, Malaysia. Manila, South China Sea Fisheries Programme, 1982.

SCS MANUALS

SCS Manuals No. 1 Handbook on field identification of fishes, crustaceans, molluscs, shells, and important aquatic plants. Manila, South China Sea Fisheries Programme, 1978. 60p.

PERIODIC PROGRESS REPORTS

SCS/PR/74/1 WOODLAND, A.G. Project progress report of the South China Sea Fisheries Development and Coordinating Programme. 1 July to 31 December 1974. Manila, South China Sea Fisheries Programme, 1974. 19p.

SCS/PR/75/2 _____. Project progress report of the South China Sea Fisheries Development and Coordinating Programme. 1 January to 30 June 1975. Manila, South China Sea Fisheries Programme, 1975. 40p.

SCS/PR/75/3 _____. Project progress report of the South China Sea Fisheries Development and Coordinating Programme. 1 July to 31 December 1975. Manila, South China Sea Fisheries Programme, 1975. 38p.

SCS/PR/76/4 _____. Project progress report of the South China Sea Fisheries Development and Coordinating Programme. 1 January to 31 December 1976. Manila, South China Sea Fisheries Programme, 1976. 47p.

SCS/PR/77/5 _____. Project progress report of the South China Sea Fisheries Development and Coordinating Programme. 1 January to 30 June 1977. Manila, South China Sea Fisheries Programme, 1977. 37p.

SCS/PR/77/6 _____. Project progress report of the South China Sea Fisheries Development and Coordinating Programme. 1 July to 31 December 1977. Manila, South China Sea Fisheries Programme, 1977. 19p.

SCS/PR/78/7 _____. Project progress report of the South China Sea Fisheries Development and Coordinating Programme. 1 January to 30 June 1978. Manila, South China Sea Fisheries Programme, 1978. 12p.

SCS/PR/78/8 _____. Project progress report of the South China Sea Fisheries Development and Coordinating Programme. 1 July to 31 December 1978. Manila, South China Sea Fisheries Programme, 1978. 11p.

SCS/PR/79/9 _____. Project progress report of the South China Sea Fisheries Development and Coordinating Programme. 1 January to 30 June 1979. Manila, South China Sea Fisheries Programme, 1979. 12p.

SCS/PR/79/10 _____. Project progress report of the South China Sea Fisheries Development and Coordinating Programme. 1 July to 31 Decemher 1979. Manila, South China Sea Fisheries Programme, 1979. 65p.

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SCS/PR/81/14 _____ Project progress report of the South China Sea Fisheries Development and Coordinating Programme. 1 July to 31 December 1981. Manila, South China Sea Fisheries Programme, 1981.

COORDINATING COMMITTEE REPORTS

SCSP/74/1 REP Report of the *Ad Hoc* Coordinating Committee Meeting of the South China Sea Fisheries Development and Coordinating Programme. Manila, 18-19 June 1974. 27p.

SCSP/74/2 REP Report of the first session of the Coordinating Committee of the South China Sea Fisheries Development and Coordinating Programme. Jakarta, Indonesia, 6 November 1974. Rome, FAO, 1974. 22p.

SCSP/76/3 REP Report of the second session of the Coordinating Committee of the South Chinna Sea Fisheries Development and Coordinating Programme. Manila, 9 April 1976. 16p

SCSP/77/4 REP Report of the third session of the Coordinating Committee of the South China Sea Fisheries Development and Coordinating Programme. Manila, 24-25 February 1977. 19p.

SCSP/77/5/ REP Report of the fourth session of the Coordinating Committee of the South China Sea Fisheries Development and Coordinating Programme. Manila, 11-12 October 1977. 21p.

SCSP/78/6 REP Report of the fifth session of the Coordinating Committee of the South China Sea Fisheries Development and Coordinating Programme. Manila, 11 March 1978. 16p.

SCSP/78/7 REP Report of the sixth session of the Coordinating Committee of the South China Sea Fisheries Development and Coordinating Programme. Manila, 28-29 September 1978.

SCSP/79/8 REP Report of the seventh session of the Coordinating Committee of the South China Sea Fisheries Development and Coordinating Programme. Rome, 11-16 Octoher 1979.

FISHERIES TECHNICAL PAPERS

SCS/DEV/73/1 WOODLAND, A.G. *et al.* The South China Sea Fisheries: A proposal for accelerated development. Rome, FAO, 1974. 162p.

SCS/DEV/73/2 YAMAMOTO, T. Review of marine fishery statistical system in countries bordering the South China Sea, and proposals for their improvement. Rome, FAO, 1973. 46p. (Cover title: The South China Sea Fisheries Statistical Systems)

SCS/DEV/73/3 AOYAMA, T. The demersal fish stocks and fisheries of the South China Sea. Rome, FAO, 1973. 80p. (Cover title: The South China Sea Fisheries Demersal Resources)

SCS/DEV/73/4 KUME, S. Tuna resources in the South China Sea. Rome, FAO, 1973. 18p.

SCS/DEV/73/5 LING, S. Status, potential and development of coastal aquaculture in the countries bordering the South China Sea. Rome, FAO, 1973. 51p. (Cover title: The South China Sea Fisheries Aquaculture Development)

SCS/DEV/73/6 MENASVETA, D *et al.* Pelagic fishery resources of the South China Sea and prospects for their development. Rome, FAO, 1973. (Cover title: The South China Sea Fisheries Pelagic Resources)

SCS/DEV/73/7 MISTAKIDIS, M.N. The crustacean resources and related fisheries in the countries bordering the South China Sea (Cover title: The South China Sea Fisheries Crustacean Resources)

SCS/DEV/73/8 RUCKES, E. Fish utilization, marketing and trade in countries bordering the South China Sea status and programme proposals. Rome, FAO, 1973. 33p. (Cover title: The South China Sea Fisheries Marketing and Trade)

SCS/DEV/73/9 DOUCET, F.J. *et al.* Institutional and legal aspects affecting fishery development in selected countries bordering the South China Sea. Rome, FAO, 1973. 32p. (Cover title: The South China Sea Fisheries Institutional Legal Aspects)

FAO species identification for fishery purposes. Eastern Indian Ocean (Fishing area 57) and Western Central Pacific (Fishing area 71). Rome, FAO, 1974. 4 vols.

SCS/DEV/76/11 Development potentials of selected fishery products in the regional member countries of the Asian Development Bank. Manila, South China Sea Fisheries Programme, 1976. 107p. (ADB FAO Market Studies)

SCS/DEV/76/11 Fishery country profiles. Manila, South China Sea Fisheries Programme, (Appendix 1) 1976. 173p. (ADB FAO Market Studies)

SCS/DEV/76/12 The international market for shrimp. Manila, South China Sea Fisheries Programme, 1976. 105p. (ADB FAO Market Studies)

SCS/DEV/76/13 The international market for tuna. Manila, South China Sea Fisheries Programme, 1976. 69p. (ADB FAO Market Studies)

SCS/DEV/76/14 The international market for crab. Manila, South China Sea Fisheries Programme, 1976. 46p. (ADB/FAO Market Studies)

SCS/DEV/76/15 The international market for lobster. Manila, South China Sea Fisheries Programme, 1976. 46p. (ADB/FAO Market Studies)

SCS/DEV/76/16 The international market for cephalopods. Manila, South China Sea Fisheries Programme, 1976. 95p. (ADB FAO Market Studies)

SCS/DEV/76/17 The European canned fish market: Prospects for *Rastrelliger* spp. Manila, South China Sea Fisheries Programme, 1976. 56p. (ADB FAO Market Studies)

SCS/DEV/78/18 CHIKUNI, S., A.C. SIMPSON and W.R. MURDOCH. Test fishing for tuna and small pelagic species: Reports on the operation of FAO chartered purse siners in Philippine and South China Sea waters, 1974-1977. Manila, South China Sea Fisheries Programme, 1978. v.p.

SCS/DEV/79/19 POPE, J. Stock assessment in multispecies fisheries with special reference to the trawl fishery in the Gulf of Thailand. Manila, South China Sea Fisheries Programme, 1979. 106p.

SCS/DEV/80/20 Implications of the extension of national jurisdiction for fisheries management and development. Report of an FAO Mission to the Government of Indonesia. 7 January 2 February 1980. Manila, South China Sea Fisheries Programme and Food and Agriculture Organization of the United Nations, 1980. 90p. (Restricted)

TECHNICAL REPORTS CONTRIBUTED TO SYMPOSIA/MEETINGS, ETC.

RABANAL, H.R. FAO activities in inland fisheries and aquaculture with particular reference
1975 to Asia and the Far East. Manila, South China Sea Fisheries Programme. 17p. (Contributed to the First Fisheries Research Congress, Philippine Council for Agriculture and Resources Research, 7-10 March 1975, Legaspi City, Philippines).

_____. Preliminary report on the Macrobrachium fishery in the Indo-Pacific region.
1975 Manila, South China Sea Fisheries Programme. 20p. (Contributed to the International Conference on Prawn Farming, Vung Tau, Vietnam, 31 March — 4 April 1975).

_____. Distribution and occurrence of milkfish *Chanos chanos* (Forskal). Manila, South
1975 China Sea Fisheries Programme, 1975. 18p. (Contributed to the National Bangus Symposium. Manila, 25-26 July 1975).

_____. Mangrove and their utilization for aquaculture. Manila, South China Sea Fish-
1976 eries Programme. 20p. (Contributed to the National Workshop on Mangrove Ecology held in Phuket, Thailand, 10-16 January 1976).

_____. Report of project identification mission to Bangladesh on inland fisheries and
1976 aquaculture. Manila, Asian Development Bank. 56p.

_____. Aquaculture 1976: Focus Southeast Asia. Manila, South China Sea Fisheries
1976 Programme. 12p. (Talk delivered at the National Convention of the Federation of Fish Producers of the Philippines, Iloilo City, 26 August 1976).

SIMPSON, A.C. Some proposals for research related to the understanding of mangrove
1976 ecology and the utilization of mangrove areas. Manila, South China Sea Fisheries Programme. 10p. (Contributed to the National Workshop on Mangrove Ecology held in Phuket, Thailand, 10-16 January 1976).

COOK, H.L. Some aspects of shrimp culture research with particular reference to Philippine
1976 species. Manila, South China Sea Fisheries Programme. 7p. (Contributed to the Philippine Council for Agriculture and Resources Research (PCARR) Fisheries Workshop, Subic, Zambales, Philippines, 15-17 January 1976).

RABANAL, H.R. The resources in inland waters: their utilization and management. Manila,
1976 South China Sea Fisheries Programme. 21p. (Talk delivered before the Phi Sigma Biological Society as a contribution to the Deogracias V. Villadolid Memorial lecture series. Manila, Philippines, 26 November 1976).

_____. Aquaculture in the Philippines. Manila, South China Sea Fisheries Programme.
1977 15p. (Talk delivered before the United States Peace Corps Volunteers, Los Banos, Laguna, Philippines. 11 January 1977).

RABANAL, H.R. Aquaculture in Southeast Asia. Manila, South China Sea Fisheries
1977 Programme. 10p. (Paper contributed to the Fifth FAO/SIDA Workshop on Aquatic Pollution in relation to Protection of Living Resources. Manila, Philippines, 17-27 February 1977).

SIMPSON, A.C. Fisheries research and development in the Philippines: Some recommenda-
1977 tions with special reference to resource assessment. Manila, South China Sea Fisheries Programme. 16p.

RABANAL, H.R. Aquaculture management. Manila, South China Sea Fisheries Pro-
1977 gramme. 12p. (Contribution to the BFAR/FAO-UNDP Training of Regional Trainors in Aquaculture. Lucena, Quezon, Philippines, 19 September to 27 October 1977).

_____. Recent trends in aquaculture. Manila, South China Sea Fisheries Programme.
1977 13p. (Paper contributed to the Seminar/Workshop for Fishery Schools' Administrators, conducted by the Bureau of Fisheries and Aquatic Resources. Manila, Philippines, 24-28 October 1977).

_____. Forest conservation and aquaculture development of mangroves. Manila, South
1977 China Sea Fisheries Programme. 15p. (Paper contributed to the International Workshop on Mangrove and Estuarine Area Development for the Indo-Pacific region. 14-19 November 1977, Manila, Philippines).

THOMSON, D.B. Lecture notes on fishing methods, equipment and deck layout of fishing
1978 vessels. Manila, South China Sea Fisheries Programme, 1978. 151p. (Paper presented at the FAO NORAD Course on Fishing Vessel Design, Bangkok, Thailand, October-November 1978).

RABANAL, H.R. International traffic of live and fish eggs and control of the spread of fish
1978 diseases. Manila, South China Sea Fisheries Programme, 1978. 21p. (Contributed to the Workshop on Tropical Fisheries — their causes and control in Southeast Asia, Puncak, West Java, Indonesia, 28 November to 1 December 1978).

RABANAL, H.R. and R.O. JULIANA. Aquaculture extension: How it could be a potent
1979 force in fisheries development in the ASEAN region. Manila, South China Sea Fisheries Programme, 1979. (Paper contributed to the First ASEAN Seminar/Workshop on Fisheries Extension, Manila 18-25 February 1979.

THOMSON, D.B. Marine fisheries extension. Manila, South China Sea Fisheries Pro-
1979 gramme, 1979. 41p. (Paper contributed to the First ASEAN Seminar/Workshop on Fisheries Extension, Manila, 18-25 February 1979).

_____. Training requirements of the fisheries of Southeast Asia. Manila, South China
1979 Sea Fisheries Programme, 1979. 11p. (Paper presented at the SEAFDEC Consultative Meeting on Fisheries Training, Bangkok, 14-18 May, 1979.

KUHNHOLD, W.W. Aquatic pollution: Classes of pollutants, their occurrence, transport and
1979 dispersion. Manila, South China Sea Fisheries Programme, 1979. 22p. (Lecture given at the Seventh FAO/SIDA Workshop on Aquatic Pollution in Relation to Protection of Living Resources — Analyses of Metals and Organochlorines in Biota. Manila, Philippines, 7 May to 9 June 1979).

_____. Effects of aquatic pollution on fish and fisheries. Manila, South China Sea Fish-
1979 eries Programme, 1979. (Lecture given at the Seventh FAO/SIDA Workshop on Aquatic Pollution in Relation to Protection of Living Resources — Analyses of Metals and Organochlorines in Biota. Manila, Philippines, 7 May — 9 June 1979).

RABANAL, H.R. The design of research in brackishwater aquaculture. Manila, South China
1979 Sea Fisheries Programme, 1979. 7p. (Paper contributed to the Seminar/Workshop on Research Methodology and Technical Report Writing, conducted by the Fisheries Training Division, Bureau of Fisheries and Aquatic Resources, Fisheries Training Centre, Cavite City, Philippines, 10-29 June 1979).

KUHNHOLD, W.W. Some aspects of the impact of aquatic oil pollution on fishery resources.
1979 Manila, South China Sea Fisheries Programme, 1979. (Seminar held at Bureau of Fisheries and Aquatic Resources, Quezon City, Metro Manila, Philippines, 31 July 1979).

RABANAL, H.R. Production and recent innovations in design and management in aqua-
1979 culture industry in Southeast Asia. Manila, South China Sea Fisheries Programme, 1979. 7p. (Paper contributed to the Asian Seminar and Tour sponsored by the Bank of America, Manila, 6-9 November 1979).

THOMSON, D.B. The challenge of the 1980's for fisheries education, training and extension.
1979 Manila, South China Sea Fisheries Programme, 1979. 11p. (Paper presented at the First International Symposium on Fishery Education, Fish Processing and Marketing Systems. Mexico, December 1979).

KUHNHOLD, W.W. Some aspects of the impact of aquatic oil pollution on fishery resources.
1980 Manila, South China Sea Fisheries Programme, 1980. 25p. (Paper contributed to the International Workshop on the Prevention, Abatement and Combating of Pollution from Ships in East Asian Waters. 3-8 November 1980, Manila, Philippines).