

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS



INDO-PACIFIC FISHERIES COUNCIL

PROCEEDINGS

15th SESSION

WELLINGTON, NEW ZEALAND

18-27 October, 1972

SECTION 1.

REPORT OF THE SESSION

FAO Regional Office for Asia and the Far East,

Bangkok, Thailand

1972

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OFFICE BEARERS OF THE INDO-PACIFIC FISHERIES COUNCIL

1972 - 1974

EXECUTIVE COMMITTEE

Chairman:	Admiral Nizan Zachman (Indonesia)
Vice-Chairman:	Y.M. Tengku Ubaidillah bin Abdul Kadir (Malaysia)
Member:	Mr B.T. Cunningham (New Zealand)
Secretary*:	Mr D.D. Tapiador

* The Office of Secretary to the Council is currently held by the
FAO Regional Fisheries Officer for Asia and the Far East.

IPFC WORKING PARTIES, 1972 - 1974

1. WORKING PARTY ON COASTAL AND HIGH SEAS PELAGIC RESOURCES
2. WORKING PARTY ON AQUACULTURE AND ENVIRONMENT
3. WORKING PARTY ON ECONOMICS OF AQUACULTURE
4. WORKING PARTY ON ECONOMIC AND SOCIAL ASPECTS OF NATIONAL FISHERIES
PLANNING AND DEVELOPMENT
5. IPFC/IOFC JOINT WORKING PARTY OF EXPERTS ON INDIAN OCEAN AND
WESTERN PACIFIC FISHERY STATISTICS
6. IPFC/IOFC AD HOC WORKING PARTY OF SCIENTISTS ON STOCK ASSESSMENT
OF TUNA
7. WORKING PARTY ON DEVELOPMENT AND UTILISATION OF INLAND FISHERY
RESOURCES

(17th Session Symposium)

Convenor: Dr V.G. Jhingran (India)

A. INTRODUCTORY AND PROCEDURAL MATTERS

I. OPENING OF THE SESSION

1. The Indo-Pacific Fisheries Council (IPFC) held its Fifteenth Session from 18-27 October 1972 at the James Cook Hotel, The Terrace, Wellington, New Zealand. The Session was attended by 37 representatives of 14 member nations, 4 observers from non-member nations, and 4 observer international organisations. A list of participants is given in Appendix I to this Report.

2. The representatives were welcomed in an opening address by the Honourable D.J. Carter, Minister of Agriculture and Fisheries, New Zealand. The Session also heard addresses delivered by Mr F.E. Popper, Assistant Director-General (Fisheries), the Chairman of IPFC, Mr B.T. Cunningham, and a message to the Chairman from Dr D.L. Umali, FAO Assistant Director-General and Regional Representative for Asia and the Far East. The addresses are appended as Appendix II.

II. ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION

3. Two new sub-items

- (a) "Discussion of the Future of Technical Committees I and II" and
- (b) "Election of Officers of Technical Committees I and II"

were included in the Provisional Agenda under item 12 "Any other matters", as recommended by the Executive Committee of the IPFC. The Agenda as adopted by the Council is given in Appendix III. The documents which were placed before the Council are listed in Appendix IV.

B. TECHNICAL - SCIENTIFIC MATTERS

III. SYMPOSIUM ON COASTAL AND HIGH SEAS PELAGIC RESOURCES

Origin, Objectives and Organisation

4. The Symposium on Coastal and High Seas Pelagic Resources was organised in accordance with a recommendation made at the Thirteenth Session of the Indo-Pacific Fisheries Council in Brisbane, Australia, October 1968 and with guidance from the Fourteenth Session of the Council in Bangkok, Thailand, November 1970.

5. The objectives of the Symposium were to review and evaluate technical, scientific, and economic data and information relating to the coastal and high seas pelagic resources of the IPFC area, in order to develop a series of pertinent recommendations which member countries could act upon in the order of priority, and to establish suitable guidelines through which bilateral and multilateral assistance could be obtained by interested member countries. In particular the Symposium was to review the present status of the industry, to identify the potentials and gaps in the present knowledge of the resources, and to recommend action required to achieve maximum utilisation of the potential resources.

6. The Working Party on Coastal and High Seas Pelagic Resources was responsible for the organisation of the Symposium. As a basis for the discussions, 43 scientific contributions were submitted which are listed in Appendix IV. Most of them had been considered and accepted by the IPFC Working Party on Coastal and High Seas Pelagic Resources during its meeting in Bangkok from 17 to 21 July 1972. Several other contributions were submitted between that meeting and the Symposium.

7. Mr R.S. Shomura, the Convener of the Working Party on Coastal and High Seas Pelagic Resources, acted as Chairman of the Symposium. The Symposium encompassed five meetings as follows:

Meeting I : Status of the coastal and high seas fisheries and fishery resources of the IPFC area

Meeting II : The environment

Meeting III : Resources and fisheries
 (a) Mulletts, milkfish, and clupeoids
 (b) Jack mackerels and mackerels
 (c) Tuna, billfish, and others

Meeting IV : Conclusions

Meeting V : Adoption of the Draft Report.

8. Discussion leaders appointed for each meeting introduced the subject of their session by a brief overall review of the situation and present knowledge relevant to the meeting, and summarised the papers submitted to the Symposium. They were assisted by Rapporteurs who prepared the reports of the meetings. A Steering Committee, consisting of the members of the Working Party on Coastal and High Seas Pelagic Resources, Discussion Leaders, and Rapporteurs, provided guidance throughout the Symposium, particularly on the formulation of the recommendations.

REPORT OF MEETING I - STATUS OF THE COASTAL AND
HIGH SEAS FISHERIES AND FISHERY RESOURCES OF THE IPFC AREA

Discussion Leader : R.S. Shomura
 Rapporteur : D. Eggleston

Principal papers : IPFC/72/SYM 1 to 7 and 40
 Related papers : IPFC/72/SYM 8, 43, 45, 46 and CS 1 to 12
 IPFC/72/REF 1, 18 and 19

9. The Discussion Leader pointed out that the major FAO fishing areas bordering IPFC countries covered 46% of the world sea surface area but yielded only 20% of the world landings of pelagic fish. Despite the limitations of such a generalisation the comparison did indicate that there was considerable scope for increases in pelagic fish landings in the IPFC area. When the pelagic fish are considered by ecological type (IPFC/72/REF 18) it is apparent that the IPFC area landings of the "Coastal Migrants (mackerels and hairtails)" and "Offshore (tuna and billfish)" exceed 46% of the world landings: however landings of "Coastal : Limited Migration (herrings, anchovies, and sardines)" are far below this level. Unexploited and/or underexploited stocks of herrings, anchovies, and sardines are probably present in the IPFC area but these resources are not harvested extensively due to limitations in marketing, transportation, and processing, or are not harvested as they are not vulnerable to the gear and vessels currently used. With the exception of the high seas fishery which is dominated by Japan, Taiwan, and Republic of Korea, most pelagic fishing in the IPFC area is confined to near coastal waters.

10. The Symposium discussed examples of gross fluctuations in pelagic fisheries for herrings, anchovies, and sardines in various parts of the world and stressed the importance of managing the fisheries so as to avoid gross changes in stock abundance due to excessive fishing pressure. Changes in stock abundance of pelagic fish were grouped as:

- (a) long-term cyclical changes in response to environmental cycles of many years duration;
- (b) rapid changes due to sudden environmental changes affecting distribution and abundance of fish;
- (c) fluctuations due to variations in year class strength;
- (d) changes due to excessive fishing on one component of a fish community leading to its replacement by another species;
- (e) changes due to excessive fishing pressure on a series of poor year classes;
- (f) apparent changes due to year-to-year changes in stock distribution which may or may not be associated with real changes in stock abundance. This last type is experienced where stocks are fished over only part of their range.

11. Many stocks in higher latitudes have short reproductive seasons and their breeding success is susceptible to adverse environmental conditions during this time. In contrast, those tropical species with long or multiple spawning periods should not be affected to the same extent; however, drastic fluctuations do occur because of the short life span of many tropical species. Fluctuations in year class strength, e.g., in tuna, are also related to environmental tolerance; species with wide environmental tolerance show more stability in year class strength than species or stocks of species of restricted environmental range.

12. The numerous examples of change in abundance of pelagic resources and of replacement of one species by another (e.g., the replacement of sardine by anchovy in both Californian and Japanese fisheries) stressed the need for careful development of pelagic fisheries rather than uninhibited expansion. In this way overcapitalization and consequent pressure for overexploitation of the stock can be avoided by introducing appropriate management control at an early stage. In view of the fluctuations in stock densities, particularly of herrings, sardines, and anchovies, these resources should be fished at conservative levels so as to allow stock density to remain relatively high and thus preserve the ecological balance and retain the resiliency of the resource. Fishing should be aimed at all components of the pelagic community so as to avoid depletion and replacement of desirable species by less valuable species. In Japanese waters the total stock of mackerels, horse mackerels, anchovies, herrings, and sardines appears stable from year to year, however the relative abundance of these species individually have been noted to fluctuate markedly. The fluctuations appear to be due mainly to environmental, including biotic, factors. In such situations pelagic fishing industries should be flexible enough to accommodate these year-to-year fluctuations.

13. In planning new fishery development programmes - either to exploit a virgin resource or to increase the exploitation of currently underfished resources - the whole structure of the fishery should be studied and appropriate policy decisions made as to the whole vertical structure of the industry, including the type and rate of development, ancillary requirements, marketing, transport, type of vessels to be used, level of exploitation of the stock, amount and rate of capitalisation, etc., so that development takes place in an integrated way.

14. The level of exploitation which will give the greatest economic yield will vary with the cost per unit of effort, productivity per unit of effort, etc. When two or more countries fish one resource, a conflict of management practice may occur as it is likely that each will obtain maximum economic benefit at different levels of exploitation. These countries should collaborate in the management of this resource.

15. As far as economically feasible, priority should be given to the use of fish for direct human consumption as against industrial usage. Some species, however, are currently not desired as human food and their exploitation for fish meal production should be encouraged, as should be development of techniques to convert them into acceptable food products. This will increase the value of the landed catch and will allow for better profitability of fisheries.

16. The difference between fishing for local human consumption, where market limitations and economic forces restrain growth, and fisheries where the demand is large and where capitalisation and expansion can be rapid should be borne in mind when considering management and development of pelagic fisheries. Development of fisheries should take place gradually so that management restraints can be applied at appropriate levels of development. The importance of collecting vital data such as size and age composition of the stock, distribution abundance and stock density at the onset of a fishery were emphasised. Care should be taken in the design of fisheries statistical collecting schemes to ensure that the data collected will allow monitoring of real changes and trends in the fishery, and that fishermen be made aware of the need for accurate reporting. If possible the effects of fishing on a stock should be monitored throughout its geographical area. In many cases international cooperation and assistance will be required in these fields.

REPORT OF MEETING II - THE ENVIRONMENT

Discussion Leader : J. Brodie
Rapporteur : Chen Foo Yan

Principal papers : IPFC/72/SYM 8, 9, 11, 12, 13, 41
Related papers : IPFC/72/SYM 1, 3, 5, 6, 7, 40

17. The Discussion Leader summarised the six principal papers individually and invited comments from the floor after each paper. In his summary and the subsequent discussions the following points were highlighted:

- (a) It was noted that primary and secondary productivities in tropical regions of the western North Pacific were low in comparison with temperate regions, and that the individual numbers of the dominant species of copepods, measured as standing crop, in the southern part of the South China Sea were 6-10 times less than those in the temperate zone.

- (b) While norms for the different levels of productivity were indicated by the IGY Data Centre, it was felt necessary to establish some criterion for values of standing crop. The Symposium also noted the difficulty in assessing the trophic levels of an eco-system in coastal waters, especially in connection with the understanding of the complex relationship of nutrients, productivity, and food web.
- (c) It was suggested that, although the key for the identification of fish eggs and larvae was important for the studies of the breeding biology of different commercial species and especially the seasonal peaks of occurrence of various larvae, the need to examine and perhaps establish some form of correlation between larval abundance at different locations and subsequent fish catch was emphasised.
- (d) The positive phototaxic behaviour of Rastrelliger neglectus postlarvae in the Gulf of Thailand and the successful artificial fertilisation of the eggs of this species were noted with interest.
- (e) It was felt that studies should be carried out to assess the effects of environmental changes and fishing pressure on pelagic fish stocks for the forecast of short-term as well as long-term fluctuations of pelagic fisheries.

18. The Discussion Leader mentioned the importance of studying the environmental conditions in enclosed and semi-enclosed waters of the South China Sea, the Straits of Malacca, the Java Sea, the Banda Sea, and the waters north of Australia. He drew attention to the fact that some of these waters, lying between the Indian Ocean and the Pacific Ocean, might be subject to current influence not only of the two oceans, but also the circulation of surface waters caused by monsoons which have marked and persistent seasonal winds.

19. While the justification for the high cost of environmental studies in comparison with exploratory fishing was questioned, the Symposium felt the need to conduct such studies in enclosed seas subjected to coastal pollution. The discharge of effluent and sewage waters into coastal areas and the dumping of toxic substances were cited as examples. It was agreed that the attention of FAO and member governments should be drawn to the possible serious effects on fisheries of the dumping of toxic substances into the sea. Additionally, the need to study the extent and importance of upwelling in the IPFC area was noted.

20. The Symposium recommended that methods for the studies of productivity levels and the adverse effects of atmospheric pollution on energy flow in coastal waters should be explored.

REPORT OF MEETING III - RESOURCES AND FISHERIES

(a) Mulletts, Milkfish, and Clupeoids

Discussion Leader : M. Unar
Rapporteur : Ong Kah Sin

Principal papers : IPFC/72/SYM 14 to 22
Related papers : IPFC/72/SYM 1 to 8, 11, 40

21. The Discussion Leader referred to the commercial importance of this group of fish, especially the clupeoids Stolephorus spp. and Sardinella spp. in the Indo-Pacific region. These fish constitute a regular item in the diet of many peoples of the region. In spite of the great fluctuations often experienced by sardine fisheries, the landings of the various groups have shown recently an increase and the fisheries seem capable of further expansion.

22. The Symposium noted the relationships between stolephorids and sardines with environmental factors, such as salinity, plankton abundance and phosphate levels in the sea, as has been demonstrated particularly by the studies made by Dr Tham.

23. The Symposium appreciated the importance of further studies on the biology of clupeoids, including their relation to the environment, so as to arrive at accurate assessment of their stocks.

24. The existing fisheries on clupeoids, in particular the Stolephorids, are based on coastal stocks which are composed predominantly of immature fish. However, stocks of stolephorids in their adult stages have been found offshore, for example, in the eastern tropical Pacific Ocean where the occurrence of Stolephorus buccaneeri have been noted at a considerable distance from land. The Symposium discussed the possibility of establishing an anchovy fishery based on adult offshore stocks. A suggestion was made that the large offshore anchovy stocks could be utilised for the protein enrichment of bread in protein-deficient diets, although it was realised that there may be difficulties in obtaining acceptance of the product.

25. The Symposium noted the value of anchovies like Stolephorus heterolobus, which have an iridescent body line, for use as live-bait for the skipjack fishery. Other clupeoids, in particular the Dussumierids, are also used as live-bait for skipjack tuna.

26. The Symposium discussed the possible effect which an increase in anchovy fisheries might have on the stocks of skipjack tuna. It was noted that skipjack tuna also feed on squids and crustaceans, and hence an increase in anchovy landings may not be expected to affect adversely the skipjack stocks.

27. The Symposium was of the view that member countries of the IPFC which have anchovy fisheries would benefit from each other through an exchange of practical knowledge involved in the operation of the various fishing gear.

28. With regard to the milkfish, the Symposium discussed the general shortage with the seed stock supply required for pond culture. The culture of this species is currently of particular importance in the Philippines, Taiwan, and Indonesia. The Symposium discussed the possibility of induced breeding of milkfish, in order to produce adequate and dependable supplies of fry, and at the same time develop improved culture methods. Growth of this fishery is also projected in view of the large estuarine areas where milkfish ponds can still be set up. Research on the induced breeding of milkfish is being considered in Taiwan, Indonesia, and the Philippines. The symposium appreciated the need for research on the induced breeding of this species.

(b) Jack Mackerels and Mackerels

Discussion Leader : I. Ronquillo
 Rapporteur : A. Sribhidhah

Principal papers : IPFC/72/SYM 23 to 30
 Related papers : IPFC/72/SYM 1 to 8, 11, 12, 40, CS 2

29. In reviewing the principal papers pertaining to the resources and fisheries of mackerels and related groups in the Indo-Pacific area, the Discussion Leader summarised the main points that were pertinent to the topic under discussion.

30. The mackerel fishery in Japan, which consists of two Scomber species, showed a remarkable increase in the annual landings in recent years. The increase was attributed to an increase in abundance of the fish rather than to increased efficiency of fishing gear. The principal fishing gear for this fishery is the purse seine. At present the annual catch of mackerels represents about 15% of the total annual marine landing of Japan.

31. The mackerel resources in the Gulf of Thailand consist almost entirely of the Indo-Pacific mackerel, Rastrelliger neglectus; small amounts of the Indian mackerel, R. kanagurta are also landed. Purse seines and gill nets are the prevailing gear used in this fishery; a portion of the landing comes from trawl catches. Mackerel catches in Thailand constitute between 13-15% of the total marine landing for the country. It was noted that the present mackerel fishery in the Gulf of Thailand is being operated at the optimum level. Recent analyses of tagging data and catch statistics indicate the possible occurrence of new recruitment and the dispersion of fish schools; in which case the fishery may be expected to yield landings in approximate proportion to the increase in fishing effort.

32. In the Philippines, the roundsad fishery has recently become the most important pelagic fishery. The catch consists primarily of two species of Decapterus (D. russelli and D. macrosoma). In 1970 the roundsad made up more than 30% of the total fish landings of the Philippines. The fishery is based on the capture of young forms; adults are not available to the fishery. The young fish are caught by bagnets and modern purse seines with the luring light. It was also noted that the German and wide-opening Norwegian trawls have caught some roundsads in deeper waters. Since the fishery is based mainly on young forms, it is expected that this fishery could be further expanded.

33. Elsewhere in the Indo-Pacific area other mackerel and mackerel-like species constitute major pelagic resources. The Indian Mackerel (R. kanagurta) forms one of the most important commercial pelagic fisheries along the west coast of India, while in New Zealand waters the trevally (Caranx lutescens) is commercially the most important carangid.

34. During the ensuing discussion, it was stressed that in the fishery of some species believed to be short-lived, recruitment has been noted to fluctuate greatly. In these cases, as exemplified by the Indian mackerel of India's west coast, one should be more concerned with a policy to maintain the breeding stock at optimum level rather than measures based on a certain single quantitative value, such as the level of maximum sustainable yield.

35. It was also evident from additional information provided during the discussion that although the known, as well as potential, resources of mackerels and related groups are large and widespread in the IPFC area, many species have a very low market value, and thus are low in priority for exploitation. The Symposium also noted the need for cooperation among the countries fishing common stocks, especially in the exchange of information on catches in order to provide for a rational basis for management consideration; horse mackerels in the Australia - New Zealand waters and Scomberomorus spp. in the South China Sea were cited as examples.

36. For the optimal development of some fisheries in the IPFC area, there may be a need to introduce gears which have been used successfully in some areas; examples include the bagnet system used in the Philippines and the small Chinese purse seine used in Thailand.

(c) Tuna, Billfish, and Others

Discussion Leader : A. Suda

Rapporteur : S. Hynd

Principal papers : IPFC/72/SYM 31 to 38, 42

Related papers : IPFC/72/SYM 1, 3 to 6, 8, 11, 40

37. In his introductory remarks, the Discussion Leader made the point that in the past there had been several barriers to the development of fisheries for the larger oceanic fish. These were:

- (1) the wide distribution of the species,
- (2) their discrete schooling behaviour, and
- (3) their characteristic deep-swimming habits.

However, the fishing technology problems associated with these characteristics have been overcome and most of the stocks are now fully exploited.

38. Of the latent resources, the small-sized tuna appear to be the most promising for exploitation; in particular the skipjack tuna seems to offer the best potential for increased catch, possibly exceeding 500,000 tons. Schools of skipjack can be expected to be found in the vicinity of islands in tropical seas and in areas of discontinuity, turbulence, upwelling, and waters where the thermocline is shallow.

39. Studies of the larval distribution of other small tuna (black skipjack and frigate mackerels) indicated that the adults of these species will most likely be found in coastal areas. No assessments of the yields from these species, however, are possible at present. Longtail tuna offer another opportunity for increased production. These tuna are also found in continental shelf waters.

40. In order to develop these latent resources, much more information is required as to distribution, behaviour, suitable bait supplies, etc. In this respect, the meeting noted that an acoustic detector system had been developed which could be used to detect and attract tuna as well as to check sound levels of vessels and to aid in "holding" tuna schools. The possibilities of using this instrument in place of live-bait chumming, particularly in tropical waters where live-bait is often scarce, were discussed.

41. The discussion then turned to the availability of species of live-bait traditionally used in particular tropical skipjack fisheries. Alternatives for replacing some of the heavily exploited bait-fish species were discussed including the use of a wider range of species for this method of fishing. Participants indicated that in some areas bait was plentiful, in other areas bait was scarce; the latter restricting greatly the development of these fisheries.

42. In discussing management of tuna stocks, particular interest centered around the southern bluefin tuna which is currently heavily exploited. A method for estimating fishing and natural mortality coefficients from tagging experiments was discussed and the results of the method as applied to southern bluefin tuna were examined. The Discussion Leader indicated that recently Japanese scientists had produced similar information using a different method; however, different conclusions were arrived at by the two studies. The Discussion Leader proposed that Japanese, Australian, and New Zealand scientists should collaborate in a study of this species.

43. Regarding the other species of large-sized tuna, catch and effort data were produced which indicated that with one exception, increased long-lining effort was not likely to produce increased catch. The exception was the South Pacific albacore resource in which catch-effort data indicated that an increase in catch with increased effort was likely.

44. Finally, concerning fisheries for squid and cuttlefish, several participants indicated that there was a considerable market for these species and that there was some evidence that the resources of squids and cuttlefish in the IPFC area were considerable.

REPORT OF MEETING IV - CONCLUSIONS

Discussion Leader: D. Sahrhage

Rapporteur: A.S. Mendis

45. The Discussion Leader briefly summarised the outcome of the previous three meetings along the lines as contained in the previous sections of this report.

46. The Symposium then reviewed the earlier discussions from a subject matter point of view under the headings of (a) statistics, (b) biological research needs, (c) management problems, (d) gear and fishing operations, (e) economic aspects, (f) development planning, and (g) multilateral and bilateral assistance aspects.

47. Statistics. The importance of good statistics for many purposes was emphasised. The detail and precision of the data required varies with the uses, being least in developing fisheries, and greatest when making detailed assessments of heavily exploited stocks. Though in many of the pelagic fisheries of the IPFC region the current requirements for planning and other purposes are not great, for example, with regard to total catch a precision of plus or minus 10 percent was mentioned as a reasonable target, the statistical data often falls far below even these modest levels. The Symposium therefore urged all countries in the area to pay attention to the improvement of statistics. Reference was also made to the need for training personnel in this field. It was further emphasised that there is a need to inform the fishing industry and fishermen in an understandable form of the purposes of the collection of statistics and to also disseminate the results as quickly as possible. The Symposium took note of the report of the IPFC/IOFC Joint Working Party of Experts on Indian Ocean and Western Pacific Fishery Statistics and noted the proposed list of species and groups of species set out in the Appendix to their report. The list should be used as a guide in compiling national statistics of member nations in the IPFC area.

48. Biological Research Needs. The need for studies of stock abundance was stressed. The use of acoustic methods for this purpose was discussed and most participants agreed that such surveys were the speediest and relatively most economic means for obtaining estimates of the stocks. It was indicated that such surveys should, as far as possible, include exploratory fishing for identification purposes. Attention was drawn to the holding of an ICES/FAO/ICNAF Symposium on Acoustic Methods in Fisheries Research in Bergen (Norway) in June 1973 and to the plans by FAO to organise training centres in this field in India in 1973 and in South East Asia in 1975. It was agreed that, though there are difficulties in interpreting catch per unit effort data in many pelagic fisheries, such data generally offered the simplest and most convenient method of monitoring changes in abundance in developing fisheries. It is, however, essential that the scientists concerned maintain close contact with the fishery and keep themselves aware of any changes in such matters as searching time, size of net, use of echo-sounders, etc. Other fields of studies that need to be carried out are biological and environmental investigations, population ecology studies, tagging of fish, location of breeding grounds, blood group identification studies for tuna, areas of upwelling, and taxonomy. The attention of the Symposium was drawn to the FAO/DANIDA Seminar on Fish Taxonomy in South East Asia to be held in Phuket, Thailand, in November/December 1972.

49. Management Problems. It was emphasised that there should be close collaboration between scientists of nations involved in the management of fish stocks pertaining to a fishery where more than one nation is involved. This should include the exchange of statistics between the nations. The need for strengthening the extension services was stressed, and it was emphasised that fishermen and industries should be kept informed of the reasons and need for management measures, as well as of the results of such schemes.

50. Gear and Fishing Operations. The need for comparative studies of the efficiency of specialised traditional local gear on similar stocks of fish was noted. Further, the wider use of the more efficient bulk catching gear, such as purse seines, should be promoted. It was also recommended that the dissemination of information on successful fishing methods to fishermen and the fishing industry should be intensified. The articles published in "Australian Fisheries" may be used as a guide in this regard.

51. Economic Aspects. It was realised that this topic is expected to be covered by the Symposium on Economic and Social Aspects of National Fisheries Planning to be held during the Sixteenth Session of IPFC, and it was recommended that the respective Working Party, in its preparations for that Symposium, should take into consideration relevant points from this Symposium. The problems of mercury content in fish and related economic aspects was discussed and it was recommended that FAO, WHO, and other international and national bodies concerned should continue and intensify their activities in this field. In this connection it was emphasised that there is a need to revise procedures and standards to ensure that measures aimed at the protection of public health do not unnecessarily jeopardise the well-being of the fishing industry.

52. Development Planning. It was again realised that the Symposium at the Sixteenth Session of IPFC will be concerned with this subject. The hope was expressed that the Symposium will identify priorities in fisheries planning, taking into consideration the limitations in the overall means.

53. Multilateral and Bilateral Assistance Aspects. The need for assistance, both multilateral and bilateral, for developing countries in implementing their fishery development programmes was stressed. The need for a Bulletin for the mutual exchange of views of fishery workers and administrators in the region was also indicated. Attention should be given to improvements in data storage and retrieval for mutual use by member countries, and the role of the FAO Fishery Data Centre in this regard was emphasised.

Recommendations of the Symposium

Lightly Exploited Stocks

54. There are considerable opportunities for expanding catches of pelagic fish in the IPFC area, particularly of clupeoids and of smaller tuna species. To facilitate the development of fishing on lightly exploited stocks, it is recommended that member governments undertake surveys of the distribution and abundance of such stocks. In clupeoid species at least, modern acoustic techniques are highly effective and FAO is requested to assist, wherever possible, in the planning and execution of such surveys as part of fishery research and development projects, and in the dissemination of knowledge of these methods in the IPFC region, possibly through a training centre.

Gear and Methods

55. In order to improve the overall efficiency of fishing gear in the IPFC area, it is recommended that IPFC coordinate comparative studies, to be undertaken by member governments, of the construction and efficiency of specialised traditional local fishing gear. It is also recommended that member governments consider the wider use of bulk fishing methods, such as purse seining, in underexploited fisheries.

Statistics

56. The accuracy and detail of fishery statistics need to be greatly improved. It is recommended that in small-scale fisheries member governments should pay greater attention to the estimation of total catch by appropriate sampling or survey methods. More detailed statistics should be collected from industrial scale fisheries. FAO is requested to continue to provide assistance to member governments in the development of their statistical activities for which financial support from UNDP or other sources will be required. It is also recommended that FAO, in collaboration with the IPFC/IOFC Joint Working Party of Experts on Indian Ocean and Western Pacific Fishery Statistics, should continue the development of guidelines for the collection of statistics, particularly as regards species groupings, area definitions, and specification of fishing effort.

Stock Monitoring

57. It is recommended that member governments give high priority to the collection of basic statistical and biological data (catch and effort statistics, size composition data, etc.) in any developing fishery, particularly in the early stages. Caution should be exercised when interpreting catch per unit effort data as a measure of abundance, in view of possible changes in the overall biological situation of the stock and in fishing practices. The attention of member governments is also drawn to possible alternative methods of monitoring changes in abundance, such as surveys by acoustic methods and by standard gear. Member governments are requested to make increased efforts to provide fisheries data for the use of working parties and other groups for joint benefit of all nations in the IPFC area, and to send such data to the FAO Headquarters for proper storage and retrieval for further analysis as necessary.

Rational Development and Management

58. Several pelagic stocks, particularly stocks of clupeoids, have been shown to be highly susceptible to environmental and fisheries influence. Member governments are therefore advised to exercise caution in the development of these fisheries and to ensure that resource management schemes do not allow too rapid an increase in the amount of fishing and that the permitted catch does not rise too high. Member Governments are also encouraged to promote a diversification of the pelagic fisheries to more than one species so as to relieve pressure on heavily exploited stocks and to make the fisheries less susceptible to collapses. In such fisheries scientific studies are needed to determine the level beyond which there is a risk of collapse from over-exploitation. IPFC is requested to assist member governments in these studies by means of advice from stock assessment specialists.

Multinational Fisheries

59. Several pelagic stocks, especially of tuna and mackerel, are exploited by more than one country. IPFC is requested to ensure that there is full interchange of information on these fisheries, and FAO was requested to arrange for the necessary compilation and publication of statistical and other data. It is recommended that the IOFC/IPFC ad hoc Working Party of Scientists on Stock Assessment of Tuna should be continued and strengthened.

Future Activities

60. Much further study is required of the pelagic fisheries, and it is recommended that the IPFC Working Party on Coastal and High Seas Pelagic Resources should continue in existence to facilitate the coordination of the necessary work. The participation of the Indian Ocean Fishery Survey and Development Programme and the planned South China Sea Fisheries Development and Coordinating Programme in such activities would be most desirable. Special attention should be paid to preparing a summary review of the coastal and high seas pelagic fish resources, possibly by suitably qualified consultants(s).

IV COASTAL AQUACULTURE AND ENVIRONMENT

61. The Session was held from 23 to 24 October, with Dr V.G. Jhingran (India) as the Convenor. Mr Duncan Waugh (New Zealand) acted as the Rapporteur. The Session considered:

- Effects of Aquatic Pollution on Aquaculture,
- The Use of Wastes for Aquaculture, and
- Conflicts in Land and Water Use as Related to Aquaculture.

62. The paper contributed by M. Fujiya (Japan) on "Water Pollution as a Constraint for the Development of Marine Farming" (IPFC/72/7) contained a general review of the direct and indirect effects of pollution on aquaculture in Japan. Poor growth, spread of diseases, and reduced market value of fish and shellfish have been reported in a number of instances. The tainting caused by wastes from oil refineries and petrochemical industries has seriously affected aquaculture by reducing the market value of products.

63. Red tides caused by eutrophication of coastal waters in the Inland Sea of Japan have caused major losses to aquaculture and this phenomenon is likely to become more common in the future. The toxic substances secreted by the dinoflagellates causing red tides may directly affect the animals under culture or they may cause the depletion of oxygen and thereby large-scale mortalities.

64. Among the most serious cases of concentration of toxic substances in aquaculture in Japan are those of insecticides, such as DDT which may be concentrated up to 85,000 times in relatively simple food chains, and PCBs which can be present as high residues in fish in coastal waters. A number of sub-lethal effects of pollutants on physiological functions of organisms, including protein synthesis and glycolysis which affect reproduction and growth, have been observed. Dr Fujiya's paper drew special attention to the need for studies on the effects of pollutants on the weakest stage in the life cycle of organisms under culture and on the general ecosystems of aquaculture areas.

65. "A Review of Some Effects of Contaminants on Marine Organisms" by M.A. Steinberg (U.S.A.) (IPFC/72/13) summarised the results of recent investigations on this problem. Among the toxic materials in the environment heavy metals and halogenated hydrocarbons were considered to be the most important from the point of view of aquaculture. He cited the example of the lake trout fry which show high mortality if the DDT content of the lipids in the yolk sac exceeds certain levels. The DDT content of the oceans will increase appreciably if its half life is longer than its retention time on land. In this connection he pointed out that even the breakdown products of substances like DDT have toxic properties. He also described the observed indirect effects of PCBs on certain species of fish.

66. In "A Critical Appraisal of the Water Pollution Problem in India in relation to Aquaculture" by V.G. Jhingran (India) (IPFC/72/5) the types of industries that cause pollution and the observed effects on fisheries and fish culture were reviewed. The results of studies on the direct and indirect effects of pollution on primary production, in water bodies, and metabolism, growth, and reproduction of fish were described in a paper on the "Biological Processes involved in Pollution of Coastal Aquaculture Waters" by V. Gopalakrishnan (India) (IPFC/72/6). The paper by R.M. Lesaca (Philippines) on "Coastal Aquaculture and Environment in the Philippines" (IPFC/72/8) described the pollution by industrial and domestic wastes of the river systems and its effects on inland and coastal aquaculture. The reduced availability of milkfish fry, the deterioration of fish pond areas, damage to oyster beds, and increased parasitic infections were observed to be some of the major effects of pollution.

67. The paper by L. Curtin (New Zealand) on the "Recent Developments in the New Zealand Rock Oyster Farming Industry (1970-72) and Problems Regarding Aquatic Pollution" (IPFC/72/15) drew special attention to the bacteriological standards that are being followed in the marketing of rock oysters and the problems that may arise in regard to the export of this product, if water quality of the area where oyster farming is done rather than the quality of the flesh was to be adopted as the standard.

68. In the paper entitled "Preliminary Experiments on the Effect of Thiodan and Endrin on Fish Culture in Indonesia", A. Hardjamulia and S. Kusumadinata (Indonesia) (IPFC/72/34) concluded that fish culture in rice fields would be greatly affected if Thiodan and Endrin, particularly in granule formulations, are applied.

69. The discussions that ensued clearly indicated that pollution is very seriously affecting aquaculture in both the developing and developed countries of the region. Seed collection from nature is one activity that has been very badly affected in a number of countries. Many countries have already initiated legislative action to control pollution. In this connection the need for the preparation of a list of pollutants harmful to aquaculture and the definition of water quality standards to be maintained for aquaculture, were stressed. For the effective implementation of water pollution control measures, regular monitoring was considered necessary and in this regard the need for trained personnel was pointed out. It was considered essential to organise suitable training courses on a regional basis. A global integrated research programme on the effects of pollution on coastal fisheries and aquaculture was thought to be the most efficient means of utilising the limited available resources and personnel.

The Use of Wastes for Aquaculture

70. The use of treated sewage for fish culture was described to be a widespread practice in eastern parts of India. The use of waste stabilisation ponds and activated sludge for the culture of certain species of fish was reported to be becoming increasingly important. In the paper by George L. Chan (Papua and New Guinea) on "The Use of Pollutants for Aquaculture - Conditioning of Wastes for Aquaculture - A Total Recycling System for Domestic Wastes" (IPFC/72/10) was described. Besides aquaculture, by-products such as fuel in the form of methane gas, animal feed in the form of algae, and fertiliser for agriculture, could be obtained by the treatment of domestic and animal wastes in this system.

71. In the paper on "Sewage and Aquacultural Production", E.B. Slack (New Zealand) (IPFC/72/14) described experiments in the culture of trout and other species in oxidation ponds for increasing ecological stability. The fish were reported to feed on zooplankton, which would otherwise overgraze the phytoplankton, rendering the system anaerobic. Many possibilities for the use of sewage in fish production under New Zealand conditions were mentioned. It was urged that developed countries of the region should offer assistance to the developing countries in solving their water pollution problems and should not aggravate these by merely transferring their industries together with their polluting effects to developing countries. The relevant recommendations of the U.N. Conference on the Human Environment, Stockholm, June 1972, were briefly reviewed (IPFC/72/37) and the hope was expressed that greater international cooperation in the field of pollution control would develop in the future, and support will become available from the Environment Fund for work in the region.

72. During discussions, it was pointed out that the release of pathogenic organisms into water bodies used for aquaculture is a serious pollution problem. There should be adequate safeguards to prevent this.

73. On the basis of reports on the work underway in Japan, an interesting discussion was held on the value of artificial recruitment for the improvement of fish and shellfish stocks. While many cases of successful stocking and transplantation in inland waters could be cited, such instances in the marine environment seem to be restricted to molluscs. Properly planned experiments, conducted on a sufficiently large scale, to test the effectiveness and economics of artificial recruitment were considered to be of special importance.

74. In the discussions that ensued special emphasis was laid on the possible public health hazards involved in the use of domestic and other wastes for aquaculture. It was pointed out that this could be particularly significant in areas where fish or shellfish are eaten raw. Not enough evidence is available to show that there are such hazards, at least in the case of fin fish, but the Session felt that the matter should be further studied. The need for avoiding harmful pollutants and contaminants from domestic wastes used for aquaculture was stressed. In the consideration of complete recycling systems for multiple uses, economics of the operations were given special attention. It was noted that, besides sewage, many other forms of organic wastes and thermal effluents have potential uses in aquaculture.

75. Although some discussions developed on the dumping of automobiles in the sea to serve as fish shelters, the subject was considered to be outside the purview of the Session and there was no support for such form of waste disposal even though it helps in the congregation of fish and shellfish and provide them shelter or substrates for settlement.

Conflicts in land and water use in relation to aquaculture

76. During discussions on this subject, different types of conflicts that exist in the use of coastal zone areas were identified. The paper on the "Economic Study on Alternative Uses of Mangrove Swamps : Bakawan Production or Fish Ponds" by J.M. Lawas, et al. (Philippines) (IPFC/72/36) contained an economic evaluation of the use of mangrove areas in the Philippines. From the point of view of both food production and economic return, fish farming was demonstrated to be significantly more beneficial than the use of mangrove areas for timber. Besides forestry, agriculture, recreation, industrial and real estate development, conflicts were recognised to exist between even capture fisheries and aquaculture in certain areas. It was felt that the recognition of multiple uses for coastal zone areas and effective multidisciplinary approaches for resolving such conflicts, were essential. While decisions have to be made on the use of such areas on the basis of national priorities, guidelines for decision-making have to be developed. Although economic aspects should not be the only criterion for decision-making, this would have to be a major consideration and in this connection, the need for collection of more data on the economics of aquaculture was emphasised. Rough studies in Thailand have shown that swamp areas used for shrimp farming can yield approximately US\$750/ha per annum as against US\$200-250/ha every six to ten years if they are used for production of charcoal from mangrove wood.

77. In discussing the priorities to be given to the use of coastal zone areas for aquaculture, it was argued that since fish, shellfish, and seaweeds can be grown only in the aquatic environment and, since there is an urgent need for increasing food production particularly as sources of animal proteins, aquaculture should receive high priority.

78. There was some discussion on the conflicts that arise when anadromous stocks produced through aquaculture and released into open waters are fished in the off-shore waters by nations other than those who have released them. The need for regional and international co-operation in solving such conflicts was indicated.

Recommendations

79. Based on the conclusions arrived at by the Session the following recommendations were adopted.

Effect of Pollution on Aquaculture

80. It is recommended that the Council promote studies with the assistance of Consultants to define water quality criteria for fish and shellfish culture in coastal waters. Special attention should be devoted to the effects of sub-lethal doses of pollutants on cultivated organisms.

81. In studies on the effects of pollutants, it is recommended that bio-assays should be carried out mainly on the weakest stage in the life cycle of the organism under culture and on elements of its food web.

82. In view of the limited facilities and expertise available in this field, it is recommended that research on the effects of pollutants on cultivated organisms be integrated on a regional basis. This work could be even better carried out as a global research programme and recommendation is made to FAO accordingly.

83. Recognising the need for monitoring the levels of pollutants in relation to fisheries and aquaculture for the implementation of control measures, it is recommended that FAO and member governments explore the possibility of organising suitable training courses in the region.

Use of Wastes for Aquaculture

84. Recognising the potential that lies in the use of suitable domestic and some industrial organic wastes for the production of food in the form of fish and shellfish and the benefits that could accrue, it is recommended to member governments that the feasibility and economics of complete recycling systems on a multiple use basis be further investigated in different situations; and

- (a) studies be undertaken to determine the degree to which public health hazards are involved, and if necessary develop methods by which these may be overcome;
- (b) methods of excluding contaminants and harmful pollutants from wastes used for aquaculture be further studied;
- (c) the potential for the use of thermal effluents for aquaculture be considered.

Conflicts in Land and Water Use in Relation to Aquaculture

85. There is a high priority in most countries for the production of animal proteins. These can be produced in the form of fish and shellfish only in the aquatic environment. It is therefore recommended that this fact, as well as social and economic considerations, be taken into account for establishing guidelines for the use of coastal areas. Possibility of the cultivation of seaweeds should also be included in these considerations.

86. Conflicts between the development of aquaculture and other uses of coastal areas are likely to be complex. Interdisciplinary considerations to resolve such conflicts are therefore recommended.

V. RESOURCES APPRAISAL AND MANAGEMENT

(a) Tuna Stocks

87. The report of the Second Joint Meeting of the IPFC Special Committee on Management of Indo-Pacific Tuna and the IOFC Committee on Management of Indian Ocean Tuna (IPFC/72/17) was presented by the Chairman of the meeting (C.G. Setter, Australia), who also drew attention to the relevant paragraphs of the reports of the Third Session of the Indian Ocean Fisheries Commission (IPFC/72/18) and of the First Session of the IPFC/IOFC Ad Hoc Working Party of Scientists on Stock Assessment of Tuna.

The Council noted that, whereas most of the stocks of the larger species of tuna were heavily exploited, there was considerable potential for expansion of the surface fisheries on the species of small tuna. Several countries reported plans for the development of their fisheries for skipjack and other small tuna.

89. The proposals for future activities put forward by the Joint Meeting of the Committees were endorsed, particularly as regards the preparation of reviews covering the following topics:

- (a) the status of major species in the long-line fisheries;
- (b) the skipjack stocks and the fisheries on them;
- (c) the interactions between surface and long-line fisheries;
- (d) the adequacy of currently available statistics and methods of improvement.

90. The main responsibility for these tasks had been given to specific institutes by the Joint Meeting of the Committees but it was noted that other institutes could contribute and specifically scientists from Australia and New Zealand could contribute to activity (c). The Council welcomed their contribution and also urged all countries concerned to intensify their activities on tuna stock assessment particularly as regards the collection and reporting of basic statistical and other data.

91. The Council took note of the discussions of IOFC concerning the present need for management measures in the tuna fisheries of the Indian Ocean and Western Pacific, and the role of IOFC and other fishery bodies of FAO. It believed that the relevant section of the report of the Third Session of the Commission (paras 26-33) also described the views of member countries of IPFC. It was agreed that IPFC should keep the state of the tuna fisheries and the possible need for management measures under careful review and recommended that the IPFC Special Committee on Tuna Management of Indo-Pacific Tuna and the IPFC/IOFC Ad Hoc Working Party of Scientists on Stock Assessment of Tuna should continue their activities. The time and place of possible future sessions of these bodies would be determined by FAO, in consultation with the Chairman of IOFC and IPFC in the light of developments in the tuna fisheries and their study.

* It was suggested that task (a) should be done by Dr. A. Suda, Japan, in collaboration with Dr. D.H. Bae, Republic of Korea; task (b) by FAO (Indian Ocean Development Programme, and relevant Regular Programme staff), in collaboration with the staff of the NMFS Southwest Centre Laboratory, Honolulu, U.S.A.; task (c) by the NMFS Southwest Centre, La Jolla Laboratory, and task (d) by FAO.

(b) Demersal fish stocks

92. The Council heard with interest the report on the meeting of its Working Party on Trawling which took place during the Fifteenth Session (IPFC/72/20). It also considered a review of the trawl fishery and the demersal fish stocks of the South China Sea which had been prepared by Dr S. Shindo as a consultant employed by FAO in accordance with a recommendation made by the Council at its Thirteenth Session (IPFC/72/19). The Council appreciated this action by FAO and commended Dr Shindo for his excellent work. It recommended that, in view of its importance, particularly in connection with the implementation of the South China Sea Fisheries Development and Coordinating Programme, the review should be published by FAO as soon as possible, and agreed that it could be appropriately issued as a publication under the World Appraisal of Fishery Resources.

93. The Council endorsed the report by its Working Party on Trawling and accepted the conclusions as contained in that report. Noting that there is an urgent need for management measures for the heavily exploited demersal stocks in parts of the China Mainland Shelf and in the Gulf of Thailand, the Council recommended that FAO should provide assistance in the identification and possible implementation of such measures by member governments, particularly in respect of fish stocks exploited by more than one country. The Government of Thailand was commended for the steps it had already taken to limit the fishing effort in the Gulf of Thailand.

94. The Council noted that a considerable expansion of the demersal fisheries may be possible in the southern parts of the South China Sea and on the continental shelf areas further south in the IPFC region. Consequently, it recommended that more exploratory fishing surveys and commercial fishing trials should be undertaken by member countries, to study the demersal resources and their potential for fisheries exploitation, and that FAO should, wherever possible, provide assistance in this field. Furthermore, member governments, in collaboration with FAO, should give attention to identifying any scientific, technological, economic, and social obstacles to the development of fisheries on these resources, and should take action to remedy the situation.

95. The Council realised that the activities under the International Indian Ocean Fishery Survey and Development Programme, the South China Sea Fisheries Development and Coordinating Programme, and under SEAFDEC, will contribute substantially to the development of these resources in the northern part of the IPFC region. It felt, however, that for the large area south of the South China Sea, extending as far as Australia and New Zealand, there is rather little information on the demersal resources available or compiled. It recommended therefore that an overall review on these resources and related fisheries should also be prepared for this area, identifying gaps which call for further action programmes, and that a consultant should be funded by FAO or by any other available means for this purpose.

96. The Council noted the actions taken by the Indian Ocean Fishery Commission to promote studies of the shrimp resources in that area (IPFC/72/18). It realised the commercial importance of these species and agreed that the Council should give more attention to the development of crustacea resources in the IPFC region. It also recommended that FAO should make arrangements for the participation of research workers from this area in the training centre in shrimp biology which had been proposed by IOFC.

VI. INTERNATIONAL AND REGIONAL PROGRAMMES

(a) South China Sea Fishery Development and Coordinating Programme

97. The Council examined with great interest the revised project document of the South China Sea Fishery Development and Coordinating Programme (Phase I) (IPFC/72/21 Rev. 1) and agreed that it represented a major step towards the implementation of the Programme which should have a significant impact on the development of the fisheries of the South China Sea area. It unanimously endorsed it and noted with great appreciation that the document had been submitted to UNDP. It strongly recommended the approval of Phase I of the Programme by the UNDP Governing Council at its forthcoming session in January 1973 as a project under its auspices.

98. The Council noted with interest that the project has already been endorsed by the UNDP Inter-Country Programming Mission for an initial phase in 1973 and supported by the Governments of Malaysia, Philippines, Singapore, and Thailand. In this regard the Khmer Republic and the United Kingdom also expressed their support for the project during the Session, and Australia, although not directly involved in the area, also gave its support to the project.

99. The Council invited interested member nations to submit proposals to enable priorities to be drawn up in the formulation of the plan of operations for the operational phase of the project.

100. It was noted by the Council as suggested by one delegation that, in view of the rather small area of the South China Sea, priorities should be based not on geographical considerations but by subject.

101. The attention of the Council was called to the fact that the objective of Phase I in "assistance in identifying financial sources for construction of fishery harbours at landing places" is too restrictive and recommended that assistance should be given in identifying all possible bilateral and multilateral sources of funds for all aspects of the Programme.

102. The Council agreed that any possible duplication of the Cooperative Study of the Kuroshio and Adjacent Regions (CSK), if this programme is continued, should be avoided.

103. It was recalled that it was suggested at the Fourteenth Session (Proc., Section I, paragraph 102) of the Council that it might be appropriate for SEAFDEC or some other regional body to organise a technical seminar on matters pertaining to the South China Sea and that any results arising from such efforts should be made available to the IPFC. The Council was informed by the observer of SEAFDEC, the Secretary-General of the Centre, that as agreed by the SEAFDEC Council at its Fifth Meeting (June 1972) funds have been made available and arrangements are being carried out by SEAFDEC to hold the Seminar in Bangkok early in 1973.

104. The Council noted with appreciation the action taken by SEAFDEC and emphasised the importance of coordinating the activities of the South China Sea Fishery Development and Coordinating Programme with those of the Centre.

(b) International Indian Ocean Fishery Survey and Development Programme

105. The progress report of the Programme Leader of the International Indian Ocean Fishery Survey and Development Programme (IPFC/72/22) was presented by the Secretariat, who also drew attention to comments on this programme contained in the report of the Third Session of the Indian Ocean Fishery Commission (October 1972) (IOFC/72/18). The Council welcomed the progress that was being achieved in this project and hoped that it would be fully supported by member countries.

106. The delegate of the Republic of Korea informed the Council that his country had taken delivery of a recently built 1000 G.R.T. research vessel, and that this vessel would be available to take part in cooperative research projects forming part of the programme. The Council thanked the delegate of Korea for this generous offer and noted that the details would be arranged between the Programme Leader and the Korean Authorities.

(c) Cooperative Study of the Kuroshio and Adjacent Regions (C.S.K.)

107. Recent activities of C.S.K., and particularly the report of the Eighth Session of the International Coordination Group held in Manila, Philippines, March 1972 (IOFC/72/23), were outlined by Dr I. Ronquillo (Philippines). There was some discussion of possible permanent arrangements for the coordination of marine research by such a body similar to the International Council for the Exploration of the Sea, which might follow the termination of C.S.K. It was agreed that a proliferation and duplication of international bodies was undesirable. The coordination of research of direct interest to fisheries was already being carried out by IPFC, as well as other existing bodies such as the SEAFDEC, and in this connection the Council welcomed the close cooperation that existed between SEAFDEC and the Council. Oceanographic research in general fell within the competence of the Inter-governmental Oceanographic Commission, which could well undertake the coordination of any oceanographic research activities, e.g., on some aspects of physical oceanography which might not be of direct interest to IPFC. Close cooperation existed between IOC and FAO. Council considered, therefore, that there was no need for any additional machinery for marine research in the Indo-Pacific region.

108. The Council noted the recommendation made by the C.S.K. Coordinating Group, especially those relating to fisheries. These correspond closely to recommendations made by the Council. The Council welcomed the action that was being taken by member countries, and by FAO, to implement these recommendations and urged that these activities should be continued and intensified.

(d) FAO/DANIDA Seminar on Fish Taxonomy in South East Asia

109. The Council was pleased to note the progress made in the preparations for the Seminar (to be held in Phuket, Thailand, from 6 November to 8 December 1972), as reflected in document IPFC/72/24. It commended FAO and the Danish International Development Agency (DANIDA) for their efforts and expressed its full support for this activity which is expected to contribute towards the solution of taxonomic problems leading to a better identification of commercially important fish species for statistical and research purposes.

110. The Council agreed that commercially important species of the families of Nemipteridae, Carangidae, Lutjanidae, Serranidae, Sciaenidae, Pomadasysidae, Clupeidae, Ariidae, Priacanthidae, Leiognathidae, and Synodontidae, as well as flatfish species, among various others, should receive particular attention from the Seminar. The Council noted that the consideration of tuna and tuna-like species will be excluded from the Seminar, as the Working Party on Tuna and Billfish Taxonomy of the FAO Panel of Experts for the Facilitation of Tuna Research was already concerned with this subject, and recommended that the Tuna Panel and its Working Party should intensify their efforts on taxonomic problems related to tuna, particularly to young fish and smaller size tuna species in the IPFC area which are expected to become of greater economic importance in future. The Council also emphasised that a taxonomic review of commercially important squid and cuttlefish species would be most desirable for the same reasons.

111. The Council appreciated the progress made by FAO in the preparation and publication of Species Identification Sheets for Statistical Purposes in other parts of the world, and noted with interest that the Seminar will prepare such sheets for the more important species of the IPFC area. It considered this work of importance and recommended strongly that FAO, in collaboration with IPFC, should publish these sheets as soon as possible, and encouraged member governments, research laboratories, and other possible sources to assist in this world-wide programme by contributing draft texts, drawings, and possibly funds for printing. Three delegations expressed their readiness to provide some assistance in this regard. It was emphasised that the sheets should include also information on the young fish, and the possible need, eventually, to reproduce some of the identification drawings in colour was noted.

(e) Fishery Statistics

112. The importance of statistics to most of the Council's activities was stressed as was the fact that, because of the nature of the fish resources, the statistical requirements for fisheries are greater than for other fields. It was also noted that, in general, the statistics presently available were inadequate as regards both detail and accuracy. The Council therefore drew the attention of member governments to the importance of statistics, and urged them to give greater priority within their administration to the collection of statistics.

113. Scientists, particularly those concerned with stock assessment and the provision of advice on the status of the stocks, are among the main users of statistics, and also have the greatest requirements as regards the details involved (e.g., on fishing effort, place of capture, etc.). However the collection of statistics is often carried out by a unit within the national administration quite separate from that responsible for scientific research. In such circumstances the Council urged member governments to ensure the closest collaboration between those collecting statistics and their principal customers, and noted that some countries had found it appropriate to give to the research institutes the responsibility for the planning of the collection of fishery statistics and for the processing of the data.

114. The Council also stressed the importance of assistance from FAO, UNDP, and other agencies to member governments in their statistical activities. It noted the good work that had been done by the Regional Fisheries Statistician, and stressed the importance of the continuation of this work. It regretted that the shortage of UNDP regional funds might involve the termination of this post, and recommended that FAO should seek funds for the continuation of the work from regional funds, or the Indian Ocean or South China Sea Fishery Development Programmes.

115. The impact of the Regional Fisheries Statistician and a statistician attached to a regional project on an individual country must, however, be limited. Where statistical problems are large, the assistance of a full-time statistical expert is likely to be necessary. The Council therefore stressed the importance of member governments including provision for advice on fishery statistics when drawing up proposals for UNDP country programmes, or for bilateral assistance.

116. There is also a general need for further information and training on the methodology and techniques to be used when collecting statistics, especially when obtaining information by some sampling system from small-scale widely scattered fisheries. The Council urged FAO to give special attention to those matters and welcomed the proposals that the production of a manual on field survey methods would be included in the forthcoming programme of work.

117. The Council took note of the report of the IPFC/IOFC Joint Working Party of Experts on Indian Ocean and Western Pacific Fishery Statistics (IPFC/72/25). It congratulated the Working Party on the progress that had been achieved in its important task of drawing up guidelines and standards to be used in collecting and reporting fishery statistics.

118. The Council endorsed the proposals made in the Working Party's report concerning amendments to the boundary between the Indian Ocean and adjacent regions (section 2.4 of the report). It recommended that these boundaries should be used when reporting and compiling fishery statistics on a regional basis. In making this recommendation, the Council stressed that these divisions were for statistical purposes only and did not imply any precedent as regards boundaries for any other purposes.

119. The Council noted the proposed list of species and species groups set out in Appendix VIII of the Working Party's report. It was agreed that this was a useful beginning to a valuable and difficult task, and that its present list should be used as a guide in compiling national statistics and that, as far as possible, it should be followed when reporting statistics to international or regional bodies. It was stressed that the nature of the fisheries in the IPFC region, where a very large number of different species were landed at many small and widely scattered points, made it impossible to obtain complete details of the catch at the species level, and that some grouping of species was inevitable.

120. Some proposed amendments to the species list had already been received by FAO since the meeting of the Working Party, and others had been suggested during the IOFC session. It was believed that other modifications would appear desirable as experience was gained, and all countries that had not already done so were urged to send their comments to the Secretary of the Working Party in Rome.

121. The Council took note of the proposals made by the Working Party concerning classification of vessels, gear, and fishermen. While these classifications were still subject to modification, it was felt that they were already of value for national and regional statistics. Countries were again urged to send comments on these proposals to the Secretary of the Working Party.

122. The Council endorsed the recommendation of the Working Party that the FAO Secretariat prepare a draft regional bulletin of fishery statistics containing detailed catch and effort statistics.

123. In view of the importance and complexity of the statistical problems it was agreed that a further meeting of the Working Party would be necessary, and the Council therefore endorsed the recommendation of the Working Party for a meeting during the coming intersessional period, possibly in the second half of 1973.

124. The Council noted that although most of the catches in the IPFC region came from stocks of fish exploited by only one country, there were an increasing number of fisheries in which more than one country participated. In such fisheries the compilation of comprehensive statistics giving information on all the removals from the stock was essential. One such fishery was that for tuna, and the Council endorsed the recommendation by the joint meeting of the IPFC and IOFC Committees on Tuna Management that FAO should circulate to all countries concerned, for comment and possible adoption, copies of the forms used by the International Commission for the Conservation of Atlantic Tuna, for reporting statistical data.

125. Another area where there is an international fishery is around New Zealand. The Council welcomed the assurance by certain delegations including USSR that they would make available statistical information on their fishing around New Zealand. It recommended that FAO, through the Working Party, should, in consultation with the countries concerned, make proposals for the sub-division of the South West Pacific statistical region for the purpose of standard reporting of statistical data.

(f) Cooperative Programme on Fish Product Development, Processing, and Marketing

126. The Secretariat introduced this item by recalling past Council Session discussions which pointed out the need of increasing the utilisation of fish for human food and of the alarming waste of fishery products caused by the lack of facilities for, or inadequate methods of, preservation, storage, transport, or distribution.

127. The Council noted the large quantities of small pelagic fish and also of trawl-caught demersal fish that are presently not used for human consumption and that studies or research already undertaken in other areas, e.g., the IOFC area, may well be useful in the IPFC area.

128. The Council was informed by the delegate for Sri Lanka that the Swedish International Development Authority (SIDA) will support the establishment of a fish processing research institute cum training centre in this field in his country and the Council welcomed any possible cooperation of the institute and training centre with other countries in the region.

129. The Council recognised that it could play a unique role by coordinating fish utilisation research and pilot operations of regional interest and by integrating product development with resource research, exploratory fishing, marketing research, and industrial development.

130. The Council considered, and decided to establish, a Cooperative Research Programme on Fish Product Development, including training and extension, for the utilisation of small pelagic fish and the upgrading of species of low commercial value, including those demersal fish not now used for food, taking into consideration the increasing supplies of such species, the need for increased supplies of animal protein, the complexity of the problems involved and the limitations of facilities and research personnel available.

131. The Council agreed to establish a Liaison Group on Cooperative Research on Fish Product Development which would function mainly by correspondence, at least initially. Dr M. Steinberg of the U.S.A., Dr K. Amano from Japan, and Miss Bung-orn Kasemsarn from Thailand were mentioned as possible members of the Liaison Group. The Council, however, decided to invite the U.S.A., Japan, Thailand, Malaysia, and the United Kingdom (for Hong Kong) to nominate a member each to the Group.

132. The terms of reference of the Liaison Group are:

- (i) to draft the overall cooperative programme and elaborate on specific research projects;
- (ii) to establish, with the assistance of the secretariat, close relations with research institutions within and outside the region for each research project of the programme with a view to securing their scientific advice and training assistance;
- (iii) to submit the programme to the IPFC Executive Committee for consideration and approval and for submission to all Member Nations of the Council.

133. As the programme would be finalised and endorsed by Member Nations, bilateral or multilateral agencies or donor countries would be approached with a view to securing financial assistance in support of the programme.

C. OPERATIONAL AND ADMINISTRATIVE MATTERS

VII. APPLICATION FOR MEMBERSHIP

134. The Council, noting that the Government of Fiji has taken steps to deposit an instrument of acceptance of the IPFC agreement with the Director-General of FAO, welcomed the action being taken by this Government to become a member of the IPFC and agreed to make available to Fiji information and documentation concerning Council's activities.

VIII. INTER-SESSIONAL REPORT OF THE IPFC EXECUTIVE COMMITTEE

135. The Council had before it the "Inter-Sessional Report of the IPFC Executive Committee" (IPFC/72/28).

136. The Council noted the progress made by the Secretariat in the implementation of a Cooperative Programme of Exchange of Information among Fisheries Libraries, Institutions, and Scientists in the IPFC Region. In this regard the Council considered a suggestion from the Secretariat for the establishment of an Ad Hoc Advisory Group to assist in the implementation of the Programme and agreed that there was no need for the establishment of such a group - and recommended that exchange of information should be carried out by the Administrative Correspondents of the IPFC and by the Regional Secretary. The Council further recommended that Member Nations should make available to their IPFC Administrative Correspondents for distribution copies of documents, lists, and catalogues of publications of interest to the work of the Council. Copies of these documents should be made available also to the Regional Secretary of IPFC.

137. The Council was informed by the Regional Secretary that a large collection of uncatalogued scientific and technical fishery documents is available at the FAO Regional Office, Bangkok. The Council instructed the Regional Secretary to explore with Member Nations the possibility of securing the services of a qualified librarian to catalogue and index these documents.

138. The Council noted that the appointment of consultants by FAO to undertake studies in the IPFC area has been very helpful to the development of the Council's programme of work. The Council therefore strongly recommended that the services of consultants should be financed also by its Member Nations. In this regard the Council further recommended that the participation of these consultants and specialists in its regular sessions and meetings of its subsidiary bodies should be facilitated by Member Nations.

139. The Council expressed its appreciation for the document "Cooperative Approaches to Fisheries Development in the Asia and Far East Region" (IPFC/72/28 - Attachment 6) prepared by the Regional Secretary at the request of its Executive Committee. The Council agreed that when completed the document would be a very valuable general action plan for the future activities of IPFC. The Council therefore recommended that the draft of the completed document should be made available by the Regional Secretary to all Member Nations for their consideration and comment. It further recommended that the revised version of the document to be prepared by the Regional Secretary in consultation with the Executive Committee, being made available at the same time to the Department of Fisheries of FAO, would be considered by the Sixteenth Session of the IPFC.

IX. MATTERS REFERRED BY THE COUNCIL TO

(a) Member Governments

140. The Council heard a report from the Secretariat of actions taken by member governments on matters recommended by the 14th Session and noted that the Country Statements do not give sufficient information on follow-up actions. It instructed the Secretariat, when requesting Country Statements, to include information on past Council's recommendations and to ask member governments to indicate action taken on those recommendations.

141. The delegate for India reported that his Government is taking action to include the development of coastal aquaculture in the national development plan.

142. The delegate for Japan mentioned that a law was passed in Japan in 1970 which includes research and development in coastal aquaculture, and improvement of the environment.

143. The delegate for the United Kingdom (Hong Kong) stated that research on coastal aquaculture continues to be undertaken in Hong Kong.

144. The delegate for Malaysia reported that his Government was able to have a UNDP project in food technology which includes also fish processing technology and pointed out also that, in improving the production from aquaculture, the problem of marketing should not be overlooked.

145. The observer from the USSR gave a statement that:

- (i) his country has research and practical work activities in the Indian and Pacific Oceans where systematic studies and rational use of resources are being undertaken, and that the USSR is ready to assist countries in the region as a result of their achievements;
- (ii) the USSR is ready to support the work of IPFC by providing information and if necessary to send scientists for research work in the area;
- (iii) if countries in the area will organise joint research expeditions, the USSR is ready to join such expeditions and can provide research vessels and research workers.
- (iv) all statistical data obtained in the area is provided to FAO and will continue such collaboration in future; and
- (v) a new Central Fisheries Research Institute of Information, on technical and economic matters has recently been established which, in particular, collects statistical data and tries to improve the form for this purpose and if FAO and IPFC are interested, the forms can be sent to FAO or IPFC.

The Council appreciated the statement and kind offer from the observer for the USSR.

(b) FAO

146. The Council reviewed the action taken by FAO to implement the recommendations adopted by its Fourteenth Session (1970) and noted with satisfaction that, of a total of thirty-five recommendations directed to the FAO Department of Fisheries, twenty-nine have been implemented. In this regard the Council was informed of the action being taken to implement some of the remaining six recommendations.

X MATTERS ARISING FROM THE REPORTS OF THE COMMITTEE ON FISHERIES

(a) Strengthening of the Council's activities

147. The Council carefully considered the document "Strengthening of the IPFC Activities" (IPFC/72/40) and noted that the Committee on Fisheries, at its Seventh Session (1972), in discussing the problems of regional bodies in general in securing financial and technical support, referred to the desirability that the developed countries contribute in both these respects to the work of the regional bodies in the areas in which these countries were active. The Council further noted that, in view of the limited funds available to FAO, it is doubtful that FAO will be able to meet the demand for increased assistance to IPFC unless a new source of funding is found.

148. Although there had been insufficient time for delegates to refer to their Governments for instructions, there was a thorough debate of the matter. The Council noting the views expressed by the Committee on Fisheries and the limited funds available to FAO to support future activities of IPFC, recommended that its Member Nations consider the possibility of the establishment of a regional voluntary fund by way of contributions from developed Member Nations and others for the purpose of undertaking appropriate projects under the auspices of IPFC within the region. The Council took note of the principles and procedures which should govern agreements concluded under Article XIV of the FAO Constitution - spelled out in document IPFC/72/40.

149. In order to facilitate and increase the direct participation and contributions from donor countries in the fisheries development of the IPFC area, the Council further requested the Executive Committee to attempt to identify specific projects suitable for bilateral funding together with specific donor country funds for their implementation.

150. The Council, in considering the rapidly expanding needs of the area and the importance of fish in the diet of its growing population, requested its Member Nations to actively participate in the sessions of the Committee on Fisheries to convey to this body the needs of the region and to secure further assistance for the development of its fishery resources.

151. The Council noted that the functions and structure of the FAO Regional offices are under study and recommended that the fishery aspects of the FAO Regional Office for Asia and the Far East be strengthened and return to the direction of the FAO Department of Fisheries.

(b) Other Matters

152. The Commission noted with interest the information provided by the Secretariat on a Technical Conference on Fishery Management and Development being organised by FAO at the invitation of the Government of Canada. The Conference, subject to the approval of the Fifty-ninth session of the FAO Council (November, 1972), will be held in Vancouver, British Columbia, Canada, from 12 to 23 February 1973.

XI PREPARATIONS FOR SYMPOSIA OF FUTURE SESSIONS

(a) Arrangements for the Sixteenth Session Symposium

153. The Council heard a report from a member of the Working Party on Economic and Social Aspects of National Fisheries Planning and Development on the activities of the Working Party during its First meeting (July, 1972). The Council expressed its appreciation for the accomplishments of the Working Party during the intersessional period and for the services rendered to it by its convenor. The Council, however, agreed that in accordance with established practice the convenor of the Working Party should be selected from its members. The Council therefore decided to invite Prof. B.J. Rothschild (U.S.A.), to act as convenor. The Council further decided to invite Mr F. Gonzalez (Philippines) and Mr B.T. Cunningham (New Zealand) to become members of the Working Party which was reconstituted as follows:

Prof. B.J. Rothschild (U.S.A.) Convenor
 Dr A. Sribhibhadh (Thailand)
 Mr B.T. Cunningham (New Zealand)
 Mr F. Gonzalez (Philippines)

154. The Council hoped that Dr J.A. Storer (FAO) would agree to continue to assist the Working Party in the development of its future activities in an advisory capacity.

155. The Council noted with great interest the desire expressed by the Indian Ocean Fishery Commission (IOFC) at its Third Session (October, 1972) and by the International Indian Ocean Fishery Survey and Development Programme (IOP) to be associated with the Symposium. The Council, recognising that the subject of the proposed symposium is of great interest to all countries of the Indian Ocean in their planning for the development of their fisheries, decided to extend an invitation to IOFC to participate in the activities of the Working Party and participate in the Symposium.

(b) Topic for the Symposium of the Seventeenth Session

156. The Council considered several topics suggested by the Executive Committee and in view of the importance of inland fisheries in the region decided to select the following for the Symposium of its Seventeenth Session (1976): Development and utilisation of inland fishery resources in the IPFC area, and decided that nominations for these Committees would stand as detailed in Appendix VI.

XII ANY OTHER MATTERS

(a) Discussion of future of Technical Committees I and II of the Council

157. The Council considered the new pattern of its Sessions first introduced at its Fourteenth Session (Bangkok, 1970) which did away with the need for formal meetings of its Technical Committees I and II, and found it entirely satisfactory. The Council therefore agreed to continue to hold in suspense the Technical Committees until its Sixteenth Session (1974).

158. The Council requested its Executive Committee to consider before its Sixteenth Session in consultation with FAO, the abolishment of the two Technical Committees. The Council noting, however, that in accordance with Article III of the Agreement for the establishment of the IPFC, in the unavoidable absence of one or two members of its Executive Committee from a Committee session, the chairman of the Council shall coopt the chairman of one or two of the Technical Committees, to substitute the absent Committee member or members for that Committee session, and further requested its Executive Committee to consider before its next session in consultation with FAO possible arrangements for providing adequate membership for its Executive Committee.

159. The Council requested its Executive Committee, after consultation with Member Governments, to prepare a paper, to be discussed with FAO, to enable decisions to be taken at the 16th Session regarding the future of its Technical Committees I and II. In accordance with the provisions of the Agreement and Rules of Procedure, this paper will be distributed to member governments to enable them to instruct their delegates.

(b) Election of officers of Technical Committees I and II of the Council

160. Mr G.D. Waugh (New Zealand) and Mr S. Bandhukul (Thailand) were elected chairmen of Technical Committees I and II respectively. They were elected by the present members of the Committees attending the Session.

(c) U.N. Conference on the Human Environment, Stockholm, 5-16 June 1972

161. The Council heard a brief outline of major recommendations from the U.N. Conference on the Human Environment, particularly those relating to fisheries and to the protection of living aquatic resources from pollution as contained in document IPFC/72/37. The Council noted these resolutions and recognised that the Conference had stressed the need for promoting and intensifying activities in this field on a regional basis in order to bring all significant sources of pollution under appropriate controls. It was agreed that this is an important task calling both for urgent action by member governments and for regional collaboration which should be facilitated by IPFC. The Council therefore strongly recommended that member governments should strengthen the national capabilities to deal with aquatic pollution problems.

162. The Council drew attention to the work which it had already undertaken or implemented, particularly in the field of coastal pollution in relation to aquaculture. It noted, however, that considerable assistance will be required to fight the increasing aquatic pollution within the region, and requested FAO to explore the possibilities of obtaining funds from the U.N. Environment Fund, if established, from UNDP, and from any other sources, to intensify FAO's technical assistance to member countries, wherever required, in activities related to the protection of living aquatic resources from environmental damage.

163. The Council realised the important role it can play in this field as a specialised regional body of FAO to promote and coordinate national and regional research and monitoring activities, and expressed its willingness to collaborate in this respect with other international bodies concerned, especially with the U.N. Economic Regional Commission for Asia and the Far East (ECAFE) and the Inter-governmental Oceanographic Commission (IOC).

(d) Training of research workers

164. The Council noted with appreciation that FAO plans to organise a number of additional training centres for research workers in various fields which offer opportunities for scientists from the IPFC region to participate. Attention was drawn particularly to the following courses: Training Centre in Acoustic Methods for Fish Detection and Abundance Estimation (financed by NORAD, to be held in Cochin, India, in November 1973 and possibly in South East Asia in 1975), Training Centre on Fisheries Science (Marine Biology) (financed by DANIDA, next course likely to be held in Denmark in 1974), Training Centre on Fish Eggs and Larvae Surveys (with financial support from the U.S. Government, to be held in La Jolla, California, in September 1973), and Training Course on Aquatic Pollution in Relation to Protection of Living Resources (Analytical Techniques) (financed by SIDA, to be held in Sweden in July/August 1973). The Council expressed its appreciation to the funding agencies for their valuable support. It noted also that FAO had a number of manuals on the use of acoustic instruments in fish detection and abundance estimation, fish eggs and larvae surveys, and fisheries biology, as well as marine pollution research in preparation which will be published within the next months.

165. The Council was also informed of the plans for the ICES/FAO/ICNAF Symposium on Acoustic Methods in Fisheries Research to be held in Bergen, Norway, from 19-22 June 1973, and for the IABO/ICES/FAO/ICNAF Symposium on Fish Eggs and Larvae to be held in Oban, Scotland, in May 1973.

(e) Survey and surveillance of biotoxins in marine food fish

166. The Council heard a brief report on a joint WHO/FAO project for the survey and surveillance of biotoxins (mainly ciguatera) in marine food fish which is at present under consideration by the UNDP for implementation in 1973. The Council noted with interest that this project is expected to contribute towards minimising both health hazards and obstacles to fisheries economics and development stemming from biotoxins, and that the major areas were the South Pacific, the Indian Ocean, and the Caribbean.

(f) Working Parties

167. The Council reviewed the existing working parties and decided that the Working Party on Trawling had completed its task. The Council expressed its appreciation for the work done by its members and agreed to discontinue it. The Council, however, agreed that a similar review to the "General review of the trawl fishery and the demersal fish stocks of the China Sea" should be prepared by a consultant for the southern part of the IPFC region extending as far south as the Australian and New Zealand waters and recommended that FAO explore means of funding.

168. The Council established a Working Party on Development and Utilisation of Inland Fishery Resources to be responsible for the preparations for the symposium of its Seventeenth Session. Dr V.G. Jhingran (India) agreed to act as convenor of this working party and in this capacity to select its members in consultation with the IPFC Executive Committee and FAO.

169. The Council agreed to revise the terms of reference of the Working Party on Coastal and High Seas Pelagic Resources as follows:

- (i) To continue the study of the status of the industry and the potential of the pelagic resources (excluding tuna and tuna-like species) in the overall IPFC area, possibly with assistance by a consultant(s);
- (ii) To identify scientific, technological, economic, and social obstacles to the optimum utilisation of the pelagic resources;
- (iii) To collaborate with the International Indian Ocean Fishery Survey and Development Programme, the South China Sea Fisheries Development and Coordinating Programme, and the South East Asian Fisheries Development Centre (SEAFDEC) in the implementation of these terms of reference.

170. The Council requested the Working Party on Economics of Aquaculture to consider at its next session (1973) its possible merging with the Working Party on Aquaculture and Environment.

171. The following are the working parties which the Council decided should function during the intersessional period:

- (i) Working Party on Coastal and High Seas Pelagic Resources
- (ii) Working Party on Aquaculture and Environment
- (iii) Working Party on Economics of Aquaculture (possibly to be merged with (ii))
- (iv) Working Party on Economic and Social Aspects of National Fisheries Planning and Development
- (v) IPFC/IOFC Joint Working Party of Experts on Indian Ocean and Western Pacific Fishery Statistics
- (vi) IPFC/IOFC Ad Hoc Working Party of Scientists on Stock Assessment of Tuna
- (vii) Working Party on Development and Utilisation of Inland Fishery Resources

172. The Secretariat was asked by Council to prepare for its next session a directory of the subsidiary bodies of the Council containing information on:

- (i) date of establishment
- (ii) sessions
- (iii) membership
- (iv) terms of reference
- (v) convenor
- (vi) secretaries

(g) Nomenclature of Fish Used for Trade

173. The Council's attention was drawn to the need of a nomenclature of fish trade names and it suggested to Member Nations to submit to the Fishery Products and Marketing Branch of the Department of Fisheries of FAO available lists of names of commercially marketed fish so that such information could be revised and disseminated to Council's Member Nations by FAO.

D. CONCLUDING MATTERS

XIII ELECTION OF OFFICERS

174. Admiral Nizan Zachman, of Indonesia, and Y.M. Tengku Ubaidillah bin Abdul Kadir were unanimously elected as Chairman and Vice-Chairman respectively.

XIV DATE AND VENUE OF NEXT SESSION

175. The Council accepted with deep appreciation the kind offer of Indonesia to host the Sixteenth Session in October 1974 at Djakarta.

XV VOTE OF APPRECIATION

176. Moved by the delegate of Korea on behalf of all delegates, seconded by the delegates for Australia and the Philippines, and adopted by the Council was the following Vote of appreciation:

"The Council desires to place on record its very deep appreciation to the Government of New Zealand for its generosity in hosting the 15th Session in Wellington, New Zealand.

177. The Council, in particular, wishes to express to The Honourable D.J. Carter, Minister of Agriculture and Fisheries, its sincere appreciation for his courtesy in officially opening the 15th Session of the Council and also for the gracious hospitality accorded to the participants during the Session.

178. The Council, furthermore, expresses its appreciation and gratitude to the New Zealand IPFC Organising Committee, particularly the Chairman of IPFC and the Conference Liaison Officers and to many others who helped and contributed for the success of the Session and to those who had made it possible for the participants to have a pleasant stay in New Zealand, specially the Government Tourist Bureau in association with Masterton Borough Council, the United Nations Association of New Zealand, the Fishing Industry Board, and others."

179. The U.S.S.R. delegation requested Council to place on record its appreciation in being able to participate in the XV Session and indicated their desire to be invited to the XVI Session of the IPFC.

180. The observer from Bangladesh also expressed his country's appreciation in being able to participate in the XV Session and indicated that his Government is taking the necessary steps to become a member of the Council.

181. The delegation from the Philippines, supported by the delegates from Sri Lanka and India, expressed their deep appreciation to the Chairman for the part he played as Chairman and also for the organisation of the XV Session.

XVI ADOPTION OF REPORT

182. The Council having considered the various sections of its Report formally adopted it.

LIST OF PARTICIPANTS

MEMBER GOVERNMENTS

	<u>Name</u>	<u>Designation</u>	<u>Address</u>
AUSTRALIA	Mr C. G. Setter (Delegate)	First Asst. Sec.	Fisheries Division Department of Primary Industry Barton Canberra A.C.T. 2600 Australia
	Mr A. G. Bollen (Alternate)	Asst. Secretary	Fisheries Division Department of Primary Industry Barton Canberra A.C.T. 2600 Australia
	Mr J. S. Hynd (Adviser)	Principal Research Scientist	CSIRO Div. of Fisheries and Oceanography P.O. Box 21 Cronulla N.S.W. Australia 2230
	Mr K. Radway Allen (Adviser)	Chief	CSIRO Division of Fisheries and Oceanography P.O. Box 21 Cronulla N.S.W. Australia 2230
	Dr C. Lucas (Adviser)	Research Fellow	25 Conlo Crescent Ferry Grove 4055 Queensland Australia
	Dr T. G. Dix (Adviser)	Officer-in-Charge	Department of Agriculture Marine Laboratory Torroona Hobart, Tasmania, 7006 Australia
FRANCE	Mr R. J. E. Grand- perrin (Delegate)	Oceanographer/ Biologist	ORSTOM B.P. No.4 Noumea New Caledonia
	Mr M. Legand (Alternate)	Directeur du Laboratoire d'Océanographie	ORSTOM B.P. No.4 Noumea New Caledonia
INDIA	Dr V. G. Jhingran (Delegate)	Director	Central Inland Fisheries Research Institute Barrackpore via Calcutta West Bengal India

MEMBER GOVERNMENTS (Continued)

	<u>Name</u>	<u>Designation</u>	<u>Address</u>
INDONESIA	Rear-Admiral N. Zachman (Delegate)	Director-General of Fisheries	Department of Agriculture Djl. Salemba Raya 16 Djakarta Indonesia
	Mr M. Unar (Alternate)	Director	Marine Fisheries Research Institute Djalan Kerapu 12 Djakarta - Kota Indonesia
	Mr R. Djajadiredja (Adviser)	Director	Inland Fisheries Research Institute Jalan Sempur Bogor Indonesia
JAPAN	Mr K. Shima (Delegate)	Senior Research Planning Officer	First Research Division Research Department Fishery Agency Ministry of Agriculture and Forestry 2-1, 1-Chome, Kasumigaseki Chiyoda-ku Tokyo, Japan
	Dr A. Suda (Alternate)	Chief, Division of Pelagic Resources	Far Seas Fisheries Research Laboratory 1000 Orido Shimizu-shi 424 Shizuoka Japan
KHMER	Mr Sim Kim Horn (Delegate)	Directeur	Direction de Service National des Peches Maritimes 54 Bd. Pracheathipadey Phnom Penh Khmer
	Mr Sao Leang (Alternate)	President- Directeur General	P.D.G. de la SONACOP 31 Vithei Ong Po Koun Phnom Penh Khmer
KOREA	Mr Yong Soon Kang (Delegate)	Deputy Director- General	Office of Fisheries of the Government of the Republic of Korea 111-Hapdong Seodaimun-ku Seoul Korea
	Mr Sung Hwan Ha (Alternate)	Fisheries Attache	Korean Embassy Rome Italy

MEMBER GOVERNMENTS (Continued)

	<u>Name</u>	<u>Designation</u>	<u>Address</u>
MALAYSIA	Y. M. Tengku Ubaidillah bin Abdul Kadir (Delegate)	Director-General Fisheries	Fisheries Division Ministry of Agriculture and Fisheries Jalan Swettenham Kuala Lumpur Malaysia
	Mr Ong Kah Sin (Alternate)	Senior Fisheries Research Officer (Research)	Fisheries Research Institute, Fisheries Division Glugor Penang Malaysia
	Mr Ong Kee Bian (Adviser)	Fisheries Officer (Inland Fisheries Division Sarawak)	Department of Agriculture Kuching, Sarawak Malaysia
	Mr Chin Phui Kong (Adviser)	State Fisheries Officer (Sabah)	Department of Fisheries P.O. Box 1064 Kota Kinabalu Sabah Malaysia
NEW ZEALAND	Mr B. T. Cunningham (Delegate)	Director of Fisheries	Fisheries Division Ministry of Agriculture & Fisheries The Terrace P.O. Box 2298 Wellington New Zealand
	Mr G. D. Waugh (Alternate)	Director of Fisheries Research	Fisheries Research Division Ministry of Agriculture & Fisheries The Terrace P.O. Box 19062 Wellington New Zealand
	Mr J. S. Campbell (Adviser)	General Manager	Fishing Industry Board P.O. Box 9232 Wellington New Zealand
PHILIPPINES	Mr I. A. Ronquillo (Delegate)	Chief Marine Fisheries Biology Division	Philippine Fisheries Commission P.O. Box 623 Intramuros Manila Philippines
SRI LANKA	Mr A. S. Mendis (Delegate)	Deputy Director Fishery Research	Department of Fisheries P.O. Box 531 Colombo Sri Lanka Republic

MEMBER GOVERNMENTS (Continued)

	<u>Name</u>	<u>Designation</u>	<u>Address</u>
THAILAND	Mr S. Bandhukul (Delegate)	Director-General	Department of Fisheries Ministry of Agriculture Rajadamnern Avenue Bangkok Thailand
	Mr S. Ruamragsa (Alternate)	Director Marine Fisheries Div.	Department of Fisheries Ministry of Agriculture Rajadamnern Avenue Bangkok, Thailand
	Mr U. Boonprakob (Adviser)	Fisheries Biologist	Marine Fisheries Laboratory 89/1 Soi Sapan Pla Yanawa Bangkok 11, Thailand
	Mr C. Phasukavanich (Adviser)	Director	Fish Marketing Organisation Yanawa Bangkok 12, Thailand
UNITED KINGDOM	Dr D. N. F. Hall (Delegate)	Fisheries Adviser	Foreign & Commonwealth Office Overseas Development Admin- istration Eland House Stag Place London SW1E 5DH United Kingdom
	Mr R. M. Chilvers (Alternate)	Research Officer Marine Resources Section Head	Fisheries Research Division Agriculture and Fisheries Department Shek Pai Wan Road Aberdeen, Hong Kong
UNITED STATES OF AMERICA	Mr R. C. Wilson (Delegate)	Chief	International Activities Staff National Marine Fisheries Service National Oceanic & Atmos- pheric Administration Department of Commerce Washington D.C. U.S.A. 20035
	Mr R. S. Shomura (Alternate)	Director	Tiburon Fisheries Laboratory, U.S. Dept. of Commerce National Oceanic & Atmos- pheric Administration National Marine Fisheries Service P.O. Box 98 Tiburon California, U.S.A. 94920

MEMBER GOVERNMENTS (Continued)

	<u>Name</u>	<u>Designation</u>	<u>Address</u>
UNITED STATES OF AMERICA	Dr H.R. Schmittou (Adviser)	Senior Technical Adviser	Inland Fisheries Project Agency for International Development Roxas Boulevard American Embassy, Manila Philippines
	Dr M. Steinberg (Adviser)	Centre Director	Pacific Fishery Products Technology Centre National Marine Fisheries Service National Oceanic & Atmos- pheric Administration Dept. of Commerce 2725 Montlake Boulevard East Seattle Washington, 98102, U.S.A.

OBSERVERS

38.

OBSERVER GOVERNMENTS

	<u>Name</u>	<u>Designation</u>	<u>Address</u>
BANGLADESH	Dr M. Youssouf Ali	Director	Department of Fisheries 81 Kakrail Road Dacca, 2 Bangladesh
FIJI	Mr J. M. Spottis- woode	Acting Principal Fisheries Officer	Fisheries Division Department of Agriculture Suva Fiji
PORTUGAL	Mr V. Valdez	Director	Centro Bioceanologiae Pescas do Ultramar Rua Louis de Camoes 110/6 ^o /B Lisbon, 3 Portugal
USSR	Mr Y. Znamensky	Fishing Tech- nologist	USSR Ministry of Fisheries Moscow, USSR
	Mr O. V. Bakurin	Deputy Chief of Section	Foreign Department USSR Ministry of Fisheries 12 Rozhdestvensky Boulevard Moscow, R-45, USSR
	Mr I. E. Shaboneev	Biologist	All-Union Research Institute of Fisheries and Oceanography (VNIRO) 17 Krasnoselskya Street Moscow B-140, USSR

OBSERVER ORGANISATIONS

GENERAL FISHERIES COUNCIL FOR THE MEDITERRANEAN (GFCM)	Mr H. Rosa, Jr.	Chief Fishery Liaison Officer	Fishery Liaison Unit Department of Fisheries FAO, Via delle Terme di Caracalla Rome Italy
INDIAN OCEAN FISHERY COMMISSION (IOFC)	Mr H. Rosa, Jr.	Chief Fishery Liaison Officer	Fishery Liaison Unit Department of Fisheries FAO, Via delle Terme di Caracalla Rome, Italy

OBSERVER ORGANISATIONS (Continued)

	<u>Name</u>	<u>Designation</u>	<u>Address</u>
SOUTH EAST ASIAN FISHERIES DEVELOPMENT CENTRE (SEAFDEC)	Dr A. Sribhibhadh	Secretary General and Chief Training Dept.	Southeast Asian Fisheries Development Centre P.O. Box 4 Phrapadeng, Samut Prakarn, Thailand
	Mr Chen Foo Yan	Chief, Marine Fisheries Research Department	Southeast Asian Fisheries Development Centre Fisheries Centre Changi Point Singapore 17
	Mr Lim Lian Chuan	Research Scientist	Ocean Research Section Marine Fisheries Research Department Southeast Asian Fisheries Development Centre Changi Point Singapore 17
SOUTH PACIFIC COMMISSION (SPC)	Mr R. H. Baird	SPC Fisheries Officer and Co-Director	UN/FAO South Pacific Islands Fisheries Develop- ment Agency (SPIFDA) C/- SPC P.O. Box 9 Noumea New Caledonia
VISITORS			
CAC INDUSTRIES LTD	Mr J.K. Shea	General Manager	CAC Industries Ltd, Normanby Road Mt Eden P.O. Box 8511 Auckland 3 New Zealand

VISITORS (Continued)

	<u>Name</u>	<u>Designation</u>	<u>Address</u>
DEPARTMENT OF HEALTH NEW ZEALAND	Dr W. Murphy	Director Division of Public Health	Department of Health P.O. Box 5013 Wellington New Zealand
	Mr R. R. Harcourt	Assistant Director (Environmental Health)	Department of Health P.O. Box 5013 Wellington New Zealand
	Mr N. Cook	Assistant Chief Health Inspector	Department of Health P.O. Box 5013 Wellington New Zealand
(NATIONAL HEALTH INSTITUTE NEW ZEALAND)	Mr D. G. Till	Chief Bacteriol- ogist	National Health Institute P.O. Box 7126 Wellington New Zealand
	Miss D. Norris	Senior Bacteriol- ogist	National Health Institute P.O. Box 7126 Wellington New Zealand
DOMINION MUSEUM NEW ZEALAND	Dr A. N. Baker	Curator	Dominion Museum Private Bag Wellington New Zealand
	Mr J. Moreland	Ichthyologist	Dominion Museum Private Bag Wellington New Zealand
EAST COAST FISHERIES	Mr W. T. Allen	Managing Director	East Coast Fisheries Box 282 Gisborne New Zealand
EDWARD PERCIVAL MARINE	Mr I. Mannering	Lecturer-in-Charge	Edward Percival Marine Laboratory, P.O. Box 11 Kaikoura New Zealand
ELSHAN AND ASSOCIATES LTD	Mr G. A. Hutcheson	Industrial Fisheries Engineer	Box 2154 Christchurch New Zealand

VISITORS (Continued)

	<u>Name</u>	<u>Designation</u>	<u>Address</u>
P. FERON & SON LTD	Mr M.L. Newman	Managing Director	P. Feron & Son Ltd P.O. Box 83 Christchurch New Zealand
FISHING INDUSTRY BOARD	Mr I. T. Cook	Chairman	Fishing Industry Board P.O. Box 9232 Wellington New Zealand
	Mr A. S. Alsweiler	Member	Fishing Industry Board P.O. Box 9232 Wellington New Zealand
	Mr B. L. Lyons	Member	Fishing Industry Board P.O. Box 9232 Wellington New Zealand
	Mr F. V. Lindberg	Wholesalers/ Processors Representative	Fishing Industry Board P.O. Box 9232 Wellington New Zealand
	Mr F. H. Webster	Retailers Representative	Fishing Industry Board P.O. Box 9232 Wellington New Zealand
	Mr L. P. J. Chapman	Research Officer (Processing)	Fishing Industry Board P.O. Box 9232 Wellington New Zealand
	Mr J. Thompson	Marketing Devel- opment Officer	Fishing Industry Board P.O. Box 9232 Wellington New Zealand
	Mr N. F. Parsons	Technical Officer Fishing Methods	Fishing Industry Board P.O. Box 9232 Wellington New Zealand
HOECHST (N.Z.) LTD	Mr A. J. Reeves	Entomologist	C/o Hoechst (N.Z.) Ltd P.O. Box 67 Auckland New Zealand

VISITORS (Continued)

	<u>Name</u>	<u>Designation</u>	<u>Address</u>
LINCOLN COLLEGE NEW ZEALAND	Dr R. P. Pottinger	Reader in Entomology	Lincoln College Canterbury New Zealand
McFARLANE'S FISHERIES CO. LTD	Mr S. McFarlane	Managing-Director	McFarlane's Fisheries Co. Ltd 146 Fanshawe Street Auckland New Zealand
MINISTRY OF AGRICULTURE & FISHERIES (Fisheries Div)	Mr V. T. Hinds	Assistant Director of Fisheries	Ministry of Agriculture and Fisheries P.O. Box 2298 Wellington New Zealand
	Mr R. D. Cooper	Scientist	Ministry of Agriculture and Fisheries P.O. Box 2298 Wellington New Zealand
	Mr L. D. Ritchie	Fisheries Biologist	Ministry of Agriculture and Fisheries P.O. Box 581 Whangarei New Zealand
	Mr B. F. Webb	Fisheries Biologist	Ministry of Agriculture and Fisheries P.O. Box 2298 Wellington New Zealand
	Mr G. H. Clarke	Technician	Ministry of Agriculture and Fisheries P.O. Box 2298 Wellington New Zealand

VISITORS (Continued)

	<u>Name</u>	<u>Designation</u>	<u>Address</u>
MINISTRY OF AGRICULTURE & FISHERIES (continued)	Mr A. G. York	Technical Officer	Ministry of Agriculture and Fisheries P.O. Box 2298 Wellington New Zealand
	Mr J. M. Fenaughty	Technician	Ministry of Agriculture and Fisheries P.O. Box 2298 Wellington New Zealand
	Mr A. Coakley	Scientist	Ministry of Agriculture and Fisheries Fisheries Laboratory Kyle Street Riccanton Christchurch
	Mr R. J. Street	Scientist	Ministry of Agriculture and Fisheries Dunedin New Zealand
	Mr J. P. C. Greenway	Scientist	Ministry of Agriculture and Fisheries P.O. Box 2298 Wellington New Zealand
	Mr L. W. Curtin	District Oyster Officer	Ministry of Agriculture and Fisheries P.O. Box 2298 Wellington New Zealand
	Mr D. H. Stead	Scientist	Ministry of Agriculture and Fisheries P.O. Box 2298 Wellington New Zealand
	Mr A. R. Branson	Scientist	Ministry of Agriculture and Fisheries P.O. Box 2298 Wellington New Zealand
	Mr P. W. Currie	Section Officer	Ministry of Agriculture and Fisheries P.O. Box 2298 Wellington New Zealand

VISITORS (Continued)

	<u>Name</u>	<u>Designation</u>	<u>Address</u>
MINISTRY OF AGRICULTURE & FISHERIES (continued)	Mr P. K. Michael	Fisheries Admin. Officer	Ministry of Agriculture and Fisheries P.O. Box 2298 Wellington New Zealand
(Research Division)	Dr R. L. Allen	Biometrician	Ministry of Agriculture and Fisheries Fisheries Research Div., P.O. Box 19062 Wellington New Zealand
	Dr D. Eggleston	Scientist	Ministry of Agriculture and Fisheries P.O. Box 19062 Wellington New Zealand
	Mr G. D. James	Scientist	Ministry of Agriculture and Fisheries P.O. Box 19062 Wellington New Zealand
	Mr F. E. Roberts	Scientist	Ministry of Agriculture and Fisheries P.O. Box 19062 Wellington New Zealand
	Mr R. F. Coombs	Scientist	Ministry of Agriculture and Fisheries P.O. Box 19062 Wellington New Zealand
	Dr H. J. Cranfield	Scientist	Ministry of Agriculture and Fisheries P.O. Box 19062 Wellington New Zealand
	Dr P. Dinamani	Scientist	Ministry of Agriculture and Fisheries P.O. Box 19062 Wellington New Zealand
	Mr F. Redfearn	Scientist	Ministry of Agriculture and Fisheries P.O. Box 19062 Wellington New Zealand

VISITORS (Continued)

	<u>Name</u>	<u>Designation</u>	<u>Address</u>
MINISTRY OF AGRICULTURE & FISHERIES (continued)	Mr R. W. Hickman	Scientist	Ministry of Agriculture and Fisheries P.O. Box 19062 Wellington New Zealand
	Dr R. M. McDowall	Scientist	Ministry of Agriculture and Fisheries P.O. Box 19062 Wellington New Zealand
	Mr L. J. Paul	Scientist	Ministry of Agriculture and Fisheries P.O. Box 19062 Wellington New Zealand
	Mr C. J. Bolland	Scientist	Ministry of Agriculture and Fisheries P.O. Box 19062 Wellington New Zealand
	Mr C. M. Vooren	Scientist	Ministry of Agriculture and Fisheries P.O. Box 19062 Wellington New Zealand
	Mrs M. R. Cordue	Science Technician	Ministry of Agriculture and Fisheries P.O. Box 19062 Wellington New Zealand
NEW ZEALAND ASSOCIATION SCIENTISTS	Mr E. R. A. de Zylva	Marine Biologist	10 Chatswood Grove Birkenhead Northcote, Auckland 10 New Zealand
NEW ZEALAND OCEANOGRAPHIC INSTITUTE	Mr J. W. Brodie	Director	NZ Oceanographic Institute P.O. Box 8009 Wellington New Zealand
	Mr E. W. Dawson	Scientist	NZ Oceanographic Institute D.S.I.R. P.O. Box 8009 Wellington New Zealand

VISITORS (Continued)

	<u>Name</u>	<u>Designation</u>	<u>Address</u>
NEW ZEALAND OCEANOGRAPHIC INSTITUTE (continued)	Mr N. M. Ridgway	Physical Oceanographer	NZ Oceanographic Institute D.S.I.R. P.O. Box 8009 Wellington New Zealand
	Mr B. R. Stanton	Physical Oceanographer	NZ Oceanographic Institute D.S.I.R. P.O. Box 8009 Wellington New Zealand
STARKIST FOODS LTD	Mr D. Baker		Starkist Foods Ltd New Plymouth New Zealand
UNIVERSITY OF AUCKLAND NEW ZEALAND	Prof. R. M. Cassie	Professor of Biometry	Department of Zoology University of Auckland Private Bag Auckland New Zealand
UNIVERSITY SOUTH PACIFIC	Prof. C. C. Lindsay	Professor	University of the South Pacific Box 1168 Suva, Fiji
UNIVERSITY OF CANTERBURY NEW ZEALAND	Prof. G. A. Knox	Head of Department of Zoology	University of Canterbury Christchurch 1 New Zealand
VICTORIA UNIVERSITY NEW ZEALAND	Dr P. H. J. Castle	Lecturer in Eel Biology and Taxonomy	Victoria University of Wellington P.O. Box 196 Wellington New Zealand
	Dr E. B. Slack	Reader in Applied Fisheries	Victoria University of Wellington P.O. Box 196 Wellington New Zealand
	Prof. J. A. F. Garrick	Professor of Zoology	Victoria University of Wellington P.O. Box 196 Wellington New Zealand

IPFC SECRETARIAT

<u>Name</u>	<u>Designation</u>	<u>Address</u>
Mr D. D. Tapiador	Regional Secretary of IPFC	Regional Fisheries Officer FAO Regional Office for Asia and the Far East Maliwan Mansion Phra Atit Road Bangkok 2, Thailand
Mr H. Rosa, Jr.	Headquarters Secretary of IPFC	Fishery Liaison Unit Department of Fisheries FAO, Via delle Terme di Caracalla Rome, Italy
Miss A. Jiannee	Conference Officer	Technical Assistant (Fisheries) FAO Regional Office for Asia and the Far East Maliwan Mansion Phra Atit Road Bangkok 2, Thailand
Miss M. Swanton	Interpreter	11 Pembridge Villas Notting Hill Gate London W11, England, UK
Mr J. Sala	Interpreter	1 BD de Smet de Nayer B 1090 Brussels, Belgium

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Mr F. E. Popper	Assistant Director-General (Fisheries)	Department of Fisheries FAO Via delle Terme di Caracalla Rome, Italy
Dr T. V. R. Pillay	Senior Fishery Officer (Aquaculture)	Inland Fisheries Resources Branch Fishery Resources Division Department of Fisheries FAO, Via delle Terme di Caracalla Rome, Italy
Dr D. W. Sahrhage	Chief, Marine Biology and Environment Branch	Fishery Resources Division Department of Fisheries FAO, Via delle Terme di Caracalla Rome, Italy

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (Continued)

<u>Name</u>	<u>Designation</u>	<u>Address</u>
Mr J.A. Gulland	Chief, Fishery Statistics and Economics Data Branch	Fishery Economics and Institutions Division Department of Fisheries FAO, Via delle Terme di Caracalla Rome, Italy
NEW ZEALAND GOVERNMENT		
Miss N.E. England	Conference Liaison Officer	Head of Conference Division Ministry of Foreign Affairs Private Bag Wellington, New Zealand
Mr J.G. Watkinson	Conference Liaison Officer	Administration Officer Fisheries Division Ministry of Agriculture and Fisheries P.O. Box 2298 Wellington, New Zealand

49.

ADDRESS

BY

THE MINISTER OF AGRICULTURE AND FISHERIES, HON D.J. CARTER

Mr Chairman, Mr Popper, Excellencies, distinguished guests, ladies and gentlemen:

Although New Zealand is a small nation whose economy is based on agriculture, its people enjoy a comparatively high standard of living. In some social legislation and in some agricultural research and practice we have been world leaders. However, in fishing we must be considered one of the world's developing nations. For this reason, as Minister of Agriculture and Fisheries I have very great pleasure in welcoming the members of the Indo-Pacific Fisheries Council to New Zealand.

We are delighted to have so much of the region's expertise in fishing assembled at the one time in our country. In particular I would like to say how much New Zealand appreciates the generosity of the Food and Agriculture Organisation in making available specialist staff to stay on in our country after the Council meeting. Their knowledge and expertise will be available to our fishing industry and to the officers of our Government.

The last decade has been a period of substantial growth for the New Zealand fishing industry, but the rate of growth has fluctuated. In the early 1960s output was relatively static, while confidence in the industry was also temporarily affected by the failure in 1968 of an attempt to develop longer range activities using large European stern trawlers. However, the catch in 1971 reached a new record level which, compared with ten years previously, was 50 percent greater in live weight and nearly three times more valuable. The catches of such species as snapper and trevally have shown above-average increases, and the industry has adopted techniques to ensure that high quality products are put into special markets, such as Japan. I am confident that this type of development can be expanded.

Landings of rock lobster rose rapidly with the opening up of new ground at the Chatham Islands. The total catch reached a peak in 1968 but has fallen back to a level which represents the annual available catch. Rock lobsters retain a dominant position in the industry because of the demand for tails overseas and the good prices which are being received. Rock lobsters are still the most valuable single species landed, processed, and exported from New Zealand.

The fishing industry plays a useful dual role in the New Zealand economy. Not only does it provide a fairly high degree of self-sufficiency in fish supplies, but it also makes an increasingly valuable contribution to the country's export trade. Imports of fish and fish products, consisting primarily of canned salmon, sardines and herrings, have risen in recent years; however, their cost (US\$6 million in 1971) is far outweighed by the rapidly expanding exports of New Zealand fish products. These have more than doubled in value during the last five years to over US\$23 million in 1971.

Detailed assessments of New Zealand's resources are far from complete but the evidence available suggests that demersal stocks are capable of further, but limited, development. The recent National Development Conference in New Zealand identified the pelagic fisheries as the area for greatest expansion. Currently about 4 percent of the total landings come from pelagic fishing. Stocks are known to be present of such fish as mackerel, kahawai, and barracouta which are not being fully exploited by the New Zealand industry. However, it is

hoped that changing fishing methods and world-wide requirements for fish-based protein will enable the New Zealand industry to harvest and export greater quantities of these currently lower-priced species. I recently approved an experimental project based in Gisborne which will enable a locally-built purse-seiner to concentrate on catching all forms of pelagic fish, such as mackerel, pilchards, kahawai, barracouta, and tuna, over a 12-month period, and this will be initiated as soon as a fish meal plant has been installed to ensure full utilisation of the catch.

In the mollusc field over recent years the taking of paua (abalone) and its marketing has become a significant export income earner, and under Government rules the product must be exported in the bleached and canned state. Exports are significant and are of much the same value as snapper and eels.

Traditionally the lakes and rivers of New Zealand have been used for sporting purposes only and there is an extremely popular fishery based on rainbow trout introduced from the United States of America, brown trout from the United Kingdom via Australia, and quinnat salmon introduced from Canada on the east coast of the South Island.

In recent years the native species of eels have been taken and good export markets found, particularly in Europe. To maintain supplies and increase this trade, the industry must develop farming techniques, and this has just started. To develop this aspect quickly, the Government is now allowing experimental exports of small quantities of elvers in return for technical expertise being available to the New Zealand eel industry, to assist the development of an export industry based on eel-farming.

Delegates will be aware of the expanding rock oyster farming industry from New Zealand's contribution to the symposium on aquaculture which formed part of the Council's 14th meeting at Bangkok. This industry continues to prosper and it is pleasing to note that marine farming is expanding into mussel farming and now dredge oyster farming, and that the harvesting of seaweeds and squid is being looked at.

New Zealand's waters appear to have a high potential for mariculture, and I am pleased that the industry is vigilant in looking for new markets and products, and is trying to use the full range of fish able to be caught. Assuming a continuance of recent trends, food fish consumption in New Zealand will rise by about 15 percent over the next decade to reach a total of some 58,000 tons liveweight by 1980. Consumption is unlikely to rise markedly and the greater part of such an increase in demand will be attributable to population growth. It is expected that, with the catch increasing at a greater rate than local demand, an increasing proportion of the total will be exported.

Since delicensing of the industry in 1964 the Government has continued to foster the expansion of fishing. It has enabled the industry to modernise its fleet and diversify its catching methods with a minimum of intervention. Over the same period the Government has considerably expanded research by way of increased scientific and technical staff and laboratories, and the purchasing of a technology vessel, the W.J. Scott, and an oceangoing research vessel, the James Cook. Government financial assistance relates chiefly to loans for the purchasing and equipping of fishing vessels, for the costs of changing methods of fishing, for rock oyster farming, and the installation of cool stores and icemaking plants in smaller ports. This assistance and the assistance which the Government provides through all its agencies is stimulating the catching, processing, and marketing of the highest quality possible fish and fish products.

The Fishing Industry Board, established in 1964, is responsible for promoting the development of the industry. The Board receives active support from the Government. Future policy will undoubtedly be considerably influenced by the concern presently being expressed at the problems of maintaining the competitiveness of New Zealand fish products in international markets and at the increasing level of fishing activity by other nations around the New Zealand coast.

Gentlemen, New Zealand has a dual role at this conference - that of host and pupil. We do not have the knowledge or experience to teach or to preach. Frankly, we are here to learn from you and to make whatever small contribution to the total that we can. However, as hosts we can offer you some expertise, as hospitality to strangers and visitors comes naturally to New Zealanders. I trust that your discussions and deliberations will be interesting and rewarding, and that your stay with us will be enjoyable. On behalf of the Government and people of New Zealand I sincerely welcome you to our country, and I take great pleasure in declaring the 15th session of the Indo-Pacific Fisheries Council open.

ADDRESS

BY

MR F.E. POPPER, ASSISTANT DIRECTOR-GENERAL (FISHERIES)
FAO, ROME

Mr Chairman, Hon. Minister, Excellencies, Distinguished delegates and guests, ladies and gentlemen.

It is with great pleasure that I take this opportunity of addressing, on behalf of the Director-General, this Fifteenth Session of the Indo-Pacific Fisheries Council.

It is six years since I last participated in the work of one of your Sessions and it is very pleasant to be back again among old friends, though I regret that because of other important commitments I will be able to work with you on this occasion for a very short time only. I am particularly sorry about this because this session is being held in this beautiful city of Wellington and the Government of New Zealand has made such excellent arrangements for it, which we in FAO most deeply appreciate.

Mr Chairman, I have followed with great interest the new pattern of work initiated by the Council at its last session in Bangkok and I am pleased to see that this experiment is gradually steering the Council from the role of a mere forum for the exchange of views and information to an action-oriented fishery body. This is reflected in the major substantive items of your agenda for this Session. They are concerned with problems of management and development.

Consideration will be given under one of the items to the report of the Special Committee for the Management of Indo-Pacific Tuna. The establishment of this Committee at the last session of the Council is the first positive step taken by the Council towards the conservation of fishery resources in the Indo-Pacific area.

Two meetings of this Committee have been held, in addition to a meeting of an ad hoc IPFC/IOFC Working Party of scientists on stock assessment of tuna. FAO has provided all possible support to this work, through the activities of its technical staff. I would, however, underline the view of the scientists that the supply of basic data on which the scientific assessments are made needs to be considerably improved. This will require actions to improve national arrangements for collecting statistics, as well as the international compilation and dissemination of data. I am sure that the Council will give careful consideration to this matter under the relevant agenda item, particularly as regards possible international support for these activities.

I wish to refer now to another very important enterprise conceived by the thirteenth session of the Council, the South China Sea Fisheries Development and Coordinating Programme. A revised draft project document prepared according to the UNDP suggestions is available to this session and has also been submitted to the UNDP for final approval. With the support from this Session and the expressed support from the countries concerned (Indonesia, Khmer Republic, Malaysia, Philippines, Singapore, Thailand, United Kingdom (for Brunei and Hong Kong) and Vietnam), Phase I, the preparatory phase of the project, should be initiated early next year, as I understand that the UNDP Inter-Country Programming Mission has recommended that this project should be included in the Inter-Country Programme for Asia and the Far East for the period of 1973-77.

In preparation for this project FAO has contracted the services of Mr Shindo from Japan, who I am sure is well known to many of you, to prepare a general review of the trawl fishery and the demersal fish stocks of the South China Sea. The report has been submitted to your Trawling Working Party for comments and is available to you as a working document for subsequent approval.

I would like now to turn to two cooperative programmes which should significantly strengthen the activities of the Council. One is the cooperative programme of research on coastal aquaculture approved by your last session. I understand that several institutions in the Council's region have volunteered to participate in this programme and I hope that your programme will significantly contribute towards the removal of constraints to further development of aquaculture in the region.

The other programme I wish to refer to is described in one of your working documents and consists of a cooperative project on fish product development, processing, and marketing. We hope that the Council will be able to endorse such a project because problems of product development and marketing are generally considered to require special attention in your region.

Mr Chairman, the successful pursuit by the Council of these and other similar activities would significantly contribute to the orderly development of the fisheries of this region.

We in FAO shall continue to assist the Council as we have done in the past with all the means which are available to us. (As a parenthetical remark I would like to mention that, as indicated in one of your documents, of the 35 recommendations directed to FAO by your last session 29 have been implemented. The others will be dealt with as soon as budgetary or other limitations will permit.)

The resources of the Organisation are however limited and future prospects for improvement are, as you know, not bright. I hope therefore that in considering the agenda item on the strengthening of the Council's activities, you will give very serious consideration to the problem of the financing of your activities, and the discussion of methods whereby the Council can more effectively carry out its programme of work.

Thank you, Mr Chairman.

ADDRESS

by

MR B.T. CUNNINGHAM, CHAIRMAN OF THE INDO-PACIFIC FISHERIES COUNCIL

Hon. Mr Carter, Mr Popper, Excellencies, distinguished guests, ladies and gentlemen.

October 1972 must be considered a landmark for New Zealand.

We have just concluded a Food and Agriculture Organisation Seminar on the design and construction of Ferro-Cement fishing vessels.

I was honoured to have been elected chairman for that most successful seminar, which concluded by approving guideline definitions for ferro-cement, and other aspects relating to the design and construction of ferro-cement vessels.

This is a significant step forward as it initiates a common technology for boat-builders, designers, marine engineers, and architects, and of course, the users of boats.

The ferro-cement seminar should assist the development of the fishing industries in the Indo-Pacific region, and the results of the Seminar should be useful to the Indo-Pacific Fisheries Council. There is still a need to raise the standards of artisanal fishermen, and the use of ferro-cement as a method of construction based on readily available materials could assist to achieve this end.

The FAO seminar served as a catalyst to bring people together to share their experience in ferro-cement boat building, and to discuss common problems. Likewise this meeting will serve to bring people together to work toward the development of the fishing industries of the Indo-Pacific region.

I am very conscious of the honour accorded me in being elected Chairman of the IPFC and I sincerely hope that with your co-operation and combined efforts this council meeting can be brought to a successful conclusion.

I am pleased that the IPFC continues to be the main forum for discussion and co-operation in the fisheries field in the Indo-Pacific region. Although significant increases in fish landings and improvement in quality of fisheries products have been achieved throughout the region, considerable effort is still required to continue promotion and expansion.

Following the success of the changed format for the 14th Session at Bangkok, this arrangement has been followed for the 15th Session. However, some re-arrangement of the agenda has been necessary to enable aspects which require the attention of Mr Popper, the Assistant Director-General, to be discussed while he is in New Zealand. I trust that the agenda amendments yet to be confirmed will facilitate the Council's deliberations on these aspects and that this Session will be a success.

Returning to the work of the Council, this continues to be hampered by the lack of the provision of the technical staff requested at the Regional Office.

The needs of the region are expanding and although Rome office supports in principle, the need for such staff, headquarters have not, probably due to financial restraints applying, made the additional appointments considered necessary by Council.

However, since the 14th Session, Council's work has been advanced and there is now under consideration a UNDP project under the auspices of the IPFC in the South China Sea. Similar projects are underway in the Indo-Ocean Fisheries Commission Region. It is hoped that Member Governments will support this project which must be regarded as the most significant step forward in fisheries development within the region.

Also, at its last Session, Council approved of the setting up of a Special Committee on the management of Indo-Pacific tuna. At present Australia, Indonesia, Japan, Republic of Korea, New Zealand, Philippines, Thailand, and U.S.A. are members of this special committee. I am pleased that two meetings of the committee have now been held in association with the Indian Ocean Fisheries Committee on Management of Indian Ocean Tuna.

The second meeting was held on October 5 - 6 at Colombo, Sri Lanka. A report will be available for discussion at this 15th session of the Council.

It is hoped that joint meetings of this committee will assist to determine common policies for the management of these oceanic species.

At this point I would like to convey to Mr Cedric Setter, the Immediate Past Chairman of the I.P.F.C., the Council's best wishes on his appointment as chairman of the International Whaling Commission and of the Indo-Ocean Fisheries Commission.

On behalf of the Council I wish to thank the New Zealand Government, through the Honourable D.J. Carter, Minister of Agriculture and Fisheries, for New Zealand's participation with respect to hosting and making facilities available for this Session.

I wish to welcome all representatives of member countries and all observers to this 15th Session and hope that this will be a most successful meeting.

Thank you.

MESSAGE TO MR B.T. CUNNINGHAM, CHAIRMAN INDO-PACIFIC FISHERIES COUNCIL

from

Dr. D.L. Umali

Assistant Director-General, FAO and Regional
Representative for Asia and the Far East

As we are holding the 11th FAO Regional Conference in New Delhi on 17-27 October 1972, I regret very much that I could not attend the opening of the 15th Session of the Indo-Pacific Fisheries Council in your capital city of Wellington.

May I, however, on this occasion salute you as the current Chairman of the Council and to wish you luck for the success of the Session and through you to greet the distinguished delegates and the representatives of FAO, particularly Mr Fred Popper, head of the FAO Department of Fisheries and to thank the New Zealand Government, through the Honourable D.J. Carter, Minister of Agriculture and Fisheries, for its generosity in hosting the IPFC 15th Session.

The Indo-Pacific Fisheries Council has now been in existence for more than two decades and during that time we have seen great changes taking place in fisheries in the Indo-Pacific area. While a few countries in the region have made slow progress, some countries like Korea, Thailand, India, and Philippines have made great strides in increasing their total national fish production. Overall, however, the Asian region continued to produce more fish than all the other continents, i.e., 24.7 million tons in 1969 and 26.2 million tons in 1970 and the growth rate in fish production continued to be about 10% which is equal to the global growth rate. Asia continued to produce about 40% of the total world fish production and, in inland fisheries, it continued to produce about two-thirds of the world's production.

In comparing with the other major sectors of food production in Asia, the growth rate of fisheries is more than three times that of rice and nearly three times that of meat during the last decade (1960-1970).

No doubt, these are impressive facts and figures and point out too clearly the importance of fisheries in this region which is second only to agriculture. With about two-thirds of the people of the world living in Asia and where one million more people have to be fed every week, fisheries assumes an even more significant importance as Asians have long been known to be a "rice-and-fish" eating people.

Some countries in the region may have to maintain present growth rates and others may be able to obtain more substantial increases and there will always be many and complex problems needing the attention of our Member Governments and that of FAO.

The Indo-Pacific Fisheries Council has played its useful role in the past and I hope that it will assume even a more important and effective role in the future. I am only too aware that the Council in the past and even as of now, has had inadequate support and I do hope that as recommended by the last session of the FAO Committee on Fisheries in April this year, the member countries of the Council, especially the "developed" countries, will give technical and financial support to the Council's activities. This matter, I understand, will be for your Council's discussion as Item 10 in your Agenda.

Any discussion by the Council which will help us to establish priorities in our Regional Programme of Work for the Asia and Far East Region would also be particularly useful especially for the next FAO Regional Conference.

I hope you will have fruitful discussions and arrive at meaningful conclusions which can be effectively implemented by our Member Governments and FAO.

Again, I wish you the best of success.

Appendix III

AGENDA

- A. INTRODUCTORY AND PROCEDURAL MATTERS
 - 1. Opening of the Session
 - 2. Adoption of the Agenda and arrangements for the Session
- B. TECHNICAL-SCIENTIFIC MATTERS
 - 3. Symposium on Coastal and High Seas Pelagic Resources
 - 4. Coastal aquaculture and environment
 - (a) Effect of pollution on aquaculture
 - (b) Use of pollutants for aquaculture
 - (c) Conflict in the use of coastal zone areas for aquaculture
 - 5. Resources appraisal and management
 - (a) Tuna stocks
 - (b) Demersal fish stocks
 - 6. International and regional programmes
 - (a) The South China Sea Fisheries Development and Coordinating Programme
 - (b) International Indian Ocean Fishery Survey and Development Programme
 - (c) Cooperative Study of the Kuroshio and Adjacent Regions (CSK)
 - (d) FAO/DANIDA Seminar of Fish Taxonomy in South East Asia
 - (e) Fishery Statistics
 - (f) A proposed cooperative project on fish product development, processing and marketing
- C. OPERATIONAL AND ADMINISTRATIVE MATTERS
 - 7. Application for membership
 - 8. Inter-sessional Report of the IPFC Executive Committee
 - 9. Matters referred by the Council to
 - (a) Member governments
 - (b) FAO
 - 10. Matters arising from the Reports of the Committee on Fisheries
 - (a) Strengthening of the Council's activities
 - (b) Other matters
 - 11. Preparations for symposia of future sessions
 - 12. Any other matters
 - (a) Discussion of the future of Technical Committees I and II of the Council
 - (b) Election of Officers of Technical Committees I and II of the Council
- D. CONCLUDING MATTERS
 - 13. Election of officers
 - 14. Date and venue of next session
 - 15. Adoption of the Report

Appendix IV

LIST OF DOCUMENTS

WORKING PAPERS:

- | | |
|-----------|---|
| IPFC/72/1 | Provisional Agenda |
| 1 (Fr.) | Ordre du Jour Provisoire |
| | |
| 2 | Annotated Provisional Agenda |
| 2 (Fr.) | Ordre du Jour Provisoire annoté |
| | |
| 3 | Provisional Timetable |
| 3 (Fr.) | Programme Provisoire |
| 3 (Rev.1) | Ditto (Revised) |
| | |
| 4 | Report of the First Meeting of the IPFC Working Party on Coastal Aquaculture and Environment, Wellington, New Zealand, 14-17 October 1972 |
| 5 | A critical appraisal of the water pollution problem in India in relation to aquaculture
by V.G. Jhingran |
| 6 | Biological processes involved in pollution of coastal aquaculture waters
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by M. Fujiya |
| 7 (Add.1) | Ditto (Attachments - 3 Figures) |

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by R.M. Lesaca
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by R. Djajadiredja
- 10 Use of pollutants for aquaculture-conditioning of wastes for aquaculture
by G.L. Chan
- 11 Multifarious use of coastal areas suitable for aquaculture development
by V.G. Jhingran and V. Gopalakrishnan
- Not issued (12) Conflicts in the use of coastal zone areas for aquaculture - examples of
possible solutions
by Odum
- 13 A review of some effects of contaminants of marine organisms
by M.A. Steinberg
- 14 Sewage and aquaculture production
by E.B. Slack
- 14 (Add.1) Ditto (Addendum)
- 15 Recent developments in the New Zealand rock oyster farming industry (1970-72)
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- *16 (Fr.) Rapport de la réunion conjointe du Conseil Indo-Pacifique des Pêches Comité
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Session, et de la Commission des Pêches de l'Océan Indien Comité de l'aména-
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- 19 General review of the Trawl Fishery and the demersal fish stocks of the South
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by S. Shindo
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- 21 Project Document: The South China Sea Fisheries Development and Coordinating
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- 21 (Rev.1) Ditto (Revised)

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- 23 Note on the Eighth Session of the International Coordination Group for the Cooperative Study of the Kuroshio and adjacent regions (CSK), Manila, Philippines, 6-10 March 1972
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- 26 Fishery statistics in the Indo-Pacific Fisheries Council (IPFC) region
- 27 Proposal for a cooperative programme on research, training and extension in the field of fish product development, processing and marketing, particularly of pelagic and trash fish
- 28 Inter-Sessional Report of the IPFC Executive Committee
- 29 Action taken by FAO on the recommendations arising from the Fourteenth Session of IPFC, Bangkok, Thailand
- *30 Report of the Sixth Session of the Committee on Fisheries, Rome, Italy, 15-21 April 1971
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- 32 Provisional prospectus for the Technical Conference on Fishery Management and Development
- 33 Report of the First Session of the IPFC Working Party on Economic and Social Aspects of National Fisheries Planning and Development, Bangkok, Thailand, 11-14 July 1972
- 34 Preliminary experiments on the effect of Thiodan and Endrin on fish culture in Indonesia
by A. Hardjamulia and S. Kusamadinata

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Study on the spawning ground of commercial species of shrimp along the north coast of Central Java
by N. Naamin and A. Poernomo

- 36 Economic study on alternative uses of mangrove swamps: Bakawan production or fish pond
by J.M. Lawas, J. Ravelo, P. Acosta and P.G. Esquiers
- 37 Recommendations of the U.N. Conference on the Human Environment, Stockholm, 5-16 June 1972 and possible follow-up action
- 38 Report on the Meeting of the IPFC Working Party on Coastal and High Seas Pelagic Resources, Bangkok, 17-21 July 1972.
- 39 Report of the Third Session of the Executive Committee for the implementation of the International Indian Ocean Fishery Survey and Development Programme, Colombo, Sri Lanka, 7-9 October 1972.
- 40 Strengthening of the IPFC Activities
- 41 Discussion of future of Technical Committees I and II of the Council.
Election of Officers of Technical I and II of the Council.

INCIDENTAL PAPERS:

IPFC/72/INC 11	Provisional list of documents
2	Provisional list of Delegates and Observers
2 (Rev. 1)	List of Delegates and Observers
3	Mailing of documents
4	Tentative schedule of social events
5	Nominations for period between 15th and 16th session (1972-1974) to IPFC
6	New Zealand Fisheries Publications
7	IPFC 15th Session post-session tour, Wellington to Auckland, 28 - 31 October 1972
8	Procedure in event of fire or earthquake
9	Order of the Day, 18 October 1972
10	Registration
11	Wairarapa Tour and Post-Conference Tour
12	Order of the Day, 19 October 1972
13	Order of the Day, 20 October 1972
14	Order of the Day, 21 October 1972
15	Visits to Ministry of Agriculture and Fisheries Laboratories in Wellington
16	Reconfirmation of outward air bookings and transport requirements for departure
17	Order of the Day, 23 October, 1972
18	Ministry of Agriculture and Fisheries Vessel's "W. J. Scott" and "James Cook"

COUNTRY STATEMENTS:

IPFC/72/CS	1	Country Statement - Sri Lanka
	2	Country Statement - Thailand
	3	Country Statement - Philippines
	4	Country Statement - India
	5	Country Statement - U.S.A.
	6	Country Statement - Khmer
	7	Country Statement - Australia
	8	Country Statement - Japan
	9	Country Statement - Malaysia
	10	Country Statement - France
	11	Country Statement - Indonesia
	12	Country Statement - New Zealand

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- IPFC/72/SYM 1 Coastal and high seas pelagic fishery resources
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- 1 (Add.1) Ditto (Addendum)
- 2 The status of coastal and high seas fisheries and resources of the
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- 2 (Add.1) Ditto (Addendum)
- 3 New Zealand's pelagic fisheries: Their potential for development
by D. Eggleston and G.D. Waugh
- 4 Coastal and high seas pelagic fishery resources in Sri Lanka
- 5 Concepts of fisheries development surveys and management strategy
by D.L. Alverson
- 6 Some considerations of management problems in relation to pelagic
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by J.A. Gulland
- 7 Observations on the pelagic and semi-pelagic fishery of Balasore
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by J.C. Roy and S. Roy
- 8 Fishery Oceanography of the Western Pacific; Application of oceanographic
information to forecast natural fluctuation in the abundance of certain
commercially important pelagic fish stocks
By M. Uda
- 9 Plankton ecology in the Western North Pacific Ocean: Primary and secondary
productivities
by S. Motoda, A. Taniguchi and T. Ikeda
- Withdrawn (10) The estimation of phytoplankton population in the Gulf of Thailand from
chlorophyll, oxygen determination and light data
by A. Lursinsap and M. Charoenruay (✗)
- 11 The identification of fish eggs and larvae obtained from the survey cruises
in the South China Sea
by S. Vatanachai
- 12 Diurnal vertical distribution of the larvae of the Indo-Pacific Mackerel,
Rastrelliger neglectus (van Kampen)
by U. Boonprakob and Y. Dhebtaranon
- 13 Experiments on artificial fertilization and descriptive studies of eggs and
larvae of the Indo-Pacific Mackerel, Rastrelliger neglectus (van Kampen)
by U. Boonprakob and Y. Dhebtaranon
- 14 Review on coastal water resources in relation to coastal aquaculture
by R. Djajadiredja and A. Purnomo
- 15 Exploration of new Chanos fry resources. A trial for overcoming seed
shortage in Java
by R. Djajadiredja and Suhardi

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- IPFC/72/SYM 16 Stolephorus resources in the South China Sea
by A.K. Tham
- 17 Preliminary observations of the diel feeding migrations of the
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by E.S. Hobson and J.R. Chess
- 18 Ecological monograph of the Japanese anchovy, Engraulis japonica
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for the future
by K. Kondo
- 19 A "Lemuru", Sardinella longiceps survey around the western part of the
Little Sunda Island
by A. Dwiponggo and J.C.B. Uktolseya
- 20 The fishery for and preliminary study on the growth rate of "Lemuru"
(oil sardine) at Muntjar, Bali Strait
by A. Dwiponggo
- 21 Possible explanation for the fluctuations in abundance of the Indian
Oil Sardine, Sardinella longiceps Valenciennes
by B.T. Antony Raja
- 22 Observations of various tuna bait species and their habitats in the
Palau Islands
by P.T. Wilson
- 23 Review of mackerel resources of the Western Pacific
by K. Kurogane
- 24 Review of the mackerel fishery (Rastrelliger spp.) in the Gulf of Thailand
by Y. Dhebtaranon and K. Chotiyaputta
- 25 Tagging experiments on the Indo-Pacific Mackerel Rastrelliger neglectus
(van Kampen) in the Gulf of Thailand (1960-1965)
by D. Somjaiwong and S. Chullasorn
- 25 (Rev.1) Ditto (Revised)
- 26 Population dynamics of Pla Tu, Rastrelliger neglectus (van Kampen) in
the Gulf of Thailand
by V. Hongskul
- 27 Present status of knowledge regarding the biology of Indian Mackerel,
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by M. Devidas Menon and N. Radhakrishnan
- 28 A review of the Roundscad fishery of the Philippines
by I.A. Ronquillo
- 29 On the ability of other trawls to catch pelagic fish in Manila Bay
by P. Caces-Borja
- 30 Food of a surface school of Trevally (Teleostei: Carangidae) in the
North-West Bay of Plenty
by G.D. James
- 31 Tuna fisheries and their resources in the Pacific Ocean
by S. Kume

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by A.G. York and J.M. Fenaughty
- 33 Trolling for Albacore (Thunnus alalunga Bonnaterre) off the West Coast of
Auckland
by E.R.A. de Zylva
- 34 Selective feeding by Albacore and Skipjack tuna in the New Zealand region
in spring
by P.E. Roberts
- 34 (Add. 1) Addendum (Table I)
- 35 Acoustic detection and attraction of tuna in New Zealand waters
by A.G. York
- 36 Trial fishing surveys for Skipjack as an early development of the
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- 45 Coastal and High Seas Pelagic Resources of the Philippines
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SPEECHES:

- IPFC/C72/F 1 Opening speech by His Excellency The Minister of Agriculture and Fisheries,
 the Honourable D.J. Carter
- 2 Address by Mr F.E. Popper, Assistant Director-General (Fisheries) FAO, Rome
- 3 Address by Mr B.T. Cunningham, Chairman of the Indo-Pacific Fisheries Council
- 4 Message to Mr B.T. Cunningham, Chairman Indo-Pacific Fisheries Council, from
 Dr D.L. Umali, Assistant Director-General FAO and Regional Representative
 for Asia and the Far East, FAO

NEW ZEALAND TOURIST AND PUBLICITY DEPARTMENT:

New Zealand Facts and Figures
Myths and Legends of the New Zealand Maori (map)
New Zealand - New sights, new thrills, new friends (booklet)
Wellington (brochure)
Auckland (brochure)
New Zealand Friendly vacation land (brochure)
The Wool Industry
The Meat Industry
The Dairy Industry
Trout Fishing in New Zealand
Kiwi pins and Tikis
Rotorua (brochure) *
October in Wellington 1972
FAO Conference Handbook

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IPFC ADMINISTRATIVE CORRESPONDENTS
(for period between IPFC 15 & 16th Sessions October 1972-1974)

AUSTRALIA

First Assistant Secretary (IPFC Admin. Corr.)
Fisheries Division
Department of Primary Industry
Canberra, A.C.T., 2600, Australia

BURMA

- (2) The Secretary to the Govt. of the
Union of Burma
(IPFC Administrative Correspondent)
Ministry of Agriculture and Forests
Rangoon, Burma

FRANCE

Mr M. Legand (IPFC Admin. Corr.)	Copy to: Direction des Pêches Maritimes
Directeur du Laboratoire	(Attn.: Monsieur J. Touya)
d'Océanographie	3 Place de Fontenoy
Orstom, B.P. No 4	75 - Paris 7ème
Noumea, New Caledonia	France

INDIA

Mr P.C. George (IPFC Admin. Corr.)
Joint Commissioner (Fisheries)
Ministry of Agriculture
Dept of Agriculture
New Delhi, India

INDONESIA

Mr Djanuzir (IPFC Admin. Corr.)
Chief of the Foreign Relation and
Cooperation Division
Bureau of Foreign Relations
Department of Agriculture
Djl. Salemba Raya 16
Djakarta, Indonesia

JAPAN

Mr Makoto Taniguchi (IPFC Admin. Corr.)
Head, Specialised Agencies Division
United Nations Bureau
Ministry of Foreign Affairs
2-1, 2-chome, Kasumigaseki
Chiyoda-ku, Tokyo, Japan

KHMER

Monsieur Sim Kim Horn (IPFC Admin. Corr.)
 Directeur du Service des Pêches Maritimes
 No. 54 M.V. Pracheathippatei
 Phnom Penh, République Khmère

KOREA

Mr Kim Kyun Hyun (IPFC Admin. Corr.)
 Chief, International Cooperation Section
 Office of Fisheries of the Government
 of the Rep. of Korea
 111-Hapdong, Seodaimun-Ku
 Seoul, Korea

MALAYSIA

Principal Assistant Secretary
 (IPFC Administrative Correspondent)
 Ministry of Agriculture and Fisheries
 Swettenham Road,
 Kuala Lumpur, Malaysia

NETHERLANDS

Liaison Officer for FAO Affairs
 (Attn.: Miss P.F.M. van der Togt)
 (IPFC Administrative Correspondent)
 Ministry of Agriculture and Fisheries
 1st v.d. Boschstraat 4
 The Hague, Netherlands

NEW ZEALAND

Mr B.T. Cunningham (IPFC Admin. Corr.)
 Director of Fisheries
 Fisheries Division, Ministry of Agriculture & Fisheries
 P.O. Box 2298
 Wellington, New Zealand

PAKISTAN

Mr M.A. Burney (IPFC Admin. Corr.)
 Deputy Director
 Marine Fisheries Department
 Government of Pakistan
 Fish Harbour, West Wharf
 Karachi-2, Pakistan

PHILIPPINES

Mr Priscilla Caces-Borja (IPFC Admin. Corr.)
 Supervising Fishery Biologist
 Philippine Fisheries Commission
 P.O. Box 623,
 Manila, Philippines

SRI LANKA

Mr Eardley G. Goonewardene (IPFC Admin. Corr.)
 Secretary to the Ministry of Fisheries
 Ministry of Fisheries
 P.O. Box 1707
 Galle Face
 Colombo 3, Republic of Sri Lanka

THAILAND

Mr Umpol Pongsuwan (IPFC Admin. Corr.)
 Director, Marine Fisheries Laboratory
 Marine Fisheries Laboratory
 89/1 Soi Sapanpla, Yanawa District
 Bangkok 12, Thailand

U.K.
 (For Hong Kong)

Mr E.H. Nichols, (IPFC Admin. Corr.)
 Director of Agriculture & Fisheries
 Agriculture & Fisheries Department
 Canton Road Government Offices
 393, Canton Road, 12th floor
 Kowloon, Hong Kong

U.K.
 (For London)

U.K. Liaison Officer with
 U.N. Organisations
 (IPFC Administrative Correspondent)
 British Embassy
 Ploenchit Road
 Bangkok, Thailand

U.S.A. (3)

Director, International Organisations
 Staff
 (Attn.: Dr. R.W. Phillips)
 (IPFC Administrative Correspondent)
 Office of Assistant Secretary
 U.S. Department of Agriculture, Washington, D.C. 20250
 U.S.A.

VIETNAM

Monsieur Tran Van Tri (IPFC Admin. Corr.)
 Directeur des Pêches
 Boite Postale 340
 Saigon, Vietnam

Appendix VI

NOMINATIONS FOR PERIOD BETWEEN 15th AND 16th SESSION (1972-74) TO IPFC

<u>Member Governments</u>	<u>IPFC Technical Committee I</u>	<u>IPFC Technical Committee II</u>
AUSTRALIA	<p>*Dr. G.F. Humphrey Chief, Division of Fisheries and Oceanography CSIRO, P.O. Box 21 Cronulla, N.W.S. 2230 Australia</p>	<p>*Mr. T.W. Burdon Assistant Director Fisheries Branch Department of Primary Industry Canberra, A.C.T. 2600 Australia</p> <p>*Dr. G.S. Sidhu Division of Food Preservation, CSIRO, Box 43, P.O. Ryde N.W.S. 2112, Australia</p>
BURMA	* _____	* _____
FRANCE	<p>Monsieur M. Legand Chef de la Section d'Océano- graphie du Centre ORSTOM à Noumea, B.P. No. 4 Nouvelle-Calédonie</p>	<p>Monsieur M. Legand Chef de la Section d'Océano- graphie du Centre ORSTOM à Noumea, B.P. No. 4 Nouvelle-Calédonie</p>
INDIA	<p>Mr. K. Chidambaram Deputy Commissioner (Fisheries Plan) Ministry of Food, Agri- culture, C.D. and Cooperation (Department of Agriculture) New Delhi-1, India</p>	<p>Prof. P.C. George Deputy Commissioner (Education and Trade) Ministry of Food, Agriculture, C.D. and Cooperation (Department of Agriculture) New Delhi-1, India</p>
INDONESIA	<p>*Mr. M. Unar Director, Institute of Marine Fisheries Research 12, Djalan Kerapu Djakarta, Indonesia</p>	<p>*Ir. Sofjan Iljas Director Institute of Fisheries Technology Pasar Minggu Djakarta, Indonesia</p>

Member GovernmentsIPFC Technical Committee IIPFC Technical Committee II

JAPAN

Mr. Toshiyuki Hirano
Special Assistant
Research Department
Fishery Agency
Ministry of Agriculture
and Forestry
2-1, 1-Chome Kasumigaseki
Chiyoda-ku, Tokyo, Japan

Mr. Hidekazu Hirao
Chief, Biochemical Research
Unit
Tokai Regional Fisheries
Laboratory
Fishery Agency
5-1, 5-Chome Kachidoki,
Chuo-ku, Tokyo, Japan

REPUBLIC OF
KHMER

*Mr. Suon-Saroeung
Inspecteur des Pêches
Institut d'Océanographie
Kompong Som Ville
Republic of Khmer

*Mr. Sva-Kret
Inspecteur Technique des Pêches
Direction du Service des Pêches
B.P. 46
Phnom-Penh, Republic of Khmer

KOREA

Mr. Sub, Hak Keun
Chief of Technological
Management Section
Fisheries Development and
Research Agency
Pusan, Korea

Mr. Kim, Kyun Hyun
Chief, Inland Development Sect.,
Office of Fisheries of the
Government of the Rep. of Korea
111 Hap-dong, Suh-daemoonku,
Seoul, Korea

MALAYSIA

Mr. D. Pathansali
Senior Fisheries Research
Officer,
Fisheries Research
Institute, Glugor
Penang, West Malaysia

Tengku Ubaidillah bin Tengku
Abdul Kadir
Acting Director-General
Fisheries Division
Ministry of Agriculture and Lands
Swettenham Road
Kuala Lumpur, Malaysia

NETHERLANDS

Dr. J.J. Schuurman
Reader on Pisciculture
Agricultural University
Van Iddekingeweg 56
Groningen, Netherlands

Mr. J.G. de Wit
Chief, Technological Research
Branch
Fisheries Division
Ministry of Agriculture and
Fisheries
Havenkade 19, IJmuiden
Netherlands

NEW ZEALAND

Mr. G.D. Waugh
Director of Fisheries
Research
Ministry of Agriculture
and Fisheries
P.O. Box 19062
Te Aro, Wellington
New Zealand

Mr. B.T. Cunningham
Director of Fisheries
Marine Department
P.O. Box 10142
The Terrace, Wellington
New Zealand

PAKISTAN

*

Member GovernmentsIPFC Technical Committee IIPFC Technical Committee II

PHILIPPINES

Mr. I.A. Ronquillo
Chief, Marine Fisheries
Biology Division
Philippine Fisheries
Commission, P.O. Box 623
Intramuros, Manila
Philippines

Mr. F.R. Gonzales
Supervising Fishery Technologist
Philippine Fisheries Commission
P.O. Box 623, Intramuros,
Manila, Philippines

SRI LANKA

Mr. A.S. Mendis
Deputy Director (Research)
Department of Fisheries
P.O. Box 531
Colombo-3, Sri Lanka

Permanent Secretary
Ministry of Fisheries
P.O. Box 531
Galle Face
Colombo-3, Sri Lanka

THAILAND

Dr. Deb Manasveta
Senior Fisheries
Biologist,
Marine Fisheries Laboratory
89/1 Soi Sapan Pla
Yanawa, Bangkok 12, Thailand

Mr. Sant Bandhukul
Deputy Director-General
Department of Fisheries
Ministry of Agriculture
Rajdamnern Avenue
Bangkok 2, Thailand

U.K.

Director,
Agriculture and Fisheries
(Attention: Senior
Research Officer)
Agriculture and Fisheries
Department
Cambridge Court, 2nd Floor
84 Waterloo Road
Kowloon, Hong Kong

Director,
Agriculture and Fisheries
(Attention: Senior Fisheries
Officer, Extension and
Development),
Agriculture and Fisheries Dept.
Cambridge Court, 2nd Floor
84 Waterloo Road
Kowloon, Hong Kong

U.S.A.

Mr R.S. Shomura
Associate Regional Director
for Resource Programs
National Marine Fisheries
Service
Department of Commerce
Room 2016
300 South Ferry Street
Terminal Island
California 90731
U.S.A.

Dr. M.A. Steinberg
National Marine Fisheries
Service
Department of Commerce
2725 Montlake Blvd. E.
Seattle, Washington
U.S.A. 98102

VIETNAM

Mr. Le Van Dang
Assistant Directeur des
Pêches
Chef du Service des
Pêches Continentales
P.O. Box 340
Saigon, Vietnam.

Mr. Tran Van Tri
Directeur des Pêches
P.O. Box 340
Saigon, Vietnam