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Report of the Twenty-Third Session of the

INDO-PACIFIC FISHERY COMMISSION (IPFC)

Colombo, Sri Lanka, 14-24 May 1990

REGIONAL OFFICE FOR ASIA AND THE PACIFIC (RAPA)
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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1991

PREPARATION OF THIS REPORT

This is the final version of the report approved by the Twenty-third Session of the Indo-Pacific Fishery Commission.

ABSTRACT

This is the final version of the report of the Twenty-third Session of the Indo-Pacific Fishery Commission (IPFC), held in Colombo, Sri Lanka from 14 to 24 May 1990. Major topics discussed were: artificial reefs and fish aggregating devices as resource enhancement and fisheries management tools; status and prospects of the fisheries sector in Asia and the Pacific; matters referred for the attention of the Commission; and a review of the structure, functions and responsibilities of IPFC and its subsidiary bodies including amendments to the terms of reference.

Distribution :

Participants in the Session
Members of the Commission
Other interested nations and international organizations
FAO Fisheries Department
Fishery Officers in FAO Regional Offices

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OPENING OF THE SESSION

1. The Indo-Pacific Fishery Commission (IPFC) held its Twenty-third Session and Symposium on Artificial Reefs and Fish Aggregating Devices as Resource Enhancement and Fisheries Management Tools from 14 to 24 May 1990 at the Hotel Ceylon Inter-Continental, Colombo, Sri Lanka. The Session was attended by representatives of 12 Member States of the Commission, a representative of UNDP and by an observer from SEAFDEC. The list of delegates and observers is given in Appendix A.
2. At the official opening of the Session, held on 21 May 1990, the Commission was welcomed by the Chairman of IPFC, Mr. N.V.K.K. Weragoda, Secretary, Sri Lanka Ministry of Fisheries and Aquatic Resources.
3. He stressed the importance of the Session in the development of policy guidelines for fisheries research and development activities and for promoting regional cooperation in the rational management of fishery resources.
4. In his opening statement, Dr. Armin Lindquist, Assistant Director General, Fisheries Department, conveyed the greetings of the Director-General of FAO, Mr. Edouard Saouma, and his best wishes for a successful session.
5. He thanked the Government of Sri Lanka for hosting a session of IPFC for the third time and for the excellent arrangements made for the Twenty-third Session.
6. In referring to the Symposium and to the Sixth Session of SCORRAD held in conjunction with the session, he made particular reference to the need for research oriented towards the management of both coastal and open sea resources and habitats. Such research also included issues concerning environmental degradation and pollution, which were becoming increasingly important. The complex nature of artificial reefs and fish aggregation devices had been discussed during the symposium. The discussions had shown that there were both advantages and limitations in using such structures and that a careful approach was needed.
7. Dr. Lindquist drew the attention of the Commission to the secretariat review of the status and prospects for fisheries and hoped for a thorough discussion on the future development of fisheries in the Indo-Pacific region. The Eighteenth Session of the Committee on Fisheries had requested a review of the structure, functions and responsibilities of the Commission and in this connection the Session would be invited to discuss and decide on the further action required. This was also discussed at the Sixty-fourth Session of the IPFC Executive Committee.
8. Inaugurating the Session, the Honourable Joseph Michael Perera, Minister of Fisheries and Aquatic Resources, Sri Lanka, referred to the need for cooperation among all member countries for better management of fisheries in the Indo-Pacific region. Accelerated fisheries development programmes that would result in increased availability of protein for the

undernourished, augmentation of income levels and better employment opportunities for fisherfolk were needed. He reminded the participants of the responsibilities of the Commission and the need to pause and take stock of what had been achieved so far and to ponder how these responsibilities could be more effectively discharged in the future.

9. The Honourable Minister expressed his appreciation of the assistance given by FAO for Sri Lanka's fisheries development through its national as well as sub-regional and regional fisheries development projects and programmes. Further assistance was expected in the future, particularly in the development of Sri Lanka's deep sea fisheries. A firm belief in regional cooperation had led Sri Lanka to support to the hilt programmes such as the Bay of Bengal Programme, the Indo-Pacific Tuna Programme and the concept of a Commission for the Management of Indian Ocean tuna.

10. Emphasizing the fact that tuna was an important resource for the country and Sri Lanka's concern about tuna as a regional resource, he hoped that the Indian Ocean tuna management body would very soon become a reality, with the close support and cooperation of FAO.

11. In concluding, the Honourable Minister wished the participants of the session success in their deliberations and a pleasant and fruitful stay in Sri Lanka.

ADOPTION OF THE AGENDA AND ARRANGEMENTS FOR THE SESSION

12. The Commission adopted the Agenda given in Appendix B. The documents placed before the Commission are listed in Appendix C.

SYMPOSIUM ON ARTIFICIAL REEFS AND FISH AGGREGATING DEVICES AS RESOURCE ENHANCEMENT AND FISHERIES MANAGEMENT TOOLS

13. A Symposium on Artificial Reefs (ARs) and Fish Aggregating Devices (FADs) as Resource Enhancement and Fisheries Management Tools was held from 14 to 17 May in conjunction with the Session of IPFC. The Symposium consisted of presentations of both country experiences and issue papers and addressed the appropriate use of FADs and artificial reefs in heavily fished coastal areas with large numbers of artisanal fishermen and conflicts in regard to fishing gears. The presentations and discussions highlighted the fact that these structures would not have long-lasting positive effects in the long-term if effort was not controlled. To ensure the best possible use of the large investment involved, the programmes for deployment of these structures should include limitation of fishing effort, planning with participation by fishing communities, and explicit consideration in regard to the allocation of space and resources.

14. The following recommendations of the Symposium were presented to the Commission for consideration:

15. Since FADs and ARs may produce relatively higher CPUEs and increase catchability, their application in situations where fishing effort is controlled could result in positive social and economic benefits. However

where effort is uncontrolled they may result in increased fishing mortality and further overfishing. It was therefore recommended that these structures should not be used except in situations where fishing mortality is controlled. Specifically, in situations where stocks are overfished FADs and ARs were not recommended if these structures aggregate the overfished species unless deployment is accompanied by substantial reduction in fishing effort. It was also recommended that FADs and ARs which shift fishing effort from overfished to underutilized species be considered as long as overall fishing effort is effectively controlled.

16. FADs and ARs may offer opportunities for the strengthening of community-based fisheries management. It was recommended that the planning, deployment and management of such structures be done with the active participation of the fishing communities, who, with adequate support, would be ultimately given the responsibility for their rational use.

17. ARs and FADs had important effects on allocating space and resources which would result in a distribution of benefits which could be either desirable or undesirable. It was therefore recommended that the issue of allocation and its socio-economic consequences be explicitly considered when planning a FAD and especially an AR programme, whether on a small or large scale.

18. Prior to the deployment of FADs and especially of ARs, on a large scale, it was recommended that their objectives be clearly stated and that their bio-economic and socio-economic effects on the fishery and on coastal zone activities, be thoroughly evaluated. Such evaluation should not be confined to the local level where the installations are to be sited but should also extend to the entire fishery.

19. The symposium recognized the gross inadequacy of the knowledge available, relative to the size of the investments, and the necessity to facilitate and improve research on the potential biological, socio-economic and environmental impacts of FADs and ARs. It therefore recommended that countries, in cooperation with external technical and financial agencies ensure coordination between the various deployment programmes in the region to improve knowledge through comparative studies. It was however recognized that successful experiences in one area may not always be replicable. It was also recommended that properly planned and coordinated pilot programmes be undertaken, with appropriate support for research purposes.

20. Given the relative permanence of ARs, it was recommended that a) environmental impact assessments be undertaken, and b) that FAO should collect information on the potential problem of pollution from scrap-tyre reefs and also, that if resources permit, the potential environmental impact of other commonly used scrap materials (e.g. buses, tricycles, etc.) should be thoroughly assessed.

21. It was recommended that a thorough study be conducted on the viability of using ARs on a large scale, for the purpose of excluding active gears (such as trawlers and other related gears) before further deployments are

undertaken with this objective. It was also recommended that the appropriate use of inexpensive FADs to aggregate underutilized species such as dolphin fish and rainbow runners should be investigated.

22. It was recommended that countries consider the inclusion of a specific legal framework for the deployment and management of FADs and ARs in their fisheries legislation, with due regard to the problems of siting, access fees, liability, and navigational safety.

23. The Commission concurred with and endorsed these recommendations.

STATUS AND PROSPECTS OF THE FISHERIES SECTOR IN ASIA AND THE PACIFIC

24. In introducing document IPFC/90/4, the Secretariat noted that catches from the region had been relatively stable over the last five years increasing from 26.0 to 28.0 million tons; developing country catches had remained at around 15.0 million tons. It was therefore clear that development of the fisheries sector could not be based on a continuing growth in catches. In particular, improved management of the fisheries would be necessary if yields were to be sustainable.

25. One effect of the lack of growth in output was that fish prices were rising and in the region were in general among the highest in the world. While high prices might make it possible to sustain the present high rate of fishing effort they were having an adverse effect on consumption by poorer segments of the population.

26. As regards inland fisheries it was difficult to make much comment as the gradual refinement of data on production from aquaculture was now revealing serious deficiencies in the data on catches from inland waters. The importance of improving data in this sub-sector was however stressed as catches from freshwaters in the region accounted for at least half of the world total.

27. Data available for aquaculture revealed that it was one of the most rapidly growing food production activities in the region although present high rates of growth might be prejudiced by shortages of fish feed. It was at the same time noted that important issues needed to be addressed concerning the quality control of cultured shrimp. Rejection of consignments of the latter by major importing countries continued to be unacceptably high to the detriment of export earnings.

28. A number of delegations emphasized the need to give greater attention to management. One aspect of management which merited particular attention was the question of the interaction between offshore industrial and coastal artisanal fisheries for tuna. It was noted however, that this question had been studied and discussed on several occasions by the IOFC Committee for the Management of Indian Ocean Tuna, which would be holding its next session in Bangkok in July 1990. The delegate of Japan in particular stressed the importance of this problem and informed the meeting that his government would be making \$200,000 available for a Trust Fund project to study these interactions in the Pacific Ocean. He also

mentioned the intention of Japan to convene a meeting on this subject in Japan in 1992.

29. A number of delegations also welcomed the fact that the question of the establishment of a Commission for the management of tuna in the Indian Ocean would be on the agenda of the IOFC Tuna Committee. The meeting was informed that a previous conference on this subject had failed to reach agreement. A report was given on progress towards the resolution of the issues which had stalled a satisfactory outcome of the conference.

30. The delay occasioned by this initial failure to establish a tuna management body for the Indian Ocean could have unfortunate consequences and all parties were urged to reach agreement as soon as possible. In the interim, it was urged that FAO should work in close collaboration with IOMAC in the field of training of personnel in tuna management skills. In this connection, it was noted that an IOMAC fellowship scheme already existed for this purpose.

31. Apart from the problem of tuna, the Commission agreed that management action was also necessary for other species. In this connection, India noted that improved catches had been achieved on the east coast of India as a result of the banning of bull trawling and the implementation of other restrictive management measures, while increasing effort by the traditional fisheries.

32. The problems of implementing management measures were also referred to and the Australian delegation gave a brief description of the framework within which Australian fisheries were managed. The principles on which the policy was based were that the fisheries should operate on the basis of sustainable yield; yield maximum economic value; and yield some payment to the community in the form of a resource rent. The policy would be applied through a statutory authority which would make it possible for fishermen to be involved in the management of the fisheries operated by them. Effort (and over capitalization) would be controlled through a procedure whereby formal access rights to a fishery would be registered in the same way as in a land title register.

33. There was general concurrence with the references in the paper to inland fisheries and particular mention was made of the adverse effects on inland water catches from regulation of rivers for irrigation and hydroelectric generation. It was noted that in India all new constructions for such purposes were required to make provision for fish passes or ladders to permit the free movement of fish.

34. Appreciation was expressed for the work of the Fourth Session of the Working Party of Experts on Inland Fisheries which had drawn attention to the importance of irrigation canals as a potential source of production especially in arid or semi arid areas and had recommended that a special study be undertaken.

35. In the field of aquaculture the importance and growing constraint of shortage of fish feed was emphasized. Members of the Commission were urged

to consider the possibilities of importing cheap fish meal and using more locally produced trash fish as human food. FAO was also urged to consider the problem.

36. Attention was drawn to the need to monitor changes in the fishery and in this respect the need for reliable statistics was stressed. At the same time it was noted that in many countries lower priority was being accorded to the collection of fisheries data and consequently quality of the statistics had declined. Inland fisheries data presented a particular problem in this respect as production from aquaculture and capture fisheries were often combined and it was difficult to identify trends in catches from inland waters. Special efforts to provide separate statistics both at the national and international level were recommended. It was also noted that while total catch statistics provided a useful indicator of the general state of a fishery, trends in catch rates (or yield per unit effort) provided a more immediate gauge of the health of a particular stock.

MATTERS REFERRED FOR THE ATTENTION OF THE COMMISSION

(a) Report of the Sixty-fourth Session of the IPFC Executive Committee, 17-18 May 1990, Colombo, Sri Lanka

37. The Secretariat presented the report which was before the Commission as document IPFC/90/5.

38. The Commission was informed that the main purpose of the session of the Executive Committee was to carry out a preliminary scrutiny of the reports of the subsidiary bodies of IPFC which had met during the inter-sessional period viz. the Committee for the Development and Management of Fisheries in the South China Sea (December 1988), the Working Parties on Fish Technology and Marketing (April 1988), Aquaculture (August 1988) and Inland Fisheries (September 1988). The Executive Committee had also discussed the follow-up action taken on the recommendations, decisions and directives of the Twenty-second Session of the Commission, action in regard to the IPFC arising out of the Eighteenth Session of COFI and subjects for future symposia.

39. The Commission agreed that it would be desirable for FAO to document the results and follow-up to the national conferences on fisheries policy and planning already held in Pakistan and the Philippines and scheduled to be held soon in Indonesia, for the information of other member countries.

40. The Commission emphasized the value of regional cooperation in regard to fish health management and the establishment of fish gene banks. Noting that urgent action was becoming necessary particularly in regard to fish health management due to serious outbreaks of fish disease in many countries of the region, the Commission recommended that FAO should make every attempt to hasten the process of obtaining approval for the project proposal submitted to Japan.

41. The Commission noted and concurred with the Executive Committee in its endorsement of the proposed changes to the boundaries of the Major Fishing Areas for Statistical Purposes 71, 74 and 87, subject to further discussion concerning the question of the boundary between Areas 71 and 61 in the Formosa Strait.

42. The Commission appreciated the useful research on fish technology carried out by the network of fish technology institutes under the long term research programme coordinated by the Working Party on Fish Technology and Marketing with support from the Government of Australia, and approved the following recommendations of the Working Party:

- (i) that the overall programme should continue unchanged with research into shrimp microbiology having the highest priority and
- (ii) that abstracts of new research work should be circulated in order to keep research workers upto date.

43. The Commission noted that the recommendations of the Working Party on Aquaculture were focused on the most important issues in coastal aquaculture. It approved the following prioritization of the Working Party's recommendations by the Executive Committee, according high priority to:

- (i) the recommendation concerning regional cooperation for improving the region's capability in dealing with fish disease and with the strengthening of quarantine procedures and facilities;
- (ii) the recommendation concerning the implementation of coastal resources surveys, and publication of site selection guidelines and manuals with special reference to environmental impact; and
- (iii) the recommended activities that would minimize the use of marine fish in aquaculture diets.
- (iv) The Commission also endorsed the need for socio-economic studies of aquaculture technologies and for marketing studies of domestic markets for aquaculture produce.

44. In reviewing the recommendations of the Working Party on Inland Fisheries, together with those of the Workshop on the use of Cyprinids in the fisheries management of larger inland water bodies held in conjunction with the session of the Working Party, the Commission approved the following prioritization recommended by the Executive Committee:

- (i) in depth assessment of riverine fish resources with special consideration to non-regulated rivers;
- (ii) coldwater fishery development in Asia;
- (iii) collection and processing of information on irrigation and other canals as potentially important resources for fishery development;

- (iv) development of predictive fish yield models for freshwater fishery resources on the basis of both technical and socio-economic considerations; and
- (v) improvement of the reliability of statistics on inland water catches with special attention to catches of subsistence fisheries.

45. The Commission noted that the Committee for the Development and Management of Fisheries in the South China Sea had made several useful and relevant recommendations in regard to fisheries management, fishery resources of the South China Sea, future priorities and adjustments for continuation beyond 1989 of the Programmes of Action approved by the FAO World Fisheries Conference, and on post-harvest aspects. It approved the report of the Committee with the exception of paragraphs 70 to 73 dealing with the structure, functions and responsibilities of the Committee which were left for consideration under Agenda Item 6.

46. The Commission also noted the recommendation made by the Executive Committee in regard to the modus operandi of carrying out an in-depth review of the functions and structure of IPFC as recommended by the Eighteenth Session of COFI and decided to consider this proposal also under Agenda Item 6.

47. The Commission discussed the three themes for symposia to be held in conjunction with its future sessions recommended for decision by the Executive Committee and recommended the theme "Socio-Economic Issues in Coastal Fisheries Management" as the theme for the next symposium. The theme should cover artisanal, commercial and recreational fisheries and coastal aquaculture. The Commission further recommended that the theme "Post-harvest Technology and Marketing" be listed for a future symposium.

- (b) Report of the implementation of the Strategy and Programmes of Action of the FAO World Conference on Fisheries Management and Development

48. In introducing this agenda item on the basis of documents IPFC/90/6 and IPFC/90/Inf. 10 and 11, the Secretariat reviewed the progress achieved globally and in the Indo-Pacific region. The Commission was informed that a first preliminary progress report regarding the Strategy had been presented to the Seventeenth Session of COFI in 1987 and that another progress report on the implementation of the Strategy would be presented at the Nineteenth Session of COFI in April 1991. The collaboration of all Member Nations in the region in this task was highly appreciated.

49. Progress reports on the implementation of the five Programmes of Action approved by the World Fisheries Conference had been presented to the Sessions of COFI in 1985, 1987 and 1989. At the 1989 Session, COFI agreed that the five Programmes of Action should be continued as they provided a

valid framework and guidelines for fisheries management and development. Furthermore, it identified a number of issues which should be considered as they were common to all Programmes of Action viz.: environment, information/data/statistics, investment, training, and the role of women in fisheries. The Commission was invited to review the implementation of the Programmes of Action in the Indo-Pacific region and to offer suggestions for future priorities and adjustments.

50. In the ensuing discussion it was confirmed that the Strategy had been and continued to be, very useful in drawing the attention of a large group of persons in the Member Countries such as politicians and administrators, to the needs of the fisheries sector. Some countries mentioned that the Strategy had also been relevant to the planning of their national fisheries. Recognizing the limitations of the Secretariat in assisting Member Countries, the Commission noted that it was timely for the members themselves to take action on the basis of the Strategy.

51. As regards the Programmes of Action it was felt that their priorities, together with the special issues identified at the Eighteenth Session of COFI in 1989 were adequate for the time being and therefore, in general, no reorientation was needed. In this context, the subject of monitoring, control, and surveillance (under Programme of Action No. I) was mentioned as being of particular importance. Since seventy-five per cent of catches in the region came from small-scale fisheries, their management and development was a principal task. (Programme of Action No. II). It was also noted that more economic orientation in viewing fisheries development was needed and the Commission welcomed the bio-economic approach employed by the Bay of Bengal Programme (financed by DANIDA and SIDA) (Programmes of Action Nos. I and II). Concerning Programme of Action No. V, the Commission stressed that more emphasis should be given to the reduction of post-harvest losses and that the conditions under which fish was produced by the exporting countries should conform to the health and acceptance standards required in international trade.

(c) Report of the Sixth Session of the IPFC Standing Committee on Resources Research and Development (SCORRAD)

52. The Commission unanimously approved a motion duly submitted by the delegation of Sri Lanka to suspend Rule IX 2(c) of the Rules of Procedure, as follows: "The Report of the Sixth Session of SCORRAD could not be referred to the Sixty-fourth Session of the IPFC Executive Committee due to the timing of the two sessions. Considering the fact that it would be both opportune and practical to discuss the Report of the Sixth Session of SCORRAD at the Twenty-third Session of the IPFC, the delegation of Sri Lanka suggests that in accordance with Rule XV of the IPFC Rules of Procedure, the Report of SCORRAD be discussed by the Commission without referring it to the Executive Committee".

53. Dr. Purwito Martosubroto, Chairman of SCORRAD, presented the report of the Sixth Session held in Colombo from 18 to 21 May 1990. He noted that, despite the efforts made by FAO to support participation of young scientists of the region in SCORRAD, the participation was only fifty

percent of the membership, the lowest ever recorded. SCORRAD had focused on management-oriented research, especially on multispecies and multigear fisheries and on the elaboration of a strategy for the development of such research. The case studies on Thailand, Indonesia and Malaysia described the complexity of the fisheries and research problems. It was shown that simple multispecies models led to problems. It was also shown that more realistic models required data often not available in the area. Experience in Japan showed that even in the absence of a good knowledge of the resources, management systems could be established, on a community basis, with a policy explicitly aiming at effort control, resource and space allocation as well as equity.

54. SCORRAD also identified problems affecting research and management systems. These problems stemmed from inadequacies in the institutional framework, research means, research quality, relevance and priorities and regional collaboration. The Commission endorsed the strategy recommended by SCORRAD, as a guideline for development of research in the area. In regard to the numerous elements of the strategy, it was noted that there was a need for:

- research on fisheries management and development policies
- increased and coordinated support from funding agencies
- focus on management-oriented research (e.g. allocation)
- reference to sustainable development of fisheries and integrated coastal management
- focus on coastal fisheries rehabilitation

55. In addition, reports of satisfactory progress had been presented in respect of the three collaborative research efforts of interest to the area; viz. the Penaeid Recruitment Programme (PREP), the tuna tagging programme, and the study of interactions in Pacific tuna fisheries. The confirmation of the interest by Japan to support the latter programme was of particular importance. The Commission endorsed SCORRAD's recommendations that the Secretariat should make every effort to secure or ensure continuation of funding for these important programmes.

56. In the discussions which followed, the Commission focused on the need to elaborate clear fisheries development and management policies to which research programmes could easily refer when establishing priorities. The need for research to keep pace with management was stressed as managers were not able to wait a long time for the results of research. It was agreed that the problem of incentives and career development for scientists was a serious issue needing consideration.

57. The need for information on resources beyond the presently exploited coastal areas and often referred to as "deep sea" resources was mentioned by a number of countries. The Secretariat indicated that, although the

exploitation was necessary, caution was advisable due to their relatively lower productivity and resilience.

58. The Commission discussed the theme for the next session of SCORRAD. After considering the guidelines for a strategy given by SCORRAD, it was decided that the next session should address issues related to fisheries development policies, management using uncertain data, and bioeconomic modelling, with concentration on shrimp fisheries. It was considered that this theme would provide a good linkage with the Penaeid Recruitment Programme (PREP) and opportunity for an attempt to translate its results for the use of managers. It would also be complementary to the theme selected for the next IPFC Symposium viz. socio-economic issues in coastal fisheries management.

REVIEW OF THE STRUCTURE, FUNCTIONS AND RESPONSIBILITIES OF THE IPFC AND ITS SUBSIDIARY BODIES

59. In introducing this item the Secretariat recalled that at its Sixth Session (Manila, Philippines, 6-9 December 1988) the IPFC Committee for the Development and Management of Fisheries in the South China Sea had decided to entrust an ad hoc Working Group with the task of reviewing the functions, responsibilities and structure of the Committee. This group in which three member countries participated, made several recommendations which were considered by the Executive Committee at its Sixty-fourth Session (Colombo, Sri Lanka, 17-18 May 1990).

60. At its Eighteenth Session (Rome, 10-14 April 1989) the Committee on Fisheries had reviewed the activities of all FAO regional fishery bodies. In regard to IPFC, COFI recommended that an in-depth review of its functions and structures be undertaken with a view to revitalizing it and strengthening its activities in the technical and policy fields. Document IPFC/90/8 had been prepared to facilitate the Commission's discussion of this subject.

61. When considering the reports of the South China Sea Committee and of its ad hoc Working Group, the Executive Committee had felt that the proposals made by the latter could not be discussed separately and needed to be dealt with in the broader context suggested by COFI. It recommended to IPFC that the whole matter be referred to an ad hoc Committee composed of a limited number of IPFC member nations which should meet at the seat of the Commission not later than December 1990.

62. Document IPFC/90/8 identified several areas as possible issues for consideration. The Commission believed that it was premature to discuss many of these issues before more fundamental issues were dealt with.

63. It was recognized that since the Commission was established 43 years ago the fisheries situation in the region had changed drastically. It was noted in particular that other regional bodies had been created in the Indo-Pacific region viz.: the South Pacific Commission and the South Pacific Forum Fisheries Agency in the South Pacific and the IOFC in the Indian Ocean; thus a need had arisen for avoiding duplication of efforts

and overlapping. It was recalled that when the FAO Council established IOFC it had noted that the creation of this new fishery Commission might lead to a withdrawal of interest in the Indian Ocean by IPFC. It was also noted that none of the South Pacific island states which became independent after the creation of IPFC had decided to join the Commission. Instead, these countries had preferred to set up their own fishery body. In the North Pacific, regional fishery bodies had also been created by the coastal states.

64. Many members therefore felt that there might be a need for reviewing the area of competence of IPFC but suggested that such review should also include an in-depth analysis of the situation, taking into account several factors, and in particular the need to identify which bodies were best placed to carry out certain functions; the need to try to identify the real benefits derived by member countries from their participation in IPFC; the need to continue and develop the fruitful cooperation in inland fisheries between Indian Ocean and Pacific Ocean coastal states, bearing also in mind the situation of landlocked states; the wish clearly expressed by the coastal states in the South China Sea region to reinforce their cooperation in the field of fisheries at a time when China had announced its interest in joining IPFC, thus enhancing the Commission's status, particularly in the South China Sea region; and the desirability of ensuring proper exchange of information not only between Indian Ocean and Pacific coastal states (e.g. in regard to highly mobile fishing fleets) but also between all regional fishery bodies.

65. Bearing in mind the COFI recommendation to revitalize and strengthen IPFC activities in the technical and policy fields, it was stressed that before this could be done there was a need to review the functions, role and objectives of IPFC. It was felt that factors which may have limited its efficiency might also be considered. In this regard, one member referred to the very limited role played in recent years by IPFC in the tuna fishery. The view was also expressed that, besides its traditional advisory functions, IPFC should play a more action-oriented role, such as in the implementation of regional programmes.

66. Several members stressed that no change in the membership of IPFC was envisaged for the moment. Moreover, some members noted that membership of the Commission per se would not form part of the terms of reference of the ad hoc Committee. However, changes in the membership may or may not be implied as a result of the recommendations made by the Committee on other matters.

67. The Commission realized that no final conclusion could be reached on such a wide range of issues at the present Session and endorsed the Executive Committee recommendation that the matter be referred to an ad hoc Committee.

68. The Commission recommended the establishment of an ad hoc Committee comprising representatives of Australia, India, Indonesia, Japan, Sri Lanka and Thailand (i) to review the objectives, role, and functions of IPFC, (ii) to identify the factors which may have limited the efficiency of IPFC,

and (iii) to make recommendations to Member States for rationalizing the activities of IPFC, by:

- a) identifying activities which are of direct benefit to member countries;
- b) identifying activities which do not duplicate the work of other regional FAO and non-FAO fishery bodies;
- c) identifying activities of IPFC which might more effectively be carried out by other regional FAO and non-FAO fishery bodies;
- d) reviewing its geographic scope and area of competence; and
- e) in light of conclusions drawn from (a)-(d), reviewing the IPFC agreement and making suggestions for its amendment (including the structure and budget of IPFC).

69. The Commission recommended that all Member Countries be invited to comment on the issues covered by the Terms of Reference for the ad hoc Committee agreed to by the present Session. These comments should be taken into account by the ad hoc Committee which, subject to availability of funds, should meet by the end of 1990 during 5 working days in IPFC headquarters in Bangkok. The report of the ad hoc Committee should then be sent to all Member Countries for comments. It should be submitted, together with the comments thereon received, to a special Session of the IPFC confined only to consideration of the matter in question, to be convened in 1991, subject to availability of funds.

70. In view of the rapid developments in fisheries matters in the region the Commission was of the opinion that it was desirable to hold its Twenty-fourth Session in 1992.

71. The Commission considered the proposed amendments to the Terms of Reference of SCORRAD and of the Working Parties on Aquaculture and on Inland Fisheries. It decided to defer its decision on these amendments until the completion of the work of the ad hoc Committee.

ANY OTHER MATTERS

72. The Secretariat drew the attention of the Commission to the discussion which had taken place during the Twenty-fifth Session of the FAO Conference on large scale pelagic driftnet fishing and to the Resolution on this subject adopted by the General Assembly of the United Nations at its Forty-fourth Session in December 1989. The FAO Fisheries Department would continue to deal with this important issue i.e. by collecting and analysing technical information, taking into account all the factors involved.

73. As a follow-up to the above discussions and recommendation, the Director-General had in early April 1990 convened an Expert Consultation in Rome the report of which was placed before the Commission.

74. Expressing its concern with the potential effects of large-scale pelagic driftnet fishing on the marine environment, the delegation of the United States called on all members of the international community to adhere to the General Assembly recommendation calling for no further expansion in such fishing, a cessation in the South Pacific by 1 July 1991 and a moratorium elsewhere by 30 June 1992, unless effective conservation and management measures were agreed to.

75. The delegation of Sri Lanka stated that one of the principal issues was with regard to the scale and extent of the use of driftnets. As a country where artisanal fisheries was the backbone of the fishing industry, Sri Lanka too was concerned with the impact of driftnetting, which was an important method of fishing but nevertheless required proper management measures. In Sri Lanka more than 90% of the marine fisheries production, particularly from the offshore area, now came from large mesh gill nets. Sri Lanka believed that a special case-study in Sri Lankan waters would contribute towards better understanding of the impact of driftnetting in the context of traditional fisheries. Such a study would be a good complement to the study of the use of large scale driftnets by industrial fisheries.

76. The delegation of Sri Lanka therefore requested FAO to consider

- i) setting up a pilot project on driftnetting in Sri Lanka with a preliminary phase of one year and a total duration of three years; and ii) on completion of the preliminary study the convening of an expert consultation on driftnetting in traditional fisheries which could be held in Sri Lanka.

77. The delegation of Australia reaffirmed its serious concern about the operations of vessels engaged in large scale driftnetting in the world's oceans and their impact on fish stocks and other forms of marine life. Australia indicated its strong support for the General Assembly Resolution 44/225 and in particular, the commitment to a global moratorium on driftnet fishing by 30 June 1992 and a ban on driftnet fishing in the South Pacific by 1 July 1991. Australia advised the Commission that it had signed the Wellington Convention banning driftnetting in the South Pacific region. Australia welcomed the decision by Japan to reduce its driftnet fleet in the South Pacific with a view to ceasing such fishing by July 1991 in accordance with the General Assembly Resolution.

78. Australia also expressed its concern at the possibility of an increase in driftnet fishing activity in the Indian Ocean, including by vessels displaced from the Pacific Ocean, and in this regard welcomed the statement by Japan that it had prohibited Japanese driftnet fishing vessels from operating in the Indian Ocean. Australia expressed the hope that the Taiwanese fleet would adopt equally responsible attitudes in the Indian and Pacific Oceans.

79. In regard to the report of the FAO Expert Consultation on driftnet fishing, Australia indicated that this Consultation had provided a useful basis upon which to develop a global perspective on driftnet fishing.

80. The delegation of Japan noted that the report of the Expert Consultation expressed the views of the experts and not necessarily the views of FAO. It felt that it was not appropriate for the Commission to endorse this report.

81. In line with the UN resolution adopted last year, Japan believed that the driftnet issue should be discussed and dealt with on a regional basis.

82. In the South Pacific region, Japan had reduced the number of its driftnet vessels by two-thirds, i.e. from 60 to 20. For the coming fishing season, this number would be reduced further. After 1 July 1991, and in conformity with the UN resolution, Japan intended to cease its fishing operations in this region until effective conservation measures had been taken. At the same time, Japan would work with the South Pacific and other concerned nations, through the South Pacific Albacore Research Group (SPAR), for scientific research and rational management in regard to the albacore resources in this region. Japan had also taken measures to prevent a shift of its driftnet fishing fleet to the Indian Ocean and other areas.

83. With respect to the North Pacific, Japan had taken strict conservation and management measures such as time/area closure, licensing system etc. In addition, observers had been placed on these vessels in joint cooperative programmes with the United States and Canada. Satellite transmitters, which allowed the monitoring of vessel positions on a real time basis, were installed on all Japanese driftnet fishing vessels in this region. Patrol vessels were conducting enforcement activities. Japan would make its best efforts for sound management of these fisheries under the framework of the International North Pacific Fishery Commission (INPFC).

84. The data and information obtained through these regional cooperative activities would be presented by Japan to FAO as soon as possible.

85. The delegation of France informed the Commission that no fishing vessel flying the French flag was fishing with driftnets in the IPFC area. It also provided some information on French driftnet fishing for albacore in the Atlantic Ocean. The nets were about 7 km long and they had proved to be instrumental in reactivating a fishery which had been declining for several years. In order to avoid the incidental taking of marine mammals the nets were set at 3-4 metres below the surface and this setting appeared to be fully effective in eliminating almost entirely such incidental catches.

86. The French authorities believed that the use of any type of new fishing gear on a large-scale should be preceded by a serious impact study in order to make sure that it would not endanger fish stocks. They supported international cooperation in this regard, in particular at the regional level.

87. The delegation of the Republic of Korea stated that it fully supported the Resolution of the General Assembly. It indicated that its driftnet fleet of 157 vessels was targeting mainly on North Pacific squid

which is a short-lived species and therefore deserved special consideration.

88. The delegation of Indonesia informed the Commission that some artisanal Indonesian fishermen were using small driftnets (with a boat of less than 10 GRT and a net of 1 to 2 km.) for catching skipjack and small tunas in the Indian Ocean, while some Taiwanese vessels (of about 100-200 GRT) had been granted licences for shark fishing in the Exclusive Economic Zone of the Arafura Sea. Indonesia would take into account the Resolution of the General Assembly and the Report of the Expert Consultation in formulating its future licensing policy.

89. The Commission noted that Mr. V.L.C. Pietersz, who had been Secretary of the IPFC since 1984, would be relinquishing his duties as Secretary on his retirement from FAO in April 1991, after a 12 year period of service, and expressed its appreciation of the services rendered by him and of his commitment to the work of IPFC.

ELECTION OF OFFICERS

90. Thailand and Malaysia were unanimously elected as Chairman and Vice-Chairman.

91. United States of America and Australia, were unanimously elected to serve as the other two members of the Executive Committee, in addition to the immediately-retired Chairman (Sri Lanka).

DATE AND PLACE OF THE TWENTY-FOURTH SESSION

92. The Commission noted with appreciation that Thailand would consider hosting the Twenty-fourth Session, subject to the approval of its Government. The exact date and place of the session will be decided by the Director-General of FAO in consultation with the Chairman and the authorities of the host country, taking also into consideration the Commission's suggestion to hold the next Session in 1992.

ADOPTION OF THE REPORT

93. The report was adopted on 24 May 1990.

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AGENDA

<u>Item</u>		<u>Relevant document</u>
1	Opening of the Session	
2	Adoption of the Agenda and arrangements for the Session	IPFC/90/1 IPFC/90/Inf.1
3	Symposium on Artificial Reefs and Fish Aggregating Devices as Resource Enhancement and Fisheries Management Tools	IPFC/90/2 IPFC/90/3
4	Status and Prospects of the Fisheries Sector in Asia and the Pacific	IPFC/90/4 IPFC/90/Inf.3 IPFC/90/Inf.4 IPFC/90/Inf.5 IPFC/90/Inf.6
5	Matters referred for the attention of the Commission	
	(a) Report of the Sixty-fourth Session of the IPFC Executive Committee, 17-18 May 1990, Colombo, Sri Lanka	IPFC/90/5 IPFC/90/Inf.6 IPFC/90/Inf.7 IPFC/90/Inf.8 IPFC/90/Inf.9
	(b) Report of the implementation of the Strategy and Programmes of Action of the FAO World Conference on Fisheries Management and Development	IPFC/90/6 IPFC/90/Inf.10 IPFC/90/Inf.11
	(c) Report of the Sixth Session of the IPFC Standing Committee on Resources Research and Development (SCORRAD) 18-19 May 1990, Colombo, Sri Lanka	IPFC/90/7
6	Review of the structure, functions and responsibilities of IPFC and its subsidiary bodies including amendments to the terms of reference	IPFC/90/8 IPFC/90/Inf.12 IPFC/90/Inf.13
7	Any other matters	
8	Election of Officers	
9	Date and place of the Twenty-Fourth Session	
10	Adoption of the report	

APPENDIX C

LIST OF DOCUMENTS

- IPFC/90/1 Provisional Annotated Agenda and Timetable
- 2 Prospectus of the Symposium on Artificial Reefs and Fish Aggregating Devices as tools for the management and enhancement of marine fishery resources
 - 3 Report on the Symposium on Artificial Reefs and Fish Aggregating Devices as tools for the management and enhancement of marine fishery resources
 - 4 Status and Prospects of the Fisheries Sector in Asia and the Pacific
 - 5 Report of the Sixty-fourth Session of the IPFC Executive Committee, Colombo, Sri Lanka, 17 - 18 May 1990
 - 6 Report of the Implementation of the Strategy and Programmes of Action of the FAO World Conference on Fisheries Management and Development
 - 7 Report of the Sixth Session of the IPFC Standing Committee on Resource Research and Development (SCORRAD), Colombo, Sri Lanka, 18 - 21 May 1990
 - 8 Review of the Structure, Functions and Responsibilities of the IPFC and its subsidiary bodies
 - 9 Report of the Expert Consultation on Large-scale Pelagic Drifnet Fishing, Rome, 2 -6 April 1990
- IPFC/90/Inf.1
- Rev.2 List of Documents
 - Inf.2 List of delegates and observers
 - Inf.3 Report of the Indo-Pacific Tuna Development and Management Programme (IPTP) (1987-89)
 - Inf.4 Report of the Conference for the Adoption of the Draft Agreement for the Establishment of an Indian Ocean Tuna Commission, Rome, 3-7 April 1989
 - Inf.5 Report of the Sixth Session of the IOFC Committee for the Development and Management of Fisheries in the Bay of Bengal, Pulau Pinang, Malaysia, 23-25 January 1989

- Inf.6 Report of the Sixth Session of the IPFC Committee for the Development and Management of Fisheries in the South China Sea, Manila, Philippines, 6-9 December 1988
- Inf.7 Report of the Seventh Session of the IPFC Working Party on Fish Technology and Marketing, Bangkok, Thailand, 19-22 April 1988
- Inf.8 Report of the Fourth Session of the IPFC Working Party on Aquaculture, Bangkok, Thailand, 1-6 August 1988
- Inf.9 Report of the Seventh Session of the IPFC Working Party of Experts on Inland Fisheries, Kathmandu, Nepal, 8-14 September 1988
- Inf.10 Collaboration with other bodies dealing with fisheries in the Indo-Pacific region
- Inf.11 Technical support provided by FAO for the Indo-Pacific region
- Inf.12 Structure of the Indo-Pacific Fishery Commission and Directory of Subsidiary bodies of the IPFC
- Inf.13 Report of the Ad hoc Working Group to review the situation, functions and responsibilities of the IPFC Committee for the Development and Management of Fisheries of the South China Sea, Bangkok, Thailand, 15-16 March 1989
- Inf.14 Report of the Eighteenth Session of the Committee on Fisheries (COFI), Rome, 10-14 April 1989
- Inf.15 Resolution 44/225 of the General Assembly of the United Nations on Large-scale Pelagic Drifnet Fishing and its Impact on the Living Marine Resources of the World's Oceans and Seas

APPENDIX D

SUMMARY OF MAJOR RECOMMENDATIONS, DECISIONS AND
DIRECTIVES OF THE COMMISSION

I. RECOMMENDATIONS

Agenda Item 4 - Status and Prospects of the Fisheries Sector in Asia and the Pacific

Make special efforts to provide disaggregated inland fisheries statistics in regard to capture fisheries and aquaculture (Paragraph 36 of the Report)

Agenda Item 5 - Matters referred for the Attention of the Commission

(a) Report of the Sixty-fourth Session of the IPFC Executive Committee

1. Hasten the process of obtaining approval for the regional project proposal on fish health management submitted to Japan. (Paragraph 40 of the report).
2. Organize a Symposium on "Socio-Economic Issues in Coastal Fisheries Management", in conjunction with the Twenty-fourth Session of the IPFC. (Paragraph 47 of the report).
3. List "Post-harvest Technology and Marketing" as the theme for a Symposium to be organized in conjunction with a future session. (Paragraph 47 of the report).

Agenda Item 6 - Review of the Structure, Functions and Responsibilities of the IPFC and its Subsidiary Bodies.

1. Establish an ad hoc Committee comprising of representatives of Australia, India, Indonesia, Japan, Sri Lanka, and Thailand (i) to review the objectives, role, and functions of IPFC, (ii) to identify the factors which may have limited the efficiency of IPFC and (iii) to make recommendations to Member States for rationalizing the activities of IPFC, by:
 - a) identifying activities which are of direct benefit to member countries;
 - b) identifying activities which do not duplicate the work of other regional FAO and non-FAO fishery bodies;
 - c) identifying activities of IPFC which might more effectively be carried out by other regional FAO and non-FAO fishery bodies;

- d) reviewing its geographic scope and area of competence; and
 - e) in light of conclusions drawn from (a)-(d), reviewing the IPFC agreement and making suggestions for its amendment (including the structure and budget of IPFC). (Paragraph 68 of the report)
2. Invite all Member Countries to comment on issues in the ad hoc Committee's terms of reference; convene the meeting of the ad hoc Committee, at IPFC Headquarters before the end of 1990, also taking the comments into account; send the ad hoc Committee report to all Member Countries for comments; and submit the report, together with comments, to a special session of the IPFC in 1991. (Paragraph 69 of the report)

II. OTHER DECISIONS AND DIRECTIVES OF THE COMMISSION

1. Endorsement of the recommendations of the Symposium on Artificial Reefs and Fish Aggregating Devices as Resource Enhancement and Fisheries Management Tools as detailed in paragraphs 15 to 22 of the report. (Paragraph 23 of the report)
2. Document the results and follow-up of the national fisheries policy and planning conferences in Pakistan, Philippines and Indonesia. (Paragraph 39 of the report)
3. Endorsement of the proposed changes to the boundaries of the Major Fishing Areas for Statistical Purposes 71, 74 and 87 subject to further discussion regarding boundaries between areas 71 & 61 in the Formosa Strait. (Paragraph 41 of the report)
4. Approval of recommendations of the Working Party on Fish Technology and Marketing to (i) continue overall programme unchanged with research into shrimp microbiology having the highest priority and (ii) circulate abstracts of new research work. (Paragraph 42 of the report)
5. Approval of the Executive Committee's prioritization of the recommendations of the Working Party on Aquaculture. (Paragraph 43 of the report)
6. Approval of the Executive Committee's prioritization of the recommendations of the Working Party on Inland Fisheries. (Paragraph 44 of the report)
7. Approval of the report of the IPFC Committee for the Development and Management of Fisheries in the South China Sea, with the exception of paragraphs 70-73 dealing with the Committee's structure, functions and responsibilities. (Paragraph 45 of the report)

8. Give more emphasis to reduction of post harvest losses and ensure that fish producing conditions in exporting countries conform to health and acceptance standards in international trade. (Paragraph 54 of the report)
9. Endorsement of the strategy recommended by SCORRAD for development of research in the region. (Paragraph 54 of the report)
10. Attempt to secure or ensure continuation of funding for the Penaeid Recruitment Programme (PREP), the tuna tagging programme and the study of interactions in the Pacific tuna fisheries. (Paragraph 55 of the report)
11. Consider the problem of incentives and career development for scientists. (Paragraph 56 of the report)
12. Address issues related to fisheries development policies, management using uncertain data, and bio-economic modelling, with concentration on shrimp fisheries, at the Seventh Session of SCORRAD. (Paragraph 58 of the report)
13. Consider convening of the Twenty-fourth Session of the IPFC in 1992. (Paragraph 70 of the report)
14. Defer a decision on the proposed amendments to the Terms of Reference of SCORRAD and of the Working Parties on Aquaculture and Inland Fisheries until completion of the work of the ad hoc Committee. (Paragraph 71 of the report)
15. Members of the Executive Committee 1990/92 Thailand-Chairman, Malaysia-Vice Chairman (Paragraph 90 of the report) United States of America and Australia elected members (Paragraph 91 of the report) Sri Lanka outgoing Chairman (Rule IX of IPFC Rules of Procedure)
16. Date and place of Twenty-fourth Session tentatively 1992 in Thailand. (Paragraph 92 of the report)

APPENDIX E

STATUS AND PROSPECTS OF THE FISHERIES SECTOR IN ASIA AND THE PACIFIC

INTRODUCTION

1. This paper presents a review of the status and prospects of the fisheries sector in Asia and the Pacific Region. It covers issues of concern to member countries of the Commission and is not restricted to geographical limits nor to the avoidance of areas of competence of the Indian Ocean Fisheries Commission. It is to be noted however that, in the wider interpretation of the areas of interest to the Commission, matters concerning the Pacific are discussed, even though no developing Pacific island State is a member.

MARINE CAPTURE FISHERIES

2. There are two divisions concerning marine fisheries: those fisheries within national jurisdictions extending seaward to 200 miles, and the interest of adjacent coastal States in fisheries beyond their jurisdiction which can be classified as oceanic.

3. It is now almost a decade since fisheries jurisdictions have been extended to 200 miles. Within the terminology of UNCLOS, Article 61 prescribes the obligations of coastal States for the conservation of the living resources and Article 62 prescribes the objective of optimum utilization of these resources. Article 63 prescribes the measures to be taken for the conservation of shared stocks through sub-regional or regional collaboration and Article 64 covers the highly migratory species of tunas and billfish.

4. The FAO World Fisheries Conference in 1984, in adopting a Strategy for fisheries management and development, noted the sovereign right of coastal States in determining policies for the development and use of fishery resources focussed attention of governments on taking advantage of their living marine resources to increase their contribution to national economic social and nutritional goals.

5. The review of the status of marine capture fisheries of member countries of the Commission is therefore taken within the context of improvements in these goals. A more detailed reporting on the state of the resources is provided to the Commission by SCORRAD within its new terms of reference.

6. Whereas total world catches continue to increase as a result of changes in abundance of certain shoaling pelagics, the catches of member countries have remained relatively stable at about 28 million t since 1986. This production now represents 30 percent of the world's total.

Table 1

<u>Year</u>	<u>World catches</u> (in million t)	<u>Catches by IPFC Member Countries</u>	
		<u>Total</u> (in million t)	<u>Developing Countries</u> (in million t)
1983	77.4	25.7	14.0
1984	83.8	26.8	14.3
1985	86.3	26.5	14.9
1986	92.6	28.2	15.6
1987	93.4	27.8	15.4
1988	98.0	28.4	15.8

Source: FAO Yearbook of Fishery Statistics, Vol. 66 and Fish Dab

7. The figures given in the above table for world catches include aquaculture production. By removing aquaculture, the world catch from capture fisheries in 1987 was 80 million t and the estimated rate of increase over the last five years has been about 3.1 percent a year.

8. For both statistical areas 57 and 71, landings have reached plateaux of 2.3 to 2.5 million t for the past five years in area 57 and comparably 5.7 to 6.2 million t over the same period in area 71. For both areas the fisheries on extensive continental shelves, such as the Bay of Bengal and the South China Sea, are heavily exploited, and basic conservation measures are overdue. For the Gulf of Thailand some 80 percent of the trawl landings are used for fish meal production, and the introduction of high-opening trawls to other areas reflects the decline in catch rates and economic returns to conventional trawling.

9. For the most part, coastal fisheries development is therefore stifled, without any increases in production from under-exploited resources to improve the overall economic value. The now finite supply of existing catches has, over the period, resulted in increasing prices of fish landed to sustain fleet operations. Member Governments, in response to the problems of falling catch rates in coastal areas, have sought financial assistance in fleet development for the offshore areas (e.g., Malaysia, India, Sri Lanka).

10. The Philippines, noting that fisheries production has stagnated at 1.5 million t since 1983, has emphasized the need to improve conservation by actively preventing illegal fishing and stopping destructive fishing practices, including the further destruction of coral reefs now estimated at 70 percent of the total reef area.

11. Thailand's harvest has almost reached the apparent limit of the potential for marine resources in its waters. Demersal stocks to a depth of 50 m, Indo-Pacific mackerel along the western coast, round scad in the central and inner Gulf, the penaeid shrimp and anchovy in inner to nearshore waters are all taken at or over their limit. Some demersal and mid water resources are believed to be still available for exploitation only in the middle part of the Gulf of Thailand, below 50 m depth and in the deeper parts of the Thai waters in the Andaman Sea. The fish processing industry, after extensive investment, contributes some US\$1,000

million annually in the balance of trade in fish and fish products, in relative terms 11.5 percent of agricultural exports and 7 percent of total exports.

12. For the east coast of India, fish supplies have probably reached their limits and prices of most species have effectively passed the level affordable by the majority of the population in the eastern part of the country. Most of the marine catch (70 percent) of 1.6 million t is taken from the west coast, where offshore resources potentials are estimated to yield some 1 million t, requiring investment in harvesting and infrastructure to support the development.

13. For Bangladesh, resources in the nearshore areas are fully exploited and the offshore potential is not being realized for a number of reasons, primarily being not economically feasible at this time. It is to be noted that per caput consumption of fish started to decline in 1987 in response to increased population and limits to fish supplies, even though fish is a major food source representing 45 percent of total animal protein intake.

14. Sri Lanka depends on pelagics for most of its marine catch in the inshore coastal area and these resources are fully exploited. Although some potential is considered to exist for demersal species, catches of both pelagics and demersals have gradually decreased since 1983 as a result of civil disturbances that have interrupted the fleet's activities. This, together with a decrease in imported fish, has reduced per caput consumption.

15. In Malaysia the demersal finfish and pelagic resources in the inshore waters, particularly of Peninsular Malaysia, are estimated to be exploited well beyond potential yields and the depleted inshore resources are not able to meet the increasing demand for fish. If any new resources are still available for commercial exploitation they are to be found in the offshore waters where their density is less.

16. Indonesia has experienced annual growth rates in marine fishery production in the past which are substantially higher than the average annual growth rate of the Asia-Pacific region. While the three major areas which presently contribute the bulk of the catch - north coast of Java, Malacca Strait and South Sulawesi are heavily fished, some areas of the extensive EEZ, such as the eastern coastal areas still offer scope for increased production. The tuna resources in particular have potential for further development.

17. Based on projections of demand to the year 2000, using population growth alone and the need to maintain present levels of per caput fish consumption, the Asia region is expected to have a shortfall in supply of some 5 million t. The consequence of this gap will result in further increases in the price of fish causing hardship to the poorer populations dependent on fish as an important source of animal protein.

18. For the developing coastal States of IPFC it must also be noted that conditions amongst the fishermen cannot be expected to improve other than their ability to continue fishing provided increasing prices offset

declining catch rates. There are, as given in the table below, approximately one million fishing vessels in the Commission's developing member countries, with a directly related employment of 10.5 million people.

Table 2

Number of fishing vessels and primary employment by country

	<u>Fishing Vessels</u> ^{1/}	<u>Employment</u> ^{2/}
Bangladesh	117,000	*1,196,000
India	170,000	4,221,000
Indonesia	316,000	3,582,000
Malaysia	39,000	89,000
Pakistan	30,000	248,000
Philippines	405,000	1,186,000
Sri Lanka	32,600	----
Thailand	50,000	----
Total	1,159,600	10,521,000

*includes, fishing activities that do not require a vessel and part-time and occasional employment.

Source: ^{1/} Bulletin of fishery statistics. Fishery fleet statistics 1988.

^{2/} Unpublished statistical information (FIDI).

19. The problems associated with excess fishing capacity were discussed at the Symposium on the Exploitation and Management of Marine Fishery Resources in Southeast Asia at the Twenty-second Session of the Commission, and the Commission itself recommended that governments encourage the strengthening of local fishermen groups and encourage such groups to become more deeply involved in the management of fisheries and be given greater responsibilities for management.

20. In this connection, the Philippine government transferred its jurisdiction for coastal fisheries over to municipal governments and has identified a community-based management project for funding by UNDP with assistance from the Asian Development Bank. The Philippines proposes to rehabilitate the ecology of the coastal zone and ease the wide-spread poverty of low-income fisherfolk. The State of Kerala, India, as a result of community concerns, has imposed a seasonal closure for trawlers.

21. In a recent policy statement, the Australian government announced the establishment of an Australian Fisheries Management Authority, as statutory authority to replace the normal government department's function for managing fisheries. This organization is expected to be more effective and cost efficient than a government department and will allow fishermen to be involved in the management of the fisheries in which they operate. In addition, the policy statement announced that the present practice of issuing fishing licences on an annual basis was no longer satisfactory in relation to the capital cost of fishing vessels and a procedure would be

established whereby formal fishing rights will be registered similar to a land title register. This will facilitate the fishing rights being acceptable as security for banks and other lending institutions and thereby provide larger credit to meet fishermen's needs.

22. At the Twenty-fifth Session of the FAO Conference held in Rome in November 1989, priority focus was given to the concept of sustainable development and the objective of conservation of species diversity. As a result, it can be expected that FAO in the future will report on these issues, in particular the problems of illegal fishing practices, overfishing, excess capacity and the use of non-selective fishing gears. Similarly donor funding for fisheries projects will also give increasing attention to such issues. These issues will also be included in "a review of the world fisheries, a decade after the adoption of the UN Convention on the Law of the Sea", for the consideration of the Twentieth Session of the Committee on Fisheries in 1993. The Commission may wish to examine such issues for inclusion in the above document for the Committee, as well as issues related to the progress in the implementation of the World Fisheries Conference Strategy to be considered at the Nineteenth Session of the Committee on Fisheries in 1991.

TUNA FISHERIES

23. 1988 tuna catches by country are listed below (in thousands of tons):

Australia	14.3
India	69.5
Indonesia	325.2
Japan	775.0
Korea, Republic of	172.1
Malaysia	32.8
New Zealand	8.2
Pakistan	31.9
Philippines	300.1
Sri Lanka	31.6
Thailand	91.0

Total	1,851.7
World total	3,783.3

The other member countries reported no tuna catches. The total catch shown above is 49 percent of the total world catch.

24. From the catches indicated above, most of the countries bordering the Indian Ocean, with the exception of Indonesia, still have marginal landings of tuna in comparison to countries bordering the Pacific, namely: Japan, Republic of Korea and the Philippines.

25. Indonesia and the Philippines are now the fourth and fifth largest producers of the tuna after Japan, USA and Spain (Taiwan, Province of China excluded). In 1988, Indonesia's reported catches totalled 325,000 t or 8 percent of world tuna catches and became the fourth largest exporter of

fresh sashimi tuna. In recognition of Indonesia's assessment of tuna resource potential estimated at 440,000 t/year, the country is planning to increase its tuna canning capacity based on a forecast of doubling existing tuna catches by the year 2000.

26. Present concerns for tuna are directed at (i) the need for management of tuna resources in the Indian Ocean, for which discussions are proceeding on the establishment of an Indian Ocean Tuna Commission; (ii) interactions between tuna fisheries where the effect of one fishery affects the yield in another fishery; (iii) fishing for albacore in the South and Central Pacific and the use of large-scale pelagic driftnets. The driftnet fishery has been discussed at the United Nations Forty-fourth General Assembly Second Committee wherein specialized agencies particularly FAO, were requested to study urgently the large-scale pelagic driftnet fishery and its impact on living marine resources and to report their findings to the Secretary-General of the United Nations. In this connection, FAO convened an Expert Consultation on large scale pelagic driftnet fishing in April 1990. The report of the Expert Consultation is available as document IPFC/90 Inf. 15. The interactions between tuna fisheries is important since it includes differential exploitation of age groups and therefore value in different areas within EEZ's and across oceans. An Expert Consultation on Interactions in Pacific Ocean Fisheries is scheduled for 1991. These three issues constitute the present concerns of interest to the Commission over the oceanic use of living marine resources.

INLAND CAPTURE FISHERIES

27. During the inter-sessional period, production from inland capture fisheries approximated 2.8 million t in the Asia-Pacific region, out of this amount about 2.3 million t were produced in IPFC member countries as shown in Table 3.

28. The Working Party of Experts on Inland Fisheries meeting in Kathmandu, 1988, discussed the suitability of establishing the ICES/EIFAC Codes of Practice and Manual of Procedures for Consideration of Introductions and Transfers of Marine and Freshwater Organisms for the IPFC member countries. It was recognized that some time would be required before a code of practice could be adapted to the needs of the region.

29. Various aspects of aquatic weed that are significant to fish stocks and fisheries management, as well as the control of such weeds, have been receiving attention by member countries. Indonesia has reported the use of fish in the control of weeds, while Thailand has promising results with biological control of Salvina and Pistia. In Sri Lanka, the weevil Cyrtobagous is being used for Salvina control. Two studies are in progress on the use of aquatic macrophytes in the inland fisheries of China, as well as a regional review of their significance in inland fisheries and aquaculture.

30. The continuing increase in the number and length of irrigation canals and drains in connection with expanding irrigation for agriculture offers possibilities for utilization of such water systems for compensating fish losses. A review study prepared for FAO shows that some information is

Table 3

Inland fish production from capture fisheries
in the Asia-Pacific region (1987)
(metric tons)

Country (region)	Inland fish grand total
Bangladesh	438 777
Bhutan	1 000
Brunei	102
China	558 370
Hong Kong	516
India	479 951
Indonesia	354 589
Iran	30 000
Japan	118 418
Kampuchea	61 882
Korea, D.P.R.	100 000
Korea, Rep. of	48 780
Laos	17 500
Malaysia	3 353
Mongolia	380
Myanmar	139 498
Nepal	5 281
Pakistan	81 631
Papua New Guinea	15 010
Philippines	281 493
Singapore	219
Sri Lanka	36 437
Taiwan Pr. of China	-
Thailand	85 139
Vietnam	212 000
Asia Total	3 070 107
Australia	1 013
New Zealand	-
Pacific Islands	4 756
Pacific total	5 769
Asia Pacific total	3 075 876
Rest of the World	2 784 349
World total	5 860 225

available on the use of such canals for capture fisheries and aquaculture in humid tropical countries, but little information is available for arid and semi-arid countries. A circular is being sent to member countries to gather more information and it has been recommended that a workshop be convened to discuss the potential of irrigation systems for fish production.

31. A number of countries in the region have extensive river systems, many of which are still unregulated by major engineering structures, and which represent important fishery resources. The Working Party, in recognition of this, suggested that an in-depth assessment of such riverine resources be undertaken with special consideration to their significance for fisheries. Studies of both migratory and non-migratory fish stocks are needed to improve knowledge concerning production potential of such rivers and the sudden declines or disappearances of certain species.

32. The Working Party also endorsed the current activities in developing predictive fish yield models for specific geographic areas and countries in the region. Recognizing that such models have the potential for fish yield enhancement, it was recommended that FAO establish a Task Force that can identify the action required to formulate such models, particularly those directed at the stocking of cyprinids.

33. A Workshop on the Use of Cyprinids in Fisheries Management of Larger Inland Water Bodies of the Region was convened in conjunction with the Fourth Session of the Working Party. Cyprinids constitute the dominant group of freshwater fish in most of the countries and are the most common species used for fish yield enhancement. During the last decade much progress has been achieved in the application of hatchery technology for the mass production of carp fry, both Chinese and Indian major and common carps. The stocking of these species in Thailand for enhancing capture fisheries has been documented to be economically advantageous. The workshop emphasized the need for proper assessment of the importance of stocking cyprinids and that this required attention being given to data requirements. The workshop recommended a similar meeting be held on the significance of tilapias in the capture fisheries of the region. It is proposed that this be convened in conjunction with the next session of the Working Party to be held in Indonesia in 1991.

34. An FAO mission visited USSR to investigate the possibilities of organizing three workshops on temperate and coldwater culture and capture fisheries for specialists from the countries of Asia. This is being planned for 1991 in response to renewed interest in Asia in the rehabilitation and development of coldwater fisheries where familiarization with the mid and high altitude areas of the Central Asian Republics of the USSR would benefit participants whose countries have the same indigenous species.

35. There is a growing interest in coldwater fishery development in countries of Asia. The IPFC Working Party on Inland Fisheries, has had contact with the following countries in the region: Afghanistan, Bhutan, China, India, Iran, Mongolia, Nepal and Pakistan. FAO has backstopped coldwater fisheries projects in Afghanistan, China, Iran and Pakistan, and

Table 4
Aquaculture production of major commodity groups
in the Asia-Pacific region (1987)
(metric tons)

Country	Finfish	Crustaceans	Molluscs	Seaweed	Total
Bangladesh	143 050	22 050	-	-	165 000
Brunei	2	-	-	-	2
China	3 408 964	156 003	711 137	1 324 500	5 600 604
Hong Kong	10 370	-	200	-	9 570
India	732 000	12 000	2 300	-	746 300
Indonesia	291 494	42 596	-	60 000	394 090
Japan	315 723	3 013	405 217	494 232	1 218 185
Kampuchea	1 618	-	-	-	1 618
Korea, D.P.R.	-	11 000	88 000	620 000	719 000
Korea, Rep. of	10 037	201	449 300	398 113	857 651
Laos	2 500	-	-	-	2 500
Malaysia	10 080	290	45 664	-	56 034
Myanmar	5 487	-	-	-	5 487
Nepal	5 435	-	-	-	5 435
Pakistan	10 000	-	-	-	10 000
Philippines	281 264	36 862	22 005	220 839	560 970
Singapore	383	457	1 020	-	1 860
Sri Lanka	28	400	-	-	428
Taiwan Pr. of China	163 778	90 757	45 043	5 532	305 110
Thailand	80 261	35 518	35 859	-	151 638
Vietnam	114 800	30 000	-	1 700	146 500
Asia Total	5 584 274	441 147	1 805 745	3 124 916	10 957 982
Australia	1 643	39	9 379	-	11 061
New Zealand	880	-	17 800	-	18 680
Pacific Islands	207	135	6	1 710	2 058
Pacific total	2 730	174	27 185	1 710	31 799
Asia-Pacific total	5 590 004	441 321	1 832 930	3 126 626	10 989 781
Rest of the World	1 089 237	134 985	839 464	12 847	2 076 533
World total	6 679 241	576 306	2 672 394	3 139 473	13 066 314

projects for some other countries are in the pipeline. Regional cooperation would benefit from establishing a coordinating centre or a regional project, which would among others assist in training in coldwater fisheries management and would arrange training in technical aspects of coldwater fish production in countries with a high level of expertise.

36. On the recommendation of the Third Session of the Working Party on Inland Fisheries, an FAO Fisheries Technical Paper has been published on structures assisting fish migrations in the major rivers of the USSR. In combination with a similar study prepared for Latin America the results may have application for this region. Individual countries of Asia and Australia will be contacted for information for discussion at the next session.

37. During the inter-sessional period, a number of previous FAO studies were synthesized into guidelines for development of inland fisheries under constraints from other users. The pressure on inland water fish stocks from changes in watershed and changing water flow and water quality is a typical problem of developing countries in the tropics and sub-tropics, and the guidelines represent a tool for planners and decision-makers who are involved in integrated planning for rational use of aquatic ecosystems, especially where fish stocks are under increasing pressure.

AQUACULTURE

38. The Asia-Pacific region produced 5.6 millions t of freshwater finfish in 1987. An additional 0.44 million t of crustaceans, 1.83 million t of molluscs and 3.13 million t of seaweeds resulted in a total of 11.0 million t of aquaculture production, which is 84 percent of the global 13.1 million t (Table 4). Out of the Asia-Pacific total, IPFC member countries produced 4.2 million t, or 32.1 percent of the global aquaculture production.

39. The value of aquaculture production in IPFC member countries was estimated at the equivalent of US\$ 7,012 million in 1987 representing 37.1 percent of the global value of aquaculture production. The value of the whole Asia-Pacific region's aquaculture production was the equivalent of US\$14,665 million or 77.5 percent of the total global value. The lower share in the value of Asia-Pacific production compared with its share in the volume is the result of the predominance of relatively low-value commodities, such as seaweeds, molluscs and cheap freshwater fish (primarily cyprinids).

40. Farmed finfish production in the Asia-Pacific region reached 5.6 million t in 1987. This volume consisted of almost 5 million t of freshwater fish, 416,000 t of diadromous fish and 253,000 t of marine fish. In the freshwater group various carp species predominated; these added up to 93.6 percent of the total. Together with tilapias the ratio of relatively cheap food fishes reached 97.9 percent. China was by far the major producer of freshwater fish (3,379,500 t) followed by India (732,000 t), Vietnam (230,000 t), Indonesia (182,000 t) and Bangladesh (143,050 t).

41. In the diadromous fish category milkfish dominated in Asia and the Pacific, representing 71.2 percent of the regional total. The Philippines,

Indonesia and Taiwan province of China were the biggest milkfish producers with 198,000, 104,000 and 29,000 t of production in 1987. Eels represented 17.7 percent of the diadromous fish produced in the region, biggest producers were Taiwan Province of China (43,000 t) and Japan (37,000 t). Salmonids added up only to 10.5 percent of the total, cultured almost exclusively in Japan (24,600 t) the Republic of Korea (17,600 t) and Taiwan Province of China (5,600 t).

42. Marine fish represented only 4.4 percent of the volume of finfish production in Asia and the Pacific but it consisted of several high-value fish species produced primarily for luxury markets. Yellowtail and red seabream were the two most important species, representing 63.3 and 14.8 percent of the total. Biggest producers of marine fish were Japan (208,100 t) and China (29,500 t).

43. Production of cultured crustaceans in the Asia-Pacific region reached 440,000 t in 1987, major producers were China (156 000 t), Taiwan, Province of China (90,800 t), Indonesia (42,600 t), Philippines (36,900 t), Thailand (35,500 t), Vietnam (28,600 t) and Bangladesh (22,100 t). IPFC member countries produced 181,600 t out of this total or 41.3 percent of the regional output. Overwhelming majority of the region's production (as much as 93.4 percent) was marine shrimp; freshwater crustaceans represented only 5 percent. While in 1988 the rapid growth of cultured shrimp production continued in the region, the 1989 decreases in shrimp prices prevented a continuation of this growth.

44. Cultured mollusc production was 1.8 million t in 1987 in the Asia-Pacific region. Major producers were China (711,100 t), the Republic of Korea (449,300 t) Japan (405 200 t), the DPR Korea (88,000 t) and Malaysia (45,700 t). The production of IPFC member countries amounted to 987,500 t or 53.9 percent of the regional total. Oysters represented the most important group of species in the Asia-Pacific region, their share of the total was 35.3 percent in 1987. The second most important group consisted of clams, cockles and arkshells (23.6 percent) the third comprised mussels (21.5 percent). A typical feature of the Asian mollusc culture was a rather high ratio of cultured scallops (10.7 percent). The annual average growth of cultured mollusc production between 1984 and 1987 was a steady 9.4 percent, however, in certain countries (e.g. in Japan, the Philippines, Taiwan, Province of China and Thailand) production of some species (e.g., oysters, mussels) started to decline due to marketing constraints. In some countries (e.g., in China and Singapore) cheap cultured mussels started to be used as shrimp feed ingredients.

45. Seaweed production amounted to 3.1 million t in 1987 in the Asia-Pacific region. Major producing countries were China (1.3 million t), the DPR Korea (620,000 t), Japan (494,000 t), the Republic of Korea (398,000 t) and the Philippines (221,000 t). IPFC member countries produced 1.8 million t or 57.4 percent of the regional total. Slightly more than half (50.6 percent) of the total aquaculture production in the Asia-Pacific region consisted of kelp (Laminaria) species, 17.6 percent of wakame (Undaria) species, 13 percent of laver (Porphyra) species and 9 percent of Eucheuma species. Among the major commodity groups produced by aquaculture only seaweeds have not demonstrated growth, their volume in 1987 was only 91 percent of the output reached in 1984. Production declined in the

edible seaweed group as consumption reportedly decreased in Japan and also in the case of seaweeds grown for industrial processing. Global markets for alginates and carrageenans became rather saturated, which adversely affected the production of Laminaria and Eucheuma species. Demand for agar, however, is still high, promoting efforts to grow more of the Gracilaria species.

46. The IPFC Working Party of Experts on Aquaculture, at its Seventh Session in Bangkok (1-6 August, 1988), concentrated primarily on coastal aquaculture and discussed in detail progress and problems of shrimp, mollusc and seaweed culture. Participants of the Working Party concluded that with the exception of only a few countries (e.g., Myanmar, Kampuchea, Pakistan) the countries of the region have already adapted the most important coastal aquaculture technologies. These were also transferred to most of the small island countries of the South Pacific, but few of them have proven to be viable economically and socially.

47. Considerable improvement was registered all over the region in the seed supply of freshwater fish species and also of cultured freshwater prawn and marine shrimp species. Beside large-scale hatcheries of the public and private sector, medium and small-scale fish and crustacean hatcheries emerged in high numbers in several countries of Asia (e.g., in Thailand and the Philippines) contributing significantly to the availability of fish, shrimp and prawn seed at reasonable prices. Problems, however, persist in the seed production of some marine fish species.

48. The improved supply of relatively cheap seed, together with improving availability of other external inputs, have led to shift towards higher stocking densities, consequently higher intensities in many Asian countries, particularly in China, Indonesia, the Philippines and Thailand. This, however, was followed by problems in the availability and price of fish/shrimp feeds or major feed ingredients (e.g., trashfish, fishmeal, etc.). Commercial pellet feeds, although increasingly available in the region, are by and large too expensive to produce relatively cheap commodities for domestic consumption in developing countries, therefore farm-made fish/shrimp feeds based on locally available ingredients are receiving increased attention.

49. In the inter-sessional period the spread of fish/shrimp diseases emerged as a major threat to aquaculture. The epizootic ulcerative disease of freshwater fish reached Sri Lanka, the Philippines, Bangladesh, India, Bhutan and Nepal, causing severe mortalities not only in fish ponds but in natural waters too. The disease raised serious public concern in the affected countries disrupting traditional fish distribution and consumption patterns. Unfortunately, there was little progress in understanding the transmission of the disease and the arresting of its further spread. Similarly, shrimp culturists are facing increasingly severe outbreaks of various diseases in both hatcheries and grow-out ponds. Contrary to the epizootic ulcerative disease of fish, severity of shrimp disease outbreaks seems to be related to the intensity of the applied culture techniques.

50. Marketing constraints are emerging increasingly as major problems in the further development of aquaculture. Problems faced on the export markets for shrimp and seaweeds were already mentioned, however, domestic marketing constraints were also reported from several countries (e.g., in mussel production in Malaysia and Thailand, in freshwater fish production in Indonesia, Malaysia and the Philippines, in edible seaweed production in Japan and the Republic of Korea). Marketing more value-added products on the export markets, improvement of the internal marketing systems and promotion of domestic fish/seafood consumption were proposed to overcome marketing problems.

51. Despite the emerging constraints discussed above, aquaculture proved to be the most rapidly expanding food production branch in the region. While between 1978 and 1988 the average annual growth rate of cereal production was 2.8 percent in Asia and the Pacific and marine fisheries expanded by 2.9 percent annually, aquaculture demonstrated an 8.2 percent annual growth between 1984 and 1987, years for which data are available. Such a rapid growth may not be sustainable in the forthcoming decade considering the evolving marketing constraints, however, aquaculture certainly will keep its expansion in the Asia-Pacific region by at least 3 to 5 percent annually up to the end of the century.

FISH UTILIZATION

52. There are several critical issues concerning fish utilization that require the attention of the Commission. Firstly, the extremely large revenues being generated by fish exports from the region should be noted. The protection of these revenues by efficient and effective quality assurance systems has improved but the level of rejections from some countries still gives major cause for concern.

53. In respect of domestic availability and consumption of fish there are some disturbing trends that merit close attention. For most Asian countries fish is culturally an important component in the diet and often the major source of animal protein. Per caput availability of fish is generally showing a declining trend while prices are rising steeply. There is a danger that a preferred food may become increasingly unavailable to the poorer sectors of the community. Governments could well re-evaluate their policies with regard to the role of fish in the national food supply, particularly with increased pressure on resources from the high demand of fish as feed for aquaculture.

54. In cases of declining fish availability for national needs, member States will need to take into consideration present fishmeal production as a removal from national fish consumption, since the meal is used as supplement to poultry and pork feed, as well as substantial quantities for aquaculture production of shrimp and marine fish (the ratio of 4 t live-weight trash fish to raise 1 t shrimp). Improved management practices and the introduction of better sorting and stowage technologies could result in a significant proportion of these catches being used for direct human consumption. At present fishmeal production in Thailand uses 900,000 t (live weight), Malaysia 201,500 t and India 287,000 t. The other countries- Bangladesh, Indonesia, Pakistan, Philippines, Sri Lanka and

Vietnam report zero or negligible quantities of meal production. Such situations may constrain some aspects of marine aquaculture production in the future which might be expected to accelerate research into alternative feed sources. For the present, however, some of the national benefits from foreign exchange earnings from the exports of cultured fish products are reduced when the constraint on fish supplies to a significant proportion of low income consumers is taken into account.

55. The Working Party on Fish Technology and Marketing, meeting in Bangkok in 1988, placed particular emphasis on the problems concerning quality control and inspection. The rejections of shrimp by importing countries continues to be too large to be acceptable and, together with dramatic increases in farmed shrimp, the situation causes concern. The workshop recommended that, in order to be confident of final product quality, both the industry and regulatory authorities need a code of practice for production whereby controls on raw material will require strengthening. Otherwise cultured shrimp may emerge as being considered an inherent public health risk. In addition, there is a need to collect data on the public health situation of tropical shrimp as an input for consideration in international standards.

56. The workshop also advised that the large food industries should be informed that fish powdered products had been fully investigated and were suitable raw material for producing such items as fish noodles which had particular relevance to the undernutrition problems of children.

MARKET/FISH TRADE

57. IPFC member countries have become important net exporters of fishery products. Main commodities that experienced a growth were shrimp and tuna. Cultured shrimp pushed up the export earning of China (Mainland and Taiwan Province), Thailand, Indonesia and the Philippines. Heavy arrivals of black tiger shrimp drove shrimp prices down in the second half of 1989. Every product was hit by the downward spiral and prices declined for some species and countries as much as 40 to 50 percent. For some IPFC member countries the prices were below product costs and some farmers had to abandon their aquaculture activities.

58. Tuna was another commodity that showed an impressive growth in recent years. The phenomenal expansion of the Thai canned tuna production and export has been the outstanding event in international trade of fishery products during the past five years. From nil, this country is now number one among canned tuna exporters and in terms of production second only to the USA. The low price and high quality of its tuna opened up a market to the lower income groups in developed countries. Total canned tuna consumption grew in many developed countries by 100 to 200 percent after the entry of Thailand's canned tuna on the world market. Fresh and frozen tuna trade in the IPFC region also experienced an up-swing during the past five years. On the one hand, Thailand imported substantial quantities of fresh and frozen tuna for its canneries and, on the other, huge quantities of sashimi quality tuna were exported by Taiwan (Province of China) and Korea to the Japanese market. Indonesia is an interesting newcomer as exporter of both canned and sashimi tuna.

59. The prospects are for further growth of fishery exports by IPFC developing countries. The expansion of the shrimp culture industry will bring additional foreign exchange earnings, although prices are unlikely to revert to the pre-1989 level. The tuna trade in sashimi and canned forms will continue to expand. There might be certain decline in Thai-canned tuna exports once Indonesia's industry gets into full production. Due to a decline in domestic supplies and a continuously strong demand for sashimi, Japanese tuna imports are likely to increase.

60. In terms of import/export trade balances, positive quantity balances are given for the following countries, together with their trade value balances.

Table 5

Positive trade balances in fish

	<u>Quantity</u> <u>tons</u>	<u>Value of fish trade</u> <u>balanced in US\$'000</u>
Bangladesh	27,076*	+162,402
India	99,560*	+430,171
Indonesia	122,688	+645,107
Korea, Rep.	156,791	+1,469,101
Myanmar	6,335*	+17,420
New Zealand	200,242	+443,412
Pakistan	44,430*	+122,483
Thailand	346,596	1,092,973
Vietnam	38,274*	+182,171

* no imports

For most of these countries the trade balance does not necessarily affect fish supply to national consumption needs, since the exports in question are high valued species of shrimp and/or tuna (Bangladesh, India, Indonesia, Korea, Philippines, Thailand and Vietnam) or surplus production to national needs (Indonesia, New Zealand).

61. Those countries with negative quantity trade balances are listed below together with their trade value balances.

	<u>Quantity</u>	<u>Value</u> <u>(US\$'000)</u>
Australia	62,304 t	+229,282
Japan	1,359,558 t	-9,620,249
Malaysia	98,490 t	+43,296
Philippines	74,344 t	+344,441
Sri Lanka	35,650 t	-11,008

Australia, Malaysia and Philippines although recording negative quantity trade balances have a positive trade balance in value terms as shown above.

Japan has a high national fish demand, resulting in a negative trade value of almost US\$ 10,000 million.

EXTERNAL ASSISTANCE

62. The FAO Fisheries Department, at the request of the donor community, has established an information base on fisheries projects (FIPIS). Within the present data available, covering the last eight years and not entirely complete, the level of funding in the Asia/Pacific Region has been as follows:

US\$ 712.1 million	for marine projects
US\$ 542.9 million	for inland fisheries
US\$ 1,039.0 million	indeterminate between the above two categories but fisheries directed.
US\$ 753.8 million	aquaculture both marine and freshwater
Total	US\$ 3,047.8 million

Of this total over the eight year period, US\$ 1,202.5 million has been completed and US\$ 415.7 million is either in the "pipeline" or proposed. US\$ 610 million of projects are ongoing.

63. For the projects directed at marine fisheries, 52 are divided equally between providing fishing vessels and onshore facilities, 23 are for education and training, 15 for improving fisheries research stations and vessels, nine each for institutional strengthening and for improving social conditions in the fishing community, eight for technical assistance, seven for improving quality control, four for aquaculture facilities, three for fish disease, fish nutrition and/or water toxicity, two for credit, one for cooperatives, one for pollution and its effect on fisheries and one directed at conservation of mangrove areas.

PROSPECTS

64. For the decade of the nineties, the plateaux reached in most of the marine fisheries of the Commission's member countries will mean that forecasted increases in national demand for fish will exceed supply. This can be expected to sustain further price increases for fish which, in turn, will remove fish as a source of animal protein from increasingly larger segments of national populations. The implication of this situation is that an increased proportion of foreign exchange earnings will be directed towards imported lower priced fish products or other sources of protein. Alternatively, or perhaps in conjunction with imported fish products, governments may wish to consider policies that encourage a proportion of catches presently directed to animal feed to be targetted to human consumption. This will require ensuring that the technology to make this possible is readily available.

65. In a number of countries the shortfall in supply of freshwater fish, which is particularly important in domestic fish supplies, has been experience for a considerable period of time and governments responded to the situation through stock enhancement and policies encouraging

aquaculture of fresh water species. Although present aquaculture production of these species is now 2 million t, an expanded production of a further 5 million t by the end of the nineties, to meet demand, may not be feasible under present conditions. Governments will need to address issues concerning the use of marginal sites, deteriorating water quality and conflicting interests over water use, disease, fish toxicity and feed supplies, if substantial gains in production are to be achieved.

66. There are opportunities for increased production to meet consumer needs from marine fisheries. Indonesia has demonstrated that the ban on trawling has resulted in greater levels of demersal biomass being available and the recovery of important species. It is also significant that the new landings produce table-size fish compared with the very small size of fish presently landed by trawlers in other countries in the region.

67. The implication of the Indonesian experience in marine fisheries is that national consumer needs, in terms of diversity and size of fish, can be met by changing the way fisheries are conducted. The use of more selective types of fishing gear allows the natural productivity of the marine environment to be more efficiently used in contributing to natural growth of fish species. To engage in aquaculture to raise marine species of fish, only because they have been overfished and depleted, may not be the most efficient way of using the natural environment. This has particular implications for those landings converted into fish meal. A situation whereby increased aquaculture production of marine species, which is fishmeal dependent thereby requiring increasing quantities of landings for feed, may have to be avoided in order to meet national food preferences. An alternative solution may emerge with research and development of substitute fishmeal inputs to fish feed.

68. The 1986 average value-per-ton of fish for Asia was calculated to be US\$ 700. This compares with US\$ 593/t for developed countries, US\$ 463/t for Africa and US\$ 277/t for Latin America. These value per ton figures not only indicate the high value of fish in Asia compared with the rest of the world, but point to the comparative advantage of importing certain fish products from other regions. This is particularly valid for fishmeal where the Latin American value-per-ton is lower than other parts of the world primarily because of the proportion of its production turned into meal. There would appear therefore to be economies in substituting Asian fishmeal production with imports and using the fish that is presently converted into fishmeal for food.

69. The above forecasts are of course only rough estimates of the key indicators that are required to project future trends in fisheries. The improvement and refinement of data associated with these key indicators is a necessity, if government fisheries policies are to be effective in responding to changing situations. Steps have been taken to improve the data situation. Apart from the aquaculture enquiry referred to above, there has been good cooperation between FAO and the statistical collection agencies in the Asia-Pacific region such as SEAFDEC (Southeast Asian Fisheries Development Centre), FFA (Forum Fisheries Agency) and SPC (South Pacific Commission). Exchange of data with the latter two agencies has resulted in an improvement in tuna statistics and similar results have been

acheived with SEAFDEC for other species. This cooperation should be strengthened in the future and particular emphasis needs to be given to improving the reliability of data for inland fisheries.

70. The problems of continuing quality control for export products has been brought to the attention of the Commission. There are other issues that also will require the attention of Member Nations concerning environmental degradation and the impending need to monitor fish for contaminants as a public health measure. Malaysia has already experienced the effect on demand for mollusc from public health concerns, as have a number of developed countries. Demands for government and industry cooperation can therefore be expected to increase in this decade for monitoring fish and fishery products on a public health basis. This may result in a number of fishing area closures in rivers and estuaries, as well as areas adjacent to urban and industrial sites. In this way fish supplies may be further reduced.

71. The significant increase in aquacultural production of brackishwater prawns, so beneficial to foreign exchange earnings and farm income, is exerting pressure on mangrove areas which are optimal locations for brackishwater ponds. Government attention is required to ensure that the conversion of mangrove areas to aquacultural ponds fully considers the impact of the loss of mangrove areas to natural marine species production. For the the most part, it would appear that the removal of mangrove areas for aquacultural production is in fact a transfer of income away from the fisherman to the fish farmer. Given the financial situation of many fishermen, the loss of earnings from incidental catches of high-valued species may cause dislocation in the future.

72. The fish trade projections appear buoyant and significant foreign exchange earnings are expected to continue, given the overall world supply/demand situation. As noted earlier, adjustments in net foreign exchange earnings will need to be made to allow for increased fish imports to satisfy national consumer needs. These conditions are particularly favourable towards the expansion of Indonesia's fisheries, the only developing country with apparent significant underexploited resources.

SUGGESTED ACTION BY THE COMMISSION

73. The Commission is invited to comment on the main issues emerging from this review, in particular to provide recommendations concerning the action required to address the finite levels of catches from capture fisheries reached during the last decade, in view of the projected regional demand requirements for fish by the end of this decade. In this connection, the Commission may wish to take into consideration the following:

- i) the fisheries management measures required to improve the performance of capture fisheries in this decade;
- ii) the impact on foreign exchange earnings from increased quantities of fish imports;

- iii) the benefits in protecting foreign exchange earnings by increasing quality control over fish and fishery products, as well as the public health implications on fish supplies;
- iv) the economic incentive for increasing aquaculture production as a result of the supply/demand gap, and the possible adverse effects of this increase in production on fish meal requirements and site location in mangrove areas;
- v) the marshalling of external assistance in a cohesive way so as to improve the situation of capture fisheries in order to overcome the situation of the last decade;
- vi) the data requirements in order to improve the monitoring of the fisheries in the region;
- vii) the activities needed to sustain and enhance inland fish production that may include the principle of compensating for losses in fish yield due to environmental alteration.

74. The Commission is informed that other international fisheries commissions, notably the International North Pacific Fisheries Commission, the South Pacific Commission, the Indian Ocean Fisheries Commission, and the South Pacific Forum Fisheries Agency (FFA) are concerned with the effect of large pelagic driftnets on certain fish species, as well as environmental considerations associated with the by-catch of these nets; in particular marine mammals, seabirds and turtles. The Commission may wish to propose measures concerning the use and selectivity of fishing gears to be used in those areas of the high seas within its competence in order to protect its member States' fisheries and to alleviate environmental concerns.