

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS



INDO-PACIFIC FISHERIES COUNCIL

P R O C E E D I N G S

12th SESSION

HONOLULU

HAWAII, U.S.A.

3-17 October 1968

SECTION I

IPFC Secretariat, FAO Regional Office
for Asia and the Far East
Bangkok
1968

OFFICE BEARERS OF THE INDO-PACIFIC FISHERIES COUNCIL

1966-1968

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IPFC WORKING PARTIES, 1966-1968
as designated at the 12th Session

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Dr. S. Kikawa (Japan)
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Convenor: Mr. R.S. Shomura (U.S.A.)
Dr. F. Talbot (Australia)
Dr. A. Suda (Japan)
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WORKING PARTY IN THE FISHERY ASPECTS OF THE COORDINATED STUDY OF THE KUROSHIO

Convenor: Mr. J.C. Marr (U.S.A.)
Dr. T. Ino (Japan)
(1) Mr. Hak Soo Han (Korea)
Mr. D. Pathansali (Malaysia)
Mr. I. Ronquillo (Philippines)
Dr. D. Menasveta (Thailand)
Mr. W. Lai-Yee Chan (Hong Kong)

WORKING PARTY ON TRAWLING

Convenor: Dr. A. Sribhibhadh (Thailand)
Mr. A. Stark (Australia)
Mr. A.S. Mendis (Ceylon)
(2) Mr. K.V. Rao (India)
Dr. S. Shindo (Japan)
Mr. D.J. Koh (Korea)
(3) Mr. D. Pathansali (Malaysia)
Mrs. P. Caces-Borja (Philippines)
Mr. W. Lai-Yee Chan (Hong Kong)
Mr. Tran Van Tri (Vietnam)

WORKING PARTY ON RASTRELLIGER

Convenor: Mr. G.N. Mitra (India)
Dr. G.L. Kesteven (Australia)
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WORKING PARTY ON COASTAL AQUICULTURE

Convenor: Dr. T. Ino (Japan)
Dr. A. Sribhibhadh (Thailand)
Dr. G.J. Blanco (Philippines)
(nominee) (India)

WORKING PARTY ON THE ECONOMICS OF FISH CULTURE

(nominee) (India)
(nominee) (Indonesia)
Mr. A. Hasegawa (Japan)
Mr. A.B.O. Merican (Malaysia)
Mrs. M.N. Delmendo (Philippines)

Editor's Note:

- (1) Subsequently Mr. Hee Soo Han was nominated by the Government of Korea to replace Mr. Hak Soo Han.
- (2) Mr. B. Rao should be replaced by Mr. K.V. Rao.
- (3) Subsequently Mr. Ong Kah Sin was nominated by the Government of Malaysia to replace Mr. D. Pathansali.

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ADDRESS BY HONORABLE ANDREW T.F. ING
LIEUTENANT GOVERNOR
STATE OF HAWAII

"On behalf of Governor John A Burns and the people of Hawaii, I welcome you to Hawaii. It is a double pleasure to have the Indo-Pacific Fisheries Council 12th Session in Honolulu, for this is the first time the Council had met in the United States. We are indeed honored that Hawaii was selected as the meeting site. I hope that your stay here will be interesting for you personally, as well as productive professionally.

We, in turn, expect to profit from your visit in terms of increased knowledge and understanding which can be applied to our problems. Since the day when the ancient Polynesian navigators first came to these islands, the inhabitants have been strongly oriented to the sea. How could it be otherwise, situated as we are in the middle of the Pacific Ocean?

The early Hawaiians were skilled fishermen and had great knowledge of the ocean. They produced their main source of protein in large fish ponds. Fish was dried and was used as an item of trade. We are still dependent on the sea for such diverse necessities as transportation, recreation, and as a source of food.

The fish fauna of Hawaii is not rich with respect to the numbers of different kinds. We therefore will ask your advice during the Session as to the kinds of fishes which you think might be appropriate for introduction. Such introductions might be for establishment in natural waters or for fish culture. To give but one example of how such introductions might be useful, the landings in the skipjack tuna fishery, Hawaii's largest fishery, are sometimes limited by the supply and scarcity of live bait. If an appropriate live-bait species could be established in natural waters, or cultured, this limitation could be removed.

One of the features of this 12th Session is a Symposium on Fishery Education. This is an area in which we in Hawaii and indeed in the United States in general have had little experience compared to many of the member countries of the Council. We hope to learn and benefit from your experience and knowledge.

Although man's scientific effort is still directed upward into space, he is aware that knowledge of the oceans is the key to more efficient weather forecasting and to reaching untapped mineral and food resources of immense value.

The Federal and State governments, and private industries are intensifying their research and development programs in oceanography. In the years ahead, Hawaii expects to be among the leaders in oceanography.

It is timely then that through meetings such as this one, we can be reminded of the challenge and obligation which rests upon all of us to develop and utilize the existing and potential food resources of the oceans. As the population of the world continues to explode, we shall be forced to look

While meetings for the exchange of ideas are valuable, I trust that your deliberations here will result in specific constructive actions during the coming months and years in implementation towards the attainment of the goals of the Council.

Thank you."

ADDRESS BY MR. J.C. MARR, AREA DIRECTOR,
U.S. BUREAU OF COMMERCIAL FISHERIES
HONOLULU, HAWAII

"Governor Ing, Excellencies,
Delegates, Ladies and Gentlemen:

It is my pleasure to welcome you to the United States.

I believe it is particularly appropriate that the first meeting of the Indo-Pacific Fisheries Council in the United States be held in Hawaii. Although closer geographically to North America, Hawaii is closer biologically to the Indo-Pacific region. The fishes you will see here are those with which you are familiar in your own waters. It is obvious that Hawaii also has many cultural ties with the Indo-Pacific region and offers, I believe, proof that it is possible for East and West to achieve mutual understanding and respect. The agenda of this session of the Council includes consideration of several problems of particular importance to Hawaii.

The almost two decades since the establishment of the Indo-Pacific Fisheries Council marks the period of greatest change ever experienced by man. During this period the world population has increased by 42 percent and continues to increase at an increasing rate. Sweeping political and economic changes have taken place. There has commenced a major technological revolution, the full implications of which cannot yet even be grasped.

In order to survive in a useful way, organizations, like individuals, must be able to respond to change, must be able to meet the challenges brought by change. It is appropriate at this opening of the IPFC 12th Session to briefly mention three of the changes and challenges facing the Council.

In spite of great increases in the world fish catch, there is still a tremendous shortage of protein food-stuffs; production has not kept pace with needs. How can fishery production be increased to the maximum level consonant with sound conservation practices? What can the Council do to help bring about this increased production?

Many of the land areas bordering the Indian Ocean are areas of acute protein deficiency, yet the fishery resources of the Indian Ocean are believed to be capable of supporting vastly increased production. This paradox will be considered in January 1967 at the first session of the FAO working party for the Rational Utilization of the Indian Ocean Fishery Resources. What are the implications of this awakened interest in Indian Ocean fishery resources with respect to the Indo-Pacific Fisheries Council? Does it represent an opportunity for increased effectiveness on the part of the Council?

The Council has recently taken on the responsibility of planning and coordinating the fishery studies to be undertaken as part of the international cooperative study of the Kuroshio, a study of the oceanography and fishery resources of a large area of the Western North Pacific Ocean. I believe this to be the first continuing operational function assumed by the Council. Is the assumption of operational functions an indication of the future course of the Council?

I raise only these three challenges and opportunities facing the Council out of the many that exist. I do not attempt to supply the answers to these questions. Indeed, only you, the delegates to this 12th Session of the Council, can provide the answers.

As hosts to this session, we naturally wish that our guests enjoy our country. In spite of the busy schedule of the session, I hope that you will have the opportunity to partake of the beauty and the hospitality of Hawaii.

I now declare open the 12th Session of the Indo-Pacific Fisheries Council."

TELEGRAM RECEIVED FROM THE PRESIDENT OF THE
UNITED STATES OF AMERICA

HONORABLE LYNDON B. JOHNSON

I WANT TO EXTEND A WARM WELCOME TO THE MEMBERS OF THE INDO-PACIFIC FISHERIES COUNCIL AS YOU MEET FOR THE FIRST TIME ON AMERICAN SOIL.

THE DEVELOPMENT OF THE FOOD RESOURCES OF THE SEA IS ONE OF THE MOST CONSEQUENTIAL ITEMS ON THE AGENDA OF MANKIND. OUR RAPIDLY GROWING POPULATION DEMANDS THAT WE EXPLORE AND UTILIZE OUR VAST OCEANIC STOREHOUSE OF ANIMAL PROTEIN TO ENSURE THE WELL-BEING OF FUTURE GENERATIONS.

THE RESPONSIBILITY THIS INCURS IS PONDEROUS. BUT WITH THE GENEROUS WILLINGNESS AND READY SKILLS OF PEOPLE LIKE YOU WE SHALL SUCCEED.

ADDRESS BY MR. LEE, BONG NAI, CHAIRMAN
INDO-PACIFIC FISHERIES COUNCIL
12th Session, Honolulu, Hawaii

"Governor Ing, Excellencies,
Distinguished Delegates, Ladies and Gentlemen:

I would like first of all, on behalf of the Indo-Pacific Fisheries Council, to express my sincere appreciation to the Government of the United States of America and, particularly to the State Department and Bureau of Commercial Fisheries, for the excellent arrangements made for us to hold the 12th Session of the Indo-Pacific Fisheries Council in this wonderful city of Honolulu.

My Council is particularly gratified that it has been possible for Mr. Andrew Ing, Acting Governor of the State of Hawaii to attend this Opening Ceremony and to present so felicitous an address.

Especially also, I would like to extend an expression of our appreciation to President Thomas Hamilton of the University of Hawaii, for honouring us with his presence and to him and Chancellor Howard P. Jones of the East-West Center for granting the Council access to the magnificent facilities of this Kennedy Hall for our Opening Ceremony and of Jefferson Hall for the main proceedings of the Council's Session.

It has been my great honour to have acted as Chairman of this Council since my election at its 11th Session at Kuala Lumpur, in October 1964.

At the same time, I feel the heavy responsibility of presiding over this conference successfully, since it will play an important role in promoting the development of fisheries in the region, and in improving the lives and livelihood of the many people engaged in fisheries in one way or another.

Today, most of the developing nations in the region are not only realizing the importance of fisheries protein for human food and emphasizing the need for national exploitation and utilization of the world's fisheries resources, but also many of the Member Governments in the region are undertaking ambitious fisheries development plans.

I most sincerely hope that during this session the discussions on a large number of important subjects vital to the region will lead to some fruitful results through the unsparing cooperation of our distinguished delegates in a most friendly atmosphere and ideal surroundings. I am sure that with your cooperation and help we can bring about notable achievements in this session.

Finally, ladies and gentlemen I am delighted to announce that the Government of New Zealand has, within the last few days, adhered to the Indo-Pacific Fisheries Council Agreement. On behalf of all the Members of the Council, I extend a warm and hearty welcome to the New Zealand Delegation.

Thank you."

MESSAGE BY MR. F.E. POPPER

ON BEHALF OF

DR. B.R. SEN, DIRECTOR-GENERAL
OF THE FOOD & AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

AND

MR. ROY I. JACKSON, ASSISTANT DIRECTOR-
GENERAL OF FAO IN CHARGE OF FISHERIES

"Governor, Mr. Chairman, Ladies and Gentlemen:

It is my privilege to convey to you, first of all, greetings from the Director-General, Dr. B.R. Sen, with his best wishes for a most successful session. He wishes to express his gratitude to the Government of the United States of America and to the authorities of the State and the University of Hawaii for their hospitable invitation to the Council to hold its present session in such a congenial and even magnificent setting.

Dr. Sen has just recently been present at the regular FAO Regional Conference for Asia and the Far East which some of you here also attended, and which gave a good deal of attention to fishery matters. Dr. Sen wanted me to say particularly that he would have been happy to remain in the region to have been here personally today; that he regretted that urgent business required his return to headquarters in Rome. He is looking forward, however, to receiving reports on your session which he considered as being of extreme significance since this will be the first session of your Council to take place since the Conference of FAO, at its last session, decided on a substantial strengthening of the role of work of FAO in the field of fisheries and took two important steps in this direction; namely, the establishment of a standing Committee on Fisheries directly reporting to the Council of FAO and the elevation of the former Fisheries Division to the status of a Department. This action by the FAO Conference spells both fresh challenges and fresh opportunities for international collaboration in fisheries. Dr. Sen is sure that your Council will take up these challenges and take advantage of these opportunities and he, on his part, is ready to offer the necessary support on the side of the Secretariat.

The second message I am to convey this morning, comes from Mr. Roy I. Jackson, since the beginning of this year Assistant Director-General of FAO in charge of Fisheries, with whom it is my good fortune to work very closely. Mr. Jackson too sends you his very best wishes for a fruitful session. He pledges the full support of the new Department of Fisheries for any effective steps the Council may take to further necessary international collaboration in fisheries. The creation of the Department of Fisheries and the Committee of Fisheries in FAO is symptomatic of a new phase in international activities in this field. The representative of the host Government has already referred to this. The Council, the oldest of the international Fisheries bodies established within the framework of FAO, sees before itself new or newly-urgent problems and to meet them it may have to try new ways. The era during which the Council had been merely a forum for the exchange of views and information and a source of proposals for execution by individual Member Governments may be coming to a close. More and more there will be demands for concerted international action in fisheries. This may require a greater concentration of the Council's attention on such matters. Such demands are finding expression in the new FAO Committee on Fisheries which has started upon its work with effectiveness and vigor. The Committee while reemphasizing that its task was to supplement rather than supplant international organizations already effectively working in the field of fisheries, nevertheless felt that the global nature of fisheries and the growing interdependence of national and regional fishery activities required the exercise of a driving force and of co-ordination which it was task of the Committee to provide.

The Committee is seriously tackling the question of the adequacy and efficiency of existing international bodies in relation to international fishery problems and has to this purpose established a Subcommittee on the Development of Cooperation with international organizations concerned with Fisheries. It has also made a start at identifying areas and problems requiring urgent international attention. One of these - the rational utilization of the fishery resources of the Indian Ocean - is of special concern to this Council. Another specific area at which joint international action is called for and has indeed already been initiated is that of the Kuroshio. As Mr. Marr has reminded you, your Council has important responsibilities for the fishery studies to be undertaken within the framework of the international cooperative study sponsored by the IOC.

In these specific fields as well as in some of more general application which are basic to fishery development and management - for instance, fishery education and fishery institutions - your Council has important discussions to conduct at this session which, hopefully, should lead to definite recommendations for implementation by Governments. By thus bringing about necessary international action the Council can maintain its role as the leading international fishery organization in its region. In this test I can ensure it of the fullest support of the FAO Department of Fisheries. Once, more, Mr. Chairman, on behalf of Dr. Sen, Mr. Jackson, and all the fishery staff of FAO best wishes for a successful 12th Session of the Indo-Pacific Fisheries Council."

CHAPTER I

COUNCIL PROCEDURE

AGENDA

1. Adoption of the Agenda
2. Secretary's Report on Credentials
3. Statements by Delegations
4. Council Nominations
 - 4.1 Administrative Correspondents
 - 4.2 Technical Committee Members
5. Report of the Executive Committee
 - Part A. Report on Intersession Period
 - Part B. Proposals for Future Work of the Council
 - Part C. Statement of Expenditure and Budget Proposals
6. Reports from Technical Committees
 - 6.1 Intersession Reports
 - 6.2 Session Reports
7. Report from 11th Session Working Parties
 - 7.1 Intersession Reports
 - 7.2 Session Reports
8. Secretary's Report on Status of the Industry
9. Amendments to the Agreement and Rules of Procedure
10. Agenda Items proposed by Member Governments
 - a. Tropical Fish Culture Research Institute, Malacca
 - b. Introduction of exotic species with particular reference to Hawaii
11. Joint IPFC/IOC Meeting on Fisheries Aspects of C.S.K.
12. Fisheries Education (12th Session Symposium)
13. Fisheries Census
14. Rational Utilization of Fisheries Resources of the Indian Ocean
15. Items arising from the 11th Session

16. Proposals for Symposia for the 13th Session
17. Time and Place of 13th Session
18. Formal Resolutions
19. Election of Office Bearers
20. Adoption of Summary Report.

OPENING CEREMONY

The official opening of the 12th Session of the Indo-Pacific Fisheries Council was held in Kennedy Hall, East-West Center, University of Hawaii, Honolulu, on Monday, 3rd October 1966.

The Honorable Andrew T.F. Ing, Lieutenant Governor of the State of Hawaii, presented an address welcoming the Council to Honolulu.

Mr. J.C. Marr, Representative of the Government of the United States of America, addressed the Delegates and guests, presenting a message from President Lyndon B. Johnson and formally inaugurating the 12th Session.

Mr. Lee, Bong Nai, Chairman of the Council, then presented his Opening Address.

Messages from Dr. B.R. Sen, Director-General and Mr. Roy I. Jackson, Assistant Director-General, Department of Fisheries, FAO, were delivered by Mr. F.E. Poppo, FAO Representative.

AGENDA FOR THE 12TH SESSION

The Provisional Agenda, amended by the inclusion of two sub-items under Item 10-Agenda Items proposed by Member Governments, i.e., (a) Tropical Fish Culture Research Institute, Malacca (U.K.) and (b) Introduction of Exotic Species (U.S.A.), the inclusion of new Items 14, Rational Utilization of the Fishery Resources of the Indian Ocean (D-G, FAO), and 15, Items arising from 11th Session (U.S.A.) and the re-numbering of Items 14-16 as 16-20, was adopted.

STATEMENTS BY DELEGATES AND OBSERVERS

In accordance with the Resolution passed by the Council at its 6th Session, statements by Delegates and Observers were tabled and not presented verbally, except that in recognition of the adherence of the Government of New Zealand to the Council's Agreement and its first representation at a Council Session as a full member, the New Zealand Delegate, Mr. A.C. Kaberry, was afforded an opportunity to address the Council in Plenary Session.

The Delegate for Australia recorded his Government's appreciation of the arrangements made by the Government of the United States of America for the accommodation and servicing of the 12th Session of the Indo-Pacific Fisheries Council; the services being of such kind that the Council's work would proceed with speed and efficiency; the setting for the meeting being gracious, convenient and auspicious.

The meeting in the East-West Center with its amalgam of Pacific cultures, located on the campus of the University of Hawaii, only a short distance from the Bureau of Commercial Fisheries Laboratory of the Fish and Wildlife Service, and within sight of the Pacific itself, had all in its favor. The Australian Government looked forward with confidence to useful results from a meeting so favorably accommodated.

The Delegate for Ceylon informed the Council that a newly-established Ceylon Fisheries Corporation had taken over the commercial activities previously handled by the Department of Fisheries. The Corporation was a Government institution but had complete autonomy in administration. The Corporation had taken over all the special assets previously controlled by the Department which was now limited to research, regulatory, statutory and welfare activities. The Corporation was working on the basis of a Five-Year Plan which included the construction of three fishery harbors and several new vessels. Ceylon had recently introduced a new class of steel fishing boat with a considerably greater range than older type vessels. The Corporation was also concerned with the development of fish marketing, improved fish transportation, the import of fishing gear and the distribution of salt. Recently, a factory had been established by a private company for the manufacture of synthetic fiber nets and twine.

Le Délégué de la France réaffirme l'intérêt du Gouvernement de son pays pour les problèmes posés par le développement des pêches dans la zone d'influence du Conseil. La Nouvelle Calédonie que la France représente dans cette organisation a certes une faible population et, ceci étant dans une certaine mesure la conséquence de cela, une pêche actuelle peu importante en regard même des plus déshérités des pays membres. Mais les ressources de la haute mer de la région tropicale Sud-Ouest du Pacifique au coeur de laquelle l'île se trouve placée sont grandes. La présence ces grandes potentialités de développement industriel est une des raisons pour lesquelles le Gouvernement français a, depuis la dernière session, considérablement développé les moyens de recherches en eaux profondes dont dispose l'ORSTOM à Nouméa. C'est aussi une des raisons de l'intérêt porté par lui aux travaux de ce Conseil.

D'autre part, l'effort du Conseil au cours de ses dernières sessions pour concentrer et rendre plus efficiente son action a été suivi avec intérêt par le Gouvernement français. Il espère vivement que cet effort se poursuivra aussi bien par un choix plus sévère encore des sujets retenus que par une meilleure répartition géographique des actions retenues.

intensive stocking programs and the development of research techniques resulting in the successful spawning of a number of species. Oceanic fishing enterprises were developing, and there appeared hope that problems confronting the development of trawling might be resolved to the benefit of the industry as a whole. Training for fisheries personnel was developing, and there had been an important increase in the number of technical staff recruited by the Department. He said a valuable report had been received from Dr. K. Tiews which was in the process of implementation. He briefly described the items and programs under the First Malaysian Development Plan 1966-70.

The Delegate for New Zealand said he felt it an honor to be the first Delegate to attend a meeting of the Indo-Pacific Fisheries Council. He said New Zealand is a small country in the South Pacific and is distant from the other countries of the region, and in this insular situation did not feel for many years that its problems and its fisheries had much in common with those of most other countries of the region. In fields quite outside fisheries, New Zealand has been moving to increase its fish production and make fuller use of its fishery resources. This year, again, the production of food fish had reached a new record level, and with developments in hand, production is expected to increase still further. In addition, New Zealand is introducing quality standards and standards of hygiene in fish handling as a basic step towards ensuring a consistently good quality product. To ensure that the industry operates with a well-found fishing fleet, New Zealand has extended the survey requirements to include vessels down to 40 feet, and, ultimately to 20 feet in length. At the same time, because the waters in the New Zealand region are stormy and vessels are ranging farther afield, a system of crew certification and qualified crews has been introduced, the emphasis being what is required for the fishing activity as opposed to the older arrangements of what was required for the mercantile marine. These are examples of the steps being taken to pave the way for industry expansion, diversification of fishing methods and diversification of fishery products. The Delegate continued saying that as a Member of FAO, moving to expand its fishing industry, New Zealand is pleased to have been accepted as a Member of IPFC which is concerned with stimulating production from aquatic resources and New Zealand looks forward to being able to play its role in the Organization.

On behalf of the President and people of the Philippines, the Delegate for the Philippines, extending greetings to the Host Government and participants in the 12th Session, pointed out that as a charter member and staunch believer of the IPFC, his Government assured all concerned of its continuing support and cooperation. He briefly reviewed current developments in the Philippines, particularly in technology, handling and processing and development of the deep-sea fishing industry. He said that further equipment, including a research vessel, was being acquired which would promote an extensive study and research into the marine fishery resources. Considerable progress had already been made through a judicious application of the limited resources of manpower, funds and technical know-how, supported by foreign assistance. He expressed his appreciation of the aid rendered by UNSF and FAO. Nevertheless, present achievement were inadequate and there was still need for increased production from the waters.

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The Delegate for New Zealand said he felt it an honor to be the first Delegate to attend a meeting of the Indo-Pacific Fisheries Council. He said New Zealand is a small country in the South Pacific and is distant from the other countries of the region, and in this insular situation did not feel for many years that its problems and its fisheries had much in common with those of most other countries of the region. In fields quite outside fisheries, New Zealand has been moving to increase its fish production and make fuller use of its fishery resources. This year, again, the production of food fish had reached a new record level, and with developments in hand, production is expected to increase still further. In addition, New Zealand is introducing quality standards and standards of hygiene in fish handling as a basic step towards ensuring a consistently good quality product. To ensure that the industry operates with a well-found fishing fleet, New Zealand has extended the survey requirements to include vessels down to 40 feet, and, ultimately to 20 feet in length. At the same time, because the waters in the New Zealand region are stormy and vessels are ranging farther afield, a system of crew certification and qualified crews has been introduced, the emphasis being what is required for the fishing activity as opposed to the older arrangements of what was required for the mercantile marine. These are examples of the steps being taken to pave the way for industry expansion, diversification of fishing methods and diversification of fishery products. The Delegate continued saying that as a Member of FAO, moving to expand its fishing industry, New Zealand is pleased to have been accepted as a Member of IPFC which is concerned with stimulating production from aquatic resources and New Zealand looks forward to being able to play its role in the Organization.

On behalf of the President and people of the Philippines, the Delegate for the Philippines, extending greetings to the Host Government and participants in the 12th Session, pointed out that as a charter member and staunch believer of the IPFC, his Government assured all concerned of its continuing support and cooperation. He briefly reviewed current developments in the Philippines, particularly in technology, handling and processing and development of the deep-sea fishing industry. He said that further equipment, including a research vessel, was being acquired which would promote an extensive study and research into the marine fishery resources. Considerable progress had already been made through a judicious application of the limited resources of manpower, funds and technical know-how, supported by foreign assistance. He expressed his appreciation of the aid rendered by UNSF and FAO. Nevertheless, present achievement were inadequate and there was still need for increased production from the waters.

The Delegate for Thailand expressed his Government's appreciation to the Government of the United States for sponsoring the 12th Session of the IPFC. He pointed out that Thailand had been represented at every Session of the Council and had faith in the Council's advice and recommendations for the development of the rational utilization of fishing resources and improvement of the living standards of the fishermen. He said that Thailand was facing many problems and listed the variety of programs for development which his Government was implementing. One of the limitations, however, was the shortage of trained staff, and his Government considered that FAO should place particular emphasis on this subject.

The Delegate for the United Kingdom said that Her Majesty's Government welcomed the invitation received from the Chairman and Executive Committee of the Indo-Pacific Fisheries Council to be represented at the Council's 12th Session, and to the opportunities that it afforded for exchanging views on all aspects of fisheries. The Fisheries Education Symposium at which the United Kingdom was tabling five papers, was keenly anticipated, offering as it did a unique opportunity to contribute to the advancement of fisheries techniques in the area. Her Majesty's Government was most grateful to the Government of the United States of America for their hospitality and the provision of such excellent facilities of every kind for the Session.

The Delegate for the United States welcomed the participants to the 12th Session, noting that Hawaii was an appropriate venue for a Council Session since it was closer biologically to the Indo-Pacific region than to North America. He referred to the cultural ties with many Member Countries of the Council which could lead to the achievement of mutual understanding and respect. He noted that the past twenty years had seen a population increase of 42%, accompanied by sweeping political and economical changes as well as the commencement of a major technological revolution. He pointed out that organizations, like individuals, must be able to respond to change and to meet the challenges so brought. He referred specifically to the fact that the world fish catch, despite its great increase, had not kept pace with the needs for protein and asked how fishery production could be increased and what the Council might do to bring about this increase. He referred specifically to the problem of the rational utilization of the Indian Ocean fisheries resources and suggested that it might represent an opportunity for increased effectiveness on the part of the Council, which had recently undertaken responsibility for planning and coordinating fisheries studies relating to the international Cooperative Study of the Kuroshio.

La Délégation du Viêt-nam est heureuse de se joindre aux Etats-Membres pour remercier le Gouvernement des Etats-Unis d'Amérique d'avoir offert l'opportunité d'organiser la 12ème Session du Conseil Indo-Pacifique des Pêches dans ce magnifique Etat de Hawaï et souhaite que cette Session soit couronnée de succès tant sur le plan technique que sur le plan des relations internationales.

Depuis une vingtaine d'années le Viêt-nam endure malgré lui une guerre qui, tantôt est à l'état latent, tantôt passe dans une phase plus active et destructive. Cette guerre épuisante réduit dans une large mesure les moyens de production et de développement économique de notre pays. Des villages de

pêches, le long des côtes, sont détruits ou obligés de se réimplanter dans des zones plus limitées, pour raison de sécurité; des Centres de Réfugiés sont créés pour recevoir les victimes des communistes car ceux-ci, par où ils passent, ne laissent que ruines et destructions.

Pourtant, parallèlement à l'action militaire, notre Gouvernement réserve d'énormes moyens de travail au secteur de production afin d'équilibrer la balance économique et commerciale. Sous cette ligne de politique générale, l'industrie des Pêches a reçu une assistance assez substantielle pour réaliser son programme de développement en accordance avec un pays en guerre. La pêche familiale et artisanale est de ce fait largement aidée sur le plan technique et financier; introduction des fibres synthétiques pour la fabrication des filets, adoption des moteurs marins pour motoriser les barques de pêche, création des stations piscicoles dans les agglomérations nouvellement formées, construction des ports de pêche avec débarcadères et marchés de poissons, création des usines de fabrique de conserve et de transformation des produits de pêche, formation des cadres, prêts aux coopératives de pêcheurs, etc.

Ainsi, malgré l'état permanent de guerre qui y règne, la production des pêches va en augmentant. La modernisation des équipements a apporté une prospérité saisissante à certains centres de pêche où les barques nouvellement construites sont d'un tonnage bien supérieur à celui traditionnellement utilisé; ces barques sont maintenant dotées de moteurs marins de grande puissance permettant aux hommes de pêcher bien loin des côtes et de rester plus longtemps sur les lieux de pêches.

Il est évident que cette pêche familiale et artisanale développée au plus haut point contribue dans une certaine mesure à l'appauvrissement progressif de la faune aquatique côtière et l'état de surexploitation qui en résulte, pourra survenir un jour très proche si nous ne prenons pas dès aujourd'hui des dispositions pour étendre les zones de pêche vers le large. A cette fin, un projet de création d'un Institut de Pêche est préparé, révisé suivant les suggestions des Techniciens du Bureau du Fonds spécial des Nations Unies et des Techniciens de la FAO, ce dit projet, en principe accepté, sera présenté à l'approbation définitive des Nations Unies à la Session de Décembre 1966. Nous espérons, avec ce projet, être en mesure de prospecter les eaux du large des côtes du Vietnam, de la Mer de Chine au Golfe de Thaïlande, et de donner à nos pêcheurs un rayon d'activité plus grand et par voie de conséquence, augmenter leur revenu annuel.

Enfin à la lumière des recommandations du Conseil Indo-Pacifique des Pêches, des mesures adéquates ont été prises dans le programme de développement des pêches au Vietnam. Le Conseil qui réunit tous les deux ans les Experts et techniciens spécialisés aussi bien en matière de recherche que des pratiques de pêche et d'organisation commerciale, continue à être l'Organisme des plus utiles pour la Région. Nous sommes ainsi persuadés que le Conseil sera en mesure d'aider avec efficacité les Gouvernements-Membres à faire face aux nouveaux problèmes posés au fur et à mesure du développement des pêches dans la Région.

L'Observateur de la C.P.S. tient à apporter au Conseil les vœux de succès de cette organisation pour les travaux de la présente Session. La C.P.S. a toujours tenu compte avec intérêt dans le passé des délibérations du CIPP pour son propre programme d'aide au développement des pêches dans la région

La C.P.S. s'y trouve confrontée avec des situations très diverses, d'autant plus difficiles à améliorer quelquefois que les marches considérés son très souvent de taille très réduite et que les problèmes concernent des populations plus ou moins denses mais toujours assez faibles en nombre absolu, placées dans des îles très éloignées les unes des autres. Elle tente actuellement de promouvoir l'étude de ces problèmes à l'échelle régionale et aura besoin à cet égard de toute l'aide possible: les compétences techniques du CIPP et la large documentation réunie pour chaque session sont un des éléments sur lesquels compte la Commission.

The Observer for the Pacific Science Association said it was a great honor and privilege for him to express his sincere gratitude to the Government of the United States and to the State of Hawaii, who were acting as Host to this 12th Meeting of the IPFC in this city. It gave him great pleasure to welcome the Delegates, Officials and visitors to the Conference and expressed the hope that their deliberations would be fruitful and their stay here enjoyable. The battle between food production and population explosion was most keenly fought in recent years. However, he had no doubt that the scientific and technological progress, especially in fisheries would make it possible to free the world from hunger and malnutrition. He referred to the Resolutions of the 11th Pacific Science Congress held in Tokyo during August 22 to September 3. Those of interest to IPFC had already been distributed and would be sent to the Food and Agriculture Organization by the President of the PSA and of the Congress, Professor Sin-itiro Tomonaga, in the near future. He hoped that all would give their prompt consideration to these Resolutions and was sure these would be of great assistance in the performance of the tasks of IPFC. He conveyed the best wishes of the Pacific Science Association for the success of the twelfth Session in Honolulu.

The Observer for UNESCO thanked the Chairman of IPFC for his kind invitation to UNESCO to send an Observer to this 12th Session of the IPFC.

He assured all Delegates of the great interest that UNESCO had in the activities of the IPFC. The presence at this meeting of an Observer for UNESCO was a tradition, not purely routine; it was a practical means whereby UNESCO maintains cooperation, as far as is possible, in the furtherment of common aims to improve the application of science to the development of fisheries in the respective countries.

He noted that a joint meeting of the IOC/IPFC, devoted to the fisheries aspects of the cooperative study of Kuroshio (CSK) will occupy some part of the work during the present Session, and that such a meeting reflects, in itself, the cooperation which already exists. It stressed how much the inter-governmental body sponsored by UNESCO for Oceanic Research considers it to be important to have the views of this Council on the matter. UNESCO was also anxious to see IPFC study by what possible means this scientific venture could be made more efficient in its fisheries aspects.

He also noted that the Symposium was devoted to the subject of training and education in fisheries and was sure all knew how very actively UNESCO was engaged in the various aspects of education; and sincerely hoped that the deliberations of this Symposium might lead to defining some new ways of cooperation between the activities of this Council and those of UNESCO. He added that UNESCO was ready to assist in any form of development in the field of education, including of course any specific deliberations relating to fishery problems, as a means of fostering progress in the Region.

ARRANGEMENTS FOR 12TH SESSION

Through the courtesy of the Government of the United States of America, the University of Hawaii, the East-West Center and the United States Fish and Wildlife Service, Bureau of Commercial Fisheries, facilities for the IPFC 12th Session were made available in Kennedy Hall for the official Opening Ceremony and in Jefferson Hall of the East-West Center for the Plenary and Technical Committee meetings.

SECRETARY'S REPORT ON CREDENTIALS

Letters of credence or authorization in proper form were received from Delegations representing the Member Governments of: Australia, Ceylon, France, India, Japan, Korea, Malaysia, New Zealand, Philippines, Thailand, United Kingdom, United States of America and Vietnam.

Non-member Governments represented by Observers were: Brunei, Canada (unofficial).

International Organizations represented by accredited Observers were:

Pacific Science Association
South Pacific Commission
United Nations Educational Scientific and Cultural Organization
Food and Agriculture Organization.

Expression of regret at inability to attend the 12th Session were received from the Governments of Burma, Laos, Netherlands and Pakistan and from World Meteorological Organization, and the United Nations Development Program.

STEERING COMMITTEE

The Council at its first plenary meeting appointed a Steering Committee consisting of the Executive Committee and the Chairman of the two Technical Committees.

REPORT OF THE EXECUTIVE COMMITTEE

The Chairman presented the Report of the Executive Committee in three sections;

- A. Administration
- B. Proposals for Future Work
- C. Financial Statement and Budget Estimates

Sections A and B as presented were adopted subject to the amendments of Section A, Membership of the Council, by the insertion of names of New Zealand and Indonesia, thus raising the total membership of the Council to 18 and the deletion of the third paragraph under this heading. The matter of communication with Member Governments was referred to an ad hoc subcommittee for report to the Council in plenary session.

The several proposals submitted in Section B were referred to the two Technical Committees and to the Council in plenary session as relevant.

AMENDMENT OF THE RULES OF PROCEDURE

The Delegate of Australia moved amendments to the Rules of Procedure as set out below.

The motion was seconded by the Delegate of Thailand and adopted. Delegates of Australia, France, India, Japan, Korea, Malaysia, New Zealand, Thailand, United Kingdom, United States of America and Vietnam voted in favor. The Delegate of the Philippines abstained from voting.

RULES OF PROCEDURE (as amended)

Rule X

1. stet
2. Two Technical Committee (Article III.1) shall be constituted and shall conduct their work according to the following provisions:
 - a - d. stet
2. (e) (New) In establishing a sub-committee or working party a Technical Committee shall determine whether the sub-committee or working party shall be ad hoc or standing and if standing shall determine the period for which it shall function, provided that in the case of any standing sub-committee or working party the Technical Committee shall at each regular Session review the need for continuance of such sub-committee or working party and may at that time modify the composition of the sub-committee or working party.
2. (f) The terms of reference of these Technical Committees shall be determined by the Council and shall always be published along with these Rules.
3. The Council may establish at regular sessions such other committees and/or working parties as may be necessary to consider such matters as may not fall within the terms of reference of its Technical Committees, or which may be common to more than one of them.

a - d. stet

3. (e) (New) In establishing a Committee or Working Party, the Council shall determine whether the Committee or Working Party shall be ad hoc or standing and if standing shall determine the period for which it shall function, provided that in the case of any standing Committee the Council shall at each regular Session review the need for the continuance of such Committee or Working Party and may at that time modify the composition of the Committee or Working Party.

4. The convening of committees and working parties referred to in paragraphs 2 and 3 above shall be subject to the provisions of Article III(3) of the Agreement.

TERMS OF REFERENCE OF TECHNICAL COMMITTEES

Arising from proposals of the 10th and 11th Session, and in accordance with a request from the Government of Australia the Executive Committee submitted proposals for revision of the terms of Reference of the two Technical Committees.

Following discussions in plenary session, the Council appointed an ad hoc Working Party to study the proposal in the light of the discussions. The following text proposed by the Working Party, subject to one amendment was adopted.

The Council may refer to the Technical Committees specific problems and the Technical Committees shall study and report thereon, with recommendations, for Council action. Such problems when appropriate may be dealt with in joint meetings of the committees concerned. The Council may refer to:

- (a) Technical Committee I on Resources and Exploitation: specific problems of the development and proper utilization through rational exploitation of the fisheries resources and particularly dealing with (i) the physical, chemical and biological factors relative to the assessment of the aquatic resources and the management of their exploitation; (ii) effects on fisheries resources of outside factors including especially those related to human activity; (iii) increasing fish culture production; (iv) the operational and design requirements of fishing vessels and gear in relation to the nature of the resources.
- (b) Technical Committee II on Fishery Economics and Products: species problems on the development and proper utilization of fisheries production and the technological, economic and sociological factors related thereto and in particular dealing with (i) the design, construction and operation of fishing vessels and gear; (ii) economic analysis and management including statistics; (iii) fisheries institutions and services including fisheries administration; (iv) the development, utilization and distribution of fisheries products; (v) marketing; (vi) fisheries financing and credit; (vii) ancillary sociological problems related to the improvement of the status in the community of fisheries operatives.

PROVISIONAL FRENCH TEXT (TEXTE FRANCAIS PROVISOIRE)

1. Inchangé
2. Deux Comités Techniques sont créés (voir Art.III i) et travaillent sur la base du mandat suivant :
 - a - d. inchangés

- (e) Lors de la création d'un sous-comité ou d'un Groupe de Travail, le Comité Technique concerné décide si cet organisme est ad-hoc ou permanent. Dans le deuxième cas le Comité Technique fixe la durée de ses activités étant entendu qu'à chacune de ses Sessions ordinaires le Comité Technique détermine s'il y a lieu de maintenir ou non le mandat de ces Sous-Comités ou Groupes de Travail s'ils sont permanents, cette décision pouvant s'accompagner d'une modification dans la composition des Organismes ainsi visés.
 - (f) Le mandat de ces comités techniques est fixé par le Conseil et est toujours publié avec le présent Règlement.
3. Le Conseil peut créer, à une session ordinaire, tous autres comités ou groupes de travail qui lui paraissent nécessaires pour examiner les questions n'entrant pas dans le mandat de ses comités techniques ou qui relèvent simultanément de la compétence de plusieurs de ces comités.

a - d. inchangés

- (e) Lors de la création d'un Sous-Comité ou Groupe de Travail le Conseil décide si cet organisme est ad-hoc ou permanent; dans le dernier cas le Comité Technique fixe la durée de ses activités, étant entendu qu'à chacune des Sessions Ordinaires le Conseil détermine s'il y a lieu de maintenir ou non le mandat de ces Sous-Comités ou Groupes de Travail cette décision pouvant s'accompagner d'une modification dans la composition des organismes ainsi visés.
4. La convocation des comités et groupes de travail mentionnés dans les paragraphes 2 et 3 ci-dessus est subordonnée aux dispositions de l'article III de l'Accord.

ATTRIBUTIONS DES COMITES TECHNIQUES

Le Conseil peut renvoyer aux Comités Techniques des problèmes particuliers, et les comités techniques les étudieront et présenteront sur ces problèmes des rapports accompagnés de recommandations pour décision du Conseil. Ces problèmes peuvent, si nécessaire, être traités par les comités intéressés en réunions mixtes. Le Conseil peut renvoyer:

- (a) au Comité Technique I des Ressources et de l'Exploitation, les problèmes particuliers au développement et à la bonne utilisation des ressources des pêches par leur exploitation rationnelle, et concernant notamment:
 - (1) les facteurs physiques, chimiques et biologiques relatifs à l'évaluation des ressources aquatiques et à l'aménagement de leur exploitation;
 - (2) les effets sur les ressources des pêches des facteurs extérieurs, notamment des facteurs relatifs à l'activité humaine;

- (3) l'accroissement de la production de la pisciculture;
 - (4) les caractéristiques désirables dans la conception et l'utilisation des bateaux et engins de pêche en fonction de la nature des ressources.
- (b) au Comité Technique II des aspects économiques des pêches et des produits de la Pêche, les problèmes spécifiques du développement et de l'utilisation rationnelle de la production des pêches, et les facteurs technologiques, économiques et sociologiques qui s'y rattachent, concernant notamment:
- (1) la conception, la construction et le fonctionnement des bateaux et engins de pêche;
 - (2) l'analyse économique et l'exploitation, y compris les statistiques;
 - (3) les institutions ou services des pêches, y compris l'administration des pêches;
 - (4) le développement, l'utilisation et la distribution des produits de la pêche;
 - (5) la commercialisation;
 - (6) le financement et le crédit en matière de pêche;
 - (7) les problèmes sociologiques connexes relatifs à l'amélioration de la condition des collectivités de pêcheurs.

AMENDMENT OF THE COUNCIL'S AGREEMENT

The Secretary advised the Council of receipt of a proposal from the Government of Australia for the amendment of the Council's Agreement.

In view of the fact that adequate notice of this proposal could not be given to Member Governments prior to the current Session it was held that consideration of the proposal should be deferred until the Council's 13th Session.

The Secretary was requested to circularize all Member Governments on the subject.

COMMUNICATION WITH MEMBER GOVERNMENTS

The Council considered the question of communication with Member Governments during intersession periods and adopted the following policy directives:

- (a) that communication with the Member Governments on technical matters be made directly with the Government's officers nominated to the Council's Technical Committees, and on administrative matters, with the Government's officers nominated as Administrative Correspondent; provided that the Administrative Correspondents were also kept informed, by copy, of communications addressed to other government officers;
- (b) that the Council may establish at regular sessions such other committees and/or Working Parties which the Council considers important and necessary, and the terms of reference of which, laid down by the Council at the time of their establishment, may not be fulfilled on the basis of communication by correspondence alone. Of course, when such sub-committees are appointed the Secretariat may communicate with Members of such bodies, subject to the requirement to keep the Administrative Correspondents informed of such exchange.

PUBLICATION OF COUNCIL DOCUMENTS

The Council recommended the publication of the Inter-session Reports of Technical Committees I and II as Occasional Papers or in Section I of the Proceedings at the discretion of the Secretary.

The Council decided that technical papers presented at the 12th Session should be published as follows:

- (a) In full in the Proceedings
Numbers: 1, 5, 7, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 31, 34, 35(b), 36, 37, 39.
- (b) As Occasional Papers
Numbers: 4, 11, 12, 13, 32, 35(a), 38, 40.
- (c) To be incorporated in Inter-Session Report of Technical Committee II
Numbers: 28, 29, 30.
- (d) As Special Article in C.A.P.
Numbers: 2, 3.
- (e) To be returned to authors as unsuitable for any of the above classifications
Numbers: 8 - requires further review in relation to literature on animal feeds
9 - possible basis for extension circular for use in home country
10 - possible basis for extension circular for use in home country
14 - might be submitted to chemical trade journal.

The Council recommends that the papers TECH. 6 and 33 should be compiled, with the paper on the resources of the CSK Region presented at the Council's 11th Session, and with papers on the resources of the central sector and on the pelagic high-seas resources of the Indian Ocean; to this material should be added material drawn from papers on national unit-fisheries presented to the Council. The Council decided to request Dr. Tham Ah Kow to prepare the paper on Central Sector resources and was informed that Drs. Shomura and Kikawa will prepare a paper on the Indian Ocean pelagic high-seas resources. The Council also proposed that the authors of these regional papers should act as an editorial working party to prepare this compilation and that Dr. G.L. Kesteven should be convener of the party. Publication of the final document should be in the IPFC Regional Studies series.

ITEMS ARISING FROM THE 11TH SESSION

This Item introduced by the Delegate for the United States of America related primarily to recommendations submitted by the Council to FAO. The Secretary for Technical Committees I and II indicated that most of the items listed for consideration had been covered in the Inter-Session Reports of Technical Committees I and II, and it was regretted that it had not been possible to distribute these documents prior to the Council's Session.

Specifically the request for a training center on induced spawning would be covered in part by a seminar to be held in U.S.S.R. 1967 on genetic selection and hybridization of fish.

On the question of fishery oceanography FAO was moving to meet the request, and experts in fisheries oceanography had been recruited for Aden, Pakistan and India.

On the question of pollution, it was reported that the FAO was preparing a study on national legislation covering this subject and the first draft of the study had been distributed to experts for comments and discussion. Further, FAO is cooperating closely with WHO on the matter of insecticides and their effects.

On the question of the proposed seminar on fishery credit, a proposal had been submitted for consideration by UNDP under the 1967-68 program and Governments would be advised of the outcome of the negotiations.

SUMMARY REVIEW OF THE RESOLUTIONS AND RECOMMENDATIONS 1956-64

The Council noted that in these five sessions it adopted 253 resolutions on 98 of which no action had been taken. Although unable to make a detailed analysis of the origins, intent, and follow-up of each such abortive resolution the Council considered that failure might have been due to: (1) inept framing of resolutions, resulting in vagueness as to intention, (2) failure to indicate clearly the courses of action expected, (3) errors in deciding upon to whom each resolution should be directed. It was believed that such errors would often have had their origin in a breakdown of communication as a consequence of which the Delegates at a Council meeting might have found themselves insufficiently informed as to their Government's position on matters before the Council. In other instances, failure might have resulted from insufficiently vigorous follow-up action. The Secretariat was requested to analyze the set of resolutions adopted at a Council meeting and to take appropriate action to secure implementation of each resolution; the Secretariat should be vigilant in eliciting response from those to whom resolutions are addressed.

The Executive Committee was requested to prepare a schedule of the resolutions of the 11th and 12th Sessions on which there has been no action and to draw the attention of Member Governments to the need for action.

Finally the Council recommended that at each Session the Executive Committee should present an analysis of the resolutions of the immediately preceding Session, report the action taken in implementation of each resolution, and in the case of resolutions on which no action had been taken, give where possible an explanation of why no action had been taken; in particular the Executive Committee should draw attention to mistakes on the part of the Council in drawing up its resolutions.

Council was aware that Member Governments were not bound by its resolutions and recommendations and that FAO could only implement resolution and recommendations within the limits of its financial resources. It was suggested that, if Member Governments had more time to consider working papers and express their views on the proposals contained in them, before meetings of Council began, there would be less likelihood of resolutions and recommendations being made which Member Governments, for one reason or another, might find themselves unable to implement. It was therefore recommended that in the future no working paper should be considered by Council which had not been in the hands of Member Governments at least 2 months before the Council meeting, and that, before proposing any item for the agenda of a Council meeting, the Executive Committee should take account of representations received from Member Governments. This procedure would enable Delegations to arrive at Sessions of the Council more adequately briefed by their Governments on the substance of resolutions and recommendations likely to be put forward and would reduce the likelihood that Member Governments would be indifferent to resolutions and recommendations which their Delegates had supported in Council.

STRENGTHENING OF FAR EAST REGIONAL OFFICE

The Council considered that the proposal to strengthen the Far East Regional Office by appointment to it of regional specialists in fishing boat construction and in fishing gear should be reviewed in the light of the changed situation of the fishery industries of the region and the altered character of governmental programmes. Various Delegates drew attention to the fact that these changes were such that Member Governments were now in need of specialists in narrow fields instead of in broad subjects. The Council held the view that the role of the Regional Office should be to assist Member Governments, FAO and the Council itself to identify problems and opportunities for action rather than to provide specialists able to assist in solving those problems. The Regional Office should maintain an intelligence service through which it would have a reliable and up-to-date view of the status of the industries in the region and of governmental and other programmes relating to these industries. Through this intelligence service the Regional Office should be in a strong position to advise Member Governments and FAO of opportunities for international aid to national programmes. It should furnish the Council at each session with a reliable survey of fishery matters in the region on which much of the deliberations of the Council could be based. Any strengthening of the Regional Office should be by way of providing personnel able to participate in the operation of such an intelligence service and available for consultation by Member Governments in appraisal of the situation of their industries and their programmes. Careful attention should be given to the methods employed in operating this service and to the equipment required for it. The Council, having been informed that the whole matter of FAO's regional activity was under review decided to recommend to the Director-General of FAO that he convene a Sub-Committee of representatives of Member Governments of IPFC to review the structure and function of the Regional Fisheries Office in the light of the views expressed above, and to assist him in his review.

12TH SESSION SYMPOSIUM ON 'FISHERIES TRAINING AND EDUCATION'

A. ARRANGEMENT FOR THE SYMPOSIUM

At the 11th Session of the Council a decision was taken that the Symposium subject at the 12th Session should be Fisheries Education, and Dr. G.L. Kesteven was appointed as Convenor of the Symposium. In response to the prospectus issued by the Convenor, some 40 papers were contributed, of which 30 were from countries within the region and 10 were from countries outside the region.

Dr. W.F. Hampton was appointed Chairman of the Symposium and was assisted in his work by a small working group. The subject matter of the Symposium was dealt with under the following headings:

I. Planning for Fisheries Education and Training

- A. Fishery occupations and the knowledge and skills required for them
 - a. Schedule of occupations, job specifications (statement of duties)
 - b. Standards of proficiency
 - c. Subjects in which there is to be training for each occupation

Rapporteur: A.C. Bogg

Discussion Leaders: J.W. Cobble
T. Ino

- F. Manpower requirements for development, growth and stability; assessment of proficiency lag
 - a. Methods of estimating numbers required in each occupation
 - b. Determination of priorities among occupations
 - c. Planning the trainee throughout

Rapporteur: D. Menasveta

Discussion Leaders: G.L. Kesteven

II. Conduct of Education and Training Programmes

A. Types of programmes and subject content

- a. Curriculum, Syllabus, course
- b. Programmes and timetables
- c. Duration of course
- d. Entrance requirements
- e. Graduation standards

Rapporteur: B. Muir
G.I. Murphy

Discussion Leaders: L.C. Devambez
D.N.F. Hall
R. Van Cleve
T. Yamamoto

B. Management of Programmes

- a. Student numbers
- b. Building (teaching and domestic accommodation)
- c. Ships
- d. Staff qualifications; training
- e. Organization
- f. Finance

Rapporteur: D.N.F. Hall

Discussion Leaders: W.F. Hampton
A.S. Timbol
Soong Min Kong
G.N. Mitra
T. Ino

C. Educational methods and equipment

- a. Audio-visual aid
- b. Textbook

Rapporteur: D.N.F. Hall

Discussion Leaders: D.A. Lubitz

D. International aid and opportunities

Rapporteur: D.N.F. Hall

Discussion Leaders: F.E. Popper

III. Assessment of the Efficacy of Education and Training Programmes

A. Wastage

- a. In course (students who fail to "graduate"),
- b. Post-graduate (students who move to other industries; but this may not be a real loss to community)

B. Indices of production, productivity and efficiency (assessment of the gains in these attributable to training)

- a. At level of the individual trainee
- b. At level of the operating unit in which trainees are employed
- c. At level of unit fishery, group of unit fisheries, or entire industry

C. Cost/benefit ratio

- a. For extension programmes
- b. For institutionalized programmes

Rapporteur: A.C. Bogg

Discussion Leaders: D. Menasveta
E.S. Holliman
E.P. Ho

The symposium took place on October 5th and 6th, with morning and afternoon meetings, and on the evening of October 5th films and slides were shown. Grateful acknowledgement must here be made of the contributions made to the Symposium by Mr. D.A. Lubitz, Dr. G.I. Murphy and Dr. B. Muir of the University of Hawaii. Also the Council was especially appreciative of the display of audio-visual equipment set out by various business enterprises and of the display of books provided by the British Council, by the United States Fish and Wildlife Service and by the Japanese Fisheries Agency.

B. SUMMARY OF MAIN POINTS RAISED IN THE DISCUSSION

It was recognized in the Symposium that the primary objective of the educational program in any country was to develop the proficiencies of operatives and personnel that would lead to increased fish production and improved utilization of fish and fishery products. In the main, participants considered that the basis of fishery education programs should be the training of fishing boat personnel, but strong arguments were presented for the training of administrative field staff, especially those required for extension programmes. A case was also made for training in the management of fishery enterprises. The participants agreed that the training of trainers constituted a major part of the problem of fisheries education in the region. It was emphasized that the planning of fisheries education programs had to be closely coordinated with the general fisheries development plan of a country and should be shaped within the context of such program. It was also agreed that in planning an education program for a particular country, the likely lines of future technological development should be studied so that training should be aimed at meeting effectively the needs of such development. The participants agreed that there were certain unique skills required in fisheries not only in the conduct of fishing operations at sea but in certain activities on land, and that whilst training for many occupations can be included in a country's general educational and training program, special arrangements have to be made for many of the fishery occupations.

There was considerable detailed discussion of administrative and other aspects of the conduct of education and training programs and the detailed report of the symposium will undoubtedly furnish valuable material for the use of Member Governments. These discussions dealt with such matters as student-staff ratio, the nature of accommodation required and the qualifications of teachers. On the last point, a special reference was made to the desirability of having teachers who are able to go to sea. There was useful discussion of audio-visual aids and textbooks, and with respect to the latter participants gave an account of special needs such as for instruction manuals to be made available to fishermen in the national languages. A detailed account was given of current arrangements at international level for providing assistance in education programs and participants gave some account of the difficulties they encounter in ascertaining what aid was available and how they might gain access to it. The participants welcomed the suggestion that a meeting should take place of countries that could give aid and suggested that countries seeking aid should also be represented at such a meeting, and that the meeting should produce a directory of internationally-available aid and aid-giving organizations, with details of the methods and procedures for applying for such aid.

The participants recognized that there was some wastage during the training courses and after graduation from them, but the view was generally held by the participants that trained persons, although not available to the fisheries, were valuable to the economy generally and therefore should not be regarded as a loss to the community.

Although the participants could not enter into details with regard to the techniques for assessing the efficiency of training programs and the cost-benefit ratio of any particular program, they agreed that methods should be developed for this purpose and applied within the region.

C. CONCLUSIONS

In the light of the discussions that took place in the Symposium, the Council:

- I. Recommends to FAO that continuing emphasis should be given to development of its fishery education and training activities. The Council believes that Member Governments of the IPFC region and the Council itself should be able to obtain advice and assistance on education matters from the FAO.
- II. Endorses the suggestion that a meeting should take place of countries giving aid in fisheries education but suggests that countries seeking such aid should be represented at the meeting. It hopes that as a result of the meeting a directory will be prepared furnishing detailed information on educational aid and opportunities in fisheries at international level.
- III. Recommends that one or more educational centers should be established in the Indo-Pacific region for purposes such as:

- a) the training of extension officers and other training staff;
 - b) preparation of audio-visual aids, texts, etc;
 - c) preparing a map of the location of educational centers;
 - d) making a comparative study of curricula and courses for fisheries;
 - e) giving support to experts rendering assistance to Member Governments;
 - f) providing information and advice to Member Governments.
- IV. Requests the Executive Committee to accept a continuing charge with regard to education and development. In this connection, the Committee is requested to maintain contact with FAO with regard to implementation of the recommendations drawn from the Symposium discussions and to assist the organization in this work. In particular, the Committee should collaborate in any plans for the establishment of the education center and be available to assist the consultant appointed to prepare the report referred to in recommendation V. The Council further suggests to the Committee that in this section of its work it might seek assistance from Dr. R. Van Cleve and others specialized in the field of fisheries education.
- V. Requests FAO to appoint a consultant to prepare a report based on this Symposium and making use of the papers presented and the record of discussions that took place. The Council suggests that this consultant should visit one or two countries such as Malaysia and Thailand in order to make detailed country studies following the pattern of the Symposium outline and should incorporate the results of the studies in his report. The resulting work should, in the view of the Council, constitute an exceedingly useful manual on the problems and methods of fisheries education.

SYMPOSIUM FOR THE 13TH SESSION

The Council adopted a proposal for the two Technical Committees that the Symposium for the 13th Session should be "Demersal Fisheries" and requested the Working Party on Trawling to organize this symposium under the convenorship of the Chairman Dr. Arporna Sribhibhadh. It was recommended that the subject matter for the symposium be arranged under the headings:

1. Experimental Fishing
2. Exploratory Fishing
3. Stock Identity and Distribution
4. Stock Assessment.

SYMPOSIUM FOR THE 14TH SESSION

It was agreed that the subject coastal aquiculture deserved serious attention, but that due to its complexity, preparation for its consideration might involve some time. Accordingly, the Council recommended that "Coastal Aquiculture" be adopted as the Symposium subject for the 14th Session. Dr. T. Ino (Japan) was asked to serve as Convenor, and it was agreed that he should be assisted by a Working Party consisting of Dr. A. Sribhibhach (shrimps; Thailand), Dr. Blanco (seaweeds; Philippines) and a member to be nominated (fish culture; India).

The Party was asked to interpret "coastal culture" in a broad sense. The Symposium should deal with biological, technological and economic aspects of the subject. The Party was asked to arrange for papers on this subject to be submitted to the 13th Session and at the 13th Session to present to the Council plans for the 14th Session Symposium.

TIME AND PLACE OF 13TH SESSION

There being no invitation offered by any Member Government represented the Council invoked the provision of Rule 11 placing responsibility for the selection of the time and place for the next Session on the Chairman, in consultation with the Director-General of FAO and subject to the approval of a majority of Member Governments.

COUNCIL OFFICE BEARERS

Election of the Chairman and Vice-Chairman

The Delegate for Philippines nominated and the Delegate for U.K. seconded, Delegate for Malaysia as Chairman. Mr. Soong Min Kong was declared elected, with acclamation.

The Delegate for Thailand nominated and the Delegate for New Zealand seconded Mr. J.C. Marr, Delegate for U.S.A. as Vice-Chairman. The Delegate for Korea supported the nomination and Mr. J.C. Marr was declared elected, with acclamation.

Dr. Lee, Bong Nai, retiring Chairman, became Member (ex officio) of the Executive Committee.

FORMAL RESOLUTIONS

The Delegate for France moved and the Council adopted the following resolutions:

The Council having convened in Plenary Session desires to place on record its very deep appreciation of the courtesy and generosity of President Lyndon B. Johnson and the Government of the United States of America in extending to it an invitation to hold its 12th Session in Honolulu, Hawaii.

The Delegate for Malaysia moved and the Council adopted a resolution that the Council express to the Area Director and staff of the Bureau of Commercial Fisheries, Honolulu, a sincere and personal expression of appreciation for the willing and friendly assistance provided by the officers and staff of the Bureau for the day-to-day operations of the Council's session.

The Delegate for Korea moved and the Council adopted a resolution extending to the United States Delegation to the 12th Session of the Council an expression of sincere appreciation for the courtesy and hospitality extended to it during the 12th Session.

The Delegate for Japan moved and the Council adopted a resolution extending to the President of the University of Hawaii an expression of its sincere appreciation for the courtesies and facilities extended to it.

The Delegate for Vietnam moved and the Council adopted a resolution that the Council extend to the Chancellor and administrative personnel of the East-West Center an expression of sincere appreciation for access to and the use of the magnificent facilities in Jefferson Hall, and particularly for the willing and courteous assistance rendered the Council by personnel of the Center.

The Delegate for Australia moved and the Council adopted a resolution that the Council place on record an expression of warm appreciation for the courtesy, generosity and cooperation shown by the British Council in assembling and forwarding to Honolulu for display during the Council's Symposium on Fisheries Education a most interesting and extensive collection of publications relevant to the subject.

FINANCIAL REPORT AND BUDGET ESTIMATES

I. Normal Recurrent Expenditure

Every effort has been made to bring this report up-to-date but certain outstanding commitments have had to be entered merely as estimates for the year 1966.

In preparing these statements of expenditure and estimates, it has been realized that the financial biennium of the Council differs from that of Food and Agriculture Organization and hence the various statements and estimates are presented on a yearly basis.

For the year 1965, Executive Committee Travel was slightly in excess of the initial estimates, while printing costs largely due to delays were appreciably below the original figures estimated.

Miscellaneous Costs fit comfortably within the Budget Estimates.

For 1966, the second year of the biennium, the expenditure will exceed in all cases the initial Budget Estimates.

In the case of the Executive Committee Travel, costs are expected to exceed by some US\$56 the original estimates.

Much of the printing load of 1965 was carried over into 1966 and the major part of the overall program was completed at costs considerably above the original estimates. Charged against this item, however, is a significant stock of paper and equipment which will be carried over for use during 1967.

It had been expected that with the installation in the FAO Far East Regional Office of basic printing facilities, printing cost might be appreciably reduced. However, the bulk of material arising from the Council's 11th Session together with the newly introduced Regional Studies has eliminated the anticipated savings.

Distribution costs of publications have been high, owing to the bulk and weight of the material distributed.

It is anticipated that the direct costs of the 12th Session to be held in Honolulu will greatly exceed the original budget estimates which were drawn up before the invitation to hold the 12th Session was received from the Government of U.S.A. and the increase in costs is due to heavy charges for seafreight and airfreight of documents from and to the Regional Office, Bangkok.

Miscellaneous expenditure during 1966 is expected to exceed only slightly the original Budget Estimates.

I. NORMAL RECURRENT EXPENDITURE

i. IPFC Statement of Expenditure for Jan.-Dec. 1965

	<u>Expenditure</u> US\$	<u>Budget</u> <u>Estimates</u> US\$
A. <u>EXECUTIVE COMMITTEE TRAVEL</u>	1,576.80	1,500.00

38th ExCo Meeting, Bangkok, Thailand
30 Aug.-2 Sept. 1965

J.
Chairman: Dr. Lee, Bong Nai (Korea)

Fare	516.10	
Subsistence, etc.	209.00	275.10

Vice-Chairman: Mr. Soong Min Kong (Malaysia)

Fare	127.70	
Subsistence, etc.	173.00	300.70

Member: Mr. K. Gopinatha Pillai (India)

Fare	363.00	
Subsistence, etc.	188.00	551.00

		<u>Expenditure</u> US\$	<u>Budget</u> <u>Estimates</u> US\$
B.	<u>PRINTING</u>	2,022.55	3,950.00
	IPFC 11th Proceedings Sect. I & III (part)	1,629.74	
	Regional Studies	51.44	
	C.A.B. 42, 43, 44	125.00	
	Distribution	126.22	
	Miscellaneous charges	90.15	
C.	<u>MEETING</u>		
	No Council Session occurred in 1965.		
D.	<u>MISCELLANEOUS</u>	1,459.12	1,500.00
	Postage & Telegrams	656.54	
	Stationery & Office Supplies	777.93	
	IPFC Expenditure, New Delhi	7.00	
	Sea Freight	24.65	

ii. IPFC Statement of Expenditure for Jan.-Dec.1966 (est.)

		<u>Expenditure</u> <u>(estimated)</u> US\$	<u>Budget</u> <u>Estimates</u> US\$
A.	<u>EXECUTIVE COMMITTEE TRAVEL</u>	1,555.80	1,500.00
	39th ExCo Meeting, Bangkok, July 1-4, 1966.		
	Chairman: Dr. Lee, Bong Nai (Korea)		
	Fare	516.00	
	Subsistence, etc.	139.00	655.00
	Vice-Chairman: Mr. Soong Min Kong (Malaysia)		
	Fare	127.70	
	Subsistence, etc.	127.00	254.70

		Expenditure (estimated) US\$	Budget Estimates US\$
Member: Mr. K. Gopinatha Pillai (India)			
	Fare	363.00	
	Subsistence, etc.	151.00	514.00
40th ExCo Meeting, Honolulu, 1-2 Oct. 1966			
	Subsistence allowance only	88.00	
41st ExCo Meeting, Honolulu, 18 Oct. 1966			
	Subsistence allowance only	44.00	
B.	<u>PRINTING</u>	3,299.19	2,000.00
	IPFC 11th Proceedings		
	Sect. III part, Sect. II	2,099.19	
	C.A.B. Nos. 45, 46 est.	100.00	
	Distribution	1,000.00	
	Miscellaneous charges	100.00	
C.	<u>MEETING (est.)</u>	800.00	400.00
	IPFC 12th Session, Honolulu		
	Sea Freight Documents	.452	
	Bangkok-Honolulu-Bangkok		
	Air Freight on Documents	230	
	Miscellaneous charges	118	
D.	<u>MISCELLANEOUS</u>	1,660.00	1,500.00
	Postage & Telegrams (est.)	850	
	Stationery, Office Supplies (est.)	810	

II. IPFC Budget Estimates 1967, 1968

In order to give a more realistic view of the situation and to ensure that adequate funds are available to permit the Executive Committee, subject to Council's approval, to reinstitute the older practice of convening for its statutory meetings in places other than FAO Regional Office, Bangkok, it is proposed that provision for the 42nd and 43rd Executive Committee Meetings should be increased to US\$2000 for each meeting.

Provision has also been made for two brief pre- and post-session meetings in connection with the Council's 13th Session.

The anticipated cost in relation to printing should be mostly absorbed during 1967.

Provision has been made for issuance in 3 separate parts of the 3 sections of the Proceedings. It is difficult for the Secretariat to estimate the amount of material which will be received for the 12th Session but there is every indication that the report on the Symposium, Section III of the Proceedings, will be quite voluminous and carry with it a number of important appendices. Accordingly expenditure up to US\$3,750 is anticipated.

Three issues each year of the Current Affairs Bulletin and up to 5 issues each year of IPFC Regional Studies are provided for. An estimate of distribution cost is also entered.

Under Item C. Meeting Costs, while no session is scheduled for 1967 the amount estimated for the 13th Session 1968 has been increased to avoid the kind of underestimation which occurred in connection with the 12th Session estimates.

Under Item D. Miscellaneous, no increase in general expenditure is anticipated and provision is made for an allocation of US\$1500 for each year of the biennium.

II. IPFC BUDGET ESTIMATES

NORMAL RECURRENT EXPENDITURE

1967-1968				US \$
A. <u>EXECUTIVE COMMITTEE TRAVEL</u>				4,162
1967 42nd Executive Committee Meeting	\$2,000			
1968 43rd " " "	\$2,000			
44th " " "	Per diem only \$108			
45th " " " " "	\$54			

US \$

B. PRINTING

6,600

	<u>1967</u>	<u>1968</u>
IPFC 12th Session Proceedings 1400 copies	3,750	-
Current Affairs Bulletin, 3 issue x 750 "	250	250
Regional Studies (say) 5 issues x 750 "	500	500
Distribution Costs	<u>1,000</u>	<u>350</u>
	5,500	1,100

C. MEETING COSTS

No Session scheduled for 1967

Costs for 13th Session 1968 750

D. MISCELLANEOUS

3,000

Postage, Stationery, Office Equipment 1967-1968

III. IPFC Working Parties and Sub-Committee Expenditure 1966

At its 39th Meeting held in Bangkok, July 1966, the Executive Committee recommended that the Statement of Expenditure in connection with the Working Party on Trawling and the Working Party on Fresh Fish Preservation, both of which convened at the FAO Regional Office, Bangkok, during the year, should be presented to the Council and that an additional major item in the Budget for the period 1967-68 should be included to permit the Council to have some indication of the expenditure involved in convening such bodies.

Accordingly a Statement is appended hereto showing the approximate expenditure in relation to the two Working Parties which have already convened but for which final costings have not yet been determined and Estimates of Expenditure allowing for 3 working parties' meetings, one in 1967 and two in 1968 and one sub-committee at an appropriate time in the biennium has been provided for.

It has not been possible to obtain precise estimates of such costs but on the basis of the 1965 experience it is anticipated that such meetings, lasting not more than 4 days, should cost approximately US\$450 per person.

It will be realised that budgeting for such meetings cannot be incorporated in the IPFC budget, as described under Rule XI (2) of the Rules of Procedure.

In this connection, Article III, para 3 and 4, of the Agreement of the IPFC are relevant.

III. IPFC WORKING PARTIES AND SUB-COMMITTEES

EXPENDITURE 1966

US \$

A. WORKING PARTY ON TRAWLING, Bangkok, 27-30 June 1966

1,669

CHAIRMAN: Dr. A. Sribhibhad

MEMBERS:	Mrs. P. Caces Borja,	Fares, Excess Baggage etc.	\$298
		Subsistence	138
	Dr. S. Shindo,	Fares, Excess Baggage etc.	506
		Subsistence	138
	Mr. D. Pathansali,	Fares, Excess Baggage etc.	98
		Subsistence	138
	Mr. Tran Van Tri,	Fares, Excess Baggage etc.	123
		Subsistence	138
	Mr. K.G. Pillai,	Fares, Excess Baggage etc. (see ExCo 39th Meeting)	
		Subsistence	92

B. WORKING PARTY ON FRESH FISH PRESERVATION, Bangkok, June 5-8, 1966

\$3,141

CHAIRMAN:	Dr. K. Amano,	Fares, Excess Baggage etc.	\$506
		Subsistence	138
MEMBERS:	Mr. I. Petersen,	Fares, Excess Baggage etc.	202
		Subsistence	138
	Mr. Hee-Un Chang,	Fares, Excess Baggage etc.	663
		Subsistence	138
	Dr. J.A. Dassow,	Fares, Excess Baggage etc.	988
		Subsistence	184
	Mr. K.G. Pillai,	Fares, Excess Baggage etc. (see ExCo 39th Meeting)	
		Subsistence	92
	Mr. Min-Kong Soong,	Fares, Excess Baggage etc. (see ExCo 39th Meeting)	
		Subsistence	92

BUDGET ESTIMATES*

1967-1968

	<u>1967</u>	<u>1968</u>
WORKING PARTY MEETINGS 3, each of 5 persons, at Bangkok	\$2,250	\$4,500
SUB-COMMITTEE MEETING 1, of 12 persons, at Bangkok		\$5,400

*Based on estimate of average costs of US\$450 per person for a 4-day meeting.

CHAPTER II

RESOURCES

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A. INTERSESSION ACTIVITIES

I. REPORT OF TECHNICAL COMMITTEE I ON NATIONAL AND INTERNATIONAL ACTIVITIES

Introduction

This survey of activities in the IPFC Member Countries in the fields of fishery biology, oceanography, limnology and fish culture during the inter-session period 1964-1966, has been prepared by IPFC Technical Committee I on the basis of the reports of Member Governments and FAO. For fuller information, reference should be made to the original reports presented as Session Working Papers and this summary only attempts to highlight some of the significant trends or activities.

Information - General

A levy has been imposed on the Western Australian fishermen to provide finance for exploratory fishing and fishery development generally and the provision of an extension service.

The forecast service for fishing and sea conditions in Japan has been strengthened by the close cooperation of fishery research and information agencies. Initiation of the Cooperative Study of the Kuroshio and Adjacent Regions (CSK) is of special significance in the oceanographic and fisheries investigations in the country. In India a National Oceanographic Laboratory has been established as one of the national laboratories under the Council of Scientific and Industrial Research. A new fishery oceanography centre has been constructed by the U.S. Bureau of Commercial Fisheries in La Jolla, California.

Thailand has acquired nine research vessels (including one under construction) for oceanographic and fishery studies and established two new marine stations and a marine research aquarium. In the Philippines the launching of the United Nations Development Program/Special Fund (UNDP/SF) Deep Sea Fishing Development Project and the establishment of six marine biology laboratories were events of major importance. An Oceanographical Research Centre has been established in Flinders University, Adelaide, in South Australia. The New South Wales Government in Australia has expanded its fisheries activities since 1964 and appointed six additional biologists to conduct fishery investigations. The California Current Resource Laboratory of the U.S. Bureau of Commercial Fisheries (BCF) has commissioned a 171 ft research vessel with ample on-board laboratory facilities.

An interesting fishery biological research programme initiated during the period is the one on the alleged decline of whiting (*Sillago spp.*) in Shark Bay, Western Australia. The Hawaii Area, BCF, has completed a series of cruises in the Central Tropical Pacific as a preliminary to an investigation of the entire trade wind zone. A Cooperative Program of Studies on the Tuna Resources of the Pacific, has been established between this institution and the Fisheries Agency, Japan and an exchange of scientists of the two countries under this program is now under way.

An experimental oyster culture station has been established in New Caledonia. The construction of a marine and fresh-water aquarium for the Fisheries Research Institute at Penang in Malaysia is expected to be completed at least by early 1967.

In Japan further progress was made in the study of marine fish culture, and the propagation of molluscs and sea-weeds. Experiments in the cultivation of rainbow trout (*Salmo gairdneri*) in sea water and the use of warm effluents of power plants for fish culture were also conducted. A research program to develop new methods of brackish-and freshwater culture of pond fish has been initiated at the Oceanic Institute in Hawaii (U.S.A.).

The Central Institute of Fisheries Education in India, established with UNDP/SF assistance, has now developed into a major educational institution in the country and its diploma has been recognized as equivalent to a Master's degree in Zoology for purposes of appointment in fisheries departments.

Several symposia and meetings on fish culture problems, plankton culture, red tide and water pollution were organized during the period in Japan by the Japan Fishery Science Society, Oceanographic Society or Fisheries Production Increase Consultation Meeting.

The fisheries set-up in FAO underwent reorganization, following the decision of the Thirteenth Session of the Conference (1965). The former Fisheries Division has been raised to the status of a Department, headed by an Assistant Director-General, with two Divisions to start with, viz. the Fishery Resources and Exploitation Division and the Fishery Economic and Products Division. A Committee on Fisheries (COFI) consisting of thirty Member Nations of FAO, has been established. At its First Session (June 1966), the Committee set up a Sub-committee on the Development of Cooperation with International Organizations concerned with Fisheries and a Working Party on the Rational Utilization of the Fishery Resources of the Indian Ocean.

FAO convened a Conference of Plenipotentiaries on the Conservation of Atlantic Tunas in Rio de Janeiro, Brazil, in May 1966 and it prepared an International Convention for the Conservation of Atlantic Tunas.

Methodology and Techniques

The Council of Scientific and Industrial Research (CSIRO) in Australia made further progress in developing its fisheries data registry and data processing arrangements. The FAO Fisheries Data Centre, which is being strengthened, will besides storing the fisheries data of the International Indian Ocean Expedition (IIOE), eventually serve as a depository of data coming from UNDP projects executed by FAO.

In New Caledonia and French Polynesia (France) attempts were made to intercalibrate plankton nets. As a part of primary production studies using C^{14} , intercalibration of measurements were made in India. In Japan a new handy current meter was designed. The Hawaii Area, BCF, has installed a research sonar incorporating continuous transmission frequency modulated principles in one of their research vessels. It has also made the first

use of a two-man research submarine in inshore Hawaiian water and initiated electro-physiological experiments with live tuna. The use of balloons filled with hot air for spotting schools of tuna is being investigated by the Tuna Resources Laboratory of the BCF.

There were a number of new developments in the area of fish culture in the Region. In Japan a new system of fish culture in tanks with closed water circulation was developed. A splashless tank for transport of fish fry as well adults was designed in India. In Japan an automatic fish grader for use in hatcheries was evolved. Culture of fish in cages has been successfully introduced in the Philippines.

A new method of electrical treatment of industrial wastes was developed in India; it promises to be very effective and economical in pollution control.

In New South Wales, Australia a 16-ft. flat-bottom aluminium boat is being developed for electrical fishing in fresh waters.

Fishery Oceanography and Limnology

There has been a general expansion and intensification of oceanographic investigations in the Region. The IIOE and the CSK are two of the most important oceanographic studies carried out in the area. Many countries acquired new research vessels and established oceanographic or marine biological centres. The Japanese Society of Fisheries Oceanography held a Symposium on Kuroshio in the spring of 1965. In the U.S.A. two important programs of oceanographic studies, one, a long range investigation of the trade wind zone and the other a study of Pacific-wide oceanography are underway.

A survey of the benthic biomass along the western seaboard of Thailand was jointly sponsored by the Governments of Thailand and Denmark. Measurements of primary productivity in the sea continued in Indian and New Caledonia. In Australia the production of an atlas of surface conditions of waters surrounding the country, including monthly charts of surface temperature and salinity, is underway. In the U.S.A. an oceanographic atlas of the Pacific Ocean has been prepared.

Pre- and post-impoundment studies in connection with river basin development plans were undertaken in Thailand and Japan. Limnological studies of disused tin-mining pools which are being used for fish production in Malaysia are of special interest. Limnological investigations were also carried out in estuarine prawn ponds in Singapore.

Aquatic Resources Appraisal

Efforts were made to assess tuna resources in Australia and Japan. Surveys were conducted with aircraft and surface vessels for southern blue-fin tuna (*Thunnus thynnus maccoyii*) and other pelagic species in South-east Australian waters and for yellow-fin tuna (*Thunnus albacaris*) in Queensland waters. Air observations were made in Japan to estimate the population size of larval yellowtail (*Seriola quinquiradiata*) by estimating the quantity

of floating sea-weeds to which they attach. A cooperative research programme was carried out by four regional fisheries research laboratories and fourteen prefectural fishery experimental stations in the country to determine the effect of fishing larval yellowtail for culture from the southern and western regions of Japan. It was found that the mean annual population of larval yellowtail in these waters was about 200 to 800 millions and the removal of 20 millions of them annually would not adversely affect the resource. Other major studies of fish populations in Japan relate to crucian carp (*Carassius carassius*) in Biwa Lake, jack mackerel (Family: Carangidae) in the East China Sea, yellow croaker (*Pseudosciaena* sp.) in the East China and Yellow Seas, Pacific salmon (*Oncorhynchus*) in Central and South-eastern Alaska waters and fin-whale (*Balaenoptera physalus*) in the Antarctic Ocean.

A conference on Central Pacific Fishery Resources held in Hawaii in 1966 attempted to estimate the potential catch of three species of tunas from the Pacific as a whole.

In the Philippines, a general fishery resource inventory was initiated. An appraisal of the demersal fishery resources of the South China Sea is underway. Study of catch statistics in Thailand showed an average increase of 24 percent in total landings between 1960 and 1965.

Recent work on the Western Australian crayfish (*Panulirus cygnus*) fishery has shown that the fishable stock has in 1963 been reduced to a quarter of what it was before 1944. Preliminary assessments of prawns (*Penaeus* spp.) in Shark Bay (Western Australia) suggest that the exploitation rate is moderately high.

As a part of the FAO Indicative World Plan for Agricultural Development (IWP), the Department of Fisheries has initiated resource appraisals of developing countries. Work on the South Asia Sub-region is now in progress and study of other areas of Asia and the Far East is expected to commence shortly.

The FAO Department of Fisheries prepared an analysis of the status of the Antarctic whale stocks, which led to regulations of whaling operations.

Management of Fishery Resources

During the period, a number of regulatory measures were introduced in Australia to reduce the fishing effort or stabilize recruitment. Limitations of the number of fishing boats and number of crayfish pots per boat in Western Australia crayfish fishery appears to have halted the decline in seasonal catch. To control effort in the Shark Bay and Exmouth Gulf (Western Australia) prawn fisheries license limitation was imposed.

In Malaysia the size limit of the cockle (*Anadara granosa*) that can be harvested from natural or culture beds has been raised to 1.25 inches.

Fisheries development in river basin development projects attracted the special attention of fishery agencies in some of the countries. The inclusion of a fish-way and provision for research and observation facilities

have been approved in the Chowilla Dam project in Australia. In the Philippines and Vietnam dams have been stocked with carps or other species of fresh-water fishes to increase production.

The Atlantic salmon has been introduced into the land-locked waters of New South Wales in Australia. The Chinese carps (*Ctenopharyngodon idella*, *Hypophthalmichthys molitrix* and *Aristichthys nobilis*) and pond-smelt (*Hyponomoeus olidus*) have been introduced into Vietnam. The Philippines introduced Indian major carps (*Catla catla*, *Labeo rohita* and *Cirrhina mrigala*) from India. Besides continuing the annual importation of Chinese carps, Thailand introduced *Tilapia nilotica* from Japan and Japan introduced the sturgeon *Acipenser baeri* from the U.S.S.R. An experimental introduction of the frog *Rana catesbeiana* into Vietnam did not prove successful.

A general intensification of fish stocking operations in the Philippines is reported to have resulted in bigger and better harvests from lakes and reservoirs. Three lakes of the Dalat area and the Danhin reservoir in Vietnam were stocked periodically with the common carp (*Cyprinus carpio*). Salmon stocking operations continued in Japan.

Surveys to assess the extent of pollution caused by industrial effluents and sewage in some of the major river systems and bio-assay studies to determine their effect on fish and fish food organisms were carried out in India. Water pollution studies were continued also in Japan and the Philippines and efforts are being made to control their adverse effects on fishery resources. In the U.S.A., the Institute of Marine Biology in Hawaii is planning studies on the effect of water pollution in an enclosed tropical bay.

Fish Culture and Fish Disease Control

Fish culture research and development continued to be important activities in most countries of the Region. In Vietnam there was very rapid development of fish culture as a part of the national programme of rural reconstruction. A large number of personnel were given specialized training, demonstration farms were established in different parts of the country and farmers given increased assistance to step up production. In Japan fish culture in both fresh and salt water increased steadily, producing about 40,278 tons of fish in 1964, the important fishes cultured being eel (*Anguilla japonica*), yellowtail, common carp and rainbow trout (in order of importance).

Further work on induced breeding of fish was carried out in India, Thailand, Malaysia and the Philippines. As the Indian major carps, even when induced, breed only under certain atmospheric conditions, experiments were conducted in breeding them in air-conditioned rooms and under simulated rain conditions. Attempts are also being made to use mammalian pituitary or synthetic hormones for induced breeding. Experiments were conducted to increase the period of storage of common carp sperm. In Malaysia success was achieved in the induced breeding and rearing of the off-spring of silver carp (*Hypophthalmichthys molitrix*) and rohu (*Labeo rohita*). In Thailand the catfish *Pangasius sutchi* and in the Philippines the catfish *Clarias batrachus* were successfully induced to breed by hormone injection.

Thailand has initiated an important programme of selection of common carp for favoured characters. Several intergeneric and interspecific hybrids of cultivated fishes have been developed in India and experiments on hybridization of carp and salmon are reported from Japan.

In Malaysia, as well as in Thailand and in Hawaii (U.S.A.), the culture of the giant fresh-water prawn (*Macrobrachium rosenbergii*) has been tried with encouraging results. In Malaysia success was achieved in increasing survival at larval stage, but the reason for the high mortality at the final moult of larvae remains still unknown. In Thailand special efforts were made to extend rice field fish culture with satisfactory results. Fresh-water fish culture is steadily increasing in the Philippines and production from brackish-water fish ponds has been considerably increased by the adoption of Taiwanese practices, especially fertilization. The culture of *Mytilus smaragdinus* is spreading in the country.

An economical artificial feed for carps has been prepared with shrimps and harmful aquatic insects collected from fish ponds in India.

The use of grass carp (*Ctenopharyngodon idella*) for the control of pond weeds is being tried in a number of countries in the Region. In India it has been found to eradicate all aquatic weeds in ponds except some of the floating forms like *Pistia*, *Eichhornia*, *Nymphaea* and *Nelumbium*. A large winch-operated de-weeder was designed in India for operation in fish ponds.

The etiology and control measures of an eye disease in catla (*Catla catla*) and a bacterial ulcer in catla and rohu were studied in India. In Thailand the addition of oxytetracycline, vitamin B₁₂ and sodium chloride in the diet was tried as a means of controlling disease in pond-reared catfish, but the results are not yet conclusive.

The FAO World Symposium on Warm-water Pond Fish Culture held in Rome, 18-25 May 1966, enabled an appraisal of the major problems of warm-water pond fish culture and the Symposium made several recommendations for furthering fish culture research and development.

II. REPORT ON THE RESPONSE TO THE 11TH SESSION RECOMMENDATIONS

Introduction

The 11th Session of the Indo-Pacific Fisheries Council made a number of recommendations on subjects within the terms of reference of Technical Committee I. These are listed below in abridged form ^{1/}, appropriately grouped, with an account of action taken by various bodies to whom they were specifically directed.

^{1/} Cross references are made to the pages of Proc. Indo-Pac. Fish. Coun., 11, Sect. I (1965) where the full recommendations as approved by the Council are reported.

Committee Work

(i) Terms of Reference of the Technical Committees

The Executive Committee should consider making necessary changes in the terms of reference of the Technical Committees as would bring them into alignment with the distribution of functions in the FAO Fisheries Unit. (Proc. 11th Session: Sect. I, pp. 18, 44).

The Executive Committee considered this matter at its 39th Meeting at Bangkok, 1-4 July 1966 and adopted the terms of reference of the Technical Committees as proposed in the Council document IPFC/C64/WP7 and as the FAO Department of Fisheries is likely to undergo further structural changes, the Committee felt that there was no need at this stage for further revision.

(ii) Inter-Sessional Reports

The inter-sessional reports prepared by Member Governments should consist of a narrative section followed by a series of project summaries prepared in accordance with the outline prescribed. (Proc. 11th Session: Sect. I, p. 46).

The Technical Committee I members were requested to follow this format for the preparation of their consolidated country reports and a number of them have complied.

The Council's Executive Committee, however, in its 39th Meeting at Bangkok, 1-4 July 1966 felt that in cases where the preparation of project summaries was not possible narrative reports may be received.

Aquatic Resources Appraisal

(i) Trawling in Malaysia

The Council stresses the importance of keeping detailed records of trawling experiments in Malaysia and recommends that detailed study be made of the operations and research leading to the assessment of ground fish resources in relation to fishing intensity be undertaken and measures be taken to prevent the onset of over-fishing. (Proc. 11th Session: Sect. I, p. 24).

Malaysia started trawl fishing investigations in the northern part of the Straits of Malacca in early 1965, with the main objective of determining the nature of variations of catch rate, species composition and size distribution of fish in relation to depth, locality and time. Survey of prawn trawling grounds in Sabah was also continued. The preliminary results of these investigations have been analyzed and form the basis of two technical papers submitted for presentation at the 12th Session of the Council.

(ii) Working Party on Trawling

The Council established a Working Party on Trawling

- (a) to receive from Australia its computer program for analysis of trawling data and review this in the light of conditions prevailing in the countries of the Region, and to
- (b) promote the extraction and processing of data on trawling in the countries in the Region according to a standard plan.
(Proc. 11th Session: Sect. I, p. 24).

The Working Group met in Bangkok, 27-30 June 1966 and its report is included as a Council document.

(iii) Unit Fisheries

The Council recommended to Member Governments that they prepare catalogues of its unit fisheries as done by Australia and the Philippines.
(Proc. 11th Session: Sect. I, p. 40).

Catalogues of the unit fisheries of Japan and Thailand and of the unit fisheries shrimps and prawns in the IPFC Region have been prepared for presentation at the Current Session as Working Papers.

(iv) Stock Assessment

The Council established the following order of priority for attention to be given to each group in stock assessment work:

1. Tunas
2. Shrimps
3. Rastrelliger
4. Sardinella
5. Chanos

(Proc. 11th Session: Sect. I, p. 37).

The above order of priority appears to have been followed in the countries of the Region, within the limits of their resources, relative importance of fisheries and scope of current research programs.

(v) Tuna

The Council appointed a Working Party to:

- (a) assemble, as may be possible, such data as may serve for assessment of tuna stocks in the Region, and
- (b) formulate suggestions, to be placed before those Member Governments not engaged in tuna research, for special collection of material, measurements and observations on tunas.

(Proc. 11th Session: Sect. I, pp. 38-9).

Due to budget limitations, the Working Party could not meet during the inter-sessional period.

Collection and analysis of data for the assessment of tuna stocks and the study of their fisheries continued in Japan, Australia and India.

(vi) Shrimps

The Council requested Dr. Tham Ah Kow (Singapore) to prepare an IPFC Regional Paper for the FAO World Scientific Meeting on the Biology and Culture of Shrimps and Prawns, describing the unit stocks in the Region and the unit fisheries exploiting them, based on catalogues of unit fisheries and research project summaries prepared by Member Governments. (Proc. 11th Session: Sect. I, p. 38).

The Technical Secretary, Technical Committee I circulated to all Member Governments copies of proformae for the preparation of unit fisheries catalogues and project summaries in March 1965 and requested them to fill in and forward them to Dr. Tham Ah Kow. Dr. Tham has prepared a paper on the Unit Stocks of Shrimps and Prawns in region and the unit fisheries exploiting them (WP5). The meeting is proposed to be held 12-24 June 1967, probably in Mexico City.

(vii) Rastrelliger

The Working Party established on *Rastrelliger* was asked to:

- (a) plan and describe a *Rastrelliger* catch sample system to be subsequently implemented by each country;
- (b) prescribe catch and effort statistics to be collected;
- (c) determine appropriate methods of analysis of the data arising from (a) and (b);
- (d) indicate appropriate lines of laboratory work (e.g. methods of age determination) to be undertaken;
- (e) indicate the work necessary for stock identification, and
- (f) determine the steps to be taken to pool the resulting data for presentation at the 12th Session.

(Proc. 11th Session: Sect. I, p. 38).

Due to budget limitations, the Working Party was not able to meet during the inter-sessional period. Studies on *Rastrelliger* were continued in a number of countries in the Region, especially the Philippines, Thailand, Malaysia and India, but no major advances in the methodology of investigation or resource assessment are reflected in the country reports. In Thailand and the Philippines attempts were made to identify the stocks of mackerel by analysis of morphometric characters. In Malaysia unsuccessful attempts were made to use length-frequency data in determining age and growth. Both Thailand and Malaysia have submitted technical papers on this subject for presentation at the Council's 12th Session.

Investigations on *Rastrelliger* fisheries are expected to be included in the program of the Cooperative Study of the Kuroshio and Adjacent Regions (CSK) fishery studies.

Research, Methodology and Techniques

(i) Indian Ocean Fishery Resources

The Council resolved to request FAO in consultation with appropriate other UN bodies to examine the feasibility of designing and funding a program of fishery oceanography for the Indian Ocean. (Proc. 11th Session: Sect. I, pp. 36-7).

FAO has provided the services of a fishery oceanographer to East Pakistan and one will soon be assigned to work from Aden under the United Nations Development Program/Special Fund (UNDP/SF) assisted projects. Under a United Nations Development Program/Technical Assistance (UNDP/TA) project, an oceanographer is working on the West Coast of India.

FAO's Committee on Fisheries (COFI) at its First Session in Rome, 13-18 June 1966, considered the question of the rational utilization of the pelagic fishery resources in the Indian Ocean and appointed a Working Party to examine this matter in detail. The Working Party is expected to meet in January 1967 and it is likely that the study of fishery oceanography of the Indian Ocean will also be discussed at this meeting.

(ii) IOBC

The Council hoped that the Indian Ocean Biological Centre (IOBC) would continue its activities after the end of the International Indian Ocean Expeditions (IIOE) and encouraged the United Nations Educational, Scientific and Cultural Organization (UNESCO), together with FAO and the Government of India, to seek ways and means of ensuring this. (Proc. 11th Session: Sect. I, p. 37).

UNESCO and the Government of India have given the necessary assistance for the IOBC to attain a stable status.

(iii) UNESCO Regional Meeting (Marine Sciences Experts)

The Council resolved to recommend to Member Governments that they make it possible for senior fishery officers to attend this meeting. It is also recommended to the Special Committee on Oceanic Research (SCOR) that it arrange, if possible, for its Liaison Officer with the Advisory Committee on Marine Resources Research (ACMRR) to attend this meeting. (Proc. 11th Session: Sect. I, pp. 37-8).

The meeting was well attended by scientists from IPFC countries and fisheries problems related to cooperative programs were discussed in detail.

(iv) CSK

The Council believed that a series of national working groups should be convened at the earliest possible time, to prepare national fishery programs which could be considered at the next meeting of the National Coordinators. The Council also suggested to the Inter-governmental Oceanographic Commission (IOC) that the terms of reference of the Fishery Subject Leader should be revised in consultation with FAO. (Proc. 11th Session: Sect. I, pp. 34-5).

National fisheries programs for CSK have been prepared by Member Countries and used as a basis for the preparation of the regional fisheries program for this cooperative study. In order to facilitate discussion and coordination of this study, FAO has included in its 1966-67 budget funds for the travel of the Assistant International Coordinator for Fisheries, CSK. Mr. J.C. Marr, who was elected to this position at the Second Meeting of the International Coordination Group (Paris, 2-5 November 1965) has already visited a number of participating countries and discussed with fishery experts various matters regarding the program. The Third Meeting of the International Coordination Group for the CSK held in Tokyo, 18-20 August 1966 considered the results of these discussions. The program of CSK fisheries studies is expected to be finalized at the joint CSK/IPFC meeting to be held during the IPFC 12th Session.

(v) Cooperative Research Project in the South China Sea and the Sunda Shelf

The Council resolved to:

- (a) recommend the project to the attention of countries bordering the Sunda Shelf, especially Malaysia and the Philippines;
- (b) suggest that the Working Party appointed in connection with the compilation of data from tropical trawling operations might be able to assist in planning this project and interpreting its results, and
- (c) to request FAO and UNESCO to give all possible assistance to the project.

(Proc. 11th Session: Sect. I, pp. 32-3).

No specific action appears to have been taken on this recommendation. However, the International Coordination Group for the CSK, at its Third Meeting in Tokyo, 18-20 August 1966, has recommended adequate coverage of the whole South China Sea area in its synoptic surveys.

Management of Fishery Resources

(i) Pollution

The Council resolved to

- (a) emphasize to Member Governments the urgent need to review their policies in regard to the use of pesticides harmful to aquatic life;
- (b) urge on Member Governments the desirability of exploring more fully the possibility of developing control measures, not harmful to aquatic life;
- (c) request FAO to render all possible assistance to Member Governments in this regard, and
- (d) request FAO to make available to Member Governments the documentation on pollution control in Europe and North America and urge on them the desirability of adopting codes presented in them.

The United States has adopted the Federal Water Quality Control Act of 1965, which requires the establishment of water quality standards for all inter state and coastal waters. Standards of quality may be based on protection of public health or welfare, enhancing the quality of water, and take into consideration their use and value for public water supplies, propagation of fish and wildlife, recreational purposes, agriculture, industry, and other legitimate uses.

A comprehensive program to monitor levels of pesticide residues in fish and wildlife, soil, water, etc., in the United States has been approved by the Federal Committee on Pest Control. The Department of the Interior will monitor fish for pesticide residues to obtain information about the aquatic environmental conditions in which fish live.

The Government of the Philippines has passed a Water Pollution Control Commission Law to deal with the increasing cases of water pollution in the country.

Under a Special Services Agreement with FAO (Legislation Research Branch) and an International Legal Studies Fellowship awarded by the University of California School of Law, Berkeley, U.S.A., Mr. E.R. Malakoff prepared a preliminary version of a study on national legislation and policy concerning water pollution control (Water pollution control: national legislation and policy - A comparative study by E.R. Malakoff, FAO, Rome, ii + 64 p., 1966).

The Expert Committee on Water Pollution Control appointed by the World Health Organization (WHO) to review the most important problems of water pollution control and to advise on appropriate corrective measures; to evaluate progress and trends in measures for the control of water pollution and to identify broad areas where there is a need for investigation and research into the scientific, technical, economic, social and administrative aspects of such problems; and to formulate recommendations for national and international action,

met in Geneva from 6 to 12 April 1965. The views of this Expert Committee are contained in the WHO Technical Report Series No. 318 (Water Pollution Control - Report of a WHO Expert Committee, WHO, Geneva, 1966: ii + 32 p.).

Under a UNDP/TA project the services of a Water Pollution Expert are being made available to India by FAO for a period of four months at the first instance.

While the codes followed in North America will be of interest to the IPFC, it is recognized that the codes suitable under conditions in the Region have to be worked out.

Fish Culture and Fish Disease Control

(i) Tropical Fish Culture Research Institute, Malacca

A careful examination should be made of the possibility of maintaining this Institute as a centre for international action in training and research. (Proc. 11th Session: Sect. I, pp. 27-28).

FAO approached selected philanthropic organizations for financial support to expand and internationalize the Institute and a number of universities and research institutes to ascertain their willingness to act as managing agency for it. As at the present stage, none of the organizations approached was willing to consider support for the Institute, a draft request has been prepared for UNDP/SF assistance for an initial period of five years. However, concrete evidence of the interest of the governments of the Region and their commitment to run the Institute on a continuing basis after the initial period of SF support may be essential for UNDP/SF to consider such a request. Two universities in the U.S.A. have expressed interest in acting as managing agency, should the Institute be internationalized.

(ii) Induced Spawning of Fish

The Council resolved to request FAO to organize through the United Nations Technical Assistance Program a Regional Training Centre on induced spawning of fish through hormone injection, preferably not later than 1967. (Proc. 11th Session: Sect. I, p. 32).

Due to lack of budgetary provision, it has not been possible to organize the Regional Training Centre. However, a Group Fellowship Seminar/Study Tour on genetic selection and hybridization, which will also include induced breeding is scheduled under Category II, to be held in the U.S.S.R. in 1967.

III. REPORT OF THE WORKING PARTY ON TRAWLING

Introduction

At its 11th Session held in Kuala Lumpur, 16-31 October 1964, the Indo-Pacific Fisheries Council established a Working Party on Trawling consisting of:

Dr. Arporn Sribhibhadh, Thailand - Chairman
Mr. K. Gopinatha Pillai, India
Dr. Sigeaki Shindo, Japan
Mr. D. Pathansali, Malaysia
Mrs. Priscilla Caces-Borja, Philippines
Mr. J.D. Bromhall, Hong Kong
Mr. Tran Van Tri, Vietnam

All members of the Working Party attended the meeting except Mr. J.D. Bromhall, who was unable to attend, having left the Hong Kong Government service and returned to England.

The Working Party conducted the early phases of its work by correspondence and through the courtesy of the Regional Representative for Asia and the Far East of the Director-General of FAO, facilities were made available for the Working Party to convene in the Far East Regional Office of FAO, Bangkok, from 27-30 June 1966.

Dr. T. Yamamoto, Regional Statistician for Asia and the Far East attended the meeting as Consultant.

The Working Party conducted its discussion in the Staff Meeting Room of the FAO Far East Regional Office except that the morning of Tuesday 28th June 1966 was occupied by an inspection of the Bangkok Fish Market, Yanawa, where trawlers and their landings were seen and the Chairman, Dr. A. Sribhibhadh conducted an inspection tour of the Marine Fisheries Research Laboratory, Department of Fisheries, explaining the structure and operation of current research in connection with the trawl fisheries of the Gulf of Thailand.

Documentation

The meeting had before it a number of documents and included in these documents was a letter from Dr. G.L. Kesteven, Assistant Chief of Division, Fisheries Division CSIRO, Australia, giving some suggestions as to the plan of action which the Working Party might like to follow and a Proforma Inventory of Data designed to show what types of information were at present being collected in the various countries of the region. A copy of this Proforma is appended to this report (See p. 58).

The Working Party also had before it a manuscript paper prepared by Dr. Klaus Tiews, forecasting possibilities for future developments in South East Asian fisheries including the development of trawling.

Of considerable interest to the Working Party were FAO Fisheries Circulars Nos. 63, 64, 78 and 90 (draft).

It was considered however that the scope of the information required in the proformas described or referred to and in the circulars was somewhat too elaborate for them to be adopted immediately by most of the countries in the region. The adoption of these or similar i.e. modified if necessary to meet specific local or regional requirements, proformas was a goal to aim at, but in the meantime a start in recording essential data might be made on a much simpler basis. The detailed compilation proformas should be adopted by all Governments as and when the administrative machinery, staffing and organization permitted, and Governments might consider taking immediate steps towards the attainment of this objective.

Inventory of Data (See p. 63).

In examining the consolidated inventory of data, the Working Party noted that virtually all countries in the region maintained some records of trawl fishing although in certain instances these records related solely to government operations either in the field of research or of exploratory fishing.

In most cases the inventory showed a clear recognition by Member Governments of the need for reliable data on the trawling industry and was a valuable guide to the Working Party in its deliberations.

It was also evident from the discussions that the majority, if not all countries of the region, had considerable hopes for the development of trawling enterprises within the adjacent and neighboring waters. But such development was contingent upon a number of factors, not the least being the antagonism to such development by established inshore fisheries.

The Working Party was fully aware of the different uses to which data concerning the trawling industry could be put, particularly the need for fisheries administrative services to be aware of the level of development and rate of progress of the industry as and where appropriate, the need to introduce control measures to ensure the most efficient management of the resources.

It was recognised that the industry itself, supplemented by research activities, could yield valuable data leading to an assessment of the available stocks of fish and the effect of the fisheries upon these stocks.

A knowledge of both factors was essential for administrative purposes since this would guide both the preparation and implementation of fisheries development plans.

From the discussions it emerged that the data to be collected fell within three major categories:

- (a) Official records, including such items as registers of vessels and gear which would be maintained by government authorities concerned.
- (b) Records of actual fishing operations, to be maintained by the industry itself and of the results of these operations, derivable in part or whole from marketing organizations.
- (c) The results of the research activities, which would be expected to add further refinements to the frequently rough or gross data compiled on the basis of Government and industry records.

Terms of Reference and Future of Working Party

The Working Party in reviewing its terms of reference and bearing in mind its own discussions which demonstrated the marked lack of data noted that it was unable to fulfil the requirements of its terms of reference.

Concerning the Australian Computer programme, the Working Party noted the comments of Dr. G.L. Kesteven (in litt) that "There is not just a single programme to be made available by us, which then can be used to process trawl data of any kind whatsoever. On the contrary, one needs to know the characteristics of the data to be processed and the end results to be got from them (in the sense chiefly of what tabulations are required) before one can decide whether existing programmes can serve or new programmes must be written. It was in the light of this position that we suggested to you the preparation of an inventory of trawler data.

The next point is that a computer programme can be usefully transmitted from one unit to another only if the person on the receiving end has the equipment and the services of specialist personnel to be responsible for transference of data onto cards or tape and then for operation of the computer equipment with the programme and the deck of cards or data tape. As indicated in the statement by Mr. Stark a list of the FORTRAN statements of Dr. Claringbold NANOVA programme can be forwarded to anyone that would wish to have it and would be able to make use of it".

Further it was realized that, despite the length of the list of published papers on trawling in tropical waters (IPFC Occ. Pap. 64/4, 1964) virtually all of the items included refer to exploratory fishing or research operations and there are almost no published records of trawling operations covering relatively extensive periods of time or area of sea.

The Working Party has drafted recommendations which it believes will create an atmosphere suitable for the establishing and functioning of a Working Party as envisaged in the present terms of reference.

The primary requirement is, of course, the establishment at national level of data collecting systems to ensure the availability of the essential information.

Second, the extraction and processing of the data should be done according to a standard plan, it being realized that the mechanical operations concerned may not necessarily for an appreciable period of time, contingent on the rate and extent of development and overall coverage of the data collecting systems involve recourse to computer analysis.

The Working Party noted therefore that it will not be able to meet the requirements of receiving compilations and collecting, studying and reporting thereon to the Council.

The Working Party was of the opinion that it would be difficult for it as constituted to "promote the extraction and processing of data" and to "ensure that the operation was conducted as far as possible according to a standard plan". It considered that these objectives, being dependent upon the extent to which Governments might adopt appropriate recommendations, could best be achieved on a basis of advice officially communicated to Governments by the Council itself.

Accordingly, and subject to the Council's review of the recommendations contained herein, subject also to the Council's decision as to whether or not its term of reference might be modified or amended to permit it to bring its competence more specifically to bear on the primary problems of initiating the use in some cases or extending in others the proposed system of data collection and compilation, the Working Party proposes that this Report be considered its First and Final Report.

Recommendations

The following recommendations are based on the Working Party's assessment of minimum requirements of data, the analysis of which may be of value in assessing the extent, rate of progress and general trends of the trawling industry.

It is understood that individual Governments may wish to extend the coverage in more detail for their own records and the proposals given below should not be interpreted as placing any restriction on efforts to collect and collate specific information relating to any or all parts of the Industry

(i) Government Records

Basic records concerning the structure of the industry should of course be maintained by Governments and one step towards this would be the institution and maintenance of continuing records along the following lines:

- a. Vessels. It is recommended that a Register of (Licensed) fishing vessels be established and that individual registry cards be maintained for each commercial fishing vessel. Such cards as a minimum should contain information on:

Date of issue of Licence
Name of boat
Licence or Registry Number
Name and address of owner
Fishing base
Length OAL
Tonnage G.T.
Type and make of engine
Horse power
Type and make of winch
Crew number
Gear used

- b. Gear. Governments should establish a basic list of fishing gears, essentially for compilation purposes and particularly where provision may not exist for the direct licensing of such gear.

For trawling operations it is recommended that the following major categories be specified in this list:

Otter trawls
Beam trawls
Pair trawls
Spread sailing trawls
Danish seines

These gears are described in considerable detail and various varieties specified in the FAO Catalogue of Fishing Gear Design, Food and Agriculture Organization of the United Nations, Rome, 1965. The sole exception is the spread sailing trawl, a gear used in many areas of the China Sea for which the vessels are sail-driven and the spread of the net is obtained by attaching the warps to two long spars, extending fore and aft from the vessel which moves laterally with the sail or sails close hauled.

(ii) Industry Records

The Working Party considers it is essential that the industry itself should participate in the maintenance of records and contribute on this basis towards its own welfare and management.

Fishing Log Books. The Working Party strongly recommends the installation of an official Log Book System, possibly with appropriate regulatory safeguards and requirements. Such a step could contribute eventually to the total enumeration, for statistical purposes, of the essential data from the industry and may be achieved through the convinced and active participation of the operatives of the industry. Such log books should be designed to give the following information:

- A. Name and Licence (Registration) No. of vessels.
- B. Location of operations (Fishing grounds, based on an accepted grid system).
- C. Depth at beginning of each haul.
- D. Duration of each haul.
- E. Retained catch of each haul (by weight or container).
- F. Total quantity of each species or group of species per cruise.
- G. Type and size of gear used.
- H. Weather observations.
- I. Loss of time at sea.

Market Records: Market operatives including fish dealers should maintain detailed records or submit returns daily which should contain the following information:

- Name and registration No. of each boat.
- Quantity and price obtained for each species or group of species.

(iii) Standardization of Compilation Forms

Compilation of statistics for analysis either manual or through computer should be such that the form used is common to all countries or the region.

While recognising the current problems involved and the difficulties to be met in developing systems of data collection and compilation which will give the detailed information essential to the proper appreciation and management of the trawling industry, the Working Party considers that immediate action should be taken to draw up suitable forms for use in the region.

The three major areas in which agreed categorisation of information is required are:

- a. Fishing craft
- b. Fishing gear
- c. Fish and other aquatic products e.g. ISSCAAP*

The Working Party proposes that the Council examine the possibility of establishing a Working Party or Sub-Committee specifically to examine this question and draft the appropriate recommendations.

(iv) Derivation of Conversion Factors

The Working Party, noting that there were extreme variations in type, size, and efficiency of vessels and gear used in the trawling industry and recognising that the adoption of one or a few standard vessels and/or gears

*ISSCAAP - International Standard Statistical Classification of Aquatic Animals and Plants.

could not be expected, emphasised the need for the organization of a series of fishing trials and experiments which could result in the derivation of a series of conversion factors relating to the efficiency levels of the various items concerned to a selected standard.

This approach is regarded as essential, if a realistic stock assessment is to be achieved.

(v) Research Monitoring and Standardization of Reports on Research

The Working Party, recognising that research studies incorporating test fishing, and studies similar to those at present being conducted by the Deep-Sea and Offshore Fishing Stations in India and the Department of Fisheries of Thailand and other fisheries authorities could serve valuable purposes in monitoring the effect of the changes in the environment and of the commercial fisheries upon the available stocks of trawled fish in the areas concerned, considered that the Council might well recommend to Governments to examine the possibility of establishing a programme of regular monitoring cruises by their research vessels. These cruises should follow a defined pattern and be so designed as to ensure the minimum of variation in the various factors involved, e.g. all tests should be made with standard nets for a standard time at a standard speed.

The Working Party considered that pending the development of the kinds of statistical collecting and compiling systems indicated above, such repetitive monitoring could yield valuable information on the industry, particularly to indicate major trends and availability of stock.

Consistent with the above program, the Working Party emphasised the need for research vessels conducting this type of operation to ensure that the reporting of their results not only of fishing operations but of ancillary environmental and biological studies should be standardised in order to permit comparison and correlation of the results between countries of the region.

The Working Party therefore proposes that the preparation of an appropriate standard reporting system for such monitoring operations be included in the terms of reference of the Working Party or Sub-Committee proposed under iii, Standardization of Compilation Forms.

DRAFT

INVENTORY OF DATA

1. Name of Vessels:

2. Period of Operations, from , to

3. Lapsed time years months days

4. Area of operations

Data:

5. On vessels: a. General b. Detailed

6. Standing Gear: a. General b. Detailed

7. Fishing Gear: a. General b. Detailed

8. Fish catch

8.1 Record is: a. only of total for entire lapsed time

b. total for each cruise

c. for each haul

8.2 Record relates to: a. entire catch

b. retained catch only

8.3 Record of retained catch is of:

a. total amount, all species together

b. amount, each of certain species

c. amount, each of all species

8.4 Record of rejected catch gives:

a. only gross amount, all species

b. amount, each species

8.5 Amount of catch:

a. estimated

b. measured with container(e.g. basket)

c. weighed

8.6 Identification of species:

a. by fishermen

b. by fishermen assisted by scientist

c. by scientist

8.7 Trash material (sponges, corals etc.): a. is estimated

b. is measured

c. is identified

9. Fishing Effort

9.1 Record shows: a. only total lapsed time of operations

b. duration each cruise

c. time spent on fishing grounds

d. time at beginning and at end each haul

9.2 Record gives explanation of lost time at sea:

a. yes ☐

b. no ☐

10. Location of operations

10.1 Record shows, a. the area fished ☐

b. site of each haul ☐

10.2 Record shows, for the site of each haul:

a. position at beginning ☐

b. position at end ☐

c. both positions ☐

10.3 Position, in 10.2, is shown as:

a. bearings on landmarks ☐

b. latitude and longitude ☐

10.4 Depth of water, record gives:

a. no information ☐

b. depth at beginning of haul ☐

c. depth at middle of haul ☐

d. depth at end of haul ☐

11. Nature of Bottom

- 11.1 Record shows: a. no information ☐
- b. information for some hauls ☐
- c. information for all hauls ☐

12. Weather

- 12.1 Record shows: a. no information ☐
- b. information for some hauls ☐
- c. information for all hauls ☐

12.2 Record of: wind strength ☐ wind direction

air temperature ☐

cloud ☐

13. Amount of Information

13.1 Number of cruises:

13.2 Number (approximately) of hauls:

preferable this question should be answered with a table as follows (and photocopy of a representative sheet of records):

Cruise Number	Number of Days Absent	Number of Hauls

Country

Inventory sheet compiled by

Date:

Note

1. Apart from items 1 to 4, this inventory sheet is to indicate only the availability or not, in the records of trawling operations, of various kinds of data. The data themselves can be given in sheets attached to the inventory, either completely, as can be done for items 5 to 7, or by copies (e.g. photostat) of the record itself (for items 8 to 12).
2. A separate inventory sheet should be used for each vessel, and if a vessel is operated under varying arrangements so that its records differ in character from period to period, a separate inventory sheet should be used for each period.
3. Answers in the boxes should be "yes" or "no", except for item 13.

INVENTORY ANALYSIS

Based on an Inventory of Trawling Data drafted by Dr. G.L. Kesteven, Australia, the Working Party adopted an Inventory designed to show the types of information on trawling at present being collected or recorded by the countries of the region. The attached sheets show which items are recorded, to a greater or lesser extent by the countries of the region.

The following notes give some indication of the coverage at present achieved by the countries:-

Korea: has a reasonable good coverage based on statistics collected from the (K) industry, supplemented by research data.

Japan: as above for Korea. Very detailed records cover certain specified (J) fisheries or areas, e.g. Yellow Sea and East China Sea but Japan does not cover in detail the operations of small inshore vessels.

Taiwan: Good records of distant and offshore operations but does not cover in (Ta) detail small inshore operations.

Hong Kong: Good records obtained through Fish Marketing Organization for (HK) commercial operations and offshore fishing. Local inshore coverage not so detailed.

China (mainland): No reliable information on hand. (-)

Philippines: Data cover major categories for larger vessels, but are suspect (P) owing to tax problems. Some detailed data available from exploratory and research activities.

Vietnam: Coverage includes information provided by a few pairs of pair-trawlers (V) operating in Vietnam waters during recent years. Smaller (sailing) vessels yield no information at present, nor do the majority of pair trawlers, only about 40 percent of which are mechanized.

Thailand: Detailed data available only from Government research vessels. (Th) Some data, but generally lacking in detail, is obtained through a sampling programme.

Malaya: The position here is unsettled. Some data are obtained from the (M) limited number of licensed trawlers. There are however believed to be a large number of unlicensed vessels operating.

India: Except for prawn trawling, coverage is entirely from government
(I) operated vessels.

Ceylon: Coverage except for gross landings, entirely from government
(C) operated vessels.

Pakistan E & W.)	
(-))	
Singapore)	
(-))	
Burma)	No information available to the Working Party.
(-))	
Indonesia)	
(-))	

COUNTRIES RECORDING TRAWLING DATA

1. ON VESSELS

- 1.1 General: Ta, HK, V, I.
- 1.2 Detailed: K, J, Ta, HK, P₁/, V, Th, M, C.

2. FISHING GEAR

- 2.1 General: P, V, Th, I, C.
- 2.2 Detailed: K, J, Ta, V, M.

3. FISH CATCH

- 3.1 Record total for entire lapsed time: P, V.
 - 3.11 total for each cruise: K, Ta, HK, V, Th, M, I.
 - 3.12 for each haul: J, HK, P₂/, V, I, C.
- 3.2 Record relates to
 - 3.21 entire catch:
 - 3.22 retained catch only: K, J, Ta, HK, P, V, Th, M, I.
- 3.3 Record of retained catch is
 - 3.31 total amount, all species: V, I.
 - 3.32 amount each of certain species: V, Th, I.
 - 3.33 amount each of all species: K, J₄/, Ta, HK, P₂/, V, M, C.
- 3.4 Record of rejected catch gives
 - 3.41 gross amount, all species:
 - 3.42 amount, each species:

3.5 Amount of landed (retained) catch

- 3.51 estimated: P.
- 3.52 measured with container: K, J, Ta, P₃/, V, C.
- 3.53 weighed: HK, V, Th, M, I, C.

3.6 Identification of species

- 3.61 by fishermen: K, J, Ta, HK, P, V, Th, M, I.
- 3.62 by fishermen assisted by scientist: I.
- 3.63 by scientist: P₄/, C.

3.7 Trash material sponges, corals etc.

- 3.71 is estimated:
- 3.72 is measured:
- 3.73 is identified: J₄/, V.

4. FISHING EFFORT

4.1 Record shows

- 4.11 total lapsed time of operations: V.
- 4.12 duration each cruise: J, P, V, Th, M, I, C.
- 4.13 time spent on fishing grounds: J, HK, V, I, C.
- 4.14 time at beginning and end of each haul: P₃/, V.
- 4.15 number of haul: K, J, Ta, HK, P₂/, V, Th.

4.2 Record gives explanation of time lost at sea: Yes:

No: K, J, Ta, HK, P,
V, Th, M, I.

5. LOCATION OF OPERATIONS

5.1 Record shows

- 5.11 the area fished: K, J, P, V, Th, M, I.
- 5.12 site of each haul: P₃/, V, I.

5.2 Record shows for site of each haul

- 5.21 position at beginning: V.
- 5.22 position at end:
- 5.23 both positions: P₃/

5.3 Position is shown by

- 5.31 bearing on landmarks: P.
- 5.32 latitude and longitude: P, V, I.

5.4 Depth of water, record gives

- 5.41 no information: K, J, Ta, HK, P, M.
- 5.42 depth at beginning of haul: P₃/, V, I.
- 5.43 depth at middle of haul:
- 5.44 depth at end of haul:

6. NATURE OF BOTTOM

6.1 Record shows

- 6.11 no information: K, J, Ta, Th, M.
- 6.12 information for some hauls: HK, I.
- 6.13 information for all hauls: J₄/, P₃/, V.

7. WEATHER

7.1 Record shows

- 7.11 no information: K, J, Ta, HK, P, Th, M.
- 7.12 information for some hauls: I.
- 7.13 information for all hauls, J₄/, P₃/, V.

7.2 Record shows

- 7.21 wind strength: P, V.
- 7.22 wind direction: P.
- 7.23 air temperature: P, V.
- 7.24 cloud: V₅/, I.

- 1/ Tonnage, H.P. type, fuel used.
- 2/ If fisheries worker is aboard.
- 3/ When technician is on board.
- 4/ Research vessels only.
- 5/ Provided by few pairs of vessels.

IV. REPORT OF THE WORKING PARTY ON TUNA

The Council, at its 11th Session, appointed a Working Party on Tuna, consisting of:

Convenor: J.C. Marr (U.S.A.)
Members: J. Hynd (Australia)
 M. Legand (France)
 E.G. Silas (India)
 H. Yabe (Japan)

It was not possible for the Working Party to meet during the Inter-Session Period, owing to the lack of funds. By correspondence the following areas of interest were agreed upon:

1. Collection of catch statistics.
2. Study of subpopulations through blood group systems.
3. Study of migrations (etc.) through tagging experiments.
4. Collection of larval and juvenile tunas by (a) plankton nets and (b) billfish.

Events of general interest with respect to these items include:

1. Governor's Conference on Central Pacific Fishery Resources, Hawaii, 28 February - 12 March 1966. Using all available evidence, estimates were made of the maximum yield of yellowfin and bigeye in the tropical Pacific and skipjack in the eastern half of the tropical Pacific. It is expected that the Proceedings will be published by the end of 1966.

2. The Second Meeting of FAO Expert Panel for the Facilitation of Tunas Research, Japan, 15-21 August 1966. Subjects receiving emphasis at the Meeting included catch and effort statistics, collection and identification of larvae, identification of subpopulations, and studies of migrations. The Report of the Meeting will be published in the near future.

3. The 11th Pacific Science Congress Symposium on Biological Studies of Tunas and Sharks in the Pacific Ocean, Japan, 23-27 August 1966. Of particular interest was the report of trans-Pacific migrations (in both directions) of the North Pacific bluefin. The abstracts of the papers have been published.

Items of specific interest include:

1. Catch statistics: A cooperative study between the Nankai Regional Fisheries Research Laboratory (Japan Fisheries Agency) and the Honolulu Laboratory (U.S. Bureau of Commercial Fisheries) has resulted in the exchange of all available data for Pacific albacore. Analysis of these data is in progress. The Japan Fisheries Agency has published "Annual Report of Effort and Catch Statistics by Area on Japanese Tuna Longline Fishery 1963".

2. Subpopulation studies: A cooperative study between the Japan Fisheries Agency and the Honolulu Laboratory has recently been started. The subpopulation structure of skipjack, initially of the North Pacific, will be examined.

3. Migrations: Trans-Pacific migrations of bluefin have already been mentioned. An attempt to tag small albacore off the coast of Chile was abortive, owing to the lack of fish. Considerable interest exists in tagging experiments on several species and such experiments will probably be initiated within the next year or so.

4. Collection of larval and juvenile tunas: A Working Group of the FAO Expert Panel has prepared specifications of nets and methods for collecting larvae. Experimental work with large mid-water trawls for the capture of juveniles has commenced at the Honolulu Laboratory and examinations of the contents of billfish stomachs has yielded information on the distribution and growth of juvenile albacore.

V. REPORT OF THE WORKING PARTY ON *RASTRELLIGER*

The Working Party on *Rastrelliger* appointed by the IPFC at its 11th Session met with Mr. J.A. Gulland as adviser at Cronulla, Sydney, during the FAO/IPFC Training Centre on Mackerel and Tuna Research, 2 to 28 November 1964, and discussed the terms of reference of the Working Party and submitted its report (see p. 69).

Up to the time of reporting the Working Party is advised that no completed data forms have been submitted by any member country to the FAO Department of Fisheries or the IPFC Secretariat as recommended. However, the Working Party is aware that some member countries are conducting comprehensive programmes of investigation on *Rastrelliger* and recommends that the IPFC at its 12th Session ascertain from the member countries.

- (a) the types of investigations being conducted on *Rastrelliger*;
- (b) the types of data being compiled and available for analyses;
- (c) the types of analyses, if any, being carried out; and
- (d) the results of these analyses.

The IPFC could then from submissions on these points by member countries determine what further action needs to be taken regarding *Rastrelliger*.

The Working Party would also urge the FAO to give favourable consideration to the recommendation made by the FAO/IPFC Training Centre on Mackerel and Tuna Research at Cronulla, to supply member countries with fish measuring boards.

Stock Assessment of *Rastrelliger*

1. During the 11th Session of the IPFC held in Kuala Lumpur, Malaysia, from 16th to 31st October 1964, the Sub-Committee on Stock Assessment set up a Working Party comprising of Mr. D. Pathansali (Malaysia) convener, Dr. Deb Menasveta (Thailand) Dr. E.O. Tan (Philippines) and Dr. Than Ah Kow (Singapore), Members, to discuss at the FAO/IPFC Training Centre on Mackerel and Tuna Research to be held at Cronulla, Australia, from 2nd to 27th November 1964, with Mr. J.A. Guiland and other participants attending this Training Centre from the Indo-Pacific Region, problems on research with particular reference to the *Rastrelliger* fisheries.

2. The terms of reference decided upon were:

- a) to work out a catch sampling programme;
- b) to plan the collection of catch and catch/effort data;
- c) to look into the question of age determination;
- d) to decide upon methods of analysis of data collected for assessment of populations;
- e) to investigate methods on the identification of stocks;
- f) to submit the results of researches on *Rastrelliger* at the next Session of the IPFC.

It will be observed that the terms of reference are already covered by the "Report of the International Training Centre on the Methodology and Techniques of Research on Mackerel (*Rastrelliger*)" by S.J. Holt, 1959, FAO/EPTA Report No. 1095. Nevertheless, it was decided to revive discussions in the light of researches conducted since the first Training Centre and to present recommendations on the lines of research to be followed until the next Session of the IPFC.

3. Results of Discussions

It was generally agreed that it was unnecessary to go into the details of the terms of reference again as these had already been dealt with during the first Training Centre held at Bangkok, and also during this current Training Centre.

However, it was decided that lines of investigations should be continued as recommended in FAO/EPTA Report No. 1095 with particular emphasis on the study of catch, effort, length frequency, age and growth as these would provide the necessary data for assessment of *Rastrelliger* populations.

u. Recommendations

It is recommended that:

- a) member countries continue to pursue investigations on *Rastrelliger*
- b) investigations be directed towards the collection, compilation and on the study of:

- (i) catch statistics
- (ii) catch effort data
- (iii) length-frequency composition of catch
- (iv) age
- (v) growth and
- (vi) tagging

(i) Catch Statistics (Total Catch)

First of all to examine the present collection of catch statistics and to decide if these need be modified and/or improved. Catch should be recorded by area, by gear (giving percentage of *Rastrelliger* taken), and compiled in monthly units.

(ii) Catch/Effort Data

To determine what effort data are available and whether these need further improvements. Effort data should be compiled in conjunction with (i) above and a suitable or appropriate unit of effort decided upon. The best unit of effort recommended for purse seines is "searching time".

(iii) Length-frequency Composition of Catch

Sampling programmes to be conducted as frequently as possible - minimum number of samples should be at least one sample a month - and this should be compiled in the form recommended in Appendix 8, p. 85 in FAO/EPTA Report No. 1095 (modifications to this form were recommended at the FAO/IPFC Training Centre on Mackerel and Tuna Research and the new version of the form will be circulated). Copies of completed forms should be sent to the Chief, Fisheries Biology Branch, FAO Rome. Measurements of length-frequency should be dorsal extreme length (Appendix 5, and p. 73 defined as Lx, FAO/EPTA Report No. 1095). Conversion factors should be given where any other measure of length is used.

(iv) Age

Since it seems not possible to determine age by otoliths or scales, modes in length-frequency composition of catch should be examined to determine age.

(v) Growth

The growth rate could be determined by following the shift of the modes, in length-frequency compositions of catch, with time. It might be necessary to conduct more frequent sampling to determine the growth rate of fish like *Rastrelliger*, which is said to be short-lived, and with an initial rapid growth rate.

(vi) Tagging

If possible to initiate a tagging programme to determine migrations, stocks, growth and mortality rates.

5. As it was recommended that the first meeting of this Working Committee be held sometime after June 1965, to assess the progress of work with an expert on population dynamics in attendance to assist the Working Party, all colleagues engaged on *Rastrelliger* investigations are urged to make every effort to continue (or if necessary initiate) their programmes of research and to compile and to submit available data before this Working Party meets. It is hoped to widen the membership of this Party so as to include at least one member representative of each country actively engaged on *Rastrelliger* research.

It is hoped that this Working Party would be the first one to be set up in the series under the sponsorship of an International Agency for cooperative and coordinated research on fisheries in the Indo-Pacific Region, and this would require the active support and participation of IPFC.

B. COUNCIL PROCEEDINGS

I. INDIAN OCEAN RESOURCES

The Council noted that the FAO Committee on Fisheries at its 1st Session had considered the question of the Rational Utilization of the Fishery Resources of the Indian Ocean, had established a Working Party of selected countries to study this problem in detail and to prepare proposals for further action, and had requested that the views of the IPFC on the subject matter of the Working Party should be ascertained. The Council was informed that the Working Party would meet in Rome in January 1967.

The Council, in considering the fishery resources of the Indian Ocean, recognized four "sectors" of the Indian Ocean Fishery Resources and Industries; namely, (1) Asian-Australian Coastal, (2) African-Arabian Coastal, (3) Pelagic, and (4) Antarctic. Oceanographically, and with respect to pelagic resources, the Indian Ocean must be regarded as a single unit with the exception of the Antarctic, which, on geographic and other grounds, the Council decided to set apart altogether. In any case, the Antarctic is at present the responsibility of the International Whaling Commission and various other international bodies.

The coastal resources are, more or less, homogeneous from Port Elizabeth in Africa northward and then eastward around to Exmouth Gulf in Western Australia, and biologically could be treated as a single entity. However, assessment and management of these resources would have to be carried out in separate sectors; more especially, the resources of the East African and Arabian coasts would have to be treated separately from those of Asia and Australia. This would be because the stocks of the African coast are independent of those of the Asian coast and because their exploitation is carried out by a separate group of countries.

A major sector of the Indian Ocean resources consists of the tunas, marlins, sharks and other pelagic species of the high seas, and indeed it is with respect to assessment of these resources and possible management of their fisheries that this question has arisen. The Council felt that this group of resources required attention most immediately, but that promotion of the rational utilization of the Asian-Australian coastal resources also was a matter requiring attention.

With respect to both the coastal and pelagic sectors the Council's interest is primarily in the commercially important species and whilst this should not exclude from the investigations consideration of other species the Council considers that it should emphasize that in recommending investigations of resources it gives first priority to the commercially important species.

The Council was of the opinion that any body responsible for the programming and coordination of high-seas fishery investigations in the Indian Ocean would be in need of expert advice. It accordingly nominated Dr. F. J. Alder, Mr. R.S. Shomura, Dr. A. Suda and Dr. D. Menasveta to form a group of

experts for this purpose, with Mr. Shomura to act as Convenor of the group. The Council recommended to the Director-General of FAO that he call a meeting of the group in Rome in January 1967 so that its advice could be made directly available to the Working Party on the Rational Utilization of the Fishery Resources of the Indian Ocean and it requested the Convenor meanwhile to establish contacts by correspondence among the Members of the group to enable it to prepare for its proposed meeting. The Council requested the Director-General to make arrangements in consultation with the Chairman of the Council for such further meetings of the group as might appear to him to be advisable between January 1967 and the next Session of the Council.

Regarding the kind of international body (existing or new) needed to carry out the relevant investigations and to promote the rational utilization of the fishery resources, the Council saw three possible alternatives.

The first alternative was to take such steps as would be required to enable the Council itself to carry out the necessary work. The Council considered that it would be necessary that certain countries having a direct interest in the resources of the Indian Ocean but which are not at present Members of the Council should also participate in this work. If the Council were to carry out this work, these countries should be invited to become Members. The Council noted that under its present Agreement, Member Nations and Associate Members of FAO and such non-member nations of FAO which are Members of the United Nations could assume membership in the Council through acceptance of the Agreement, provided that in the case of nations not Members of FAO, the Council must admit them by a two-thirds majority of its membership.

With regard to investigations of the Fishery Resources of the Indian Ocean necessary for assessment of their potential and as a basis for rational exploitation, the Council was of the opinion that these would have to be carried out mainly by continuation, extension and better coordination of investigation programs already initiated by several of the interested countries. In the particular case of the pelagic species of the high seas, coordination and programming of the investigations could best be entrusted to a special subcommittee of the IPFC, if the investigations should become the Council's responsibility. To be prepared for such a contingency the Council accordingly decided to establish such a subcommittee, to be known as the Subcommittee on Pelagic High Seas Fishery Resources of the Indian Ocean, to consist of such Members of the IPFC as declared their interest in these resources. The Subcommittee would be convened by the Director-General of FAO in consultation with the Chairman of the Council, if and when such action appeared desirable to him in the light of the conclusions reached by the FAO Committee on Fisheries or its subsidiary bodies on this matter.

The Council was of the view that the programming and coordination of investigations into the high-seas fishery resources of the Indian Ocean, if undertaken under the aegis of the Council, should be considered as a cooperative research and development project within the meaning of Article IV, Paragraph e, of the Agreement. The Council further considered that the expenses incurred in this connection, especially those arising from the activities of the Subcommittee on Pelagic High Seas Fishery Resources of the Indian Ocean, the appointment of experts and other staff to assist in its work and from joint research activities that could not conveniently be charged directly to the participating countries, should be paid from a trust fund to be established in

accordance with Article VII, Paragraph 4, of the Agreement. Members of the Subcommittee should contribute to the trust fund according to a scale to be agreed by the Subcommittee on the basis of proposals to be submitted to it by the Director-General.

The alternatives to the proposals outlined above are, first, to establish a new intergovernmental body to deal with the pelagic high-seas resources of the Indian Ocean alone; second, to establish a new intergovernmental body to deal with all the fishery resources of that Ocean.

A new high-seas resources body would have a more limited membership than the IPFC would need to have, if it were to deal with these resources effectively. The new body could also, right from the beginning, make provision not only for the required finance, but also for the exercise of functions relating to the regulation or management of the exploitation of the fishery resources whereas such provisions would have to be introduced into the Agreement of the IPFC if it were to discharge the functions mentioned. The creation of a new body for the pelagic high-seas resources of the Indian Ocean would, however, have not only the disadvantages inherent in adding to the already considerable number of international fishery bodies, but would specifically make it necessary for eight (8) Members (Australia, Burma, Ceylon, India, Indonesia, Malaysia, Pakistan and Thailand) of the IPFC to participate both in its work and in the work of the new body.

The creation of a new body to deal with all of the fishery resources of the Indian Ocean would avoid the last-mentioned disadvantage, but would involve the bringing together of countries with widely divergent interests in regard to coastal and inland resources and with respect to problems of fish processing, marketing and various socio-economic questions while dividing the existing membership of the IPFC who have many common interests in these fields.

The Council felt it would be desirable to review the work now being carried out in the investigation of the coastal resources of the Indian Ocean and promotion of their rational exploitation, which, in the opinion of the Council, was best undertaken by groups of countries concerned, which, at least as regards the Asian-Australian resources, could be formed within the framework of the IPFC. The Council decided to put this question on the agenda of its next Session and requested the Secretary to assemble relevant information and to make it available to Member Countries.

In summary, and with reference to the points enumerated in Resolution COFI/1/2, establishing the Working Party on the Rational Utilization of the Fishery Resources of the Indian Ocean, the Council's observations and recommendations are as follows:

- (a) The whole area of the Indian Ocean, with the exception only of the Antarctic, requires attention; but the tunas, marlins, sharks and other pelagic species of the high seas require such attention more immediately.

- (b) The necessary investigations should be carried out mainly by continuation, extension and better coordination of existing programs of interested countries; they should be concentrated on commercially important species; expert advice will be needed and some will be available from a group of experts nominated by the IPFC.
- (c) Three alternatives exist regarding the body to carry out such investigations and these are examined in the Report of the Present Session of the IPFC; the Council has proposed or taken such action as would be necessary if the Council itself were to undertake this responsibility.
- (d) The Council has made financial proposals to be adopted in this case.
- (e) & (f) No special observations are offered on these points.

II. TRAWLING

The Council had before it the reports of the Working Party appointed at the Council's 11th Session (IPFC/C66/WP 11), and Technical Papers No. 2 by K. Tiews and No. 34 by Andhi P. Isarankura and Georg Kuhlmoorgen-Hille.

The Council recorded its appreciation of the efforts of the Working Party in compiling information on statistical data drawn from trawling operations in the IPFC area, and took note of several difficulties which the Working Party was unable to overcome.

Detailed discussion took place on Dr. Tiews' paper and on the results reported from Thailand. This discussion led to the following conclusions:

The Council decided to draw the attention of Member Governments to the considerable production obtainable from the demersal stocks of the continental shelf of Southeast Asia. Dr. K. Tiews had estimated that this production might be in the order of 6.5 million metric tons, basing this estimate on a yield of 35 kilograms per hectare per year, to be taken from an estimated 590,000 nautical square miles of continental shelf out to a depth of 50 metres. From evidence contained in the paper on the Trawl Fishery of Thailand, and other evidence elicited in the course of the discussion, the Council reached the conclusion that this estimate should be treated with some reservation. It was pointed out that the figure of 35 kilograms per hectare per year had been arrived at from the results of experimental trawling on what were virtually virgin stocks. The paper from Thailand showed that the catch per unit effort had declined since 1961 from 298 kilograms per hour to 179 kilograms per hour in 1965. It is possible that a further decline will take place considering that the industry is diligently seeking out the most productive grounds and over the past five years has shifted its operations. This decline almost certainly means that the sustainable level of production is somewhat

lower than the figure on which Dr. Tiews based his calculations. Furthermore, the figure used by him was drawn from operations on what was traditionally known to be the most productive part of the Gulf. There is abundant evidence within the Gulf of Thailand itself of variability of productivity between depth zones and within each depth zone. There will also be variability between different sectors of the Southeast Asian continental shelf. In the light of these considerations, the Council considered that it might be sounder to take a prospective yield at 1/2 or 1/3 of the figure of 35 kilograms per hectare per year. However, this still meant that there was likely to be available a total catch in the order of 2-3 million tons. Probably half of this would be of species for which there will be only industrial use, e.g. meals and fertilizers.

Whilst there is good evidence on which Governments could act to promote these fisheries, nevertheless it would be desirable to obtain data on which to base an improved estimate of the prospective total yield from these resources. Information should be obtained on the variability in space and from time to time of the productivity of these grounds. In addition, information should be obtained on the productive characteristics of the resource species to form the basis of estimates of sustainable yield. The availability, for each of the different grounds of this region, of a reliable account of geographic and seasonal distribution of the resources and of their productivity would enable Governments to formulate development plans with confidence and to avoid both undercapitalization and overcapitalization.

Accordingly the Council decided that the Working Party on Trawling should continue to function and that its membership should be:

Dr. A. Sribhibhadh (Thailand) Chairman
Mr. A. Stark (Australia)
Mr. A.S. Mendis (Ceylon)
Mr. B. Rao (India)
Dr. S. Shindo (Japan)
Mr. T.J. Koh (Korea)
Mr. D. Pathansali (Malaysia)
Mrs. P. Caces-Borja (Philippines)
Mr. W.L.Y. Chan (UK Hong Kong)
Mr. Tran Van Tri (Vietnam)

The terms of reference of this Working Paper should be as follows:

- 1) To compile data on yields from the various demersal grounds of Southeast Asia.
- 2) To promote the collection of statistics and to assemble sets of statistics drawn from trawling operations in the region.

- 3) To promote and as it sees fit to carry out an analysis and interpretation of the statistics.

It was noted that Dr. Deb Menasveta had been requested under the CSK programme to compile statistics on trawling on the Sunda Shelf fisheries, the Working Party was requested to collaborate with him.

III. BENTHIC STUDIES

The Council noted that relatively few studies of benthic communities had been made in the course of fisheries research in the Indo-Pacific region and indeed generally in the world. The Council considered that in view of the actual and prospective importance of benthic communities, steps should be taken to remove this deficiency and improve the situation. It was of the opinion that the current situation of this work was due largely to the cost of such research and to a failure, attributable to various causes, to develop and standardise the equipment and methods of such research; it was further of the opinion that the theory of benthic communities, especially of those of tropical and subtropical waters, was in need of development. The Council was of the opinion that many fishery programmes of the region would benefit if a programme could be instituted for:

- A. Improvement and standardization of equipment and methods of benthic research.
- B. Development of the theory of benthic communities, with special reference to those of tropical and sub-tropical waters.
- C. Provision of training in this field.

The Council requests the Director-General of FAO to draw the attention of UNESCO to this problem and to the views expressed by IPFC and to request UNESCO to ensure that these problems receive special attention within its programme of oceanography.

IV. INTRODUCTION OF EXOTIC SPECIES

The Council noted the real need of Hawaii to increase and improve its aquatic fauna and recommended for introduction on a experimental basis the following indigenous and exotic species of aquatic animals to meet the requirements of supplementing the existing live-bait species biological control of aquatic vegetation, improvement of food fish fauna and increased availability of forage organisms.

Potential live-bait fishes: Grey mullets (*Mugil spp.*, *Liza spp.*)
Milkfish (*Chanos chanos*)

Sport fishes: Indian Mahseer (*Barbus (Tor) tor*)

Biological control of aquatic weeds:	Grass carp (<i>Ctenopharyngodon idella</i>)
Shellfish as human food:	<i>Meretrix lamarckii</i> <i>Ostrea nippona</i> <i>Anadara subcrenata</i> , <i>A. granosa</i>
Forage animals of introduced species:	<i>Macrobrachium lanchesteri</i> <i>Macrobrachium rudis</i>

It was also felt that since the snappers and groupers introduced in the coastal waters have established themselves, more intensive stocking operations may help in building up larger populations. The Council also took note of the recommendations of the FAO World Symposium on Warm-Water Pond Fish Culture held in Rome, that a Central Registry of fish introductions be established and suggested that the Host Country furnish relevant information to this Registry when established.

V. RASTRELLIGER

The Council recommended to interested Member Countries that their existing research programme on *Rastrelliger* be strengthened and extended especially by adopting a common, agreed approach to the identified problems in particular endorsing the following lines of action:

1. A preliminary trial of tagging methods should be conducted in the current season by Ceylon, India, Thailand and Malaysia. The Delegate of Australia indicated that he could probably provide suitable tags for this operation.
2. A programme of aerial spotting, tagging and of biological and oceanographical observations should be initiated as from October 1967 and that for this purpose.
 - A. Preparations be initiated without delay to arrange for equipment, personnel, funds, etc., required for this operation and to draw up an outline work plan for it;
 - B. That a meeting be convened if convenient in April 1967 to establish agreement on the details of this operation; and
 - C. That an approach be made to Colombo Plan authorities to provide the services of aerial fish spotters and the loan of radio-telephone equipment for this programme.
3. That the results of these operations be reported to the IPFC at its next sessions.

4. That the Council appoint a Working Party to be responsible for the foregoing programme. This Working Party to consist of:

D. Pathansali - Malaysia
D. Menasveta - Thailand
L. Tisseverasinghe - Ceylon
G.N. Mitra - India (Convenor)
G.L. Kesteven - Australia

VI. TUNA

The Council decided not to reappoint the Working Party on Tuna. However, it endorsed the proposals on tuna taxonomy set out by the FAO Expert Panel for the Facilitation of Tuna Research and recommended to Member Governments that they arrange for the supply of tuna specimens to the E.P.F.T.R. Working Party on Tuna Taxonomy.

VII. RESOURCES APPRAISAL AND THE MANPOWER REQUIREMENTS

The Council took note of the recommendations by the Executive Committee in connection with resources appraisal and of observations on this matter made by the 7th and 8th FAO Regional Conferences. The Council had devoted considerable time to problems concerned with assessments of stocks of commercial species of fish and had confined its discussions to species to which priority could be assigned. In the course of these discussions, the Council had already made various proposals for concerted action to contribute to solution of problems in the exploitation of the stocks. The Symposium on Fisheries Education had reviewed the problem of fisheries training in a general sense and the report of the Symposium led to certain specific recommendations for action by FAO and Member Governments within this sphere.

In considering wider manpower requirements, the Council recognized the need for a wider and integrated training program in the Indo-Pacific region and urged that in the first instance, Member Governments should define to the Council their individual needs for trained personnel and facilities. The Council would recommend, however, that such information should also cover the requirements for the vital field of exploration and experimental fishing which is necessary for the more precise knowledge of the fishery resources of the region.

The Council recommended that immediate steps should be taken by the Member Governments with the assistance of FAO to promote intra-regional development of training in these fields. For example, group participation by personnel of other countries could be arranged in fishery development country projects set up under UNDP, such as the Philippine Deep Sea Fishing Development Project, or in ways similar to those being developed at present cooperatively by Malaysia and Thailand.

VIII. FISH CULTURE

The Council took note of the recommendation of the Executive Committee that a subcommittee on fish culture should be established and that one of its primary tasks should be to undertake a study at national level of the economics of fish culture. It was agreed that the economics of fish culture should be studied and that such a study would require the services of biologists as well as of economists, insofar as it would be concerned with estimates of the economic productivity of fish culture under improved practices.

The Council decided to appoint a Working Party on this subject, to consist of biologists to be designated by the Governments of India, Indonesia, Japan, Malaysia and Philippines, together with fisheries economists to be appointed by FAO, provided FAO intends to take action in this field. In the event that FAO is able to participate in this operation, the Council requests the biologists concerned to proceed with the study insofar as it falls within their fields of competence.

Recognizing the importance of fish culture in relation to the planning of land utilization and taking into account the multifarious practices adopted in various Member Countries involving great variations in capital investment and return, and also the efforts to introduce improved techniques, it was considered that the inquiry, inter alia should cover:

- 1) levels of investment in different types of fish culture, with details of the practices employed;
- 2) investment and return ratio in comparison with agriculture, horticulture, silviculture, etc.; and
- 3) current stage of development and future programs of evolving techniques in fish culture with a bearing on better utilization of capital investment.

IX. INTERNATIONAL TROPICAL FISH CULTURE RESEARCH

The Council had a full discussion on the question of the setting up of an International Tropical Fish Culture Research Institute in the form of an expansion and internationalization of the existing Institute at Malacca, Malaysia on the basis of a report from its special committee. Most of the Delegates favored the establishment of an International Tropical Fish Culture Institute, and with the exception of the Delegate from New Zealand all Delegates expressed interest in the continued operation of the Institute at Malacca under the terms proposed. Delegate from Australia, India, Korea, Malaysia, Thailand, United Kingdom and United States of America stated that they would be prepared in due course and subject to the success of the project to recommend their Governments should give consideration to providing financial support to the Institute. Only the Delegate of Malaysia was able to say that his Government would be prepared to make a contribution to the costs of operation of the Institute after end of the UNSF Project if it were established as proposed.

The United Kingdom Delegate explained that his statement was made in personal capacity and that his present official instructions were that the United Kingdom Government would be unwilling to make any further contribution after the end of the Special Fund Project.

The Delegate of India said that his recommendation would be subject to the facilities offered by the Institute being considered adequate for an International Training and Research Center by experts and to the Institute's program being relevant to the problems of India.

The Delegate of Ceylon had to emphasize that, even if he should be in the position to make a recommendation, his Government's contribution even if made would be purely nominal.

The Delegates of France, Japan, New Zealand, Philippines and Vietnam said that their Governments would not be able to make any financial contribution to the costs of operation of the Institute.

A majority of the Delegates considered inland fishery development as of equal or nearly equal importance with marine fishery development, and all thought that international action with regard to inland fisheries was desirable. It was agreed that an International Institute could not only itself be valuable in doing research and training and might also become the focus for activities of national institutions throughout the region. Many Delegates stressed the need for a very careful review of the program that might be assigned to the International Institute, and it was agreed that such a review should take into account the possibility of alternative location. The hope was expressed that the UNDP would agree to the proposal for a preparatory mission and that mission's terms of reference would allow it to make a comprehensive and thorough review. The Council accordingly decided to support the proposed request to the UNDP as set out in the Appendix to Working Paper 38 in the expectation that only necessary modifications would be introduced into the project as a result of a preparatory mission to be financed by the UNDP.

The Delegate of Malaysia drew the attention of the Council to the fact that the annual cost of running the Institute even at the level now proposed will be of the order of US\$400,000. He was particularly concerned that Malaysia should not have to contribute more than she does now to the cost of running such an Institute at the end of the UNSF period. He wished to inform the Council that in view of the lack of evidence of strong financial support for the project from interested member countries, his Government will have to do a re-thinking on the proposal. He requested that these views be recorded in the Minutes.

The Council, noting that most of the Delegates present had expressed interest in the establishment of an International Fish Culture Institute and that a majority had agreed to make representations to their Governments to support the TFCRI Malacca if it were internationalized and recognizing that the Malaysian Government may for reasons made clear by its Delegate at this Session find itself unwilling to submit, on behalf of the Member Governments of IPFC, a request to UNDP for assistance in the internationalization and expansion of the TFCRI, recommends that, in that event, the Director-General of FAO should, in consultation with UNDP and the Governments of Malaysia and the United Kingdom,

take immediate steps to appoint a consultant group to conduct an on-the-spot examination of the potentialities of the present Institute to review the proposals for internationalization already set out in the Appendix to WP38 and to recommend a programme of training and research having regard to the particular needs of the countries members of IPFC and further recommends that the Director-General of FAO should initiate discussions with Member Governments and with foundations and other aid giving agencies with a view to agreeing upon a formula for providing continuing financial support to any international fish culture institute which the consultant group may recommend.

X. JOINT IPFC/IOC MEETING

Arising from a request addressed to it by the Intergovernmental Oceanographic Commission, the IPFC organized a joint meeting between the two bodies at its 12th Session.

Arising from the discussion, the meeting prepared the following report that was presented to the Council at its Plenary Session.

RECOMMENDATIONS FROM THE JOINT IPFC/IOC MEETING ON FISHERY ASPECTS OF CSK HONOLULU, 7-10 OCTOBER 1966

With respect to the important species selected at the Third Meeting of the CSK International Coordinating Group (Tokyo, August 1966), the Joint Meeting took the following actions:

1. Saury (*Cololabis saira*)
 - A. Endorsed the action of the CSK Assistant International Coordinator for Fisheries (AICF) in working with FAO to arrange for the preparation of a Species Synopsis, and
 - B. Agreed that subpopulation studies were of highest priority, including especially the relationship of the saury of the western Pacific to those of the Sea of Japan and the relationship of fish in these two areas to those to the east; the AICF is to work with the appropriate individuals in the countries concerned to coordinate the details of such studies.
2. Skipjack tuna (*Katsuwonus pelamis*)
 - A. Agreed that subpopulation studies were of highest priority, including studies of the association of particular subpopulations with particular water masses or types, and
 - B. Noted that cooperative studies of skipjack subpopulations, based on the study of blood-group systems and serum constituents, were already in progress between the Japan Fisheries Agency and the U.S. Bureau of Commercial Fisheries Honolulu Laboratory, and

- C. Urged other participating countries to cooperate by providing blood collections where possible according to instructions available from FAO and the Honolulu Laboratory, making use of collecting and shipping kits available from the Honolulu Laboratory, and
 - D. Noted also plans of the Japan Fisheries Agency to supplement these studies with tagging experiments.
3. Spanish mackerel (*Scomberomorus commerson*, *S. lineolatus*, *S. guttatus*)
- A. Agreed that there was need for a Species Synopsis and requested AICF to work with FAO in arranging for the preparation of this, and
 - B. Agreed that there was need for the services of a taxonomic specialist in identifying *Scomberomorus* specimens and noted the offer of Mr. W. Chan, Hong Kong, to provide such services, and
 - C. Agreed that much useful information could be obtained on range and seasonal distribution through a questionnaire system of the kind employed by Thailand and Vietnam and requested these and other interested countries to exchange information on the forms and system used and the information obtained through their use.
4. Chub mackerel (*Rastrelliger kanagurta*, *R. brachysoma*, *R. faughni*)
- A. Agreed that there were still pressing taxonomic (and nomenclatural) problems for this genus and requested the AICF to locate a taxonomic specialist in this group willing to provide taxonomic services for collections (including juveniles as well as adults) sent by interested countries.
5. Yellow croaker (*Pseudosciaenia manchurica*)
- A. Agreed that subpopulation studies were of the highest priority and that these might most appropriately be carried out by tagging experiments, and
 - B. Recognized that the methodological problems of tagging yellow croaker must be solved before such experiments are feasible and encouraged the countries concerned to investigate the feasibility of tagging small yellow croaker in shallow water.
6. Lizardfish (*Saurida tumbil*)
- A. Endorsed the action of the AICF in working with FAO to arrange for the preparation of a Species Synopsis.

7. Goldenthread (*Nemipterus virgatus*)

- A. Endorsed the action of the AICF in working with FAO to arrange for the preparation of a Species Synopsis, and
- B. Requested close cooperation on the part of countries carrying out tagging experiments and countries in which tagged fish might be recovered, and
- C. Recognized the desirability of a "universal symbol" to be used on tags and the need for agreement between countries whereby the country in which the tagged fish was recovered would pay a reward to the fisherman returning the tag, and
- D. Recognized the potential value of a "training film" in promoting the return of tags by fishermen and requested Dr. G.L. Kesteven, Australia, to investigate the possibility of having such a film prepared.

In addition to these actions on particular species, and with respect to a survey of the bottom resources of the South China Sea, the Joint Meeting took the following actions:

- 1. Agreed that it was desirable to summarize all existing information on the results of trawling on the Sunda Shelf and requested Dr. D. Menasveta, Thailand, to undertake such a summary. In this connection:
 - A. Mr. W. Chan, Hong Kong, agreed to provide a reference to data published by scientists in Taiwan, and
 - B. Dr. T. Ino, Japan, and Mr. J. Marr, USA, agreed to try to locate a report on pre-World War II trawling by Japan in the South China Sea, and
 - C. The AICF offered to be of assistance in reproducing copies of data.
- 2. Agreed that the CSK Coordinating Group should provide assistance in planning and coordinating future trawling studies in the South China Sea.

With respect to data on common-use resources, and particularly those selected as important species, the Joint Meeting took the following actions:

- 1. Agreed that there are needed, on a resource basis rather than a country basis, adequate time-series data on (a) catch, (b) effort (c) age composition, and (d) length composition, agreed to provide these (to the extent available) to the FAO Fishery Data Center, and
- 2. Requested the AICF to ascertain the precise nature of the data available for each species and to communicate this information to the FAO Fishery Data Center, and to request the FAO Fishery

Data Center to provide (a) guidelines for the submission of such data to the Center and (b) a "readout" service, to provide copies or summaries by species upon request.

With respect to the question of how CSK oceanographic observations can best be made for use in fishery studies, the Joint Meeting took the following actions:

1. Recognized (a) the close relation between oceanographic studies and the development of fisheries and (b) the fact that in many CSK countries the responsibility for these subjects rests in separate organizations, and
2. Recommended that, in the implementation of all aspects of the CSK, participating countries make every effort to
 - A. Arrange the closest possible collaboration between the organizations concerned with oceanography, hydrography, meteorology, fisheries resources research, and marine biology, and
 - B. Ensure the regular exchange of relevant data and information between these organizations, and
 - C. Ensure that programs of research undertaken by any of these organizations take into consideration the needs of the others.

With respect to the continued responsibility on the part of the Indo-Pacific Fisheries Council for the fishery aspects of the CSK, the Joint Meeting took the following actions:

1. Recommended that the Council establish a Working Party on CSK Fishery Aspects, with the following individuals to serve in their capacities as experts: T. Ino (Japan), Hak Soo Han (Korea), D. Pathansali (Malaysia), I. Ronquillo (Philippines), D. Menasveta (Thailand), W. Chan (U.K. Hong Kong), J. Marr (USA) Convenor, Tran Van Tri (Vietnam), and
2. Agreed that the terms of reference of the Working Party should be
 - A. Individually to maintain liaison between national institutions engaged in CSK studies and the UNESCO/IOC/CSK.
 - B. Joint (i) to review progress in the conduct of work proposed at the Joint Meeting, Honolulu, October 1966.
 - (ii) to advise UNESCO/IOC/CSK on the fisheries aspects of CSK studies.
 - (iii) to report to IPFC on the fishery aspects of CSK.

3. Urged that high priority be given by the Council and FAO to provision for meetings of this Working Party during the Inter-Sessional period.

The Council received and endorsed the Report, the U.K. abstaining and appointed the Working Party on CSK Fishery Aspects as recommended.

Note:

In respect of membership to the Working Party in the Fishery Aspects of the Coordinated Study of the Kuroshio, subsequently Mr. Hee Soo Han was nominated by the Government of Korea to replace Mr. Hak Soo Han.

CHAPTER III

FISHING CRAFT AND GEAR

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A. INTERSESSION ACTIVITIES

INTRODUCTION

During the 11th Session of the Council and also during the 39th Meeting of the Executive Committee, it was recommended that countries should consider reporting fisheries developments on the basis of project summaries but where this was not practicable, narrative reports would be received. Some reports on unit fisheries have been received and these have been presented as separate Working Papers. This report deals mainly with the developments during the intersession period and also actions taken by Member Governments, FAO and the Council on recommendations made by the Council during its 11th Session.

The basis of this Report is mainly information contributed by Members of Technical Committee II. In this connection, the Secretariat issued a circular to the Members of Committee during mid-1966. At the time of preparing this report, information had been received only from Australia, Ceylon, France (Pacific Territories), U.K. (Hong Kong) and U.S.A. A paper on unit fisheries based mainly on gear has been received from Japan and this is presented separately as document IPFC/C66/WP 6.

GENERAL

IMPROVEMENTS IN FISHING CRAFT

NEW TYPES OF CRAFT

11th Session Recommendations: Nil

Intersession Developments:

Ceylon: Several new types of vessels have been designed. More designs are being studied for construction of larger craft in Ceylon. Fishing boat design has been standardized. Boats between 7.92 and 10.67 m are constructed on 3 approved plans. Material used is timber but the Fisheries Corporation has commenced construction of steel boats about 11.28 m in length and intends constructing boats up to 18.29 m in length of steel. Fibre glass is used for boats up to 5.48 m powered with outboard engines. Several boats of about 34 m equipped for stern trawling and fitted with stern gantry are operating.

Hong Kong: Otter Trawlers: A 20.11 m l.o.a., prototype wooden stern otter trawler, designed by the officers of the Department, was built with a Government loan from the Fisheries Development Loan.

GENERAL

PRESENT FISHERIES ACTIVITIES AND DEVELOPMENT OF CRAFT AND GEAR IN JAPAN

1. Amount of catch by kinds of fishing method and number of boats newly built in 1965

The amount of catch in 1965 occupies the position of maximum yield in the history of Japanese fisheries. Since 1962 which is year of the maximum catch in Japanese fisheries history, the amount of catch has been decreasing year by year. Therefore, it is a brilliant record for Japan that the catch of 1965 firstly is over that of 1962, even though the increase is small in fact, and the total catch is 6.88 million tons as shown in Table I.

TABLE I
AMOUNT OF CATCH IN 1965

Classification	1960	1961	1962	1963	1964	1965
Total (ratio)	6,192 (100)	6,710 (108)	6,864 (111)	6,698 (108)	6,350 (102)	6,880 (111)
Sea fishery (ratio)	5,817 (100)	6,287 (108)	6,379 (109)	6,200 (106)	5,868 (101)	6,372 (109)
Shallow sea water culture (ratio)	284 (100)	322 (113)	362 (127)	389 (136)	362 (127)	361 (127)
Fresh water fisheries and culture (ratio)	90 (100)	100 (111)	104 (116)	108 (120)	118 (132)	146 (167)

This result is mainly due to three fisheries as follows: the purse seine fishery harvest 1.28 million tons, maximum yields in it's history; the squid angling fishery which remarkably increased the catch is compared with last year; and pelagic trawls which show development for several consecutive years. As to the pure seine fishery, the efforts have been for improving the efficiency by using larger boats as well as modernizing fishing equipment onboard. These efforts have borne fruit in the increased catch of 1965. It is considered that this fishing method will be more and more useful to catch the schools at one time, and will become the most important fishing method in Southeast Asian countries in the future as increased mechanization of boats materialize.

The production of fishery by kind of fishing method, are shown in Fig. 1 and Tables II. Table III shows the number of boats newly built in 1965 which are responsive for the developing fishery of Japan.

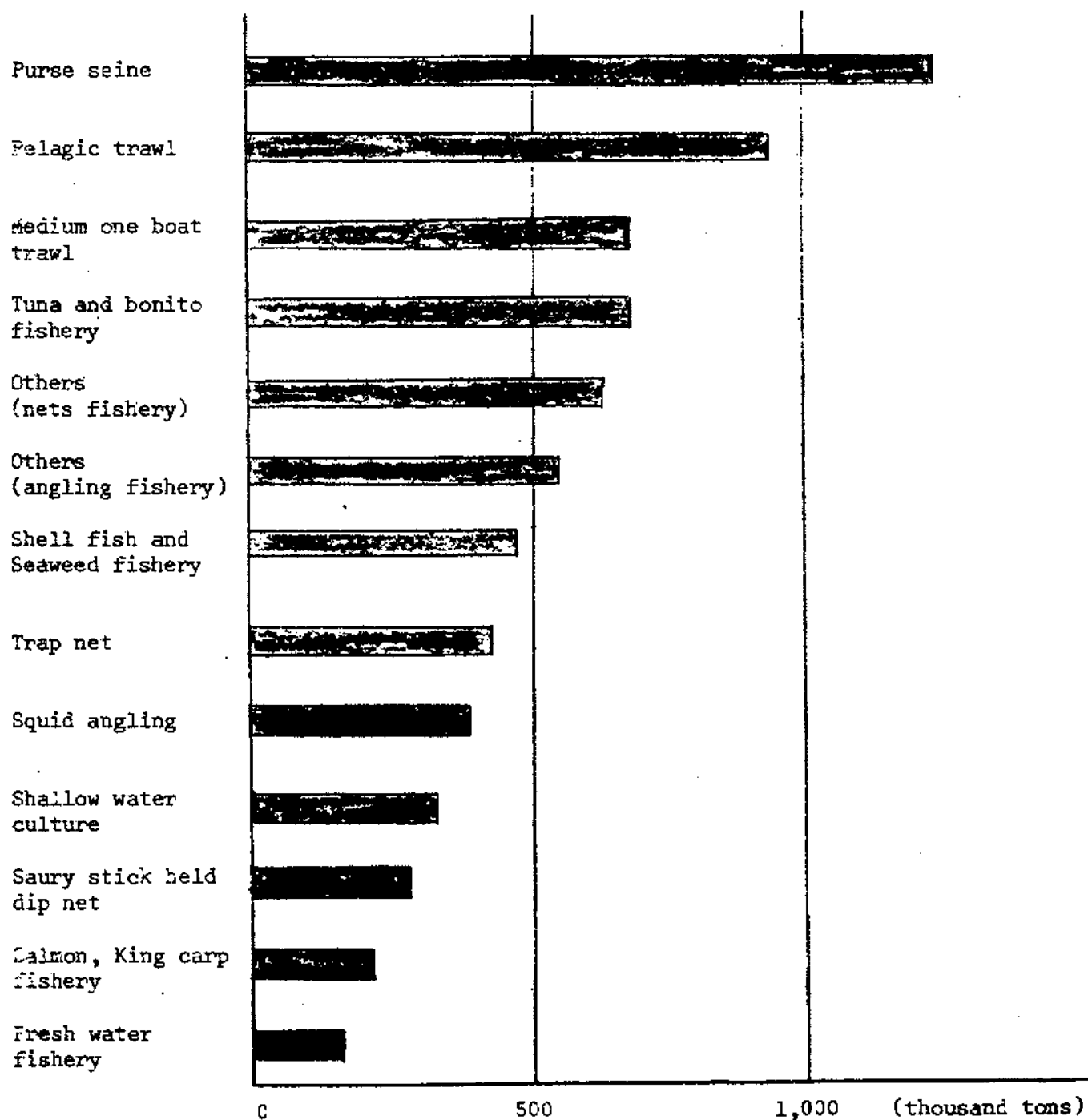


Fig. 1. Catch by kinds of fishery

TABLE II

AMOUNT OF CATCH BY KINDS OF FISHERY

unit : thousand tons

Kinds of fishery	1964	1965
Grand total	6,350	6,879
Total of Marine product	5,868	6,372
Off shore and coast fishery	1,544	1,599
Trawl fishery	1,875	1,913
Mother boat type	438	430
Pelagic trawl	130	169
Northern Pacific trawl	29	35
East China sea otter trawl	13	9
East China sea bull trawl	289	316
Medium size danish seine	703	746
Small trawls	230	250
Tuna and bonito fishery	691	686
Mother boat type tuna fishery	82	69
Atlantic tuna fishery	69	83
Overseas based tuna fishery	35	30
Mainland based tuna fishery	321	310
Over 50 gross tonnage	266	252
Under 50 gross tonnage	55	58
Bonito Angling	184	194
Salmon and trout fishery	101	127
Mother boat type	44	45
Salmon drift net fishery	45	59
Salmon long line fishery	12	22
Mother boat type king carp fishery	28	24
Purse seine fishery	1,012	1,276
Saury stick held dip net fishery	202	227
Mackerel angling fishery	159	153
Squid angling fishery	237	387

Table II (Contd.)

unit : thousand tons

Kinds of fishery	1964	1965
Seine net (by land, by boat)	144	192
Shell fish and Seaweeds fishery	447	440
Shell fish	203	192
Seaweeds	244	248
Trap net	220	222
Large scale type	131	125
Small scale type	89	97
Other fishery	751	725
Purse seine	43	40
Lift net	91	115
Gill net	252	211
Angling and long line	236	226
Others	129	133
Shallow sea water culture	362	361
Laver culture	112	142
Oyster culture	241	209
Pearl culture	0	0
Other culture	10	10
Fresh water fishery	118	146
Fresh water fishing industry	89	113
Fresh water culture	29	33

TABLE III

NUMBER OF FISHING BOATS NEWLY BUILT IN JAPAN

	1964		1965	
	Number	Total gross tonnage	Number	Total gross tonnage
Steel boats	502	110,680		77,519
Wooden boats	429	17,808		15,571
Total	931	128,488		93,090

2. The feature of fishery in 1965 by kind of fishing method and fishing boat

The catch of pelagic fishery amounts to 1.60 million tons, 3 percent increase compared with that of last year. The pelagic trawls operating in North Pacific Ocean, East China Sea and African Sea yielded 60 percent or 950,000 tons which is 7 percent increase over the catch of previous year. The number of pelagic trawl boats newly built are shown as Table IV. On the other hand, tuna fishery maintains same level of catch as last year. Number of new tuna boats built in 1965 are also shown in Table IV.

TABLE IV
NUMBER OF PELAGIC TRAWL FISHING BOATS
AND TUNA BOAT NEWLY BUILT IN 1965 IN JAPAN

Size of boat (Gross tonnage)	Pelagic trawl		Tuna long line
	Number	Total gross tonnage	Number
Under 100	0	0	17
100 200	1	193	58
200 300	17	5,096	46
300 500	6	1,885	14
500 1,000	4	2,198	1
Over 1,000	8	15,584	0
Total	36	25,956	136

The catch of off shore fishery and coastal fishery is 70 percent of grand total of Japanese fishery yield. This amounts to 4.77 million tons and is 10 percent higher than previous year. The representative off shore fisheries are medium size Danish seine, purse seine, stick held dip net, squid angling, mackerel angling and salmon drift net and these yield 2.80 million tons. Especially purse seine fishery catch is good amounting to 1.28 million tons, maximum figure in it's history, which exceeds previous year's catch by 260 thousand tons.

The coastal fishery catch is 40 percent of the total catch of off shore and coastal fishery. The catch is 1.97 million tons which shows 3 percent increase over that of previous year. The trap net, small trawls, angling and long line fisheries have all improved.

India: New designs of stern trawlers, combination fishing vessels and pole and line fishing vessels have been made at the Central Institute of Fisheries Technology, Ernakulam. A large number of bigger size trawlers (up to 36.57 m length overall) are to be acquired during the IVth 5-year Plan.

Japan: The boat used for off shore and coastal fisheries have changed during these years. As engine, installation of the Diesel have increased remarkably in marine powered boats within the last five years. Even in small boats, superior small diesel engines are becoming popular. The development of small and light weight engines is being promoted in two ways at present. The one is to use supercharged by which one can obtain increased H.P. of about 50 to 60 percent. The other is to use 4 cycle high speed diesel engine. Since 1962 small boats of about 20 to 40 tons with less than 300 H.P. engine, such as small purse seine boat, trawl boat and long line boat, have widely used it with the development of remote control devices. This engine can increase its power by increasing the r.p.m. and so it can be small in size. Saving of man power in engine operation as well as in fishing operation are urgently needed because of the present situation of the fishery and this is done by adopting the remote control device in main engine operation and this is more effective if variable pitch propeller is used simultaneously. In 1963, small purse seine boat of 20 tons firstly used hydraulic propeller. Oil at high pressure of 160 kg/cm² supplied from a pump driven by diesel engine is allowed flow into a hydraulic motor to rotate the propeller shaft. Recently fishing equipment driven by hydraulic means have developed, e.g. trawl winch, net hauler, line hauler, windlass, reel etc. These not only serve to save man power but also to increase, the efficiency of operation.

Small steel fishing boat development has also been taken up recently. Attempts are being made to make coastal fishing boats of 5 to 10 tons constructed in steel in practical fishing. Its advantages are saving of time in boat construction, bear wave resistance, good steering and lasting durability of more than 10 years. On the contrary, it is higher in price and it is necessary to make balance carefully when it is built.

Philippines: The development of purse seining fleet has now stabilized and numbers about 50 boats equipped with power blocks.

U.S.A.: Minor changes have been evidenced in the design and construction of small trawlers in the New England which incorporate stern trawler features from European vessels. In addition, several tuna and menhaden vessel designs include features for adapting the vessels for trawling as well as purse seining.

Vietnam: The adoption of Nylon monofilament in gill netting helps largely in the development of fisheries in Vietnam. Fishermen with motorized boats and long sets of gill nets venture far away from the coast and have better catch mainly in the offshore area of the Mekong River. The results obtained by some of them at the beginning encouraged others to build larger boats and use more powerful engines. In fact a few years ago, the most popular fishing boat ranged from 3 to 5 tons; now boats of 15 - 20 tons are quite commonly built.

Bamboo bottom boats still share a good part in Vietnamese fishing fleet but the larger boats are gradually turned out entirely in wood for easy motorization as it is difficult to set the propeller shaft through bamboo without shrinkage. Small boats particularly those fishing in bays or in inshore waters are still partly made of bamboo and propelled either by oars or by outboard engines. In areas where wood is expensive and where there are plenty of bamboo these types of small boats may be advantageous as their building is quite cheap and the boats themselves are light and convenient for beaching after each fishing operation or during the rough seas.

To modify the haul of boats and to adopt some improved techniques of construction suited to Vietnamese fishing fleet for mechanization, one boat builder has been sent all along the coast to gather necessary information from different types of boats now existing in Vietnam. Drawings and comments have been written down in special reports which are sent to FAO Regional Office in Bangkok for checking by FAO naval architects.

IMPROVED CONSTRUCTION MATERIALS AND METHODS

11th Session Recommendations:

Ceylon: Construction of steel boats has commenced due to the difficulty of obtaining sufficient quantities of suitable timber. Fibre-glass has been used for construction of boats up to 5.48 m in length. Boats up to 8.53 m have also been constructed of fibre-glass. Firm in Ceylon is constructing a boat using reinforced concrete. Fibre-glass boats have been found to be tough and easily repaired as evidenced by the effects of a Cyclonic storm which destroyed a large number of wooden craft.

Fund for one of the leading commercial fishermen. This boat, named "Kestrel", was launched on the 3 June 1965. Speed and engine trials were completed in July. After a course of instruction under the Fishing Master on the handling of the trawl winch and fishing gear, the Skipper/Owner and his crew commenced their first fishing voyage on the 14 September 1965. The catch rate from this boat, powered with an 8L3B "Gardner" marine diesel engine of 200 b.h.p., has been most satisfactory. The otter trawl gear has consistently produced a higher percentage of large size fish than those taken with pair trawls operated by the other boats. Prices paid for the fish landed have consequently been good.

Government loans have been issued to two other fishermen who each wish to acquire similar 20.11 m stern otter trawlers, and, at the present time (July 1966), the construction of these vessels is progressing satisfactorily.

Pair Trawlers: The most popular size for the wooden pair trawlers built locally is in the region of 28.65 m l.o.a. Over the past few years gradual improvements in the hull form and construction of boats of this size have taken place with the building of each successive new boat, but complete drawings had never been called for. In September 1965 the leading long-line fisherman of Shau Kei Wan district approached the Department and asked if the design for a unit of modern pair trawlers could be prepared for him. Following consultations with the boatbuilder and the fisherman, a general arrangement drawing was prepared and agreed, the weight calculations were done and detailed design drawings completed. A Government loan was then approved. The keels were laid on the 21 November 1965, and these new boats were launched on the 28 April 1966. After undergoing trials, which were considered highly successful, the boats proceeded on their first fishing voyage in July 1966. The Skipper/Owner is delighted with the seakindly behaviour and fishing performance of his ships. The keels for a second similar unit of 28.65 m l.o.a., pair trawlers of modern design were laid on the 27 July 1966. These boats also are being built with financial assistance from Government.

New Procedure: The above-mentioned prototype 20.11 m otter trawlers and the 28.65 m pair trawlers are the first boats to be built completely in accordance with the Department's design drawings, under the supervision of the Government technical officers and construct to standards that meet their satisfaction - in addition to being acceptable to the fishermen owners. This is a significant change in procedure, and encouraging progress.

India: Conventionally boats are built with teakwood with copper sheathing. These are being replaced by cheaper material. Venteak (*Lagenstroemia lanceolata*) has been found to be a suitable substitute material for boat building. Likewise Aluminium - Magnesium alloy has been found to be a suitable sheathing material. At Kakinada, an attempt is being made to give fibre glass sheathing to wooden boats to prevent marine borer attack.

U.S.A.: Methods of construction have not changed during this period. However, during the past 2 years steel shrimp vessel construction has gained in popularity, especially in vessels destined to fish in areas of northeast South America.

MOTORIZATION

11th Session Recommendations:

Economic Research: Regarding research on economic impact of technical improvements in fishing, the Council reiterated its 10th Session recommendation to the Member Governments that research be conducted on "Impact of Introduction of Mechanized Fishing on Socio-Economic Status of Fishermen".

Fuel Supplies: Having noted that certain administrative problems arise in connection with abolition of import duties and other taxes on fuel oil, and nevertheless emphasising the beneficial effects of the availability of duty and tax free fuel oil to the industry.

Intersession Developments:

Ceylon: Economic Research: The full impact of the introduction of mechanized fishing boats on the socio-economic status of fishermen has not been studied in detail primarily due to the difficulty of collecting reliable data. Fishermen are unwilling to disclose their real earnings and tend to inflate their expenditure as the majority of owners of mechanized craft have obtained their craft or engine on Government credit. Since the rate of repayment of the loans are poor they are naturally reluctant to give information which would enable Government to exert more pressure in recovering the loans.

Fuel Supplies: The tax on diesel fuel has been increased from January 1966. Due to the diffusion of fishing craft over the coastline and due to lack of fishery harbours to control the distribution of Diesel or petrol to fishing boats it was found impossible to operate a scheme of subsidy for fishing boats. The alternative relief to the fishing industry was to permit the import of Diesel and petrol outboard engines used in the fishing industry free of duty. This has been done.

Hong Kong: Progress of Motorization: Motorization of the fishing fleet has continued to increase although at a slower pace compared with previous years. In the period from July 1964 to March 1966, 241 fishing vessels, mainly gill-netters and small long liners joined the motorized fleet. 5,205 of some 8,600 active fishing vessels are now mechanized.

Engines:

(i) Types, Makes, Fuel Supplies and Prices

Engines installed in Hong Kong fishing vessels are all of the "Full" diesel type. The use of semi-diesels (hot bulb) engines, and petrol engines, is prohibited.

A wide range of diesel engines is available. No import duty has to be paid on engines and spare parts in Hong Kong. Fuel and lubricating oils are readily available. The markets are highly competitive for both engines and oils in Hong Kong.

(ii) Servicing Facilities

Adequate servicing facilities are available in most of the main fishing centres.

(iii) Indigenous Production or Assembly of Engines

There are no locally manufactured small diesel engine for marine or industrial use. Gearboxes, fuel pumps and certain other parts are imported. No assembly of engines of overseas manufacture is carried out in Hong Kong.

(iv) Government Assistance in Procurement of Supplies

Loans from both Government and Fish Marketing Organization sources are readily available to fishermen for the construction of new boats, procurement of engines, to meet engine installation expenses and for the purchase of supplies required for productive purposes. Arrangements have been made with some local agents for the sale of engines to allow a special "cash discount" to fishermen purchasing such engines.

Effects of Motorization of Fishing Craft:

(i) Extension of Fishing Grounds

In the earlier years of the motorization programme, engines in local fishing craft were auxiliary to the sails carried. More recently there has been a tendency for some what larger engines to be installed, and some fishing vessels now carry no sails. The installation of diesel engines, coupled with the use of some simple forms of

labour saving deck machinery and the introduction of fishing gear made with synthetic fibre materials, has resulted in greater fishing intensity and efficiency than was hitherto possible. Engines have led to faster passages to and from the fishing grounds, and have allowed fishermen more fishing time on the grounds. New and more distant grounds are now being exploited by many of the mechanized medium sized vessels (i.e. 40 to 70 ft. or 13.41 to 23.64 m l.o.a.) and larger vessels of over 80 feet (26.83 m) in length. Mechanized forty foot long local type craft are now operating in the vicinity of Taya Island, off the east coast of Hainan, a distance of over 200 miles from Hong Kong. In the last two years some of the larger mechanized junks have commenced fishing in the even more distant Gulf of Tongking, which was previously accessible only to company-operated Japanese type vessels.

(ii) Fish Catch

The following table of landings for the two years 1965/66 and 1963/64 (both years ending on the 31 March) illustrates the advantages of mechanization over traditional junk-type vessels. The Fish quantities are in piculs (one picul = 133.33 lbs. or 60.47 kg).

<u>1965/66</u>				
<u>Trawler Cos.</u>	<u>Mechanized Fleet</u>			<u>Wind-driven Vessels</u>
	<u>Traditional Type Junks</u>	<u>Foreign Vessels</u>	<u>Sub-total</u>	
36,376	716,393	-	752,759	127,432
4.13%	81.39%	-	85.52%	14.48%
<u>1963/64</u>				
61,819	712,617	2,382	776,818	166,657
6.55%	75.53%	0.26%	82.34%	17.66%

The composition of the mechanized fleet as at the 31 March in 1964, 1965 and 1966 was as follows:-

		1964	1965	1966
Trawlers	British registered (steel) trawlers*	14	14	14
	Company operated Japanese type pair trawlers	12	5	-
	Large junk pair trawlers	175	185	90
	Shrimp beam trawlers	546	562	641
	In-shore junk pair trawlers	252	227	226
	Single boat stern otter trawlers	-	-	1
Liners	Large junk long liners#	60	57	52
	In-shore long liners and hand liners	1,914	1,896	2,013
Seiners	In-shore purse seiners	848	829	589
	Pa-tengs	8	5	-
Misc.	In-shore gill netters	1,957	2,237	2,560
Collectors	Fish dealers' collector boats	24	18	19
		5,810	6,034	6,205

Remarks: * Including Research Vessel "Cape St. Mary".

Big long liners and medium long liners are included.

(iii) Fishermen's Earnings

Mechanization has increased the income of both owner-operators and their crews. With mechanization, however, there has been a marked deterioration in catch composition. Skipper/Owners have also experienced difficulties in engaging crew which are attracted into Hong Kong's booming industries ashore. This in turn has led to vessels fishing further afield, using labour saving deck machinery and synthetic

fibre fishing gear and fishing throughout the year as well as working longer hours. The introduction of the first small stern otter trawler in 1965 has set a new trend in the local fishing industry. As this is a multipurpose vessel, it can be fished in all seasons and on almost any grounds, annual income from this type of trawler has been satisfactory as operational expenditure is cut to minimum with a small crew on board.

(iv) Employment

Motorization of fishing craft and the addition of simple mechanical deck working gear in certain boat types - such as powered windlasses (with clutch operated warping ends) in pair trawlers, and capstans in shrimp beam trawlers - has resulted in the better fishermen being more selective in their choice of employment. For example, skipper/owners of large long liners - vessels requiring a large crew to man fishing sampan operating from the mother boat, and to hand haul the lines - now find it almost impossible to recruit adequate numbers of men; many of the vessels registered as large long liners have accordingly been converted into pair trawlers. Fishermen are now clearly showing their preference for better paid and less arduous work, either on shore or on the more modern boats. In an attempt to solve the problems of engaging crew for the large long liners, the Fisheries Development Division has designed, and tested a relatively inexpensive but efficient mechanical line hauler. It is hoped to introduce this hauler to the fishing fleet in the near future.

India: At the end of 1965-66, there were 5206 motor fishing boats in India. During the Fourth Five Year Plan, which has commenced with 1966-67, it is proposed to introduce 8,000 small motor boats and 200 medium and large boats.

Except for 600 outboard engines used for motorization of fishing craft in Gujarat, all other motorised fishing vessels are fitted with inboard engines.

The Government of India propose to give assistance at the rate of 50% of the cost of engine as subsidy and the remaining 50% will be advanced as loan. On the boats, 25% is proposed to be given as subsidy and 75% as loan. In both these cases, the expenses will be shared equally by the centre and the state. With the rising cost of diesel oil the different maritime states have been given relief to the fishermen to partly off-set the high cost. So far, the extent of relief varied from state to state. It is now proposed to introduce a subsidy on diesel oil on a uniform scale. All boats having engines of 50 H.P. and below are eligible for subsidy at a flat rate of 7.5 paise per litre and this cost would be shared equally between centre and the states. This ofcourse is subject to a ceiling of Rs.500 for engines less than 20 H.P., Rs.1,000 for 20-40 H.P. and Rs.1,500 for engines between 40 and 50 H.P.

U.S.A.: Progress of Motorization: No notable changes have occurred except for a general increase in horsepower in new vessels destined for the shrimp and tuna fishery.

Outboard and Inboard Engines: A slow increase has been noted in the use of outboard engines for fishing vessels. As reported in the last period, inboard engines of lighter weight through the use of aluminum alloys and compact design are gaining in popularity.

Government Assistance in Motorization: The Federal Government administers a Fisheries Loan Program which provides funds for repair or improvement of fishing vessels, including purchase of engines.

FISH HARBOR FACILITIES

11th Session Observations:

Fish Landing Facilities

Provision of landing, icing, marketing and preservation facilities at landing places were regarded by the Council as extremely important, as well as appropriate harbour facilities and roads to markets.

The Council brought to the attention of Governments the FAO Publication, "Landing and Marketing Facilities at Selected Sea Fishing Ports", (available in English draft), FAO Fisheries Report No. 8, 1963, which contains useful information.

Ceylon: The construction of a number of harbours and anchorages to facilitate fishing boat operation, and handling, of fish is under way. 3 such schemes have been commenced, the investigation and design of the others being carried out simultaneously.

Hong Kong: Marketing facilities: A new wholesale fish market was opened at Cheung Sha Wan, Kowloon, in April 1966. This replaces an old and inadequate market at Yau Ma Tei. The new market covers an area of 5,017 m² and can handle 100 to 150 tons of fish each day (the present load is about 60 tons a day). This market has cold storage facilities and the total cost of construction, inclusive of two jetties, is about HK\$2.2 million. Nearly 50% of this sum is met by a grant from the United Kingdom Government through the Colonial Development and Welfare Fund, the remainder was paid for by the Fish Marketing Organization.

Boatbuilding Yards: The boatbuilding and repair facilities provided by the yards at various fishing centres are adequate to meet present needs. A number of these yards are capable of building excellent wooden sea-going vessels of up to 33.52 m length overall.

India: Fishing harbours with all necessary facilities, including ancillary industries are proposed for the major harbours of Bombay, Goa, Mangalore, Cochin, Tuticorin, Madras, Paradip and Haldia. Construction of small fishing harbours has been taken in 14 centres (viz. Porbunder, Umergoan, Veravel, Karwar, Bhatkal, Mangalore, Cannanore, Baliapatnam, Beypore, Azhicode, Ponnani, Nagapatinam, Cuddalore, Kakinada). These harbours will provide facilities like quays, jetties, basin for landing berthing and mooring, ice plants, cold storages, handling sheds and workshops.

Malaysia: Canadian Colombo Plan aid has been obtained for the planning of a fishing harbour complex for Kuala Kedah. A Canadian team has made a survey and the report is now being finalised in Ottawa.

Other major ports are being planned, one at Penang and the other at Lumut.

On the East Coast of Western Malaysia, dredging operations are being carried out to improve Kuala Besut.

TRAINING OF BOATBUILDERS

11th Session Recommendations: Nil

Hong Kong: Appointment of Craft Technicians: Six Craft Technicians are employed in the Fisheries Development Division. Three of these officers are naval architects, one is a master shipwright, while the other two officers are mechanical and electrical engineers.

The Craft Technicians have each completed a 5-year apprenticeship course in a dockyard and work in conjunction with the Fishing Master. Their main duties are to design modern boats, advise fishermen on maintenance of these vessels and engines, help junk builders to produce better constructed boats with improved hull forms, advise on the introduction of thermally insulated fish-holds, on engine installation problems and on the provision of deck machinery etc.

Training of Boatbuilders: The Master Shipwright of the Fisheries Development Division conducted eight series of evening course for fishing junk building yard employees, in the reading of boat plans and the "Laying-off" of boats' lines. Each course consisted of 36 two-hour lessons. A total of 169 trainees have been enrolled in these classes, but, due in most cases to the lack of previous formal education, only 100 of these men completed their course and passed the final examination. Graduation certificates were presented to the successful students by the Agriculture and Fisheries Department.

Experience in Hong Kong indicates that given encouragement and guidance the proprietors of the more progressive junk building yards are able and willing (at very slight extra cost) to build better boats. It is a much more difficult problem to convince our fishermen to accept new ideas. A little progress has been made in the "boatbuilding education" of fishermen who have received loans from Government and the Fish Marketing Organization for the construction of new boats. In the case of Government loans, this has been achieved by incorporating a brief Specification (laying down principal dimension of the proposed boats, sizes of scantlings, types and qualities of wood to be used) in the fishermen's loan agreements. Furthermore, payment is made by instalments on completion, to the satisfaction of both the fishermen and Craft Technicians concerned, of each stage of the work. In the case of Fish Marketing Organization loans a form entitled "Description of the Boat", which embodies a brief specification, has to be completed. Whereas in times gone by the fishermen usually had their boats built at least partly with credit extended by the junk builder, and, were therefore under some obligation to accept whatever material and workmanship the builder decided to give them, they now pay cash made available from loan funds and accordingly expect higher standards. Much of the Fishing Master and Craft Technicians' time has been spent in rectifying earlier mistakes that were built into fishing craft at the insistence of the fishermen owners.

India: Ad-hoc training courses are conducted by the Central Institute of Fisheries Technology, Ernakulam. In due course this training will be taken over by the Central Institute of Fisheries Operatives, Ernakulam.

PROBLEMS RELATING TO FISHING CRAFT

11th Session Recommendations: Nil

Hong Kong: Fouling: As in all tropical and sub-tropical regions, fouling is a serious problem in Hong Kong. The traditional remedy used by the Chinese fishermen is to beach, or slip the boat frequently and to burn off all marine growth. The heat from this carreening also serves to kill any torredo worms and other wood borers in the boat. The hull is then treated with wood oil which, although a good wood preservative, contains no anti-fouling properties.

More and more fishing boat owners in Hong Kong are now using anti-fouling marine paints.

Corrosion: Corrosion of underwater metal parts (e.g. particularly steel rudders and propeller tips) is still a problem confronting local fishing boat owners. As a result of sorry experience, earlier advice given by the Fisheries Development Division on the need to fit zinc plates as protection against galvanic corrosion is now generally accepted.

Motorization: The Hong Kong fishermen have taken a great step forward in the past fifteen years but still need continuous education on proper engine installation, propeller selection and the need to maintain an engine.

RESEARCH ACTIVITIES

11th Session Recommendations: Nil

Research Activities:

No information available except from India. Besides preparing various standard designs of small fishing boat, the craft wing of the Central Institute of Fisheries Technology, Ernakulam has been engaged on studies relating to engine, propeller, sheathing material, scantlings, waves, anti-rolling passive tanks, testing of ventilation system inside engine rooms, standardization of various fittings, preservation of boats againsts marine borers and fouling.

FAO TECHNICAL ASSISTANCE IN THE REGION

11th Session Recommendations:

"The Council resolved to request the appointment of Craft and Gear Technicians at the FAO Regional Office, Bangkok. If sufficient funds are not available for both posts, the Council recommended that the first priority should be for a Gear Technologist and that the second priority should be for Boat Designer (Naval Architect)".

Due to lack of funds, the appointments of Gear Technologist and a Boat Designer at Bangkok have not been possible but FAO has these posts constantly under review and action will be taken as soon as practicable.

Training Centers:

"The Council resolved to request FAO to hold a Training Center for instructors in Boatbuilding through UNDP. Such a Training Center which should include in its curriculum the principles of fishing boat design, boat construction and maintenance, and engine installation, should not last one year.

However the duration of the course may be decided by FAO after considering the qualifications of the trainees". While deciding on priorities, this Training Center was given 5th priority by the Council and due to lack of funds, no action has been taken by FAO so far.

Country Programs:

Australia: The FAO Chief Naval Architect visited Australia to offer advice on fishing boat designs. The second of two visits by Chief, FAO Fishing Vessel Section, took place from 6 March to 8 April 1966. A technical meeting with him as Chairman was held from 14 to 18 March. There were 38 participants, including naval architects, boatbuilders and representatives of Maritime and Fisheries Authorities. Nine papers were presented covering the following subjects:

- | | |
|-------------|--|
| Paper No. 1 | What Boat builders must be given from naval architects in the way of plans and specifications for the most economical construction of fishing vessels. |
| Paper No. 2 | Proposals regarding measurements of Australian fishing vessels. |
| Paper No. 3 | Scantlings and construction proposals for Australian timbers having in mind Australian fishing conditions. |
| Paper No. 4 | Design study on lines necessary for a 50 ft. prawn trawler suited to bar work. |
| Paper No. 5 | Stability of tuna vessels. |
| Paper No. 6 | When can fishing boats be made planing. |
| Paper No. 7 | Small steel fishing boat design incorporating sea water tanks for fish storage. |
| Paper No. 8 | Methods for holding crayfish at sea. |
| Paper No. 9 | A study of winches, deck gear and layout for fishing vessels and in particular prawn trawlers. |

The FAO Specialist has prepared a report covering his observations during his two visits and has made a number of recommendations.

The design of a standard trawler for the developing prawn fishery in the Gulf of Carpentaria is being studied.

Ceylon: An FAO Naval Architect continues to work in Ceylon assisting the Government in design of motorized steel and wooden boats to be locally built for inshore and offshore fishing as well as offering advice in finalizing specifications of large sized craft to be imported. Also an FAO/IBRD Mission visited Ceylon to evaluate a request for assistance in building up modern fishing fleet.

India: An FAO/IBRD Mission visited India to evaluate a request for assistance in the development of fish harbors and fishing fleet.

Malaysia: The Chief FAO Naval Architect visited Malaysia.

Pakistan: FAO Naval Architect visited Pakistan in connection with use of outboard motors for installation in East Pakistan fishing craft.

Thailand: Following the work of a UNDP Naval Architect in 1963, a fellowship was offered to one of the officers in the Department of Fisheries of Thailand for advanced training in boat designing in Canada. The fellow has now returned and is on the staff of Fisheries Department. During 1966, an FAO/UNDP Boatbuilder-Designer was appointed for a period of 6 months to assist the Government in improving their boatbuilding and designing programs.

SUPPLY OF GEAR

11th Session Recommendations: Nil

In India, Government arranges for the import of hemp twines, and raw material for the manufacture of nylon twines. Wherever necessary, import of nylon is also allowed, to meet the demand in excess of the indigenous production of nylon. The Government also provides a 25% grant on the cost of synthetic fishing material.

IMPROVEMENTS IN GEAR DESIGN AND HANDLING

11th Session Recommendations:

"The Council heard with interest new developments in the Philippines in one boat purse seine using power blocks. The Council requested the Delegate from the Philippines to send an Experience Paper on the development of one boat purse seine in the Philippines for publication in the IPFC Current Affairs Bulletin for the benefit of the other Member Governments.

In addition, the Council requested FAO to prepare for publication in the CAB a world-wide review article of other modern developments in purse seining".

Information has been received that the staff of the Philippine Fisheries Commission in preparing a paper on purse seining to be presented at the 12th Session as a Technical Paper. The Council may recommend the publication of this paper in any of the IPFC serial publications.

Australia: There have been further developments in the rig for double trawling (for prawns) and in the efficiency of the deck layout for this method. A number of vessels have now been fitted out for double trawling in both Eastern and Western Australia.

Ceylon: Experiments conducted with purse seining have not so far given any positive results in terms of increase in catch. No new developments in gear are reported but the Ceylon Fisheries Corporation is planning to introduce tuna fishing on a large scale.

Hong Kong: Mechanical Line-haulers: The Fisheries Development Division has designed a mechanical line-hauler capable of accommodating the small diameter synthetic fibre lines used locally, and fitted with an adjustable tension clutch. After initial departmental tests, the first of these haulers was installed, for commercial proving trials, in the boat of a fisherman operating out of Tai Po district. A number of teething troubles were encountered, but these are thought to have not been overcome.

A line-hauler and capstan of Scandinavian origin, which had been experimentally installed in a small narrow beam type boat, had to be removed from the vessel as the fishermen concerned decided to give up fishing. This labour-saving mechanical device has still not yet been given a fair trial, and it is hoped to arrange further trials.

Baiting of long-lining hooks on shore: Reference has already been made earlier in this Report to the difficulties of employing sufficient crews for certain types of fishing craft, especially large long-liners. Within the last twelve months a scheme was introduced whereby a long liner was equipped with additional lines, all pre-baited on shore before going to sea. The object of this scheme is to reduce the amount of work which previously had to be done at sea, thus necessitating a large crew. The pre-baited lines cut down this work and hence the numbers of crew. It is, as yet, too early to come to any conclusions on the outcome of this experiment.

New Nets: A new nylon box-net and an Isaac Kidd net designed by the staff of the Fisheries Research Division were tested with satisfactory results. The former one has two unique features : the great height of the head-rope and easy operation in shooting and hauling; whereas the latter one is most suitable for catching mid-water fishes and prawns.

India: Only about 1250 fishing vessels out of 5200 mechanised boats are equipped for mechanical fishing and almost all there are operating trawl nets. However, India is shortly to acquire purse - seiners equipped with power blocks.

Philippines: The Filipino fishermen are finally convinced to use nylon nets in single boat seining operations. Aside from the change of the types and kinds of net materials the use of power blocks and flood lights in fishing is finding its way in commercial use. The increase catch of trawlers is attributed to the increase of trawling speed during fishing from 2 - 4 knots using two or more units of 25 h.p. Gray Marine engines. However, the increase of speed very often causes breakdown in the engine. As a result from these shortcomings, some operations are shifting to single unit of heavy duty (low speed) engines to minimize loss of fishing time operation.

Another development is the common use of 30 - 40 kilowatt generators and sometimes 80 kilowatt. The result of this development is very encouraging. To boost further fish production, the Philippine Fisheries Commission is taking advance steps by buying modern fishing paraphernalia like fish finders to be loaned to develop their skill in fish detecting practices and techniques.

Another development of importance is the use of electric fishing in rivers, lakes and other bodies of fresh water with the use of homemade portable generator units operated from batteries which is gaining popularity in this country.

U.S.A.: The Bureau of Commercial Fisheries has developed: (a) system of midwater trawling for hake and other schooling fish which shows promise of acceptance by the industry, (b) developed and introduced laboreaving mechanical devices for harvesting fish in shallow ponds and lakes. No new types of gear have been introduced.

The use of hydraulic systems to drive power blocks, winches, controls, seine drums, etc., are gaining acceptance throughout the fishing industry. The almost exclusive use of synthetic fibers has limited the use and research on preservatives.

GEAR MATERIALS

11th Session Recommendations:

"The Council requested FAO to provide information on the efficiency of colored fishing nets to the Member Countries as and when such information becomes available".

Such information when available will be published in the Current Affairs Bulletin.

No information has been so far available on colored fishing nets.

In Australia, the use of monofilament nylon gill net has gained in popularity for this fishery in Eastern Victoria. The monofilament netting has been found the more selective and retains very little rubbish as compared with multifilament netting. New deck layouts and winching techniques have been developed to simplify handling the gear.

In India, by and large, the conventional gear preservation method are being practised by the industry. On the research side, experiments were conducted with 'Avigal C' on cotton twines.

In Japan, regarding materials for fishing nets, nylon nets made of three types of monofilament, multifilament and spun, are used in gill net exclusively, sardine and tuna purse seine and medium and small size trawl net. Polyvinyl alcohol material is widely used for horse mackerel, mackerel, sardine purse seine, medium and small size trawl, king crab gill net, small trap net and stick held dip net. This is made both in spun and multifilament nylon. Polyvinylidene chloride material consisting of both multifilament and monofilament is mainly used for big scale trap net. Since 1960 polyethylene has been used both for big and small trawls with advantages.

In U.S.A., it is reported that no gear materials were introduced in the fishing industry during the intersession period.

Vietnam: There has been no great change during the intersession period. The only thing worth while noticing is the use of nylon monofilament of large size ($1\text{m}/\text{m}_4$ - $1\text{m}/\text{m}_5$ diameter) to catch the *Polynemus* sp. It is generally believed that large size nylon monofilament is too stiff to make gill nets and too rough to catch fish. But in practice it has been proved that large size nylon monofilament is very efficient in gill netting for large fish; the quantity of fish caught is higher than that caught in ramie, nylon polyfilament or any other fishing materials.

FISH DETECTION

11th Session Recommendations:

"The Council was very much interested in the paper from Japan 'The Modern Fish Finder and its Application in Japan' by Y. Tawara on echo sounders, and requested FAO to make available to Governments extra reprints of the paper, together with illustrations as soon as it is published".

The above Paper was published in the IPFC Current Affairs Bulletin (No. 42, April 1965), and reprints were distributed to Member Governments.

Regarding intersession developments, in Australia, modern echo-sounding equipment is being used extensively, but as yet there is only a small use of sonar equipment. No information is available from other countries except U.S.A. where it is stated that the use of white line echo sounders and multi-angle sonar scanners are gaining popularity in the bottom and pelagic fisheries

FISH ATTRACTION

11th Session Recommendation and Observations:

"The Council heard with interest from the Delegate from Malaysia that petromax lamps are now fitted with mica globes to prevent breakage. The need for systematic study of the efficiency of surface as well as submerged lights was stressed"

"The Council requested FAO to provide information on the efficiency of colored fishing nets to the Member Countries as and when such information becomes available"

It may be noted that developments and advances in fishing technology are regularly reviewed by FAO and abstracts of articles dealing with important developments are published in the World Fisheries Abstracts. However news items of particular importance to this Region are usually published in the IPFC Current Affairs Bulletin as and when such information becomes available.

Ceylon: Unprotected kerosine flares are used. This is not a very important fishing technique in Ceylon. Petromax lamps are used only in the lagoon fisheries. Fishing with underwater lights has not been attempted.

India: An earlier study conducted in Kerala revealed that fishes particularly prawns and mullets were attracted by light and that certain colours are still more effective. Experiments with "Killong" at Mandapam indicated that certain fishes, particularly *Athrinus* sp. were attracted by light. Currently Chinese dip nets alone use light to lure fish.

Philippines: Incandescent bulbs of 1,000 watts each are used ordinarily in fish attraction. However, mercury lights have found acceptance by fishing light operators. It is very good at competition in a ground where there are many fishing boats lighting fish. However, its retaining power for the attracted fish has yet to be proven.

The use of submerged light is being practised by many operators. Its efficiency over surface lights should be studied such as lowering the light below the level of the fish and bringing it up slowly so the fish will follow up. This would necessitate the use of an inverted reflector. Necessarily, this study would require the use of an echo sounder to determine the behavior of the fish.

U.S.A.: No noteworthy development have taken place in this field. The Bureau of Commercial Fisheries conducts limited research on light attraction in conjunction with electrical fish guidance and fish pumps.

WEATHER FORECASTING

11th Session Recommendations:

"The Council noted that weather forecasting for fishermen has expanded in the Region and drew the attention of the Member Governments to the recommendations made by the Council during its 10th Session on this subject". (The 10th Session recommendation is as follows: "While noting the existence of weather forecasting services for the fisheries in some member countries, the Council strongly recommends that similar services be developed in those countries where they do not exist at present. For instance weather forecasts could be broadcast at certain periods of the day and received by the fishing craft by means of inexpensive radio receivers").

Ceylon: Weather forecasting to fishermen is carried out in Ceylon. Where bad weather at sea is anticipated special "bad weather warnings" are broadcast for information to fishermen giving the location and duration of the predicted bad weather.

Hong Kong: Since the 1st January 1960, a special "Fishermen's Weather Forecast" has been a regular item in the programme of Radio Hong Kong. The information, supplied by the Royal Observatory in Hong Kong, is broadcast at 0746, 1230, 2145 and 2347 hours daily. The weather forecasts give details of expected wind force (in Beaufort Scale), rain, fog, etc., for the forthcoming 24 hours. Separate forecasts are given for six different fishing areas, covering all the grounds worked by local boats.

Also a daily broadcast of fish landings and fish prices at the main wholesale fish markets commenced in May 1965. The reports include quantities of fish landed and main species of fish marketed, wholesale prices of main species of fish and the number of different types of fishing boats with estimated quantities of fish, alongside the markets waiting to land their catch for sale the next day.

India: Weather forecasts are made by the meteorological offices and whenever necessary the information is passed on to the port authorities, who in turn hoist warning signals. Where organised ports do not exist, the information is passed on to the fisheries Department officials, who in turn contact the fishing villages and advise the fishermen.

Malaysia: No systematic weather-forecasting is done. However during the Northeast monsoon period, weather forecasts mainly for the benefit of fishermen on the East Coast of Western Malaysia (mainland) have been carried out by Radio Malaysia for a number of years. These broadcasts give 24-hour notice of expected direction and velocity of wind and height of waves. Thus fishermen are sufficiently warned and the broadcasts have proved very valuable.

U.S.A.: The situation is same as in the preceding intersession period. No new developments have taken place.

FISHERIES TRAINING

11th Session Recommendations: Nil

Hong Kong: The Fisheries Extension Division has for many years been providing, free of charge, courses of instruction to fishermen wishing to take the Marine Department examinations to qualify as either Coxswains or Diesel-engine Operators.

In addition to training Skippers for the Marine Department "Trawling Master" certificate of competency (required in the case of company operated British registered trawlers), the Fisheries Extension Division also provides courses of instruction in navigation for fishermen from the mechanized junk fleet. The latter courses, also free of charge, are each of six month's duration : training is given in chartwork and navigation by dead reckoning. Trainees selected are all required to have previously had at least five years of formal primary school education. Candidates attending this course are mainly the sons and relatives of skipper/owners of large junk trawlers or long liners. Eight of these courses have so far been completed and to date 87 graduates have been awarded certificates issued by the Department. Elementary commercial book-keeping has been added to the syllabus as an extra subject.

India: The Central Institute of Fisheries Operatives is shortly to undertake advanced training on gear fabrication. However general training on fishing gear is part of the training imparted at the fishermen's training centres at Veraval, Kolak, Versova, Bassein, Karwar, Mangalore, Cannanore, Beypore, Cochin, Quilon, Vizhinjam, Colachel, Tuticorin, Mandapam, Nagapatinam, Madras and Kakinda.

Korea: An FAO/UNDP Special Fund Project for fishermen's training is in operation. No other information is available.

Malaysia: At the end of 1965, 154 fishermen trainees graduated from the two Marine Fisheries Schools in Penang and Kuala Trengganu. The total number of graduates from both schools, since their inception in 1953 and 1961, now stands at 1,201.

Inspite of the apparent usefulness of the present curricula it was felt that a more practical approach with greater emphasis on actual fishing operations aboard the School's vessel and commercial fishing vessels would be desirable. The curricula have now been revised so that up to two thirds of the course time is spent on practical fishing exercises at sea. In addition the course at the Marine Fisheries School in Penang is to be extended to one year as from 1967 to allow all items in its curriculum to be undertaken in some detail.

U.S.A.: In addition to the activities shown for the last reporting period the Bureau of Commercial Fisheries and other Federal agencies are providing training services to fishermen, especially in areas of higher unemployment and areas of new and expanding fisheries. Examples of this training service occur in the Great Lakes area, the Pacific Northwest States and Alaska.

Vietnam: Mobile courses are organized in different fishing centers to train fishermen how to operate and maintain diesel engines. These courses are generally of a low level just to teach fishermen elementary knowledge about engines. It is intended that in a near future course of a higher level will be organized to meet the demand of more qualified fishermen while operating larger engines and fishing further from the coast.

The Agriculture college in Vietnam has trained engineers, those specialized in Forestry and Husbandry have some knowledge in fisheries. In 1966 a special programme for fisheries at a lower level is to be introduced with the prospect of upgrading it to an engineers degree a few years later.

The long lasting war in Vietnam creates new problems to fishermen such as those regarding coastal navigation and the delimitation of fishing grounds. In fact, fishing grounds are limited differently in different areas. The Directorate of Fisheries has to work out with military authorities to define fishery zones how to keep security for people and to protect the interest of fishermen. A hand book is prepared to teach fishermen what should be done at sea, the kind of papers they should have on board, the formalities they should fulfil before leaving home port for fishing in other provinces, etc. Also another hand book is ready for printing to provide fishermen some knowledge of seamanship while navigating far from the coast; basic and common international regulations are shown in the book as now the fishermen have larger engines and larger boats, and have begun to operate in international waters.

RESEARCH ACTIVITIES

11th Session Recommendations: Nil

Ceylon: Experimental small boat trawling from 13.7 m boats have indicated that this is likely be of great advantage to the coastal fisheries. On the results of this experimental fishing it has been decided to commence a commercial fishery. 30 steel boats of about 10.97 m in length have been ordered 10 of which are to be used as trawlers. These boats are to commence fishing operations in May 1966. Larger sizes up to 15.24 m are under investigation. Trawling with larger sizes continue. There are 3 stern trawlers 34.16 m in length now operating and 2 more are expected to arrive in May 1966. Purchase of additional vessels is also planned. The experiments so far conducted on purse seining have not given any positive results.

India: The main research work relating to the fishing gear is done at the Central Institute of Fisheries Technology, Ernakulam and its substations at Veravel, Kakinada, Burla and Nangal. At Ernakulam the work included study of physical properties of gear material, gear preservation new designs of nets etc. At Veravel and Kakinada Experimental fishing was conducted with different sizes of trawls, gill nets, long lines etc. and tentative conclusions regarding their relative merits under given conditions were obtained. At Burla and Nangal different types of gill nets were tried for fishing in fresh water reservoirs.

Japan: It is preferable to mention in detail the technical aspects of two fisheries especially --- trawl and purse seine --- which are mainly responsible for the record catch of 1965.

As seen in Table below the most remarkable progress in 1965 was accomplished by one boat type mackerel purse seine in Hokkaido, the two boat type anchovy purse seine in Japan Sea and one boat type East China Sea horse mackerel purse seine being next in importance.

TABLE
CATCH OF PURSE SEINE BY REGION

unit : thousand ton

	1964	1965	Ratio	Remarks
Hokkaido	78	176	2.26	One boat type, mackerel
(Sanriku	48	55	1.15	Two boat type, tuna
Pacific (Joban	137	195	1.42	Two boat type, anchovy
(Others	34	40	1.18	Two boat type, anchovy
Japan sea (Northern part	57	24	.42	One boat type, horse mackerel
(Southern part	58	27	.47	One boat type, horse mackerel
Kyushu	138	158	1.14	One boat type, horse mackerel
East China Sea	232	300	1.29	One boat type, horse mackerel
T o t a l	781	976	1.25	

The production by purse seine is closely linked with the boat installations such as engine, propeller, fishing equipment, as well as an optimum design of fishing net. In order to get the most effective fish yield depending on the conditions such as character of fishing ground, the behaviour of fish, and kind of fishing method --- one boat type or two boat type ---, the proportion of length of net along buoy line times to the depth of net and the composition of net materials should first be decided. After the decision regarding the size of net, the size of boat which should have the capacity to hold the entire catch of the net should be decided to ensure complete safety of operation. Next, the horse power of engine and the efficiency of the propeller are decided according to the distance of fishing ground, navigation intervals, number of operating days and speed of the boat. Types, efficiency and arrangement of fishing equipment is next considered and necessary number of crew are decided from the conditions of fishing operation and efficiency of the fishing equipment.

When the purse seine fishing equipment --- net hauler, power block, reel winch of purse seine, side roller, windlass, etc. -- are set on the boat, the resistance of the net as well as the tension of purse line in the operation should be estimated. Some experimental estimations are first conducted on the tension of net and ropes (Nomura et al, 1966) which will serve as a guide for using proper power in the fishing equipment. The important values of one-boat type mackerel purse seine net having 600 meters length of buoy line and 200 meters depth are estimated from the results of experiment on one-tenth model net to full scale. During laying out the net, the tension of buoyline and sinker line are 20 kg. and 28 kg. respectively, while in the course of hauling

the net, the tension of the former and the latter show 70 and 47 kg. respectively. The maximum tension of purse line when it is reeled in is about 6 to 7 tons and whole tension of net when it is taken up by power block is more or less 1 ton.

Some observation on the behaviour of purse seine net in the operation are conducted (Hamuro, 1965) by use of calculating instruments and it is concluded that the way of using reel winch of purse line influence very much the catching ability of the gear directly. The light time at which purse line should be hauled in after laying out the net is most important operative condition for expecting a good catch.

The kinds of trawls that are generally considered are side trawl, stern trawl, bull trawl, Danish seine, small trawl, etc. Among them stern trawl is the most developing gear now in Japan. In 1959 Japan first sent the stern trawl to waters off Africa. Since then it has progressively developed year by year, and at present fifty boats are under operation in that area. The size of the boats are large upto 3,000 tons with 3,500 H.P. engines at present. Under the conditions the relation between towing power of the recently built stern trawlers of big size and the size of the nets are urgently necessary. With this point in view, some researches on stern trawls have been carried out (Koyama, 1964; Hamuro, 1964; Koyama, 1965). These reports deal with the determination of the fundamental requirements in the nets and gear designs suitable for the boats. Some conclusions are as follows: (1) shaft horse power (B.H.P.) of each trawler is approximately proportionate to cube of engine revolution (r.p.m.). (2) Towing speed v (knots) is approximately proportionate to engine revolution. (3) R' , total resistance offered by one set of trawl nets and gear, is obtained by the formula, $R' = T \cos \alpha$, where T is the total tension of a pair of warps and α is an angle of inclination of the warps. R' (tons) in relation to towing speed v is expressed by the following empirical formula, $R' = k_2 v^2$, where value of k_2 varies with the difference in the sizes of the nets and gear. (4) Effective horse power (E.H.P.) of boat in relation to shaft horse power (B.H.P.) is expressed as, $E.H.P. = k_3 (B.H.P.)$, where the value of k_3 is from 0.23 to 0.27. (5) The relation between maximum continuous as, $E.H.P. = 0.167 P$, where P is limited within the hourse power from 2000 H.P. to 3500 H.P. (6) L , the developing force of an otter board, is formulated as, $L = C_L \rho v^2 S$, where S is the area of an otter board, ρ is density of sea water, v is towing speed, C_L is developing coefficient -- this is equal to 0.79 for "Süberkrüß" upright type otter board and 0.77 for ordinary plate otter board.

As to Danish seine, dynamic analysis have been conducted with the study of the behaviour of sweep line in which the sweepline, neglecting the effect of net, and warps are laid originally in a quadrilateral-shape (Suzuki, 1964) and in triangle-shape (Suzuki, 1964). The fishing gear used in the Bering Sea in 1963 by catcher trawlers belonging to a mother factory ship, namely the Danish seine trawl net and the two-boat type trawl have been studied comparatively (Higo, 1966). The results are as: (1) By the radar measurement, it is ascertained that the sweeping area of towing rope of bull trawl is wider than that of Danish seine. (2) According to the experiment the height to net-mouth of bull trawl is larger than that of Danish seine; the difference is about 0.6 to 2.0 meters in the full scale net. The filtering capacity of towing net of bull trawl is bigger than that of latter one; the ratio

being about 9. (3) Judging from the catch per one set of towing-nets, it is assumed that the catch of the former (bull trawl) is bigger than that of the latter (Danish seine) which correlates with the above data, but the catch record, based on a unit sweeping area of towing rope and a unit filtering capacity of towing-net, shows that the fishing efficiency of the latter is superior to the former.

As to mid-water trawl some studies have been made on the estimation of the working depth of the gear by means of a chart prepared by a computer based on the supposition that the configuration of the warp during fishing takes on the shape of part of circular arc (Nakasai; Kawakami, 1965). The researches on dynamic analysis of trawl net are on the following items (Kawakami, 1964): hydraulic resistance of net, resistance of cod end, dynamical equilibrium of trawl net, distribution of tension, dynamics of otter board, behaviour of net and model experiments.

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Malaysia: Investigations were recently initiated to examine some of the more important fishing gears used in the fishery. Materials used, form and structure, size of fishing crew, craft used and methods of operation are being studied and recorded and would later be modified and experimented upon to effect improvements wherever necessary.

The team of investigators comprises 2 Japanese gear technologists, seconded for service to the Fisheries Division under the Japanese Overseas Co-operation Volunteer Scheme, a Fishing Gear Technologist, a graduate from Japan recently recruited into service, and the Principal of the Marine Fisheries School. A new 15.24 m twin-screw vessel fitted with a puretic power block has been placed at their disposal for investigation.

U.S.A.: Research stations and activities are the same as indicated during the last reporting period except for change of address:

From

Bureau of Commercial Fisheries
Exploratory Fishing Gear and
Research Station
P.O. Box 1909
Panama City, Florida 32402

To

Exploratory Fishing Base
Bureau of Commercial Fisheries
P.O. Box 1207
Pascagoula, Mississippi 39567

Publications: A list of publications originating from Exploratory Fishing and Gear Research activities since 1964 is available. Publications directly related to the subject matter are also available.

A list of 46 papers published in U.S.A. during 1964-66 is available with the Secretariat.

Vietnam: A project for general prospecting of the offshore waters in South China Sea (along the coast of Vietnam only) and part of the Gulf of Thailand has been prepared in 1964, revised recently and presented to get assistance from the U.N. Special Fund. The project foresees the supply of 3 boats:

- 1 of 120 tons for research, prospection and training
- 1 of 50 tons for coastal trawling
- 1 of 25/30 tons for purse seining and light fishing.

Experimental fishing will be carried out to test and define the proper gear for the existing fauna, to investigate fishing conditions, the species of fish, density of school, time of migration, fishing grounds, etc. The services of a number of foreign technicians are also foreseen to conduct the initial experimental work and mainly to train Vietnamese counterpart-assistants to take over the responsibility after 5 years of activity of the programme.

After revising, the project now comes up to a total amount of US\$3,451,000 part of which will be financed by Vietnamese Government. It is hoped that the project be approved sometime this year.

FAO TECHNICAL ASSISTANCE

Two master fisherman under the EPTA program are continuing to carry out exploratory fishing and train local fishermen in Ceylon.

Three following Special Fund Projects are now in operation in the Region.

Korea: Organization of a Deep Sea Fishing Training Center.

Pakistan: Marine Resources Survey.

Philippines: Marine Resources Survey.

B. COUNCIL PROCEEDINGS

CRAFT AND GEAR

Inter-Session Report

The Inter-Session Report for 1964-66 was reviewed and adopted by the Council after incorporation of additional information contributed by the Member during the meeting.

During the discussion of the Inter-Session Report the following subjects were reviewed in detail, particularly with reference to implementation of the Council's recommendations made during earlier Sessions.

The Council heard with interest from the Delegate of New Zealand that 45 ft. long fishing boats are being built in his Country with reinforced concrete and requested him to make available to the Council information on the economics and durability of such fishing craft.

The Delegate from Australia reported on the highly successful Symposium on fishing boat design held by that Government and informed the Committee that the papers presented at the Symposium will be published by the Australian Government and copies will be made available to the Council.

While considering the inter-session developments on motorization the Council noted that its earlier recommendation that "research on impact of introduction of mechanized fishing on the socio-economic status of fishermen, be carried out", had not been implemented. It was noted, nonetheless, that motorization had proceeded substantially during the inter-session period and concluded that:

- (a) the Member Countries presumably must have satisfied themselves empirically that motorization was, generally speaking, beneficial to their fishing operatives; and
- (b) the non-compliance with the previous recommendation was probably attributable to the inadequacy (or absence) of statistical data on which any value judgments could be based, but

noted that there remained a continuing need for economic studies of the effect of mechanized fishing, even though such analysis may only take the form of case studies.

Publication of Inter-Session Report of Technical Committee II

The Council decided that the Inter-Session Report (1965-66) of Technical Committee II (Technology) should be edited in suitable form and left it to the discretion of the Secretariat whether it should be included in the Proceedings of the 12th Session of the IPFC or issued as an Occasional Paper.

Manpower Requirements

In considering manpower requirements, the Council recognized the need for a wider and integrated training program in the Indo-Pacific region and supported the Executive Committee's recommendation that in the first instance Member Governments should define their individual needs for trained personnel and facilities. The Council recommended, however, that such information should also cover the requirements for the vital field of exploration and experimental fishing which is necessary for the more precise knowledge of the fishery resources of the region.

It was recommended that immediate steps be taken by the Member Governments with the assistance of the FAO to promote the intra-regional development of training in these fields. For example, group participation by personnel of other countries might be arranged in fishery development country projects set up under UNDP, such as the Philippine Deep Sea Fishing Development Project, or in ways similar to those being developed at present cooperatively by Malaysia and Thailand.

Improvements in Fishing Craft Design

Discussion of improved trawlers with modification to permit conversion to purse seining at short notice was of particular interest. In relation to the Philippine Developments in purse seining and the possibility of adapting trawlers for seining, it was noted that there is an increasing application for larger trawler-seiners (in length over 90 feet) equipped with modern sonar equipment for fish detection in the IPFC area.

Motorization

The 11th Session recommendations were reviewed, especially with reference to cost of fuel supplies. The Council requested FAO to assemble information about the present position relating to fiscal taxes applied to fuel oil, engines, gear and other equipment used by fishing craft, not only in the Indo-Pacific region, but in other parts of the world. It was also suggested that FAO should ascertain the extent of systems of tax exemptions, rebates, or refunds on such supplies and assemble details of the procedures and fiscal safeguards applied in such cases, for circulation for the information of Member Governments.

Fish Harbors

The Council noted that requirements for fish harbors are of greatest concern to those parts of the Indo-Pacific region in which facilities are needed for small fishing boats of limited draft.

Purse Seining and Pelagic Fisheries

In view of the interest in the Philippine developments in purse seining with lights and the possibility of ready application in several Member Countries, FAO was urged to obtain the reports of this development and provide the information to IPFC members as soon as possible.

The Council heard with interest from Mr. Kristjonsson, Chief Gear Technologist FAO, about the recent developments in single boat purse seining using power blocks and sonar. The Committee was informed that a paper on recent developments on this method of fishing would be made available to the Council.

Concerning the Council's 11th Session request for information on colored fishing nets, the FAO Gear Technologist mentioned that such information might become available during a seminar on Fish Behavior in Relation to Capture, scheduled to be held in 1967.

Fish Detection

The Council noted the considerable significance of Mr. Kristjonsson's report stressing the value and importance of the use of advanced sonar scanning techniques for detection of fish in exploratory and commercial fishing. It was suggested that Member Countries should take particular note of this development and consider its application in their developing fisheries.

CHAPTER IV
FISH UTILIZATION

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A. INTERSESSION ACTIVITIES

FRESH FISH HANDLING, DISTRIBUTION AND MARKETING

11th Session recommendations: Nil

Australia: Articles have been published by E.W. Hicks late of CSIRO Division of Oceanography and Fisheries on the efficiency of cooling by ice in bunkers in insulated vans. Information on the use of mechanical refrigeration in rail, cars and mechanically refrigerated boxes for rail cars, both used for the transport of fresh fish, can be obtained from the NSW Department of Railways, Mechanical Engineering Test Laboratory, Redfern, and the Victorian State Railways respectively.

The application of refrigeration in preference to ice is increasing. In Tasmania, brine cooling is being developed on an industrial scale. The use of now returnable hygienic fibre fish boxes is increasing in N.S.W.

Ceylon: No new developments are reported except that ice production has increased as well as cold storage space for frozen fish is being expanded.

France: In French Pacific Territories, in the past, the main trouble was in the local idea that the living fish was the best for consumption. This is true and the living fish market of Noumea was surely most attractive for tourists and frankly misleading to economists: percent of lost fishes enormous, high prices, high cost of handling, statistics impracticable. For 5 to 7 years, the consumption of frozen fish is increasing. Then the total consumption of fish also increased and the prices are a bit more regular. But if the facilities of freezing onboard have increased, they have remained small and there is no icing facilities, the ice is very expensive at a price which could be convenient for domestic use for which really it is produced - but not for commercial use.

Ciguatera - a type of fish poisoning very common in New Caledonia as in French Polynesia, is an obstacle against increased fish consumption, but the only thing one can do, is to encourage research on the subject mainly done in Honolulu, and to encourage the consumption of the safe fish species. There is no rule at the moment, on which regulations could be based. The local consumption has increased over the last ten years but this is due partly to the presence in increased number of Polynesian workers who are heavy fish-eaters.

As far as French Polynesia is concerned, the problem is less in increasing the consumption which is already impressive than increasing production of fish: an effort was made, and more, has to be made to diversify the origin of the consumed fish in Papeete, by importing fish in the Central Island from the low human density islands of the archipelago and organizing a proper handling chain.

In New Caledonia, there is one fishermen's co-operative pooling together approximately half of the Noumea fishermen. It is related to a special administrative office for the co-operative. The other fishermen depend on the Marine Fishing Section of the "Service de l'Elevage" (Stock Farming Department). The influence of this latter new administration is not strong enough, because of lack of people and insufficient structure, but it is increasing. The aim of the co-operative is to promote regularity in the landing of fish together with a better stability of prices, by improving facilities for landing, icing, marketing to the member fishermen. These facilities already exist at the co-operative but are small and the co-operative people are trying to improve them. To do this, mainly in ice supply, they have requested some assistance. The co-operative acts as any other private society with more or less the support of the administration and they have requested several times some regulations and facilities to protect the fishermen's interests. The production of the co-operative is approximately one third to one half of the one of the small fish markets of Noumea (around 7 metric tons per month on 20 estimated tons, only).

There is no relation between the above two administration departments and the fishermen, other than administrative ones.

India: The use of fish in the fresh condition, with or without ice, has been increasing in India. Now over 70% of the fish landed is consumed fresh and ice is now available in the major fishing centres. But as the price of ice is high, its use could not be extended far. The Central Institute of Fisheries Technology has been experimenting with various cheap packaging materials for the despatch of fresh fish with ice. Trials with plywood boxes lined with 2 cm. thick polyethylene covered Thermocole have shown that fish iced in the ratio of 1:1 remained in good condition for 72 hours, during which only 10% of the ice melted out.

Malaysia: Traditional methods of fish handling, icing and packing have continued to dominate in the fishing industry and no non-traditional methods have been attempted. However, there appears to be a greater interest in improving the existing methods of icing and handling of fish in the industry. Wooden containers made from used packing cases still dominate, though

grater use is being made of galvanised iron for making fish boxes. The wooden boxes used are very varying in sizes, but seems to have evolved into standard-type boxes of a uniform size. Increased use of chilled water is being noticed for holding smaller sized fish at the larger markets.

Philippines: For landing facility of fishing boats the government by Presidential Proclamation authorized the exclusive use of Pier 14 as a fishing wharf. In the report submitted by the FAO Fish Marketing Adviser, he recommended the improvement of said pier and the establishment of a fish market therein.

To alleviate the acute ice shortage perennially faced by the fishing industry, the Philippine Fisheries Commission has embarked in the construction and installation of 18 units ice plants with capacities ranging from 5 to 40 tons with cold storage ranging from 30 to 300 tons. To date 3 units are actually in operation, six (6) are under construction and nine (9) are awaiting selection of appropriate sites. These eighteen (18) units will produce flake, tube and block ice exclusively for use by the fishing industry.

Through the directive from the Office of the President of the Philippines requisition for twenty (20) more units of ice plants and cold storage machineries have been submitted for inclusion in the allotment of the 11th year of the reparation.

To improve the Navotas Fish Landing, the major landing that supply the fish needs of the City of Manila and the provinces in Luzon, the Philippine Fisheries Commission has begun the project of reclaiming the front portion of the Navotas Fish Landing towards the sea. At the moment the breakwater has already been constructed measuring 250 by 100 meters.

The big Navotas Fishing Port Project is presently being pushed up. This reclamation project will include the establishment of harbor for fishing boats. Refrigeration, slipways, fish market, industrial and residential lots, parks and church with a total area of about 900 hectares.

The present fish marketing methods, practices and techniques have not changed from the old and traditional way. As a measure to improve this method, the Government has requested FAO for technical assistance on all aspects relating to the marketing and distribution of fish, including the planning and establishment of suitable marketing and distribution facilities and the handling of fish from the points of capture to the consumer.

Vietnam: With a longer time of absence from port and operating in farther grounds, Vietnamese fishermen now carry ice on board and also fish dealers use more ice at landing centers. The quantity of ice used in fish preservation is however still low. Over 375,000 tons of fish were caught in 1965, and only about 1/10 of this is preserved in ice. As the demand for ice increases rapidly, a typical plant for ice making with an output of 5 tons/day has been designed and made popular with every fishing center. The plant is conceived economically while most of the existing plants suffer high overhead expenses due to technical inefficiency.

TRADITIONAL METHODS OF PROCESSING

(Boiling, salting and drying, fermenting, etc.)

In Australia, interest is being shown in developing fish smoking and fish meal production in Australia. An alginates industry using *Macrocystis pyrifera* is now firmly established in Tasmania.

Boiling

11th Session recommendations: Nil

No developments are reported except from Malaysia.

Malaysia: Boiled fish, which has been entirely prepared from *Rastrelliger* species, is still being produced at the main landing centres though in smaller quantities as a result of reduced landings.

Salting and Drying

11th Session recommendations:

"Detailed discussions were held on salted, dried and smoked fish and the Council requested FAO to obtain information from U.S. firms on the mechanical driers used for drying shrimp".

The Secretariat is in touch with the U.S. officials on this subject and a report will be circulated to the Member Governments as soon as relevant information is received.

India: Sun drying with or without salting is the traditional method of fish preservation in India. Consequent to the increased availability of ice, the quantity of fish used for curing is getting reduced. A few pilot mechanical dehydration plants are expected to be introduced shortly.

Malaysia: Traditional methods of preparing salt fish largely by brine salting followed by sun drying is still the dominant form of curing in the curing establishments. All salt used in curing is imported Taiwanese or Siamese salt. Taiwanese salt is more popular with curers as it is cheaper and cleaner than other imported salts. Packaging and storage have however shown marked improvements as the industry is becoming more conscious of the need for improved handling of the cured product. The more expensive varieties are now packed in polythene bags. Cellophane is finding increased use in packaging shrimp paste (Belachan).

Fermenting

11th Session recommendations:

"Considering that fermented fish products are very important and that large capital investment in this form of processing exists and noting that very little basic data on this process exists, the Council recommended that basic research in this field be encouraged, and suggested that a suitably qualified person be awarded a fellowship for carrying out fundamental research in this field".

No progress has been reported.

Ceylon: Fermented fish is not consumed in Ceylon and no work has been done. As it is not likely that this commodity will be of importance even in the future no research is being undertaken.

Vietnam: Residue of Nuoc-mam. Up to date the residue of Nuoc-mam (fish sauce) is sold to farmers for fertilizer. Recently it is being used to make fish meal for cattle and an analysis of its composition is as follows:

Moisture	6.00 to 6.5%
Protein	31.80 to 32.3%
Fat	14.37 to 14.21%
Ash	34.12 to 35.41%

Other Traditional Methods

Nothing to report.

NON-TRADITIONAL METHODS

11th Session recommendations: Nil

Ceylon: The Ceylon Fisheries Corporation has commenced establishment of fish terminals with cold storage (minus 10°F) and holding (32°F) facilities. Fish is issued from these terminals to authorize distributors for sale to the consumer. The Corporation envisages the establishment of a number of such terminals in the fish consuming areas of the island.

Frozen fish is transported in refrigerated trucks while 'wet' fish is transported in lorries packed in boxes with ice.

Authorized distributors are required to conform to type plan structures for the sale of fish and are also induced to invest in wet fish holding cabinets (32°F) and deep freezers (0°F) for frozen fish.

India: There has been an increase in the number of units processing canned and frozen fish. The research institutes are engaged on various problems connected with the canning and freezing particularly with reference to fish and prawns. Work on the standardization of the technique of canning other fishes are also in progress. Recently a pilot scale accelerated freeze drying (AFD) plant has been installed and preliminary work on the preparation of AFD fish is in progress.

Malaysia: Frozen shrimp export appears to be catching on in the industry, as the government has provided the added incentive of pioneer status for any new venture. Frozen shrimp is now being exported to the U.S. markets and Japan market in small quantities from Western Malaysia and in larger quantities from Western Malaysia and in larger quantities from Eastern Malaysia.

Little or no activity has been noticed in other forms of non-traditional processing.

Although frozen fish has been introduced into the Malaysian market, it has not received much support from the consumer. The bulk of the frozen fish is still channelled to the armed forces.

Canning of fish is still a very small industry in Malaya; tuna fish canned at the Malayan Marine Industries Ltd. Penang is being exported entirely to the United States.

FISH PROTEIN CONCENTRATES

11th Session observations:

"The Council noted that a large project sponsored by FAO under FFHC is being started in Peru on the production of fish protein concentrates for human consumption. The Council requested FAO to consider the possibility of circularizing the Member Governments regarding their interest in starting a project in their countries for production and promotion of fish protein concentrates".

Australia: Fish protein concentrate for human consumption has been produced in this country using a patented process, the rights to which are held by Cavanagh's Solvent Processes Ltd., 168 Adelaide Terrace, Perth. Some tests have been made on the product by this Division, and the Section of Chemical Engineering, CSIRO, has reported on the process economics.

At the appropriate time consideration might be given to the use of this process for the domestic production of Fish Protein Concentrate.

No developments during the intersession period have been reported concerning the above.

India: Laboratory scale trials have been made to prepare protein concentrates from prawn head, using acetone as the solvent.

U.S.A.: The National Academy of Sciences has recommended building an experimental pilot plant, capable of producing about 3,000 tons of the product in the next two years for large-scale human nutritional studies in the United States and abroad.

BY-PRODUCTS FROM FISH

11th Session recommendations: Nil

India: The technology of the preparation of fish ensilage as cattle feed has been standardised, but no commercial production of ensilage has been taken up so far.

Malaysia: A large percentage of the marine products harvested from the sea consist of small fish termed manure fish. In fact manure fish forms about 15% of the total marine landings. A large portion of manure fish are salted and dried in the same manner as salted fish and are used either as feed-stuff for pigs and poultry or as fertilizers for plants. A few processing plants have been established by the private sector to process these manure fish into fish meal to be used as feeding stuff for animals.

SEaweEDS

11th Session recommendations: Nil

Vietnam: Experiments in making agar-agar from seaweeds have been conducted. A factory has been set up in the surroundings of Saigon and will be able by the end of this year to produce about 40 kg. of agar-agar per day.

Different varieties of seaweeds available along the coast of Vietnam will now be properly used as until now coastal fishermen collect and consume them raw and have no means of preservation. The *Gellidiella acerosa* is found as the most productive; other varieties also produce agar-agar but of a lower quality.

QUALITY CONTROL

11th Session recommendations: Nil

India: Compulsory quality control and pre-shipment inspection have been enforced for frozen and canned fish intended for export.

RESEARCH ACTIVITIES

11th Session recommendations:

"The Council brought to the attention of the Member Governments the importance of research in fish preservation and the development of new products and processes, and recommended that research in this field should be encouraged and expanded".

"The Council requested FAO to provide a summary of the research carried out in this field in other areas in order to eliminate possible duplication of effort and especially to make available the results of the most pertinent research in fish processing".

Information regarding research developments are regularly published in the Current Affairs Bulletin as and when such information becomes available.

Australia: The following is a brief resume of the researches on fish carried out in Australia by the CSIRO Division of Food Preservation.

- (a) Crayfish (*Jasus lalandii*). A study is in progress on the effects of freezing and frozen storage (including the effects of decay between death and freezing) on the quality of crayfish muscle. These studies have been made in replicated experiments. The assessment of quality was made by a tasting panel.

The crayfish was stored in three forms, viz. tails, whole green, whole cooked, at 0°F for periods of 0, 3, 6 and 9 months. It was observed that the tails gave the best quality followed by whole green, though some autolysis was noticeable in the latter form which resulted in soft texture. The holding of crayfish samples at 7° for 24 hours after killing did not produce any adverse effect on the overall quality. The quality of crayfish, however, declined as the period of storage was prolonged from 0 to 9 months. Efforts are being made to correlate changes in quality as assessed by tasting panel with the physiochemical changes in crayfish muscle.

- (b) Crayfish (*Jasus lalandii* and *Jasus verreauxi*). These sub-species are being used in a physiological and biochemical study of post-mortem changes in crayfish muscle. Arginine kinase and phospho-arginine have been prepared from crayfish muscle with the object of using these compounds to characterise pre- and post-rigor events in crayfish muscle.

Physiological studies have centered on delay, onset and resolution phases of rigor mortis in excised live crayfish muscle. Length changes in the muscle have been used to determine the time course of these events. A modified "Regorometer" is being employed to indicate extensibility changes in the muscle. These studies were initiated in order to know the rigor mortis behaviour and its relationship with the quality of crayfish muscle after frozen storage.

- (c) Live storage of crayfish (*Jasus lalandii* and *Jasus verreauxi*). These two sub-species of domestic crayfish have been used in experimental work to determine the factors involved in the long term live storage of crayfish. Using suitable techniques, periods in excess of nine months, with no deaths, have been achieved. The crayfish made commensurate weight gains during the storage period.

Studies on the accumulation of metabolic end-products in a crayfish vivarium have shown the beneficial effects of adding reducing substances to reduce the nitrate concentration and extend the time during which the same recirculating sea-water may be used. This study has important bearings on the storage and transport of live crayfish, since the fish must be marketed alive otherwise serious disabilities such as "drop-tail" occur which render it unsalable on the fresh fish market.

- (d) Spoilage in crayfish. Preliminary studies on the occurrence of spoilage characterized by ammonia and trimethyl-amine production, decrease in arginine concentration and increase in pH, indicate the muscle has a very short storage life once the resolution of rigor occurs. A delay in the onset of rigor increases storage life. These studies indicate the reasons for crayfish being regarded as very susceptible to spoilage.

Further work on spoilage has shown that the rise in pH after the resolution of rigor can be prevented by dipping the muscle in 15 ppm oxy-tetra-cycline (OTC). The multiplication of bacteria is largely suppressed with a fall in the production of volatile bases. The OTC has no effect on the time course of rigor exhibited by the muscle.

- (e) Fish - Australian Salmon. An investigation is being carried out of the factors governing the quality of canned Australian salmon (*Arripis trutta*). The factors so far investigated include current work on the distribution and characterization of the lipids in Australian salmon and the effect of pre-brining treatments on tenderness. It is intended to include in the study treatments for the retention of colour.

Considerable data has been collected on the extent and distribution of lipids in different portions of the body meat. It has long been the practice of these laboratories to recommend the addition of sodium nitrite (allowable under the NSW State Pure Food Regulations within certain limits) to enhance the pink colour of canned Australian salmon. Some tenderising effect is achieved by overnight brining of the cut fish sections in 8% salt. A greater degree of tenderness is achieved by holding the brine at 70°F than at 35°F and by holding the fish at room temperatures for longer times. Autolysis is the main factor in tenderising salmon but bacterial enzymes may also be important.

- (f) Northern Bluefin Tuna (*Kishionella tonggol*): Utilization. Acceptance trials have been made on this hitherto virtually unused resource and there are no technical reasons why it should not be processed commercially. The canned products have been found to be acceptable.
- (g) Browning and retention of flavour in canned shellfish. Studies on discoloration in canned scallops (*Pecten spp.*) and canned abalone, (*Haliotis spp.*) and work on flavour retention are being continued.

A number of pre-processing treatments have been found to be useless in decreasing the browning occurring in canned scallops (*Pecten alba tate*). In treatments where the incidence of browning was decreased, adverse flavour changes prevented the use of the proposed treatment.

As glucose has been identified as the only sugar present in scallops sufficient to cause browning, experiments are being carried out with the object of removing the glucose by enzyme oxidation methods. The process will have some bearing on the removal of brown stains on other fish products and shellfish.

- (h) Development of new products and processes: The development stage of new products is largely carried on by the processor in the industry with the guidance and help of the CSIRO. Technical advice and processing data have been given to the industry on many subjects including fish sausages, fish cakes and tuna ham; procedures for the handling, transport, packaging, freezing and marketing of prawns caught in newly established fisheries; transport of prawns in chilled brine in insulated milk vans; ammonia development in frozen shark fillets; the use of the acid ensilaging process for the preservation of fish and fish wastes for animal feeding; improvements in the keeping quality of smoked tuna in the New Guinea climate.
- (i) Impediments to fresh fish consumption: A condition known as "earthy" mullet affects considerable quantities of mullet inhabiting the upper reaches of rivers and lakes on the New South Wales and Queensland coasts. The condition renders the fish inedible because of strong mud-like off-flavour permeating the flesh. It has been described as being similar to "taking a mouth-ful of earth". The condition cannot be detected unless the fish is cooked. This leads to considerable buyer prejudice against mullet (representing 50% of the catch in certain areas) and a consequent adverse effect on the local fishing industry.

The CSIRO Division of Food Preservation would like to know of the occurrence of this or similar taints appearing in fish of the mullet and similar species or in other species of fish, which have been observed by members of the IPFC.

A total of 19 papers have been published during 1964-1966 on fish processing.

Ceylon: Investigations on handling and processing (canning) are being carried out.

India: The technique of preparing fish ensilage for animal feeding has been standardised.

Fundamental problems like the biochemistry of fish meat, prawn meat, turtle meat, frog legs, bacteriology of fish etc. are being investigated. On the applied side, various problems connected with the canning, freezing, dehydration and utilization of marine wastes were investigated. Besides quality standards have been drawn up for a number of fishery products and quality control is now being exercised on all exported sea foods.

Japan: Below is a review of the researches carried out at the Tokai Regional Fisheries Research Laboratory, Tokyo, during the intersession period.

Many papers on fish protein have been published, apparently due to the necessity of more information on both chemical and physical nature of fish proteins to improve the quality of both fresh and processed fishery products for the market. Actomyosin in the muscle of coldwater fish was found to be more liable to denature by heat than warmwater fish protein (1). Fish protein frozen by liquid nitrogen super-rapidly at -196°C had not undergone freeze-denaturation. Storing at -20°C after freezing at -196°C however, denatures the protein during a three weeks' storage in the same way as a sample frozen and stored at -20°C throughout. Storing below -30°C after freezing at -196°C was found to keep the quality satisfactorily (2). Washing the minced fish meat prior to processing as a jelly product improves the quality (3). Effect of oil added to minced fish meat on jelly formation was studied by comparing the elasticity of various samples (4). Also rheological study was done on various jelly products in the market (5). Addition of caseinate did not improve the elasticity of jelly product (6). Neither fatty acid monoglyceride nor sugar monoester was effective in preventing the development of brittleness of jelly product during cold storage (7). Addition of arabono-gamma-lactone improves the stability of jelly products as it lowers the pH of the meat after being heated (8, 9, 16). Bacteriological studies were made on a spoiling bacteria occasionally found on fish sausage (10, 11, 12, 13, 14). Invasion of bacteria through the tin-seal of a fish sausage was discussed (15). Inactivation of tylosin, a promising antibiotic for fish sausage although it occasionally loses its activity when added to fish meat, seems ascribable to an adsorption reaction which occurs between fish protein and tylosin (17, 18, 19, 20).

Butylated hydroxy anisole was effective in improving the quality of brown fish meal (21, 22). Fish solubles produced commercially may occasionally contain histamine and tyramine which prevent a rat from the normal growth. Steam distillation will improve the quality of the solubles (23). Fish solubles seem to contain some unknown growth factor although the content seems small (24, 25). Fish soluble has to be prepared from uncooked fish material with proteinase and peptidase, because a soluble prepared from cooked material is lower in its nutritive value (26).

Formation of metmyoglobin which is the pigment responsible for the unfavorable brown color of frozen tuna meat is considerably slowed down when stored below -35°C (27, 28, 29). The green pigment which occurs in green tuna seems to be a compound of myoglobin and trimethylamine oxide (30, 31).

Vitamin content in Katsuobushi was elucidated (32). About 35 components were detected in the volatile extractives of Katsuo-bushi. Phenolic components of the above seem to have been adsorbed by Katsuobushi during the smoking process (33). Taste of dried saury strip is improved by soaking it in fish sauce prior to drying process (34).

Mechanism of formaldehyde formation in cod muscle was elucidated (35). Amino acids in a sea urchin product were analysed (36). Methionine was found responsible for the peculiar taste of the sea urchin. Organic acids, nucleotides, amino acids were analysed in shells (37, 38).

Many species of bacteria which spoil the yield and quality of agar were detected in the seaweeds, equipments and water of agar seaweed farm. Application of PCP-Na was effective to control the bacteria (39, 40). Various conditions were studied to extract more alginic acid from seaweed as well as the purification of the extract (42).

Shucked baby clam decreases its bacteria when irradiated with 100 to 400 Kilo rentgen at 0°C. On storing the clam at -20°C for 4 weeks the quality was found as good as the fresh one (43).

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Malaysia: The Fisheries Division had provided more funds for expansion of research work in Fish Processing Technology under the First Malaysian Development Plan. Funds have been made available for an Experimental Processing Laboratory in Penang for research into salt fish preservation studies, transportation of wet fish as well as studies in fish meal.

Plans to set up a Pilot Processing Plant on the East Coast of Western Malaysia have been drawn up, and the cost is to be partly financed by the United Nations and partly by the Malaysian Government. The Pilot Processing Plant would be managed by the newly created Food Science and Technology Department.

Demonstration and Free Supply of improved fish containers for fish and ice are to be undertaken by the Fisheries Division in consultation with IPFC. An allocation has been made for the above study from locally available material.

Research has been carried out by the Fisheries Division on the usefulness of Chlorotetracycline (Acronize) in extending the freshness of Malayan marine fish. The results obtained confirm the findings of workers in other countries that the antibiotic extended the freshness of fish. But the extension was rather marginal. More trials on the various types of marine fish would be carried out in the near future.

In connection with studies on fresh fish preservation using antibiotics, the newly invented electronic device, called Fish Taster V, for detecting fish freshness was used. But it was found that this instrument has limited value, because there were large variations in the readings of the instrument for the same species of fish which have been preserved under identical conditions for the same length of time.

Over 10 species of salt fish from over 150 villages in Malaya were analysed for their nutritional composition.

Traditional products such as pickled fish, fermented shrimp and prawn-paste and fish and prawn crackers continued to attract the attention of investigators in the technological field. A survey of the methods of production of fish and prawn crackers, the methods of packaging as well as the nutritional composition of fish and prawn crackers purchased from the different parts of the country were determined. It is hoped that this study would ultimately lead to the population at large. Chromatographic separation and identification of the colours used as additives in the preparation of fish crackers, prawn crackers and shrimp paste have been initiated. Colours clearly labelled 'Not for human consumption', are being used in the preparation of shrimp-paste. Chromatographic separation and identification of colors used in the various traditional foods would enable the Fisheries Division to find out to what extent forbidden and harmful colours are being used. In the light of the findings the Division would be able to recommend permissible food colours.

Canning trials on Malayan fish and laboratory preparation of fish sausage have been initiated. Production of diversified fish preparations is envisaged for the future as an attempt to foster a greater intake of fish proteins through a wider consumption of fish and fish preparations.

U.S.A.: The highlights of the researches on fish processing carried out by the Fish and Wildlife Service's Laboratories include development of fish protein concentrates, irradiation of fish, fish oils, storage of frozen fishery products, etc.

Concerning the use of ionizing radiation in the preservation of foods, a national program to develop methods based on the use of low dose ionizing radiation has been sponsored by the U.S. Atomic Energy Commission and the U.S. Fish and Wildlife's Bureau of Commercial Fisheries Laboratories have participated in this program particularly on the use of gamma rays from Cobalt-60 source for preservation of fish and shellfish. The preliminary results of the studies on king crab, Dungeness crab, and sole fillets indicate that a keeping quality of more than 4 weeks can be obtained at 32°F by irradiation at 0.2 megarad level. Other studies include suitable packaging materials for products to be irradiated, effect of irradiation on nutritive value, etc. Metal packages appear to be ensure better keeping quality of the product than plastics films after irradiation.

FAO TECHNICAL ASSISTANCE

11th Session recommendations: Nil

In India, an FAO/UNDP expert spent several months in training research staff of the Fishery Technology Laboratory at Cochin in the operation of freeze-drying equipment.

In Pakistan, a fish processing technologist is to be appointed in connection with the UN Special Fund Project on survey of marine resources now in operation.

In the Philippines, a fish processing technologist (Refrigeration Engineer) has been appointed in connection with the UN Special Fund Project on Marine Resources Survey.

At the Central Food Technological Research Institute, Mysore, India, an FAO/FFHC International Food Technology Training Centre has been organized in which training in fish processing technology will also be imparted.

DOCUMENTATION

The IPFC Fisheries Products Manual which was distributed as a mimeographed document in 1961/62 has been revised and will be published in a printed form as IPFC Regional Study No. 4 under the title "Fish Processing in the Indo-Pacific Area".

As per recommendation of the IPFC Working Party on Fresh (Wet) Fish Preservation, another Regional Study "Fresh Fish Handling and Distribution in the Indo-Pacific Area" is under compilation and it is hoped to publish it during 1967.

A Handbook on the use of ice in fresh fish handling and distribution is under preparation.

B. COUNCIL PROCEEDINGS

Report of the Working Party on Fresh Fish Preservation

The recommendations in the report of the Working Party on Fresh Fish Preservation were reviewed by the Council. Recommendations 1, 3, 4, 5, 6, 7 and 9 were endorsed with no comments for the record. Recommendations 2 and 8 were endorsed with the following comments:

Recommendation 2: In view of the information provided to the Council on the likely problems in using sea water ice with fish in the IPFC area, including the danger of polluted sea water being used for such ice production in some areas, it is recommended that investigations in the use of sea water ice for preservation of fresh fish should be given low priority by the Member Countries.

Recommendation 8: In future planning of the recommended seminar on fresh fish handling, the Council believes that the following considerations are important: (1) Priority in scheduling the seminar should be set after review of other items requiring technical assistance funds, (2) the seminar should be planned on a regional basis with emphasis on the handling and preservation problems on the species and under the conditions existing in the IPFC countries demonstrating interest in the subject, and (3) the content of the seminar should be practical with suitable laboratory and field demonstrations illustrating the practices and problems in specific fisheries of the interested countries.

Recommendation 10 was not endorsed by the Council. The following comments explain the Committee's views: (1) The Working Party on Fresh Fish Preservation has made an excellent contribution in the form of its report and the recommendations for further actions, (2) it is apparent that guidelines have been given in the report and the symposium material of the 1964 IPFC Session for appropriate studies and implementation by the interested countries during the 1966-1968 inter-session period, (3) the Council has agreed previously that Working Parties should not be appointed or continued unless the terms of reference necessitate significant action and a meeting of the Working Party during the inter-session period, and (4) since their work of implementation rests with the interested countries, there is no need for the Working Party during the 1966-1968 period. It is suggested further that Technical Committee II give special attention during the inter-session period to reports of progress and developments in this regard by Member Countries, and that the need for the reconvening of the Working Party be reviewed at the 13th Session of IPFC.

The following amended recommendations refer to aspects of the problems which the Council considers as of immediate and direct significance to Member Governments:

Recommendation 1

It was recommended that Member Governments may determine the need for regular ice supplies in the fishing industry of their respective countries and to implement, at the earliest opportunity, a program of making adequate supplies of suitable types of ice available in areas where ice is not obtainable, of alleviating short supplies in areas where ice production is inadequate and of ensuring that available ice is never marketed at a price which may constitute a hindrance to the proper use of ice, hamper development of the fishing industry or be detrimental to the socio-economic welfare of fishermen.

Recommendation 3

Realizing the need for improvements in the handling of fish on board fishing vessels, Member Governments should examine with care the possibility of introducing the gutting and cleaning of fish at sea prior to icing without causing adverse effects to the economics of fish catching, in the knowledge of the importance of this practice being accepted by the consuming public, for whom it is primarily carried out, and

acknowledging the importance of fish stowage, Member Governments are similarly requested to investigate current methods of stowing fish in fish holds, the design and efficiency of such holds, with a view to introducing improved stowing practices by shelving or the use of containers, bearing in mind the need for economic and hygienic containers of uniform sizes and materials which will withstand the hard wear and tear of usage in fishing vessels.

Recommendation 4

The attention of Member Governments is drawn to the general need for improved containers used in the handling of fish onshore with particular regard to hygiene, standardization and the quality of fish carried in such containers, and

the need to ensure that re-icing is carried out in a satisfactory manner combined with maintaining the necessary low internal temperature of fish prior to re-icing particularly in the case of re-iced fish for transportation over long distances.

It is also recommended that re-icing with contaminated ice should be discouraged and the industry should be advised to use only fresh ice.

Recommendation 5

Member Governments may, investigate in detail the current practices of fish marketing in their respective countries with a view to establishing at the earliest opportunity orderly wholesale marketing facilities in which fish are auctioned. If it is found that a middlemen system or vested interests of other kinds prevent the socio-economic betterment of fishermen and the development of the industry both with regard to efficiency and increased production, efforts should be made to establish such orderly wholesale marketing facilities within a policy of encouraging the formation of fishermen's co-operative societies or associations with a view to the direct participation of fishermen in wholesale marketing functions and operations.

Prevailing standards of hygiene in fish handling should be determined with a view to introducing minimum standards of cleanliness in all stages either by legislation or by education as may be most practical in the circumstances and to ensure that such minimum standards are applied to all sections of the fishing industry including the handling at processing factories and retail outlets.

Recommendation 6

In consideration of the standards of containers used for the movement of fish being generally low in the Indo-Pacific Region, Member Governments may investigate the possibility of usage of such containers and to encourage the introduction of improved types of containers, particularly in relation to the carrying of fish over long distances, and

to consider the possibilities of providing insulated or refrigerated vehicles or vessels for fish carrying and to study the costs of freight charges for fish with a view to arranging cheaper rates, and

to promote and encourage fisheries co-operatives and associations in their undertaking transportation of fish where possible.

Recommendation 7

In view of the very limited knowledge available on fresh fish spoilage under the conditions existing in the Indo-Pacific Region, Member Governments may initiate investigations on fish spoilage with particular reference to species and the fishery at various stages in the handling including the need for ice in relation to fish prices.

Recommendation 9

The Working Party wishes to draw the attention of Member Governments to the need for examining the availability of scientists, technologists and fisheries workers and the necessary training for personnel concerned with the research and implementation of the various aspects involved in the recommendations made by this Working Party.

Salt

In view of the importance of providing good quality salt to the fish curing industry, FAO was requested to provide Member Governments with technical information on the production of salt suitable for fish curing.

Fermented

The Council noted that advanced research on fermented fish sauce was being carried out in U.S.A.

Fish Processing Research

The Council supported the 11th Session recommendation that research in fish processing be promoted and wished to bring the document Working Paper Number 25 to the attention of the Member Governments in this connection. It also requested the Fisheries Officer, stationed in FAO Regional Office, Bangkok, to contact Member Governments and advise on specific research problems including exchange of information on developments in other areas. Member Governments were requested to make available to the Technical Secretary information on fish processing developments in their countries.

Fish Protein Concentrate

The Council was advised that considerable technological progress on methods of production of fish protein concentrate had been made during the inter-session period; but that additional pilot marketing studies should await clarification of the acceptability of the product by the U.S. Food and Drug Administration. Following expected favorable developments on this matter, it was suggested that the FAO circularize Member Governments to ascertain their interest in fish protein concentrate, in conformity with the recommendation of the 11th Session of IPFC. The Secretariat was requested to make available to Member Governments latest developments in this field as and when such information becomes available.

CHAPTER V

SOCIO-ECONOMICS, MARKETING AND STATISTICS

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A. INTERSESSION ACTIVITIES

FISHERY CREDIT

AUSTRALIA

The trading banks have given an assurance that applications from the fishing industry for loans for development purposes and for working capital are accorded the same sympathetic treatment extended to rural and other export producers and that conditions for servicing the loans are related to the special circumstances of the industry.

The provision of medium and long term loans comes within the scope of the term lending arrangements of the trading banks. The Term Loan Funds were set up in 1962 to finance capital expenditure by way of loans for fixed periods. No fixed ceiling is set on the size of individual loans and, as a general rule, loans are for periods ranging from three to eight years, or possibly a little longer.

Usually loans are amortized by regular instalments but if the project is not expected to produce income in the early stages, the banks may give sympathetic consideration to deferment of repayment of principal for a period. The Term Loan Fund Accounts were increased by a further \$21 million early in 1966.

As mentioned in previous correspondence, producers in the fishing industry, if they are otherwise unable to obtain finance for the development of their business on reasonable and suitable terms and conditions, can approach the Commonwealth Development Bank for loans for this purpose.

HONG KONG (United Kingdom)

Four loan funds, with a capital of over Hong Kong \$8,200,000 at the end of the financial year 1965/66 were available to fishermen. The present credit facilities for fishermen and recent developments are as follows:

(1) The Fisheries Development Loan Fund

This Fund was established by the Hong Kong Government in 1959 with an appropriation of Hong Kong \$2 million (later increased to Hong Kong \$5 million), and intended specifically to develop the mid-distant and offshore fishing fleet, particularly by providing financial assistance for fishermen to convert from sail to mechanical propulsion, to install larger engines in under-powered vessels and to construct new modified mechanized deep sea craft. The administration of the Fund is assisted by an Advisory Committee consisting of five members. At the end of March, 1966 a total of some Hong Kong \$4.6 million had been lent from this Fund. Loans issued from this fund are normally repayable over a five year period.

At first, interest was a first charge and repayments were made in the form of 20 percent deduction from the proceeds of sale. Since 1964 the normal rate of deduction from catch proceeds has been lowered to 15 percent, and greater flexibility is allowed in that repayments of the capital sum only is a first charge and that the fishermen should be required to save 5 percent of the proceeds of his sales as a reserve for recurrent expenditure.

(2) The Fish Marketing Organization Loan Fund

This Fund, established primarily for making short-term loans for productive purposes, was started in 1946 and has, since then, issued loans totalling some Hong Kong \$20.9 million.

(3) C.A.R.E. (Co-operative for American Relief Everywhere Incorporated) Loan Fund

This Fund was established by the Co-operative for American Relief Everywhere Incorporated in 1957 for the purpose of making short term loans for production purposes to shrimp fishermen. The capital available was augmented in December 1962, by a further donation of US\$10,000 from C.A.R.E. and now stands at Hong Kong \$95,889. Since 1957 some Hong Kong \$355,000 have been disbursed.

(4) World Refugee Year Loan Fund for Co-operative Societies

In 1963 the United Nations High Commissioner for Refugees made available a sum of over Hong Kong \$322,500 for lending to co-operative societies for purposes of relief from indebtedness, productive purposes, the establishment of Revolving Funds, from which loans to members could be made to help them with such matters as doctors' bills, school fees and burial expenses of close relatives, and larger schemes which would lead to either the social or economic improvement of the members of the Society. During the financial year 1965/66 some Hong Kong \$140,000 has been lent from this Fund.

(5) Colonial Development and Welfare Loan Fund

This Fund originated in 1954 with the primary object of providing loans for the mechanization of small inshore fishing vessels. The capital then made available was Hong Kong \$800,000. The Fund is in the process of being repaid by instalments to the British Government, which was the donor, and has been largely superseded by the Fish Marketing Organization Loan Fund. However, this Loan Fund ceased operation some time ago and the last instalment on capital repayment to the British Government was made in April 1966. The surplus amount of some Hong Kong \$59,000 which had accrued to the Scheme since 1954, has been incorporated into the Fish Marketing Organization Loan Fund for the same purpose.

(6) Co-operative Societies' Revolving Funds

Fishermen's Co-operative Societies usually provide, in their by-laws, for a percentage of sales proceeds of members to be credited partly to a saving account and partly to a revolving loan fund. Fishermen's Co-operative Societies up to end of March 1966, have accumulated some Hong Kong \$1.3 million for their revolving loan funds.

More details regarding the collection of repayments, rates of interest security arrangements etc., are given on page 325 of the Technical Papers published as Section II of the Proceedings of the 10th IPFC Meeting.

INDIA (Maharashtra State)

Grant of loan under the Maharashtra State Aid to Fisheries Rules 1962

Loans are granted under the Maharashtra State Aid to Fisheries Rules 1962 to the fishermen and their co-operative societies as well as to those engaged in fishing industry for purchase of and repairs to boats, nets, engines, other fishing tackle, fish carrier trucks and lunches, refrigerated cabinets, installation of ice plants and cold storages, construction of godowns for storage of dry fish and for establishment of ancillary industries devoted to the advancement of fishing industry. Loans are also granted to the persons engaged in pisciculture and local bodies for construction of and improvement of fish markets.

The intending applicant has to submit his application in the prescribed form which elicits information regarding the applicant's name, age, village, particulars of business, assets owned by him, purpose of loan and amount of loan required, etc. In respect of loans for engines, the fishermen have to form a group and to submit a collective application. The number of group members vary from 3 to 8 depending on the H.P. of the engine. According to the existing procedure the loanee is required to offer as security assets worth $1\frac{1}{2}$ times the amount of loan applied for. This security is taken in the form of boats, engines, houses and other immovable properties. The assets to be created out of the loan are also computed towards the security for the loan.

The valuation of the assets for the purpose of sanction of loan is conducted through the Executive Engineers, Collectors of the Districts, Officers of the Central Excise Department and the Superintendents of Fisheries of this department.

Repayment of loan

The loans are to be repaid in the period not exceeding seven years. This period extends over 15 years in respect of big loans for purchase of engines, carrier launches, trucks, ice plants etc. The payment of instalment is spread over a period of eight months from October to May, the monsoon period being off. The repayment starts three months after its disbursement. The loans made available for trucks, ice plants and for construction of markets are repayable in yearly instalments.

Break-down of engines, loss of fishing gear in stormy weather, accidents to boats etc., which retard repayment of loan are not uncommon with fishing vessels. It is, therefore, desirable that in genuine cases where the Director of Fisheries is convinced about the fishermen's handicaps in clearance of loan instalments, he may be authorised to grant time to clear the loan in easy instalments so as to facilitate recovery of Government loan without affecting fish production.

Rate of interest

The prevailing concessional rate of interest is 4% in case of insured mortgaged assets and 7 $\frac{1}{2}$ % if the assets are not insured. Interest is calculated on diminishing balances of the principal amount. It is payable as the last instalment after clearance of the principal amount.

The present rates of interest are on the high side considering the fact that these loans are granted for development of fishing industry. The prices of fishing accessories have gone up. There is also a heavy central levy on diesel oil. As it is, an appreciable indebtedness prevails among the fishermen due to their poverty and ignorance which results in their exploitation by the private fish merchants and the money lenders. The fishermen also draw short term credit from their co-operative societies at the start of the season for purchase of coal tar, shembi-bark for dyeing nets, ropes, twine, resin (chandroos) floats, paints and oil etc., which are the items of an annual recurring nature. In view of the said circumstances the financial assistance is made available to them by Government at as low a charge as possible.

MALAYSIA

- (a) In 1966 the only sources of Government fishery credit is the Co-operative Credit Fund amounting to about \$3.4 million (Malaysian). As was done in the past only fishermen's co-operatives were given loans from the fund for purposes of acquiring fishing boats and gears and ice plants. Along with the loans the Malaysian Government has also provided fund amounting to \$3.5 million for Malaya and \$600,000/- for Sarawak under the 1st Malaysia Plan as subsidies or direct grant to both fishermen co-operatives and fishermen associations (plans for establishing the latter are in hand). It is also to be mentioned that Bank Bumiputera (or Peoples' Bank) which was established in 1965 will also become another source of credit for the fishing industry in Malaysia.
- (b) In the past loans have been given to groups of individual fishermen who are members of Co-operatives on hire-purchase basis. These individual fishermen collectively own the hire-purchased equipment. This arrangement, although good in principle, was found to be too cumbersome and impracticable and in its place a rental system has now been introduced whereby each group of fishermen are required to pay a fixed rental for the boat and gear to the Co-operatives (who now owns the boat and gear) after each outing or fishing trip.

PAKISTAN

The Government and the Cooperative Societies had been making every effort to relieve the fishermen the losses suffered by them due to the natural calamities. The Fishermen's Cooperative Societies make efforts to save the fishermen from the clutches of capitalists by providing them fishing equipments such as marine diesel engines, spare parts, teak wood, nylon twine, sponges floats and coir ropes etc., procured under import licences granted by the Government, exempted from sales tax and custom duty, on easy terms, and also timely help by advancing loans to meet accidental and unforeseen expenditures. In addition to the above, the Government has introduced the system of granting liberally import licences to the individual organizations in East Pakistan, desirous to expand the fishing fleet in that region.

The authorities and agencies controlling the management of fisheries and Socio-Economic and Welfare activities in either wing of Pakistan are as follows:

Marine Fisheries Department with head office at Karachi with its zonal office at Chittagong, under the Central Government, is responsible for the development of the Marine Fisheries resources beyond territorial waters in both wings of Pakistan.

Directorates of Fisheries East and West Pakistan (Headquarters at Lahore and Dacca). These Provincial Directorates of Fisheries are responsible for the development and management of inland, brackish waters and also marine fisheries resources within territorial waters of the East and West Coasts of Pakistan. It is now the responsibility of the Provincial Directorate to look after the Socio-Economic Welfare and Uplift of the fishermen community engaged in fishing within territorial waters in their respective regions.

Registrars Cooperative Societies in East and West Pakistan. The Registrar helps the managing committee of such societies in procuring loans from various agencies and the Government for the improvement in the discharge of their functions as and when they need such help specially to purchase fishing material and other necessary amenities of life such as Fresh Water Supply, Establishment of Fish Market, Means of Transport, Medical Facilities, Educational Facilities and Recreation Clubs, etc.

Fishermen Cooperative Society Ltd., Karachi

Credit Facilities

(i) Government Credit Facilities

The Government of Pakistan has been helping the Fishermen Cooperative Society Ltd. Karachi by granting import licences for importing fishing material required by the fishermen community. The material imported by the Fishermen Cooperative Society Ltd. Karachi under import licences is distributed among its members on easy terms of credit.

During the period 1965-66 the Government of Pakistan granted import licences to the Fishermen Cooperative Society Ltd. Karachi for the import of fishing material worth Rs.7,900,000.00 including nylon and other synthetic fiber twines, floats, wood, ropes, refrigeration equipment, engines and navigation equipment, fish finders, etc.

Import Licences worth Rs.7,900,000/- for importing fishing articles were issued during the period 1965-66. Major items are given as under:

1. Nylon Twine		Rs.7,000,000/-
2. Marine Diesel Engines		Rs. 600,000/-
3. (i) Mast Wood	Rs. 30,000/-)	
(ii) Nylon Rope	Rs. 80,000/-)	
(iii) Winches & Wire rope	Rs. 40,000/-)	Rs. 300,000/-
(iv) Teak Wood	Rs.150,000/-)	
Grand Total		Rs.7,900,000/-

In addition to above an import licence for spare parts of cold-storage and ice-plant functioning at Fish Harbour for Rs.1,000,000/- has been issued by the Government.

(ii) Setting up of Financing Bodies

Government of Pakistan have made arrangements with different banks to provide credit facilities to fishermen and industrialists in rural and urban areas of both the Wings of Pakistan. A number of banks and Cooperatives have been established with the primary object of providing facilities to improve, the production and supply of food in the country. The most outstanding Government controlled institution which has been actively financing fishermen and industrialists for the better exploitation of Inland and Marine Fisheries and economic development of fish industry are:

Agricultural Development Bank of Pakistan (ADBP)

It is Government controlled institution established under the Agriculture Development Bank Ordinance of 1961-by the merger of the Agricultural Development Finance Corporation and the Agricultural Bank of Pakistan.

Since its creation it has been advancing loans to the fishermen for building boats, trawlers, establishing of modern fish processing plants and business loans for carrying on day to day operation of the processing plants etc.

In East Pakistan Khulna Preservation and Marketing Corporation was financed by this Bank to the extent of Rs.600,000.00 as mentioned in our 'Report on the activities of Technical Committee II - 1963-64'.

The amount of loan advanced by this Bank depends upon the nature of the requirement and the securities furnished by the parties against the loans desired from the Bank. During the period 1965-66 (July-March) this Bank advanced loans to the private parties for the construction of trawlers (Marine Fishereis) Boats and Fish Culture (Inland Fisheries), as under:

Zone	1965 - 66	
	Inland	Marine
	Rs.	Rs.
1. East Pakistan	43,050	-
2. West Pakistan	15,000	250,000

The recovery position of the loans upto 30-6-1965 stood at 82.9% in West Pakistan and 69% in East Pakistan.

The rate of interests on loans advanced by this Bank are 7% recoverable within five years and 6% on loans of long terms of payment.

It was proposed that the Bank should import fishing equipment directly and issue them to fishermen on easy terms of instalments. The fishing equipment would remain mortgaged with the Bank till full price is paid up by the mortgages. The main object of the proposal was to help the poor and needy fishermen who could not afford to make down payment of the cost of fishing equipment desired to be purchased by them.

The Pakistan Industrial Credit and Investment Corporation Ltd., (PICIC)

The Corporation was established in the year 1957, with the primary object of providing credit facilities in the establishment of heavy industries in Pakistan. The minimum limit of sanctioning loan to any party is Rs.1,500,000/-. This Institution finances such Industrial ventures which need a capital investment of more than 1,500,000.00. Considerative Contribution has been made by this Bank towards the loans to the Cooperative Societies and Industrialists. During the year 1962-63 the Corporation advanced loan (foreign currency) to the tune of Rs.524,000.00 to establish fish freezing and cold storage plants in West P akistan. No further advance has so far been made by this Corporation.

Industrial Development Bank of Pakistan (IDBP)

The Industrial Development Bank is an institution whose primary object is to improve Industrial Development in Pakistan and help in setting up new Industries. It provides credit facilities to Industrialists at a time, to a maximum limit of Rs.2,500,000/- with a foreign exchange component of Rs.1,500,000/-, quite a sizeable amount (more than 50% of the maximum limit) has been granted to various parties for the establishment of fish processing plants and cold storages.

During the past 5 years (1961-66), this Bank has advanced to different private enterprisers for the Industrial Development in fishing sector, a total sum of Rs.4,107,225.00.

The National Bank of Pakistan

The National Bank of Pakistan also advances loans directly to the fishermen to a minimum limit of Rs.50,000/- under certain terms and conditions prescribed by the Bank for the Development of Fish Industry and undertaking of small private enterprisers.

During the period 1963-64 to 1965-66 this Bank advanced a total sum of Rs.5,897,000/- to 125 Marine Fishermen West Pakistan for boat building.

Standard Cooperative Bank Limited

The Standard Cooperative Bank was established in the year 1959, but in the year 1963 all the liabilities and assets of this bank were taken over by Standard Bank Ltd., and since then it is functioning as a branch of Standard Bank Limited.

During the past three years (1963-66) this bank advanced loan to the fishermen and private enterprise for the construction of launches to the tune of Rs.1,870,000/- and the recoveries so far made by this bank was Rs.1,283,000/-.

Karachi Central Cooperative Bank Limited

The principal objective of the Karachi Central Cooperative Bank Limited is to advance loans to registered members Cooperative Societies and Cooperative Banks. No advance is made to individuals. This Bank during the past three years advanced a total sum of Rs.183,819.43 to different Fishermen Cooperative Societies of West Pakistan.

PHILIPPINES

Through the initiative of the Philippine Fisheries Commission and cooperation of the Norwegian Agency for International Development, Mr. Per Custavsen, Assistant Director in the Central Bank of Norway was assigned in the Philippines to study and advise the Government on the establishment of a Fisheries Development Bank for the purpose of facilitating credit to fishermen.

The Fisheries Development Bank is to be organized along similar lines which have been so successfully adopted in Norway and some other fish producing countries.

It is also hoped that once established, international development agencies which are contributing to the economic development of the Philippines will find the Fisheries Development Bank a useful instrument through which they could participate in supporting the efforts of the government to carry out its policies.

A bill creating the Bank was introduced in the Second Session of the fifth Congress but was not acted upon. Presently, the feasibility of giving the bank to private sector is being studied by the authorities.

THAILAND

(a) Marine Fisheries Loan.

Since the initiation of the Fisheries Loan Program, the Fisheries Loan Committee of the Fisheries Department has granted 223 loans totalling 11,675,750 Baht which were used as investments for sea fisheries as follows:

Year	Application for Loan		Loan granted		Reimbursement
	No.	Bht. Amount	No.	Bht. Amount	
1958	287	22,257,117	87	3,020,000	196,712
1959	36	2,867,100	30	1,183,500	855,814
1960	37	2,445,300	18	735,000	729,265
1961	53	5,795,105	37	1,232,250	1,267,032
1962	24	2,028,000	10	506,000	987,152
1963	27	2,474,000	9	540,000	1,417,500
1964	28	5,421,000	12	1,257,000	1,120,138
1965	36	6,876,000	20	3,202,000	1,389,372
Total	528	50,163,622	223	11,675,750	7,962,985

During the year 1965 the Committee granted twenty loans amounting Bht. 3,202,000 for sea fisheries. Almost all the loans have been invested in trawling for boat, gear and fish meal reduction plant. The fishermen who received loans are the old fishermen who wanted to change their smaller fishing boats to the bigger ones. This indicates that the fishermen try to reach the deeper water of the Outer Gulf due to serious competition among small trawlers in the shallow fishing grounds of the Inner Gulf. It has been also noted that the security of the loan has now been changed from land mortgage to bank guarantee according to the policy of the Committee. Fishing boat and gears have been recently unacceptable as mortgage of the loan to avoid bad debt. Bad debt is still a great problem in fisheries loan program. In using bank guarantee as security of the loan, the bank usually charges 2% in addition to 8% interest of the Department loan. The borrowers have to mortgage for the bank guarantee.

No attempt has been made to investigate the cause or causes of bad debts of the fishermen. In the year 1966, since there is still greatly in need of fisheries loan funds in the fisheries development program, the Department submitted a project to the National Economic Development Board requesting for 50 - million Baht loan for the sea fisheries. Japanese Overseas Economic Cooperation Funds is therefore expected to be a source of this loan.

(b) Fish Culture Loan

In the year 1965, the approval of the additional loan fund of 1,000,000 Bahts has been made available to inland and on-shore fish farmers throughout the country. All security of this type of loan consist of land mortgage. The objectives of this loan are for building fish and shrimp farms and procurement of seed fry, fish food and water pumping facilities.

The following table shows the number of fish farmers and the number and amount of loan granted during the period of from 1961 to 1965.

Year	Application for Loan		Loan granted		Bht. Repayments
	No.	Bht. Amount	No.	Bht. Amount	
1961	116	2,443,694	42	261,000	-
1962	15	507,950	15	135,000	2,041
1963	16	263,200	7	55,000	66,806
1964	50	1,410,300	14	120,000	108,317
1965	50	829,700	28	251,200	165,677
Total	247	5,454,844	106	822,200	342,841

INSURANCE

In Ceylon, fishing craft are not insured.

HONG KONG (United Kingdom)

There are no special insurance facilities for fishermen in Hong Kong and the insurance of vessels is insisted upon only in certain cases when large, long-term loans have been granted either by the Government or the Fish Marketing Organization.

INDIA (Maharashtra State)

Insurance is compulsory for loans of Rs.5,000/- and above. Insurance is also compulsory in respect of loans for mechanisation. The insurance policy is assigned to Government and the risk has to be kept covered by renewing the policy periodically until such time as the loan is repaid in full.

Where insurance is compulsory no loan is disbursed to fishermen unless they produce insurance policy covering the risk for a minimum period of one year for the value of the loan amount duly assigned in favour of Government. As per terms of the mortgage deed, the policy is required to be renewed to keep it running till the loan is repaid. However, great difficulty is experienced in

the matter of renewal of the policies by fishermen. In spite of reminders issued by this department, insurance companies and their agents, loanees due to their ignorance and poverty do not respond and in many cases coercive measures are required to be adopted for recovery of insurance premia. This procedure, though somewhat effective, entails much time and the risk remains uncovered for a considerable time. This situation could be set right if the insurance of the mortgaged fishing vessels is undertaken by the State Government through the Insurance Officer. A proposal in this respect is under consideration of the State Government.

In the matter of insurance it may be pointed out that the risk covered by marine insurance companies is not specially appropriate to fishing vessels. The companies cover risk for all sea going vessels from steamship to fishing tony. As compared with the merchantile ships the risk to fishing vessels is rather high in view of the narrower margin of safety frequently observed in order to take full advantage of the waters fished, the very great strains and reduced maneuverability imposed upon fishing vessels, when actually fishing, especially in bad weather and in certain areas, and the limited complement of qualified crew carried. In practice too the incidence of claims not entertained by the insurance companies under the terms of the policies is high. In fisheries, total loss, collisions, groundings and engine break-downs do occur with greater frequency than in other shipping enterprises, and, in particular, the great strain on machinery does often result in break-down and disablement involving costly salvage claims. The fishing vessel owner, therefore, finds such insurance not only very expensive but also inadequate. No cover is given against some of the serious losses in respect of fisheries represented by loss of fishing time through interruption of voyage during stormy weather and lay-up for repairs. In such circumstances, there is a strong case for special insurance arrangements suited to the fishing industry, whether by private insurance companies, or a Government agency such as Insurance Fund.

MALAYSIA

No insurance scheme of any kind has yet been introduced for fishermen in Malaysia. It is intended that an expert on this subject be obtained to study the problems and needs and to recommend necessary action programmes.

THAILAND

There is no Government activity on insurance of fishing vessel and fishing gear. No private insurance Company takes step into these ventures in Thailand.

STATISTICS

AUSTRALIA

Introduction of the uniform statistical collection is proceeding. The system is fully operative in Victoria, Tasmania and Western Australia. It has been introduced into certain Queensland fisheries and is being considered in the remaining states.

HONG KONG (United Kingdom)

- (a) Fisheries statistics are collected by the Fisheries Research Station and the Fish Marketing Organization. The method of collection and analysis of these statistics is now under study with a view to improving the efficiency of both their collection and the use to which they are put.
- (b) A statistical survey is now being conducted to determine catch rates and catch composition by statistical regions in the South China Sea. A statistical survey in Hong Kong fishing fleet was completed in September 1965.

INDIA (Maharashtra State)

During the second five year plan a beginning was made in collection of fishery statistics with the establishment of a Statistics Section in the Fisheries Department of the then existing Bombay State. The section started functioning with the following staff:

- 1) Staff at Head Office - Technical and Administrative
 - 1 Statistical Officer (Gazetted)
 - 1 Senior Clerk
 - 1 Attendant to Statistical Officer
- 2) Field Staff
 - 5 Statistical Investigators (one each at Bassein, Alibag and Ratnagiri and two at Bombay).
 - 6 Fisheries Enumerators (one each at Dahanu, Satpati, Alibag, Murud, Harnai and Dabhol).

During the first year of the third five year plan the following field staff was sanctioned under the scheme for collection of fishery statistics:

Inspectors (one each at Bombay and Rathnagiri)

Fisheries Enumerators (one each at Kelwa, Versova, Mora and Shrivardhan).

The field staff under this scheme was meant for the collection of marine fisheries statistics. Compilation and collection of all data is done at Head Office and thus there was no separate statistical unit for different parts of the State. There is no ad-hoc staff for collection of inland fisheries statistics as yet and this work is done by the regular staff of the department as and when required.

A sample survey sponsored by the Indian Council of Agricultural Research to determine the effects of mechanisation of fishing craft in Maharashtra State was initiated in July 1960 with the following additional staff:

- 1 Assistant Statistician, Bombay
- 2 Statistical Assistants, Bombay
- 1 Inspector
- 1 Coding Assistant
- 2 Clerk-cum-Typists
- 10 Statistical Investigators
- 1 Attendant

The field work of this scheme was completed by 15th July 1963 and hence the field staff consisting of one Inspector and 10 Statistical Investigators was discontinued from 16th July 1963. The other office staff was, however, continued up to 15th July 1964 for compilation and analysis of the data collected during the survey period of three years from 1960-61 to 1962-63. The report of the survey was completed and the same has been sent to the I.C.A.R. New Delhi for approval.

A consolidated position of staff as on 31st March 1965 is given below:

1) Technical and Administrative Staff at Head Office

- | | |
|---------------------------|---|
| 1. Statistical Officer | 1 |
| 2. Assistant Statistician | 1 |
| 3. Statistical Assistant | 1 |
| 4. Research Assistants | 2 |
| 5. Inspector | 1 |
| 6. Coding Assistant | 1 |
| 7. Senior Clerk | 1 |
| 8. Attendant | 1 |

2) Field Staff

- | | |
|------------------------------|----|
| 1. Inspector | 1 |
| 2. Statistical Investigators | 5 |
| 3. Fisheries Enumerators | 12 |

A Statistical Section was established in the Department with a view to collect all statistical information found necessary by the State Government and by other agencies, official and private. During the second and third five year plan periods the section had taken up the collection of statistics on several aspects of fisheries.

The sample survey to estimate marine fish catch has been conducted every year on a routine basis. Collection of wholesale and retail price data has been also taken up in the maritime districts of the State.

A census of fishing boats was undertaken and completed in the off fishing season in the year 1963. Similarly a sample socio-economic survey of marine and estuarine fishermen was conducted during the off fishing season of the year 1964. A survey of mechanised boats in the State was carried out to ascertain whether the engines allotted to the fishermen by this department were still being utilised by the groups to whom these were allotted, whether the engines were in working condition and whether the mechanised vessels were being used for fishing. A census of fishermen, craft and tackle was undertaken and completed in the off season of the year 1965 in all the marine and estuarine fishing villages of Maharashtra State.

Apart from this the biological and experimental data obtained by research workers and scholars working at the Marine Biological Research Stations at Bombay and Ratnagiri of the department is analysed and interpreted by the Statistical Officer, whenever needed.

JAPAN

Among various statistical surveys on Japan's fishing industry, most of the basic data are provided by the Statistics and Survey Division of Ministry of Agriculture and Forestry, in close cooperation with each and every section of the Fisheries Agency, Ministry of Agriculture and Forestry.

As one of the salient features of the statistical survey, conducted by the Government, the Statistics and Survey Division deals with such statistical surveys as those which are mainly conducted in order to meet the requests of administrative agencies concerned (including governmental research organizations) or those of general users among related industries. Some fisheries statistics are, however, obtained automatically by summing up the administrative documents as in the case of the Fishing Vessels Statistics, which are obtained from the records of fishing vessel registration, instead of conducting specific statistical survey for that purpose.

Fisheries Statistics Section of the Statistics and Survey Division currently conducts following statistical surveys:

1. On the structure of fisheries production,
 - a. Fisheries Management Census (quinquennial)
 - b. Intercensal Survey on Fisheries Management and Fisheries Workers, employed or selfowner
2. On the production,
 - a. Marine Fisheries Catch Statistical Survey
 - b. Production Survey of Aquiculture in Shallow Seas
 - c. Inland Water Fisheries Catch and Aquiculture Production Survey

3. On the fisheries management and household economy,
 - a. Fisheries Household Economy Survey
 - b. Fisheries Enterprise Management Survey
 - c. Fisheries Fixed Assets Survey
 - d. Earning Survey on waged fisheries workers
4. On the marketing of fisheries products,
 - a. Marketing Survey at Landing Places
(Landings, average prices by species, shipment of fresh fish, disposition, etc.)
 - b. Production Survey on Processed Fisheries Products
 - c. Cold Storage Holdings of Fisheries Products
 - d. Fish Marketing Survey at Big Consuming Centers.

Most statistical surveys, mentioned above, are conducted through the Ministry's own statistical organization (Central Government--Local Offices --Branch Offices) with the exception of Fisheries Management Census, every month or yearly, according to the urgency of the requested data.

Recent Activities

1. The Third Fisheries Management Census
--Data processing and publication of the results--

As described in the paper submitted to the previous session (IPFC Occasional Paper 66/3), Statistics and Survey Division of Japan's Ministry of Agriculture and Forestry conducted the Third Fisheries Management Census on Nov. 1, 1963, by entrusting the field work to the local governmental statistical survey organization, the results of which were analysed both at the local governments and central government to obtain the total figures by each prefecture (which were then broken down by cities, towns and villages--the smallest units of local autonomy) and the national total respectively, by employing the simple calculation methods. In the second place, by using key figures of each management body of household, cross tabulation was made at the Ministry of Agriculture and Forestry where the electronic computer was employed, to obtain analytical, detailed figures by various classifications. With the completion of the data compilation, following statistical reports have been issued from the Ministry (cf. IPFC Occasional Paper 66/3).

- | | |
|---|----------------------|
| 1) Preliminary Report | issued in Oct. 1964 |
| 2) Summary Report | " " |
| 3) Report No. 1 (Management unit, vessel, fisheries household, fishermen) | issued in Mar. '65 |
| 4) Report No. 2 (Background of fisheries districts) | " Mar. '65 |
| 5) Report No. 3 (Key Statistics by City, Town & Village) | 9 Volumes " Nov. '64 |
| 6) Report No. 4 (Result of Post Survey) | " Mar. '65 |
| 7) Report No. 5 (Summarized Statistics by District) | " Mar. '65 |
| 8) Report No. 6 (Inland Water Fisheries) | " Sept. '65 |
| 9) Report No. 7 (Fisheries Man Power) | " Mar. '65 |
| 10) Report No. 8 (Fishing Vessels) | " Mar. '65 |

Furthermore, within a year or two, publication of some volumes on the specific statistics, overall summary and English version are scheduled.

2. Intercensual Survey

a. Statistical Survey on the Transition of Fisheries Management Units.

For the purpose of renewing the key figures on the management units to meet the requests of the administrative agencies concerned as well as to provide the latest basis for conducting various current statistical surveys -- as catch statistics or fisheries economy statistics, -- the Division conducts the survey on the transition of fisheries management units in between two Census years, in which such items as fishing vessels, number of workers, type and size of fisheries etc. are included. Though the survey was initiated in 1955, present survey has been done since 1965, employing the result of the Third Fisheries Management Census as its basis at January 1 each year.

The objective of this survey includes each and every management unit (fisheries household or enterprise) which operated marine fisheries or shallow sea aquiculture during a year prior to the date survey is made. The survey is itemized to obtain the transition of location, ownership, size, type or classification on the management unit, fisheries, fishing vessels, number of workers, days operated, number of equipment for aquiculture, etc.

The survey is conducted by such a method as to check and correct if necessary, main items in the management unit card in which figures have been transferred from each survey slip of the Fisheries Management Census, at the branch offices of the Ministry's Organization. Secondary, officials of the Branch offices make survey on the transition of above items with the representatives in each survey district which was established for this purpose and, if necessary, new management unit cards are additionally prepared for newly established management units or those omitted by mistake, and on the other hand, discontinued units are noted for deletion, from the cards in the following year.

The result of the survey is calculated, data-processed and published, the content of which is indicated by size of the management and type of fisheries. The latest issue of 1964 Fiscal was published in December 1965.

b. Fisheries Worker's Survey.

As an integral sector of the Intercensual Survey, Fisheries Workers' Survey has been conducted, annually, since 1964, in the following year of the Third Fisheries Management Census in order to obtain the transition of fisheries workers, number of fisheries household and working status of fishermen who share time for their subsidiary businesses and of the new high school graduates who belong to the fisheries households.

The object of this survey is the household in which reside those who operated marine fisheries or were employed in marine fisheries of other management units, during a year prior to the survey period. Among survey items, name of the master of household, number of household members, location of the side job,

name of fisheries workers and new high school graduates, sex distinction, personal relationship to the master, working situation etc. are important ones.

For the purpose of carrying out the field work, one enumerator is appointed in each enumeration district (E.D.) which numbers 1,500 selected at random from Fisheries Management Census Enumeration Districts totalling 30,000. The enumerator prepares the list of whole households in the E.D., in which he identifies the fisheries households for further survey. Secondly, the enumerator interviews each fisheries household in the district from one to another, thus completing the questionnaires.

From the result of this sampling survey, the total is derived by ratio-estimate using the number of the fisheries workers in the Third Census. The estimated result is published in a separate report. The report for 1964 Fiscal survey was issued in December 1965.

3. Development of Fisheries Products Marketing Survey.

In order to meet the urgent need of the administration, the Statistics and Survey Division of the Ministry of Agriculture and Forestry has revised the survey method on Catch Statistics from the former one which aimed at obtaining the data from the landing records at the ports, to the new one to obtain data by each management unit at its location by means of the declaration from the manager, as described in the report to the previous session (IPFC/C64/Tech 45). In compliance with this procedure, landing data were to be collected as a part of the Marketing Statistics. Since then, the Marketing Survey has rapidly developed. Namely, in 1965, the Statistics & Survey Division initiated the Fish Marketing Survey at Big Consuming Centers followed by the new survey on the Cold Storage Holdings started in 1964.

Following is the outline of Fisheries Product Marketing Survey, currently conducted:

a) Marketing Survey at Landing Places.

This survey aims at obtaining a) landing quantity and value (monthly at major landing places numbering to 248 ports, once a year at the fishing ports other than above), fish prices (which are derived from quantity and value), b) disposition of landed fish, c) shipment of fresh fish from landing ports. The results of surveys are compiled by region and prefecture and published monthly or in a yearbook.

The major items of the Survey are as follows:

- i) Landing quantity and value by species.
- ii) Disposition, marketed fresh, for frozen, canning, kneading etc. and for inedible products.
- iii) Shipment of fresh fish by species, by destination and kind of transportation facilities.

b) Cold storage holdings of fisheries products.

In order to present the basic data for the adjustment of demand and supply situation on the fisheries products, stabilization of price and/or construction plan on the refrigeration facilities, the Division conducts the survey to obtain the amount of products by kind and major species, entering, going out or holding in the cold storage at the end or during the month. The officials receive the information monthly from the plants which have the capacity of 5 ps or more by main power and handle fisheries products. The number of plants amounts to approximately 2,300. The result is forwarded to the Central Office through the Ministry's Statistical Organization and published in monthly bulletins and the yearbook.

c) Fish Marketing Survey at Big Consuming Center.

In order to serve the urgent request of the administration, mentioned above, the Division established new survey regarding the fresh fish marketing at whole sale markets of 18 Big Cities, in 1965 as the initial step to complete the link of marketing statistics from landing to the consumer.

The survey comprises quantities marketed and prices at each stage of marketing function. Namely, at wholesale, middlemen (or broker) and retailers' stages.

First of all, at the wholesale market, is obtained: the daily quantity taken into the market by type of product such as fresh, frozen or processed and quantity of major fresh fish by original landing place; and by monthly receipts of whole commodities and receipt of major items by original landing place. The officials of the local office, visit to make enquiry at the administrative agencies of Prefectural or Municipal Offices with the supplementary information from the wholesalers if above information is not available. Furthermore, the officials ask the wholesaler daily to prepare quantity and value of wholesale by major items as well as wholesale prices of major items of importance during the period by grade and by origin of landing place once in every ten days.

Secondly, at the middlemen level survey is made on the quantity and price (mode) by destination together with the price survey on the major items as is shown at the wholesale stage three times a month.

Thirdly retail prices are obtained from the sample retailers three times a month.

The result is published three times a month in a bulletin every 10 days.

4. Earnings Survey on Waged Fisheries Workers.

During recent times fisheries industry is suffering extremely from the shortage of labor. Especially, the problems are serious in middle and small fisheries managements which are backward in modernization of labor conditions and rationalization of wages. In order to keep solving above problems in the administration, the Division decided to initiate, the survey on the labor conditions and wages of the employees of the middle and small fisheries managements by kinds of fisheries and size of managements.

Furthermore, employment in fisheries and the payment system are quite unique, which make it difficult to compare with those of mining or other secondary industries. Accordingly, qualitative variety of fisheries labor is divided by kind of fisheries and type of operation to measure the wage standard from various types of wages and labor input.

The term of this survey covers one calendar year. The kinds of fisheries are limited to eight nation-wide important ones together with some locally important ones in which in the neighborhood of 1800 wages workers are selected, broken down by 142 fisheries regions.

The major survey items are as follows:

- Name, address and age of workers, relationship to the master of the household.
- Kinds of fisheries engaged, type and size of fishing vessels boarded on.
- Experience in fisheries, course of employment, number of days employed in the survey year.
- Number of operation, number of days operated, number of labor hours in the average day.
- Basic salary (payment), allowance, estimated value of materials supplied (including food).
- Way of calculating wages.

The result of this survey covering 1965 calendar year is to be published in October, 1966.

5. Analysis of the Trends of Coastal Fishery.

In order to provide urgently needed basic data to the administration, which is obliged to report the results and effects of the administrative measures to the Diet, according to the provisions of the Coastal Fishery Promotion Law, by clarifying the influence of highly developed Japan's economy on the fisheries sectors or on the status of fisheries development resulting from the enforcement of the project of improving the coastal fisheries structure, the Division put into force to compile and rearrange, by type of fisheries districts, the results of current fisheries statistical surveys together with the statistics of other related administrative organizations and information collected for this purpose.

Following are the major items compiled by type of fisheries district, fisheries region and prefecture.

Statistical items: Fisheries management units, Fisheries households, Fishing vessels, Fisheries production, Marketing of fisheries products, Economies of fisheries management units, etc.,
Information on condition of fishing grounds, Development of Fishing techniques, Labor situation, Marketing situation, Fisheries promotion projects, Movement of fisheries management, Living conditions etc.

The analysis is to be published after consulting the representatives of each fisheries district at the meetings to be held by districts.

MALAYSIA

- (a) With the assistance of an FAO Statistician now attached to the Ministry of Agriculture and Co-operatives, the Fisheries Division is now taking various measures to improve the reliability of fishery statistics collected and compiled by it. This is being done through increased staff and more frequent visits to fishing villages by the Fisheries Department field staff to ensure better coverage.
- (b) The 1970 World Agricultural Census may include Fisheries census, although it is understood that FAO feels that it could not provide the necessary assistance to get the World Fisheries Census going by 1970.

PAKISTAN

There are three main agencies directly responsible for the development of fishery resources of the country.

I.

a) Marine Fisheries Department

This department, under the Central Government, is also responsible for the compilation and analysis of Statistical data received from other sister departments and for the supply of statistics on all Pakistan basis to various International and local agencies.

b) Office of Marine Fisheries Department (Chittagong), East Pakistan

This Regional office of the Marine Fisheries Department stationed at Chittagong is responsible for the development and management of the Marine Fisheries resources beyond territorial waters on East Pakistan Coast. Marine Fisheries Statistics in East Pakistan is collected by this branch office, and is passed on to the Head Office at Karachi for final analysis, consolidation and dissemination to different International agencies like FAO, ILO, UNESCO and IPFC, Government department and private parties or trading agencies.

II. DIRECTORATE OF FISHERIES, WEST PAKISTAN (HEADQUARTERS) AT LAHORE

This Directorate is responsible for the development and management of Inland fishery resources and also Marine Fisheries resources within territorial waters. They are also responsible to collect, compile and furnish the fisheries statistics pertaining to their jurisdiction, to the Marine Fisheries Department, for final analysis and documentation.

Since the Government of West Pakistan is responsible for collection of the Fisheries Statistics of that region, at the end of each Calendar year the data compiled by them is sent to the Marine Fisheries Department for final analysis, compilation and dissemination.

III. DIRECTORATE OF FISHERIES, EAST PAKISTAN

Directorate of Fisheries East Pakistan, under the control of the Provincial Government of East Pakistan, is responsible for the development and management of Inland Fisheries, Brackish-water and Marine Fisheries (within territorial waters). The collection, of the fisheries statistics of East Pakistan is the responsibility of that Directorate.

Unfortunately, the Provincial Directorates of Fisheries in both the wings of the country have no staff trained in the techniques of Statistics, Marketing and Socio-Economic and consequently the responsibility of removing pitfalls and bridging up the gap in statistics collected by them falls on the skeleton trained staff of the Marine Fisheries Department.

PRIMARY SOURCE OF THE INFORMATION AND METHOD OF COLLECTION OF FISHERIES STATISTICS (CATCH AND DISPOSITION)

I. MARINE FISHERIES DEPARTMENT

The staff working under Survey and Statistics, Marketing and Socio-Economic Section of the Marine Fisheries Department stationed at Karachi and its regional office at Chittagong conduct survey and collect statistical information on different aspects of Marine Fishing Industry. The statistics collected by the Survey parties include information on:

- i) Volume and value of fish production in each fishing settlement with complete break-up of the commercial catch into species of economic importance.
- ii) Disposition and utilization of fish marked as fresh, for local consumption, curing, freezing, canning, reduction into fishmeal and manure dehydration and extraction of fish oil and for other commercial purpose.
- iii) The study of the population of fishermen engaged in Marine Fisheries and their economic status and zonal distribution.
- iv) The census of different types of fishing crafts and gears engaged in Marine fishing in different fishing zones on East and West coasts of Pakistan. The figures regarding the fishing crafts are verified and checked from the records of Mercantile Marine Department at Karachi and Chittagong.

- v) The information regarding the wholesale and retail prices with quantities of commercially important varieties of Marine fish sold in Wholesale and Retail markets is collected by the Inspectorate staff of Marine Fisheries Department Karachi, and regional office at Chittagong (East Pakistan).
- vi) Mode of transport used for the transport of fish, transport cost and total strength of different types of vehicles used for transport in different localities.
- vii) Information regarding fish processing Industry - number of plants, investment, quantity of raw material purchased, processed, exported and foreign exchange earned.
- viii) Collection of information on the Ice plants and cold storages, total investment, working capacity, actual daily output and production/sale costs.
- ix) Collection of data on production, home consumption and exportable surplus of fish and different items of fish-products such as fish dry salted, fish dry unsalted, fish wet salted, dried prawns, fish maws and shark fins etc.

II. PROVINCIAL DIRECTORATE OF FISHERIES

It is the practice of the Marine Fisheries Department that before the end of each calendar year, the Provincial Directorates of Fisheries of both the wings of Pakistan are requested to furnish the information regarding the total catch with its complete breakup of different varieties of fish, fishing population gear, crafts, Wholesale and Retail prices and other relevant information on the prescribed proformas. On receiving the data from the Provincial Directorates, the figures are examined and analysed. If these data are found consistent, the figures are incorporated as such in the final report of Fisheries Statistics of Pakistan compiled by the Marine Fisheries Department at the end of each calendar years. But, if the data is inconsistent and inadequate, then the Provincial Directorates are requested to give reasons for disparity in figure. If they are unable to give sound reasons for the considerable variations of the figures then the figures of the previous years are repeated in the current annual fisheries statistical report compiled and published by the Marine Fisheries Department.

III. FISHERMEN'S COOPERATIVE SOCIETY LTD. KARACHI

The daily record of the quantity of different varieties of fresh and cured fish landed at Fish Harbour, Karachi, with full details of the sale proceeds, commission charges etc. maintained by the Fishermen's Cooperative Society is the second primary source of information on fish catch and Wholesale prices for the major portion of the West Pakistan catch and disposal

statistics. The information thus collected from this agency gives fairly correct figures of the total catch of Marine Fish and Prawns, and their average Wholesale and Retail prices for Karachi and the coastal areas of West Pakistan.

IV. CENTRAL STATISTICAL OFFICE

The Central Statistics Office at Karachi is a main source of export and import trade statistics of fish and fish products of Pakistan. In fact it is a secondary source of information - Secondary in the sense that this organization has no field investigation staff to make on the spot- study and collect first hand information. The data incorporated in their publications on the export and import of fish and fish products are generally taken from the daily custom record. As the Customs Department have no trained fishery statisticians, the statistics collected by them are full of statistical errors. This department has often drawn the attention of the authorities concerned to make arrangements to collect correct export statistics. The Marine Fisheries Department holds the responsibility of disseminating the information on the export trade to local and foreign agencies. Therefore, the data furnished by the Central Statistical Office to this department are further analysed to remove the inconsistency and discrepancies detected in their recorded figures.

V. EXPORT PROMOTION BUREAU

Marine Fisheries Department collects statistical information from the reports and publications of the Export Promotion Bureau, specially related to the foreign markets for the export of our Fishery Products. Export Promotion Bureau mostly collects information on export trade of fish (Total quantity and value of fish and fish products exported from Pakistan) from the Collectorate of Customs and another source of their information is the State Bank of Pakistan which furnishes them information regarding the actual value of the export receipts of fish and fish products. Marine Fisheries Department supplies them the information, regarding fish production in Pakistan.

VI. STATE BANK OF PAKISTAN

State Bank of Pakistan is also one of the main source of information regarding the actual amount of foreign exchange earned in return for fishery products exported to the different World Markets.

VII. AGRICULTURE AND INDUSTRIAL BANKS

There are certain banking institutions which advance credit facilities to the fishermen and fish industrialists for the purchase of fishing equipments and establishments of fish processing plants. The following Banks are the main source of our information on the credit investment into the fisheries sector:

- i) Agricultural Development Bank of Pakistan.
- ii) Pakistan Industrial Credit and Investment Corporation Ltd.

- iii) Industrial Development Bank of Pakistan.
- iv) National Bank of Pakistan.
- v) Standard Cooperative Bank Limited.
- vi) Central Cooperative Bank Limited.

VIII. INSURANCE COMPANIES

The Fishermen's Cooperative Society Karachi has started insuring the fishing boats with the Insurance Companies. The records of the Insurance Companies of the number of boats insured and the payments made against the losses claimed due to the natural calamities and accidents, is also the primary source of information regarding the investments made in insurance of the fishing vessels. The main object of collecting this data is to acquaint the industrialists and fishermen community of the damages covered by Insurance Companies and to create incentive to get their boats insured. Another advantage of these statistics is that the fishermen and the private enterprise feel more secure to invest in fishing industry.

IX. MERCANTILE MARINE DEPARTMENT

Mercantile Marine Department is the main source of the collection of all statistical data pertaining to the fishing vessels. At the end of each calendar year, the staff of the Statistics Section of the Marine Fisheries Department collects from Mercantile Marine Department's record, detailed information regarding the number of particulars of registration - owners' name and address, branded number and name of the vessel, constructional details, tonnage, make and Horse Power of the engine (if mechanised). The object of the collection of these statistics is to have an up-to-date authentic knowledge of the strength of different types of fishing fleet of Pakistan, operative in different fishing zones.

As regards the statistics of Inland fishing crafts the primary sources of information are the Provincial Fisheries Directorates of East and West Pakistan. The data supplied by them are compiled and analysed by the staff of the Statistics section of the Marine Fisheries Department and incorporated in the technical report on this particular phase of fish-industry.

OFFICE OF THE CENSUS COMMISSION (FISHING POPULATION)

The office of the Census Commissioner is the only authentic source of information on the population of the fishing settlements and places inhabited by the fishermen community. The census figures contained in the Bulletins published by that office, from time to time are further analysed and checked with the figures of the survey of the fishing settlements conducted by the staff of the survey parties of the Marine Fisheries Department. The results are incorporated in the technical reports of the Marine Fisheries Department on this particular aspect.

As regards, the statistics of fishing population engaged in Inland Fisheries we have to depend on the information furnished by the Directorate of Fisheries East and West Pakistan and the Census Commissioners, office record.

FISH PROCESSING PLANTS AND FISH EXPORTERS ASSOCIATIONS

The record of the export statistics, maintained by the management of various Fish Processing Plants and Fish Exporters Associations is the reliable source of information regarding the raw material purchased (fresh fish and prawns) and quantum and value of the manufactured and semi-manufactured/processed fishery products exported to foreign markets. The management of all the freezing, canning and Fish-meal Plants furnish invoices in respect of each shipment to the Marine Fisheries Department. The information contained in these invoices are further processed and analysed to study the progress of individual Fish Processing Plant, and also to estimate the total export value and the quantity actually exported to the different World Markets.

Besides this, information on the export of the cured fish and prawns (both in terms of quantity and value) is collected from the exporters Associations to estimate the total value of trade of these commodities. Suggestion has been made to the Government to compel the exporters of dry fish/prawns, by promulgation of an Ordinance to furnish copies of the invoices to the Marine Fisheries Department as practised by the management of the Fish Processing Plants. The information thus collected from the Fish Processing Plant owners and Exports Association are compiled to assess the total value and quantity of fish and fish products exported from Pakistan.

The main difficulties and handicaps in the collection and compilation of Fisheries Statistics are:

Lack of Trained Staff, need for coordination, the need for accurate and reliable information from the industry.

Measures to Control Quality of Fishery Products:

Quality Control Certificates in respect of frozen and canned fishery-products are issued by the Marine Fisheries Department before shipment of every consignment. This measure, so far as frozen and canned fishery products is concerned, has to great extent helped not only in the improvement of quality of these processed products but also in the correct estimation of the foreign exchange earnings and its leakage through illegal means. Suggestions have also been made to the Government to force the exporters of cured fish through an Ordinance to furnish the invoices of each shipment of their consignment and get the quality certificates from Marine Fisheries Department as practised by the fish processors.

Difficulties Experienced in Processing the Catch & Price Statistics Furnished by the Fishermen's Cooperative Societies:

Wherever the management of the Fish Markets are entrusted to Fishermen's Cooperative Societies, it is found that the supervisory staff are neither trained in Fisheries nor in the Field of Marketing and Statistics. With the result, all Fish landing and its classification is mixed up and no one bothers to record Fish landing in accordance with species, size, quality and the factors determining the prices of different varieties of fish.

Quality Control and Standardization of Fish and Fish Products:

Fish Industry of Pakistan has reached a stage where the consideration of industrial efficiency and quality of products can no longer be regarded as the secondary phase. So far no quality control measures on fish products have been exercised by the Government. The result of this relaxation in quality control of fish products is that the quality of many fish products processed in Pakistan used to remain inferior to the standard of importing countries in terms of quality, consistency and excellence of material, refinement in packing and accuracy in dimension (Volume and weight of the material packed). To remove the difficulties of the importers regarding the standardization of fishery products to enlarge the scope of export trade to earn more foreign exchange by increasing the quantum of industrial production of an improved standard, it was proposed by the Export Promotion Council in its Second Meeting be adopted for 'Standardization and Pre-shipment Inspection of Export.

Publications on Fisheries Statistics of Pakistan

At the end of each calendar year, the Survey and Statistics Section of Marine Fisheries Department prepares and issues statistical reports on different phases of Fish Industry of Pakistan:

LIST OF PUBLICATIONS

- 1) "Fisheries Statistics of Pakistan" (1961-62).....(Printed 1964)
- 2) "Fisheries Statistics of Pakistan" (1962-63).....(Mimeographed '64)
- 3) "Ice Plant, Cold Storage and Fish Freezing Facilities for Fish in Pakistan".....(Mimeographed '64)
- 4) "Fish Production in Pakistan (1962-63).....(Mimeographed '64)
- 5) "Export of Fish and Fish Products from Pakistan" (1962-63).....(Mimeographed '64)
- 6) "Expansion of Fishing Fleet in Pakistan (1962-63).....(Mimeographed '64)
- 7) "Fishing Population in Pakistan" (1962-63).....(Mimeographed '64)
- 8) "Fish Production in Pakistan" (1963-64).....(Mimeographed '64)
- 9) "Fish Meal Industry in Pakistan" (1963-64).....(Mimeographed '64)
- 10) "Fishing Fleet of Pakistan" (1963-64).....(Mimeographed '64)

Similar publications for the year 1965 have also been published in Mimeograph Form.

PHILIPPINES

In the middle part of 1965, Dr. T. Yamamoto, Regional Fisheries Statistician stayed in Manila for six (6) weeks to make a study on improving the collection of statistics in the country. He submitted two (2) proposals on the improvement of (a) production survey on commercial fisheries, and (b) statistics concerning Municipal fisheries in general.

With the assignment in the Philippines of Mr. T. Shimura, FAO Fisheries Statistician, a survey on the daily fish landings in Navotas, Malabon is being undertaken. In Navotas is located the biggest wholesale market for fish. The fishing vessels which supply this market anchor about a mile away from the shore. Fish is transported from the vessel to the market by means of amphibians which pass through the single opening of the breakwater that surrounds the market area. Total landing is estimated by obtaining the total number of trips made by the amphibians.

Another survey on Municipal fisheries will be started by September 1966 for the purpose of estimating the total monthly fish catch by vessels of 3 tons gross or less and broken down by species. This survey although originally planned to cover the whole country, will be undertaken first in the Northern Philippines. It will be extended to the other regions upon availability of funds for the purpose.

THAILAND

After several field trips and careful study in some fishing villages made by Dr. T. Yamamoto, the statistician under Japanese Colombo Plan in the year 1964, a pilot survey on fisheries census has been conducted in the late 1965. In the beginning of the year 1966, basing on the result of the said survey, a program of improving fisheries statistics has been formulated. This program has not been implemented yet due to the lack of budget. Since in the year 1966, the Thai Government has developed a program to improve all field of statistics including fisheries at the national level under the responsibility of the National Statistics Bureau. The representatives of the National Statistics Bureau and the statistician of the FAO Regional Office in Bangkok were invited to take part in discussion on revision of the Program. This discussion finally led to the decision that the Department of Fisheries would be responsible for the survey on production and fishing effort as well as some socio-economic data and information which are urgently needed by the Department; while the National Statistics Bureau would take the first step of the preliminary survey on fisheries census, on which the comprehensive fisheries census program is to be based. Furthermore, the National Statistics Bureau will give full technical co-operation in redesigning the existing system of fisheries statistics collection and compilation. The Department of Fisheries has submitted, through the National Economic Development Board and the National Statistics Bureau, a program for an allocation of budget in the fiscal year 1967, which will begin in October 1966. If the said program is approved and allocated as per request of the Department, the staff of the Statistics Section of the Department of Fisheries will be strengthened to the extent that it will cope with the new system of more reliable fisheries data collection.

Since Dr. T. Yamamoto is now serving the FAO regional office, the Thai Government has requested the Japanese Colombo Plan for a new statistician to succeed Dr. T. Yamamoto.

FISHERY CO-OPERATIVES

CEYLON

The Department of Fisheries continues to give loans to Fishery Co-operatives for purchase and repair of fishing craft and equipment and for marketing.

In one region where there is a large number of Fishery Co-operatives (Northern Division) a Fishery Inspector has been stationed with the sole task of extension work among Fishery Co-operatives. Another Inspector is being stationed for the same purpose in the South Eastern Division from January 1967. One Inspector is also attached to the section dealing with Fishery Co-operatives in the Department's Head Office in Colombo.

HONG KONG (United Kingdom)

The Hong Kong Government and the Fish Marketing Organization continue to encourage and assist the formation and operation of fishery Co-operative Societies. There are now 75 such societies with a membership of 2,188. Periodical co-operative seminars were held for the improvement of their management.

INDIA (Maharashtra State)

Correct figures of production finance required for fresh and dry fish trade are not available, but it is estimated that finance to the extent of about Rs. 50 lakhs for fresh fish and Rs. 80 lakhs for dry fish is usually required, out of which about Rs. 8 lakhs for fresh fish and Rs. 5 lakhs for dry fish is made available through co-operative societies. It will be thus seen that bulk of the finance required for this trade is provided by merchants and middlemen. These merchants charge a commission of $6\frac{1}{2}\%$ and an additional $3\frac{1}{2}\%$ as 'Karsar' (discount), whereas the co-operatives charge only $6\frac{1}{4}\%$ commission and besides give a rebate of 2% if all the fish is sold through the co-operative. Thus, the extent of additional charges which fishermen are required to pay to private traders can be gauged taking into consideration that fresh fish worth about $1\frac{1}{2}$ crores is brought yearly to the Crawford Market for sale. In case of dry fish, most of the business is monopolised by merchants and one can very well imagine their profits taking value of dry fish marketed in Bombay at Rs. 4 crores. The principal market for dry fish is at Sewree, Bombay and here not even 2% of the business is in the hands of the Co-operatives. The reason for this is obvious since the co-operatives do not have even a fraction of the finance required to handle this business. In addition, some of the co-operatives have established direct contacts with the foreign traders in United Kingdom, Singapore, Hong Kong, etc., to whom they have started exporting fish maws, which helps to earn foreign exchange. Here also due to inadequate finance, bulk of the business is handled by private traders.

It is evident that many of our societies and their office bearers are able workers who have been conducting the affairs of the societies with zeal and energy. In spite of this, the societies have been unable to make proper headway in the field of marketing, export, etc., even with the large finance made available by the Department of Fisheries for long term requirements. The following are some of the cause which account for this.

Suggestions to solve them are also made:

i) Share capital

Most of the societies are functioning with insufficient share capital. Since the bank credits are granted in proportion to the share capital, it is necessary to take steps to increase the share capital of societies who have been doing good work. Government have, therefore, started participation in the share capital of the societies.

ii) Creditworthiness

According to rules, the banks have to provide finance eight times the capital and funds. However in actual practice, the banks do not allow finance more than 4 or 5 times the capital. Thus the societies are unable to provide adequate advances to fishermen, who take recourse to merchants or money lenders and are thus free to sell their fish anywhere. Besides, the quantum of advance required by fishermen's groups varies from region to region and this fact has also to be taken into account when the bank lays down its limitations for distribution of such advances. It is necessary that the limit of advance for each group should be increased accordingly.

iii) Marginal grants

In the distribution of such advances, the bank lays down conditions for contribution of certain amount in such advances by the co-operative society. This margin amount is usually to the extent of 20% to 30%. The societies find it difficult to provide funds for this purpose and hence they are unable to derive the benefit of the credits of the bank. It is necessary in such cases that either the bank waives this condition for margin amount or Government stands guarantee.

iv) Production finance

It is necessary that the co-operative bank frames its rules for the provision of production finance on the basis of actual needs of the fishing industry and not necessarily on the basis of the usual rules laid down for this purpose. A study of the conditions varying from region to region and the type of fishing undertaken will be helpful. Unless this is done, fishermen are bound to take recourse to merchants, who are in a position to meet the requirements.

v) Loans

Credits granted by the bank have to be returned within the stipulated period. Many times the production of fish of a unit is not satisfactory and it is not possible to recover the entire advance or at times, it is not desirable to recover the entire advance. Hence it is necessary for the banks to allow extension of the repayment period of such advances, since the credits once extended cannot be withdrawn. The banks also do not sanction fresh credits unless the previous credit is fully returned but since the entire fish marketing is run on credit basis, many a time recoveries are delayed. The banks, should therefore adopt a more sympathetic attitude. As against this the other merchants at the Crawford Market are not keen on recovering their entire advances from fishermen since they are anxious that their business goes on and the same unit continues to sell their catch of fish during the next fishing season.

vi) Dry fish transactions

Dry fish is a sort of cash crop for the fishermen. They are anxious to dispose of it for cash and reasonable payment. They hardly like to wait for the market to improve since they have to make provision for the monsoon and meet other expenses. If the societies get adequate finance to pay sufficient advances to fishing units, a good deal of this business will come to societies. It is, therefore, necessary to increase the hypothecation credits.

vii) Interest

The present rate of interest charged by the bank is 6 $\frac{1}{2}$ % which is considered very high. It is necessary to reduce the rate of interest.

viii) Clean credit

Societies are allowed clean credit by the bank for their trading activities. These credits are based on the financial position of the society and are found to be quite inadequate for societies to run their activities. If necessary, Government may stand guarantee for better credits after looking into the working of such societies.

ix) Hypothecation credits

Hypothecation credits are also given by the banks for goods in charge of the societies. These credits which are usually to the extent 60 to 70 per cent of the value of goods, are found insufficient. Several societies have now undertaken export of fish maws and it is necessary that credits to these societies are sanctioned on the basis of their transactions. The present rules do not cover such transactions and hence a rational view point is necessary. The same consideration will have to be shown for boat building which is a new activity undertaken by co-operative societies in the fishing industry.

x) Consideration by Reserve Bank

It is the plea of many fishermen's co-operatives that fishing operations involve more hazards than agricultural operations and therefore concessional finance provided by the Reserve Bank for agricultural purposes are not extended to the fishermen's societies. It is understood that the Reserve Bank's approach to the problem of finance to fishermen's societies is as follows:

- (a) The State or Central Government would have first to provide finances required by the society.
- (b) The co-operative Central Bank may agree to finance the societies after the stage of nursing is over and when the societies have been firmly established.
- (c) The Central Bank may approach the Reserve Bank when the demands from the fishermen's societies are too large to be met from their own sources.
- (d) The Reserve Bank could be at that stage examine the question of providing funds to the industry.

It may be possible to explore the possibilities of obtaining accommodation from the Reserve Bank under Section 17(2)(bb) of the Reserve Bank of India Act.

The Reserve Bank of India also suggested reorganization of the fishermen's co-operatives more systematically, fixing the field of operation and activities distinctly for local societies, district-organisations and federal bodies. The work of reorganisation of the societies has accordingly been started by the Registrar, Co-operative Societies. The local societies are adopting new bye-laws according to which they can undertake production and processing of fish, credit activities and arrange for marketing of fish. District organisations and regional federations have been established. The establishment of Maharashtra Rajya Mechhimar Sahakari Sangh the apex body of fishermen was a great achievement during the year 1963/64.

MALAYSIA

- (a) Consolidation of existing fishermen co-operatives is being carried out. The Government has now agreed to provide financial subsidies to pay for the salaries of good managers to be employed in the fishery co-operatives at least during the first one or two years of their operation to lead them on until the necessary managerial skill is available from their own members.
- (b) With limited resources at its disposal (especially in view of the shortage of Government extension staff) emphasis is being given by the Government of Malaysia to channel financial and technical assistance to fishermen through fishery co-operatives and the projected fishermen associations.

PHILIPPINES

In as much as no fishery co-operatives have as yet been organized, no measure has been made to assist fishery co-operatives in strengthening their financial standing or improving their management.

There were requests from fishermen associations for assistance to convert their associations into fishery co-operative with the belief that by organizing a fishery co-operative they are entitled to assistance by way of monetary aid from the government.

The Commission intends to concentrate on cooperative education as an initial step in its attempt to organize fishery co-operatives. In the achievement of these objectives, co-operative officers shall undergo intensive training on co-operative education at the Agriculture Credit and Cooperative Institute, an entity jointly sponsored by the ILO and the University of the Philippines.

THAILAND

Fishery co-operatives activity is under responsibility of the Department of Credit and Marketing Co-operative, Ministry of National Development. As to the information on this matter received by the Department of Fisheries, so far no progress has been made in the field of fishery co-operatives during the period of 1965-1966. No joint staff has been established as co-ordinator body between the Department of Fisheries and the Department of Credit and Marketing Co-operatives.

Information received recently from the Department of Credit and Marketing Co-operatives indicates that, now, only two fisheries Co-operatives are in existence and both are of primary type. One is the Central Co-operative Fishery Society Ltd., located at the Bangkok Fish Wholesale Market, Bangkok. This co-operative society deals with fishery credit and marketing activity. The other one is the Pisanu Fishermen Co-operative Society Ltd., located in the northern part of the country, and deals with the procurement of leasable fishing waters for its members.

It is also stated by the Department of Credit and Marketing Co-operatives that there are still many problems and difficulties in promotion and extension of fishery co-operative movement. The following are the examples:

- (1) Lack of subsidy and loan from the Government.
- (2) By the nature of the fisheries itself, the fishery occupation is highly speculative.
- (3) The Thai fishermen are still employing primitive types of fishing gear because they are lacking of loan funds for more efficient fishing equipment.

PLANNING FOR FISHERIES DEVELOPMENT AND FISHERIES ADMINISTRATION

AUSTRALIA

The Australian Fisheries Development Conference will be held in 1967 to examine the status of Australian fisheries with a view to initiating development where desirable. Various development programmes are being carried out by states, particularly in Western Australia and Tasmania, where a new fisheries laboratory is being planned and additional staff engaged.

The training course for Fisheries Field Officers continues to be held annually. A Development Conference to which representatives of every sector of the industry are being invited is to be held in February 1967.

The possibility of developing a purse-seine fishery is being investigated. If this technique is found to be operationally feasible, major changes in the financial and organizational structure of the affected sectors can be expected.

CEYLON

The Ceylon Fisheries Corporation's 10 Year Plan, which was drafted in 1965, is still under consideration by Government. A World Bank team is now in Ceylon to have further discussions in respect of granting assistance to fisheries development.

The enforcement of the Fisheries Ordinance and welfare services are carried out under the jurisdiction of the Director of Fisheries, whilst commercial activities such as operation of trawlers, cold storage plants and ice plants, sale of fishing requisites previously handled by the Department of Fisheries and Fish Marketing have been taken over by the Ceylon Fisheries Corporation.

HONG KONG (United Kingdom)

A change in Fisheries Administration took place on 1st July 1964 with the Agriculture and Forestry Department and the Co-operative Development and Fisheries Department amalgamated to become one department, known now as the Agriculture and Fisheries Department. The Director of this new Department is assisted by three Assistant Directors, one of whom is responsible for all fishery services. The Assistant Director, Fisheries, is in turn, assisted by a Senior Research Officer who heads the Fisheries Research Division; a Fisheries Officer responsible for craft and gear; an Assistant Registrar of Co-operative Societies responsible for cooperatives, marketing, credit, regulatory, fisheries extension work including training classes and radio programme; and a School Supervisor responsible for the administration of the 13 Fish Marketing Organization schools.

The Fisheries Research Division is at present surveying the South China Sea and largely on its results will depend the future development of the fleet. The Fisheries Development Division is concurrently advising fishermen on the boats and engines they will require if they are to take part in this development. This ties in with the establishment of the Fisheries Development Loan Fund.

INDIA (Maharashtra State)

Present per capita availability of fish is 14.8 lbs. per year on the basis of fish eating population. According to the recommendation of the Nutrition Advisory Committee the balanced diet of Indian population should consist of 3 ozs. of protein out of which 2 ozs. can be of fish protein. In other words, the Nutrition Advisory Committee recommends per capita requirement of fish at 45 lbs. per year. Present population of Maharashtra as per 1961 census is 395 lakhs. If it is presumed that 70 per cent of the population eats fish, the annual production of fish needs to be of the order of 555,000 tons against the present production of 170,000 tons to maintain a balanced diet.

It would thus be seen that there is a wide gap between the present production of fish and its requirements. Planned efforts are, therefore, needed for a considerably long period and this demands long term plans for development of fisheries.

Exploitation of the sea and utilisation of holdings of fresh water in the interior are the main resources of production of fish. It is, therefore, essential to undertake mechanisation of fishing boats on a large scale and to stock intensively inland waters with carp fry of selected varieties of quick growing fish. Both these items were included in the last five year plans of the department. As a result the number of mechanised fishing boats which was 15 in 1951-52 has risen to 1790 by 1965-66. Stocking of inland waters with carp fry also has been raised from 400,000 in 1954-55 to 12,102,000 in 1965-66.

During the third plan, it was proposed to mechanise 560 fishing vessels, allot 100 fishing boats and to stock about three crores of fry in inland waters. Provisions were also made during the third plan for preservation, transport and marketing of fish. Two pairs of multi-purpose boats were operated in deeper waters for exploitation of marine fisheries. As a result the level of production of fish was stepped up to attain annual catch to the extent of two lakh tons.

During the fourth plan stress will be laid on stabilising rates of fish so that the ultimate consumer is benefitted. Stress will also be laid to exploit fish from all sources possible. More mechanised boats will be put into commission. It is estimated that about 2,500 boats will be mechanised by the end of the fourth plan and trawling experiments will be gaining momentum and additional supplies of fish will be available. Steps will also be taken to concentrate attention on developing fresh water fisheries. It is estimated that production of fish will then rise up to 400,000 tons by the end of the fourth plan. Adequate facilities for preservation, transport and marketing of this fish will be provided.

Apart from increased fish production, stabilising economic stature of the industry will also receive due attention. Steps will be taken to remove illiteracy among the fisherfolk.

Research, both technological and biological, will be further intensified and will be concentrated on the problems intimately connected with the industry.

Much will have been obtained in the field of development of fisheries of the State during the first four plans. During the fifth plan, chief objective will be reassessment of the previous plans and concentrated attention to further stabilise the rates of fish, and make the industry self-sufficient, as far as possible and increase fish production. Self-sufficiency will be obtained in the production of fish and stabilising economy of the fishermen. The element of Government subsidy in all the spheres will be proportionately reduced while loans will be advanced on usual basis. About 3,500 mechanised boats will go in quest of fish at the end of fifth plan bringing bumper fish in addition to the normal production. With the operation of a few trawlers and mechanisation programme at its peak, the annual fish production will also show corresponding increase reducing the wide gap between demand and supply of fish.

Increase in supplies of fish is also expected in the field of fresh water fisheries of the State. Work pertaining to survey of cultivable waters will be completed and large number of water spreads will come under pisciculture thus bringing the total catch to about 30,000 tons by the end of fifth plan.

It will be necessary to afford extended educational facilities to fisher-youths by establishing secondary type of schools and affording intensive facilities. It may also be possible to decide price structure during the course of the plan.

Along with this, research in biological field will also make certain headway and a team of research workers will be available to undertake further research on problems, leading to increased catch. There can also be expected a wide-spread expansion in the subsidiary fishery industry, bringing to the State's exchequer large revenue.

The fishing industry will be brought up to modern standards bringing contentment among the rank and file of fishermen.

Fishermen are mostly illiterate and poor. It takes considerable time to convince them about the efficacy of any new development in their field. Generally they are inclined to stick to the age-old methods. Besides, their poor financial position prevents even their co-operatives to enter into any new venture with the fear that in the event of any loss the financial structure of the co-operatives will be seriously disturbed. However, it is very necessary that organisations of fishermen should be emboldened to undertake co-operative establishments closely connected with their trade. If this is done they acquire the most valuable confidence that they can manage their establishments. With this idea in view, Maharashtra Government, instead of increasing departmental activities, prefers to allot these establishments to fishermen's co-operatives with the necessary financial assistance to undertake the activities. However, if the co-operatives are diffident about the operation, it is necessary for Government to take up the new activities and to prove successful operation thereof so that the co-operative societies can also enter such fields with confidence.

In Maharashtra State, a co-operative society of fishermen has established a boat building yard on modern lines with up-to-date equipment. This society was given financial help in the form of loan and subsidy. Three other societies have established ice factories and cold storages with Government help of loan and subsidy. Some co-operative societies have also undertaken transport of fish from landing sites to the marketing places by operating several trucks for the purpose. All these activities could be undertaken by the co-operatives because of liberal financial help from Government and thus reducing the fear of heavy losses in case of unsuccessful operation.

Another project which the co-operative societies can take up is trawling. However, this involves a good deal of capital investment. The department has, therefore, taken up this scheme and two pairs or multi-purpose boats have commenced operation. The project can later on be transferred to the co-operative societies when the society is convinced about its successful operation.

Different projects can thus be transferred to the fisheries co-operative societies if they are capable of managing such projects.

The Department of Fisheries came into an independent Directorate in the year 1945. Since then various activities leading to the increase in fish production and improving socio-economic condition of community have been undertaken by the department. During five year plans these activities have been intensified considerably. Various developmental programmes were undertaken during the recent years and necessity of suitable trained hands to man the projects was keenly felt. The department had, therefore, established a staff training centre at Bombay where facility to train 15 candidates a term was afforded. Subjects like Ichthyology, Oceanography, fishing methods and fishery economics, fish processing, pisciculture, were taught at this centre. Besides, subjects like accounts, fishery statistics, planning in fisheries were also introduced at the centre. These subjects were introduced with the object that the candidate trained at the centre would have a better grasp of the department's working in general and would be in a position to take an independent charge of any project envisaged in the plan, 47 candidates having been trained at this centre.

Besides the above, the Department deutes two officers every year at the Central Institute for Fisheries Training, Bombay. The course is meant for officers and is of two years' duration. Four candidates of the department are under training at this institute.

In view of the expanded activities of the department since its inception in the year 1945, the strength has also considerably increased during this period. The total strength of the department which was about 100 in the beginning is now risen to 1063 for management of different activities all over the State. The total strength of staff of present may be classified as under:

Class I Officers	15
Class II Officers	32
Class III	555
Class IV	461
		<hr/>
		1063

In the beginning of the life of this department there were naturally few schemes in operation. The budget which at present amounts to about Rs. 2.5 crores per annum was much smaller in the beginning. There has been a steady expansion in the field of marine fisheries, fresh water fisheries, training, research and other schemes drawn for well being of fishermen. The department now controls 21 fish curing yards in the Ratnagiri District, eight fisheries schools, one fisheries high school, two marine biological research stations, fisheries technological laboratory, the Taraporevala Aquarium at Bombay and other schemes in the five year plans. It has regional offices located at the following places, each in charge of a gazetted officer.

Bombay - Head Office - staffed by:

- (1) Deputy Director of Fisheries (Headquarters)
- (2) Senior Scientific Officer
- (3) Survey Engineer
- (4) Deputy Director of Fisheries (Special)
- (5) Assistant Director of Fisheries (Administration)
- (6) Assistant Director of Fisheries (General)
- (7) Superintendent of Fisheries (Marine)
- (8) Superintendent of Fisheries (Inland)
- (8a) Superintendent of Fisheries (Applied Nutrition Programme)
- (9) Assistant Director of Fisheries (Craft and Gear)
- (10) Assistant Director of Fisheries (M.T.)
- (11) Accounts Officer
- (12) Personal Assistant to Director of Fisheries
- (13) Special Officer
- (14) Statistical Officer
- (15) Planning Officer
- (16) Curator
- (17) Recovery Officer
- (18) Assistant Research Officer (Fresh Water Biology)
- (19) Assistant Research Officer (Marine Biology)

Fisheries Technological Laboratory

- (1) Deputy Director of Fisheries (Technology)
 - (2) Assistant Director of Fisheries (Technology)
 - (3) Superintendent of Fisheries (Technology)
 - (4) Accounts
- | | | |
|------------|---|---|
| Nagpur | - | Assistant Director of Fisheries |
| Chandrapur | - | Superintendent of Fisheries |
| Nagpur | - | - do - |
| Bhandara | - | Superintendent of Fisheries |
| Ratnagiri | - | Assistant Director of Fisheries (off-shore) |
| Ratnagiri | - | Superintendent of Fisheries |
| Ratnagiri | - | Curator |
| Ratnagiri | - | Fisheries Training Officer |
| Ratnagiri | - | Processing Technologist, Malvan |
| Kolhapur | - | Superintendent of Fisheries |
| Alibag | - | Superintendent of Fisheries |
| Aurangabad | - | Superintendent of Fisheries |

The Director of Fisheries is the technical and administrative head with his office at Bombay.

Besides the above regional offices, the department has established sub-offices at Poona, Bhatghar, Radhanagari, Nanded, Bhir, Khopoli, Nasik, Amroati, Sindewahi, Satara, Brahmपुरi, Wardha, Akola. A section to collect statistics of fisheries has also been organised at Bombay since the second five year plan period. All these activities have sprung up recently after establishment of the department into an independent Directorate and indicate gradual expansion during these years.

MALAYSIA

- (a) Under the 1st Malaysia Development Plan 1966-1970 a total provision of \$21 million (out of a total of \$496 million for the whole of the Agricultural Sector) has been approved for the development of marine and inland water fisheries in the States of Malaya and Sarawak.
- (b) It is increasingly felt that there is urgent need to strengthen Government Fisheries Department in order to meet the increasing demand for Government fisheries services in the field of administration, development, research, education and extension. In terms of Development Fund allotted to Fisheries there is now a five-fold increase compared to financial provision under the 2nd Five Year Plan (1961-65). The number of fisheries staff too has been increased.
- (c) A request has been made for an FAO expert in Fisheries Development who will be required inter-alia to put up specific proposals for staff increase and expansion of the Fisheries Department. Three Malaysian graduates of the Tokyo University of Fisheries have recently been recruited in the Fisheries Department.

PHILIPPINES

Long term plans for the development of fisheries were prepared by the Commission and submitted to the National Economic Council; these were incorporated in the Socio-Economic Development Program for Fiscal Year 1966-67 to 1969-70 prepared by NEC for the President of the Philippines.

There has been no major change in the set-up of the Philippine Fisheries Commission.

The filling up of vacant positions in the Commission is again deferred due to the retrenchment program of the Government.

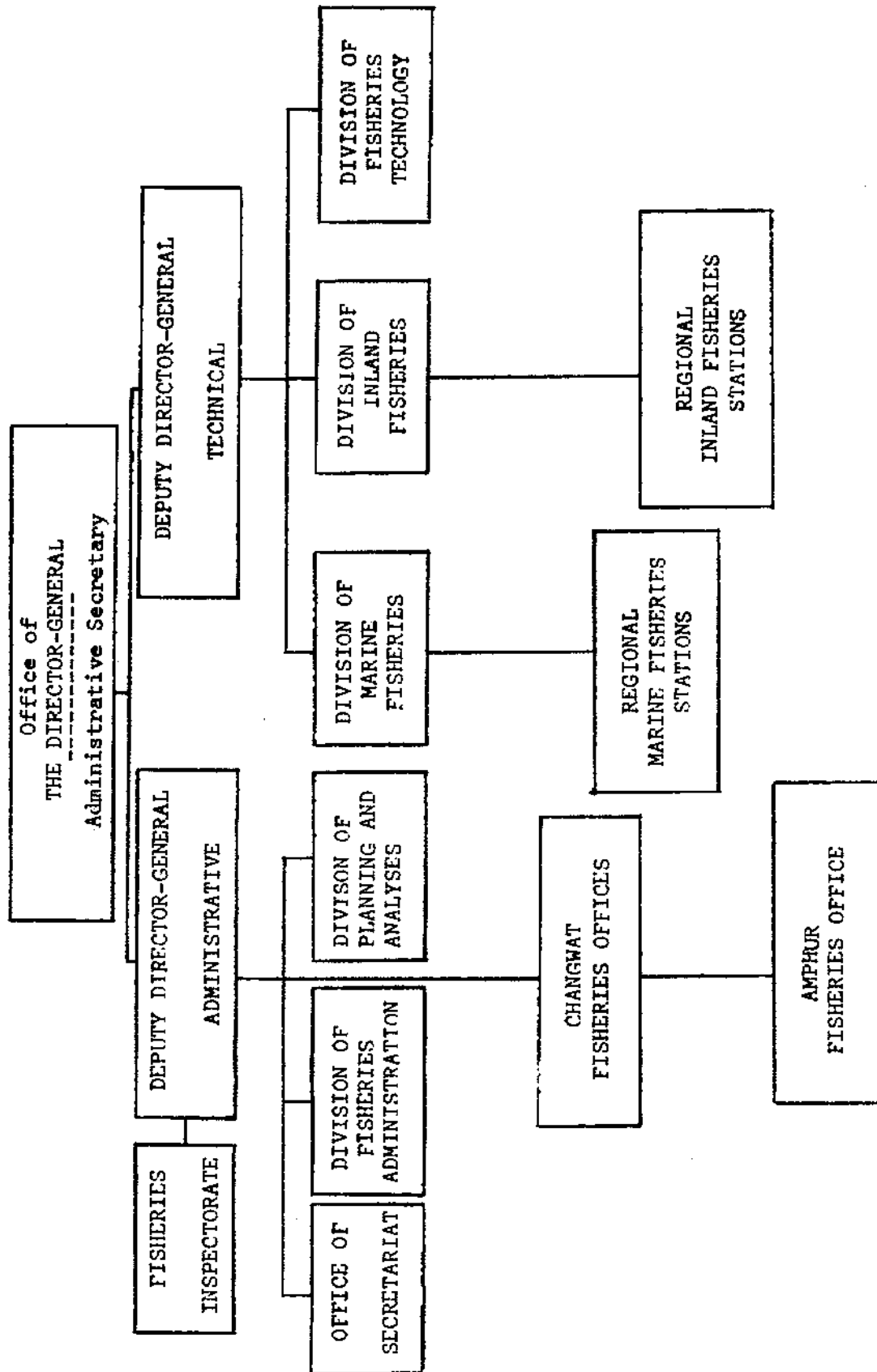
THAILAND

The year 1966 is the end of the present Six-year Plan of National Economy Development which includes the fisheries development program. The target of the fisheries development is the total landing of 500,000 metric tons of both marine and fresh water fish. The actual total landing, according to the trend of fish production of the past five years, seems to reach this target since the year 1965, even though the statistics of the year have not yet been completely compiled.

The new target for the next five year plan (1968-1972) of fisheries development has been aimed at 850,000 metric tons of marine and inland fish production. The addition is expected from expansion of sea fisheries into South China Sea and Indian Ocean. Inland fish culture and on-shore fish farming are also counted as important sources of increasing the fish production.

In order to cope with the great increase of food fish demand at the end of the next five-year plan, the Department has submitted a proposal to the Government for reorganization and strengthening of the Department. The proposed revision may be seen from the chart of the Department of Fisheries attached.

PROPOSED ORGANIZATION OF THE DEPARTMENT OF FISHERIES



FISH MARKETING

AUSTRALIA

A new Sydney Fish Market operated by the N.S.W. Fish Authority was opened on 15 July 1966. The new market has provision for unloading fish direct from fishing vessels, and has spacious cleaning rooms and refrigeration facilities. The Queensland Fish Board is planning the construction of a new depot to replace its existing facilities at Brisbane. There is a general trend toward increased use of refrigeration in storage and transport of fish. In Tasmania, the regulations dealing with hygienic standards for fish have been augmented.

HONG KONG (United Kingdom)

- (a) The Fish Marketing Organization continued to provide wholesale facilities for the marketing of marine fish. Legislation controlling the wholesaling, landing, movement, import and export of marine fish and establishing the Organization as a corporation with by-laws governing the operation of wholesale fish markets was promulgated at the end of December 1962.
- (b) Efforts to improve the Organization's services proceeded. Mechanization of the marketing procedures are being put into effect in stages and mechanized means of off-loading fish at wholesale markets are now under study. The Organization has built a new and up-to-date fish market to replace an older and less adequate market. The building of two additional markets in outlying districts is being planned.

INDIA (Maharashtra State)

The present marketing activities and the Government's role:

Fish marketing which comprises collection of fish from producing centres and then wholesaling and retailing is dependent largely on the middlemen in this State. The traders who have established themselves in this field since long make advances to producers to enable them to prepare themselves for the fishing season and recover the amount in the form of fish for which comparatively low rate is offered. The producer generally cannot receive a fair return for the catch in spite of his toiling and moiling as he has little voice in price fixation due to his indebtedness. The fish thus procured by the merchant is then transported by him to the wholesale market (i.e. Bombay) where it is auctioned to the retailers. Furthermore, the auctioneer is not an independent body but the merchant himself who conducts the auction through his agent at the wholesale market.

On account of the fillip extended by Government to co-operative effort, two co-operative organisations of fishermen mainly Maharashtra Rajya Machhimar Sahakari Sangh and Thana Julha Machhimar Sahakari Sanstha have commenced marketing of fish in Bombay. They obtain credit facilities from the State Co-operative banks for marketing fish and trading in fishery requisite. The fish caught by the fishermen members of primary societies is sent to the marketing society for disposal by open auction. After deducting from the sale proceeds commission varying from 4 to 6½% and the instalments toward the credit if any, the remaining amount is returned to the producer member. Although this type of co-operative marketing has made definite impact it has not yet made satisfactory headway as hardly 15 to 20 percent of the total sales is handled in the co-operative sector. Influence of this sector has, however, been distinctly felt as there has been considerable awakening among the fishermen and their bargaining power has also improved. Nevertheless, lack of sufficient funds with co-operatives to offer extensive credit facilities to members creates an atmosphere of hesitancy resulting in lack of full confidence in co-operative efforts. Moreover, the long-standing hold of the traders on them is withholding further progress.

With a view to removing the aforesaid handicaps and organising the marketing in a proper way, the Government have undertaken various steps, the most important being:

- a) Grant of financial assistance to fishermen's Co-operatives to take up marketing.
- b) Provision of preservation and transport facilities which indirectly influence the marketing activities.
- c) Propaganda to induce fishermen's Co-operatives to undertake marketing activities.
- d) Affording technical guidance and financial assistance for construction of fish markets and remodelling of old ones.
- e) Provision of fish marketing intelligence.

(a) Realising the need to undertake marketing activities on co-operative basis by fishermen themselves, the Government have been concentrating their attention on inducing fishermen's co-operatives to come forward so as to eliminate gradually middlemen from the trade. Full encouragement is given to the apex bodies of fishermen viz. the Thana Silla Machhimar Sahakari Sanstha Ltd., and the Maharashtra Rajya Machhimar Sahakari Sangha Ltd., Bombay in the fresh and dry fish business undertaken by them. These associations market the produce of the members and affiliated societies. Institutional credit is made available to the co-operatives through the central and district co-operative banks. This is short term credit and is offered to the co-operatives in the form of clean credit, hypothecation or pledged credit, depending on the efficiency and working capacity of the co-operatives concerned. Efforts are also being made to make the credit easily available so as to enable the co-operatives to have an effective impact on fish marketing. Impressed by the success of the aforesaid bodies and the persuasive methods by the department, several co-operative societies have asked their members to send their catch for sale through the aforesaid marketing societies. This is definitely a good sign of progress. The situation will improve further if the co-operatives are liberally financed and fishermen realise the importance of co-operative efforts.

(b) Account of transportation facilities in fish marketing

With the exception of a few areas like Ratnagiri and Kolaba districts the facilities for transport of fish from landing sites to assembling centres, consuming centres etc., are fairly improving in this State. Even in Ratnagiri on account of inability of the local co-operatives to undertake transport, the department has commenced this work. During 1965-66 the transport van made 122 trips covering 2120 miles and transported about 216 tons of fish belonging to local co-operatives to places in the interior parts of Ratnagiri district. Transport is made by rail, road and sea. Transport by air has not, however, been attempted on any noticeable scale.

(c) The municipalities, municipal corporations and gram panchayats are supplied, on request, with model designs for fish markets. If these bodies experience difficulty in finding funds to construct new fish markets at places where they do not exist, Government has a scheme to grant them financial assistance in the form of loan on construction work. A loan of Rs. 30,000/- has accordingly been sanctioned to municipality at Nagpur. The construction of fish market is completed.

(d) Detailed information about the marketing potentialities of the various areas, existing marketing system, possible development etc., is collected from important centres in the State and is passed on to the interested parties. The information covers availability of fresh and processed fish, by-products, prevailing rates, possibility of undertaking exports etc. This helps arrangements for distribution of fish and reasonable return to producers, retailers and wholesalers.

At the instance of this department and on recommendations of the All India Fisheries Conference and Fisheries Ministers' Conference, the railway authorities have introduced several improvements with a view to facilitating expeditious and safe transport of fish. Instructions have accordingly been issued (1) to reserve sufficient space in the brake vans for fish consignments to be loaded at stations nearest to important fishing centres; (2) to increase the halting time of trains, when necessary, to ensure that fish parcels do not remain to be loaded; (3) to accept fish parcels by available mail and express trains; (4) to relax the quota for fish parcels, whenever the fish traffic is found to have been increased and (5) to give priority to fish consignments. Fish being a highly perishable commodity, is charged by railways at half the usual parcel rates.

Although the bulk of fish is transported by rail and road, quite a large quantity is also sent by sea in carrier launches. The Government has made significant contribution in introducing carrier launching originally on a hire and purchase system. It is gratifying to note that this water transport sector has taken a fairly firm root though it has yet several difficulties. At present there are 20 such launches bringing fresh fish (Mackerel etc.) from as distant places as Karwar, Malpe etc., to Bombay markets. About six transport launches and about double the number of sailing craft are engaged in transport of iced fish (fresh) from Veraval, Porbunder etc. (in Gujarat) to Bombay. Under the Kokan Vikas scheme, Government proposes to construct one or two more carrier launches which would be operated departmentally from Ratnagiri to Bombay. One such carrier launch is ready and has been put into operation. This will not only improve the existing transport facilities but will serve as an impetus to fishermen to catch more fish.

Transport of fish from landing sites to local markets is generally done by trucks. Landing centres up to about 100 miles north of Bombay supply fish to the city (Bombay), the main fish consuming centres in the State. Although about 35 trucks are owned by fishermen's co-operative societies in the Bombay and Bombay-suburban district and Thana district, in other areas the work is done by private truck owners. The private owners sometimes charge exorbitant rates. In order to safeguard the interest of fishermen, the Government made efforts to persuade fishermen's co-operatives in various areas to purchase their own trucks and hire it to their members at reasonable rates. Financial assistance in the shape of loan and subsidy is also granted to the co-operative societies for purchase of trucks to undertake fish transport.

Government also has granted special permits enabling the co-operative societies to take fish vendors along with their fish baskets in the trucks, to the retail markets and vice versa. This has considerably helped retailing of fish by wives of fishermen themselves in places like Versova, Danda, Chimbai etc. and has proved very beneficial.

MALAYSIA

- (a) One of the first tasks of the newly established FAMA (or the Federal Agriculture Marketing Authority) is to set up a Fish Marketing Organization to provide and run wholesale fish markets at main consuming centres and to set up fish-collecting agencies at main fishing centres. The Organization is also expected to provide (and operate if necessary) other fish storing, processing and transport facilities.
- (b) With the establishment of the Fish Marketing Organization it is anticipated that a public fish-auctioning system will be introduced at the main consuming centres.

PAKISTAN

Agencies and authorities controlling the management of Inland and Marine Fisheries

The following are the agencies under whose management and control progress has been made in handling and marketing of fish.

1. Marine Fisheries Department:

A well organized Fisheries Department has been established under the Ministry of Agriculture & Works at Karachi with a branch at Chittagong, East Pakistan, by the Central Government. The development of Marine Fisheries beyond territorial waters and research, is Central Government's subject and hence responsibility of Marine Fisheries.

2. Provincial Departments of Fisheries (Inland), West & East Pakistan:

The entire Inland Fisheries resources and Marine Fisheries within territorial waters of the West Wing are being controlled by this Department. A Directorate of Fisheries dealing with Fresh Water and Estuarine Fisheries has been functioning with its head office at Dacca, East Pakistan, for a very long time.

3. The Agricultural Development Corporation West Pakistan, Lahore:

This Corporation has been established with a view to help promote the economic condition of the agriculturists and the fishermen of the Province by supplying necessary equipment and material on easy instalment basis. The Corporation functions in collaboration with the Agricultural Development Bank which advances loans for the development of Agriculture and Fisheries. The exploitation, conservation, marketing and handling of fresh water fisheries of certain areas of the Province specially that of Ghulam Mohammed Barrage and Kalari Lake area has been entrusted to the Fisheries Section of this Corporation which has been functioning satisfactorily.

4. The East Pakistan Fisheries Development Corporation:

The Corporation has been entrusted with the pre-investment survey work of the East Pakistan Fisheries resources of both the Inland and Marine Fisheries in collaboration with FAO for proper catching of fish, mechanization of Fishing Fleet, fish handling, marketing, preservation and processing of fish and fish products.

5. Wholesale Fish Market and Landing Jetties:

Karachi (West Pakistan)

With the provision of almost all necessary facilities of berthing of fishing crafts, landing, marketing and storing of fresh fish in Cold Storage an enormous increase has taken place in the number of mechanised fishing vessels and the landings of fish. The total landings of Fish at the Fish Harbour which stood at 33039 tons in the 1st Year of the 2nd Plan Period (1961) has risen to 58244 tons in 1965. The increase in the landing of fish is so rapid that the existing landing jetty and the Fish Market can hardly accommodate the ever growing number of fishing vessels and the fish catches. The Central Government is, therefore, inclined to sanction a scheme of constructing a landing jetty and an alternate Wholesale Fish Market at Ibrahim Hyderi fishing village (Korangi Creek) at a cost of Rs.1,300,000.00 (Thirteen lacs). The work is expected to start soon and be completed within the Third Five Year Plan Period (1969-70). In addition to this the Central Government has sanctioned a scheme named "The Extension of the Fish Harbour, Karachi" at an estimated cost of Rs.2,057,000.00 in the same period. The Fishermen's Cooperative Society Ltd., Karachi, who is entrusted with the administrative control of the operation and management of the Wholesale Fish Market at the Karachi Fish Harbour, will construct a market on the reclaimed land for disposal of semi-cured and 'Kachra' fish (Fish meant for Fish Meal) along with a modern fish curing yard. They will also construct a workshop and slipway

for the repairs of fishing vessels, a boat building yard and a small fish-meal plant on the same side. Diesel Oil facilities on the other side where jetty and dry fish market is contemplated to be built will be provided by M/S Burmah Shell. The construction of the oil Kiosk is already in hand. This firm will also construct a 100 ft. jetty to enable the fishing fleet to get their oil supplies.

Mekran Coast (West Pakistan)

The West Pakistan Government have prepared a scheme to construct two Fish Harbours on the Mekran Coast at Pasni and Gwadur area.

The Directorate of Fisheries, West Pakistan, have under-taken departmentally, the marketing of fish caught from 'Mancher Lake' (situated at Dadu District in the Former Sind Province) which is the biggest fresh water lake in Asia. The Fish caught by the Fishermen from this lake is transported through trucks and Rail-Road Cars to different consuming centres in West Pakistan.

Similar efforts on the marketing of fish caught from 'Kalari Lake' which is the 2nd biggest man-made lake and is about 75 miles from Karachi, situated in Thatta District, in the Former Sind Province covering an area of 200 sq. miles, are being made by the Fisheries Division of the Agricultural Development Corporation.

East Pakistan

The Wholesale Fish Market, Ice Plant and Cold Storage built at Pather-Ghata, Chittagong by the Central Government is now being utilised by the fish producers. The management and administrative control of the Fish Market, Ice Plant and Cold Storage has been entrusted on hire/purchase basis to the Provincial Fishermen's Cooperative Society Ltd., East Pakistan. The Society has recently added a freezing plant and a small deep freeze storage room and is thinking of going in for Frozen Shrimp/Fish and Frog Legs export business.

The Government of Pakistan has placed Rupees eleven lacs (Rs.1,100,000.00) at the disposal of the East Pakistan Provincial Government for the purchase of 110 acres of land with 3000 ft. water-frontage on the other bank of Karnafully river opposite to Chittagong City for the Fish Harbour at Chittagong. The land has already been acquired. Work on the construction of a modern fish harbour, like the one at Karachi was started by the Central Government at Chittagong, East Pakistan in 1963-64 and an amount of Rs.111,412.00 has been spent on it till 1965-66. This project has recently been transferred to the Government of East Pakistan, who will provide funds for the work under the management of the East Pakistan Fisheries Development Corporation. In addition to the Fish Harbour project, mentioned above, the East Pakistan Fisheries Development Corporation has prepared the following schemes to improve the handling and marketing of fish.

- (a) Establishment of 5 Ice Plants costing Rs. one million.
- (b) Construction of 5 Cold Storage Plants at important places costing Rs. two millions.
- (c) Purchase of marketing equipment costing Rs.2.90 millions.

The Corporation has taken in hand the marketing of fish from Cox's Bazar to Chittagong and Kaptai Lake and Rangamati centres to Chittagong. The fish produced by the mechanized fishing fleet, under the scheme 'Mechanization of Fishing Fleet in East Pakistan', specially of small crafts fitted with 'Penta' out-board motors in Kaptai lake and around Cox's Bazar water-front is transported to Chittagong in the pick-ups and delivery-vans owned by the Corporation.

6. Ice Factories:

There are 135 Ice Factories in West Pakistan with a total production capacity of 1275 tons per 24 hours. Out of these 34 Ice Factories are located in Karachi with a production capacity of 665 tons per 24 hours.

There are only 49 Ice Factories in the whole of East Pakistan producing 414 tons per 24 hours.

7. Cold Storages:

There are only 33 Cold Storages in the whole of West Pakistan having a total Storage capacity of 3,349 tons. Out of these 11 Cold Storages are at Karachi, which have a storage capacity of 1,909 tons. No cold storage, except the one attached to the Wholesale Fish Market at Karachi Fish Harbour is being used for the storage of fresh fish exclusively which has a storage capacity of 10 tons. At present only 10 Cold Storages exist in East Pakistan which have a total storage capacity of 3,552 tons.

8. Freezing Plants:

There are 19 Fish Freezing Plants in West Pakistan out of which 18 are located in Karachi having a working capacity of 187 tons per day. One plant is about to start functioning at Gwadur on Mekran Coast. Only 4 Freezing Plants are operating in East Pakistan with a working capacity of 23.5 tons per day.

9. Fish Canning Plants:

There are 3 Fish (shrimp) Canning Plants in West Pakistan and all the 3 are located in Karachi, which have a total working capacity of 12.75 tons per 24 hours.

10. Fish Meal Plants:

There are only 6 Fish Meal Plants in the whole of Pakistan and all are located in Karachi. The total production of the plants has been estimated at 1,100 tons of Fish Meal per month.

11. Transport Facilities:

The following measures are taken by the Government to improve handling and marketing of Fish.

i. The Government is fully conscious of improving the marketing facilities of fish and do not hesitate to sanction expenditure on the construction of Wholesale Fish Markets landing jetties and supply of necessary equipments.

ii. The Government has been trying its best to get the freight rates reduced by the 'Conference Lines' who have almost a monopoly to carry fish and fish-products of Pakistan, particularly frozen products to different countries like U.S.A. and U.K. etc. The National Shipping Corporation, Pakistan also has been requested to provide necessary refrigerated space in their vessels and charge reasonable freight for the Pakistan fish cargo. Subsidy on freight has also been suggested.

iii. An incentive of 30% export bonus on the export of frozen, canned and mechanically dehydrated fish has been granted by the Government to capture more foreign markets and add to foreign exchange earnings and to encourage fish exporters.

iv. The services of experts from FAO and other International Organizations are obtained from time to time to get their guidance and advice with a view to improve the handling and marketing of fish produced in Pakistan.

v. A trade delegation consisting of three fish traders of East Pakistan was sent to South East Asian countries to explore the possibilities of finding new markets for cured fish products of East Pakistan. Similar delegations are expected to be sent from West Pakistan under the guidance of a senior technical officer of Marine Fisheries Department accompanied by an officer of the Export Promotion Bureau.

vi. Recently, export of fresh fish from Karachi to Kabul (Afghanistan) via Peshawar through refrigerated rail-cars (upto Peshawar and through ordinary trucks from Peshawar to Kabul) has been started. The experiments proved very successful and the Government is encouraging this new channel of export market.

In short the grant of Export bonus and other incentives given by the Government to the fish processing industry has resulted in a foreign exchange earning of Rs.35,129,864.00.

PHILIPPINES

For landing facility of fishing boats, the government by Presidential Proclamation authorized the exclusive use of Pier 14 as a fishing wharf. In the report submitted by the FAO Fish Marketing Adviser, he recommended the improvement of said pier and the establishment of a fish market there.

To alleviate the acute ice shortage perennially faced by the fishing industry, the Philippine Fisheries Commission has embarked in the construction and installation of 18 units Ice Plants with capacities ranging from 5 to 40 tons with Cold Storage ranging from 30 to 300 tons. To date 3 units are actually in operation, six (6) are under construction and nine (9) are awaiting selection of appropriate sites. These eighteen (18) units will produce flake, tube and block ice exclusively for use by the fishing industry.

Through the directive from the Office of the President of the Philippines, requisition for twenty (20) more units of Ice Plants and Cold Storage Machineries have been submitted for inclusion in the allotment of the 11th year of the Reparation.

To improve the Navotas Fish Landing, the major landing that supply the fish needs of the City of Manila and the provinces in Luzon, the Philippine Fisheries Commission has begun the project of reclaiming the front portion of the Navotas Fish Landing towards the sea. At the present time the breakwater has already been constructed measuring 250 by 100 meters.

The big Navotas Fishing Port project is presently being pushed up. This reclamation project will include the establishment of Harbour for fishing boats, refrigeration, slipways, fish market, industrial and residential lots, parks and church with a total area of about 900 hectares.

The present fish marketing methods, practices and techniques have not changed from the old and traditional way. As a measure to improve this method, the Government has requested FAO for technical assistance on all aspects relating to the marketing and distribution of fish, including the planning and establishment of suitable marketing and distribution facilities and the handling of fish from the points of capture to the consumers.

THAILAND

During the period of 1965-1966, the Fish Marketing Organization has implemented a series of fish landing facilities and fishermen welfare projects in various fishing villages as follows:

<u>Provinces</u>	<u>Items</u>	<u>Cost Bht.</u>	<u>Financed by</u>
Prachuap-	Hua Hin fish landing pier	943,000	Government Budget
Khiri Khan	Pran fish landing pier	647,500	- do -
Songkhla	Songkhla fish landing pier	3,877,000	- do -
Rayong	Pae fish landing pier	200,000	- do -
Samut Saknon	Samut Saknon fish landing pier	7,320,000	- do -

<u>Provinces</u>	<u>Items</u>	<u>Cost Bht.</u>	<u>Financed by</u>
Ranong	Completing landing facilities of Ranong fish pier	2,064,000	- do -
Rayong	Fresh water supply, transportation facilities in Prasae fishing village, Electricity Supply in Pae Fishing Village	57,000	Fish Marketing Organization
Chon Buri	Satahib fish pier	132,000	- do -
Phetchaburi	Fresh water supply	30,000	- do -
Chanthaburi	Transportation facility	16,500	- do -
Chumphon (Paknam)	Fresh water supply Transportation facility Electricity supply	35,000	- do -
Surat Thani	Lighting for navigation	40,000	- do -
Ranong	Fresh water supply	32,700	- do -
	Fish pier	32,000	- do -
Ranong	Fresh water supply	32,700	- do -
	Fish pier	32,000	- do -
Satun	Fish pier	150,000	- do -
	Fresh water supply	28,000	- do -
Nakhon Si-	Lighting for navigation	25,000	- do -
Thammarat			
Pattani	Lighting for navigation	17,000	- do -
Total		<u>15,720,700</u> =====	

Thailand has initiated a radio broadcasting program for fishermen since the year 1965. The first fisheries radio station was established on the building of Fish Marketing Organization, and the second on the building of Department of Fisheries. There are now six fisheries radio stations scattered along the Gulf and the Indian Ocean coasts. These radio stations broadcast daily the following:

1. Weather report and forecasting.
2. Report on fish wholesale price in the Bangkok fish wholesale market as well as the daily landing.

These radio stations also serve as a means of official tele-communication between the Department and the various fisheries stations along the coastline of the country.

B. COUNCIL PROCEEDINGS

FISHERY COOPERATIVES

In reviewing the suggestion of the Executive Committee concerning a possible survey of the economic aspects of Fishery Cooperatives in the region, the Council noted considerable interest in Member Governments in cooperatives. Discussion indicated, however, that the early commissioning of such survey would be difficult to justify in the light of:

- (1) the FAO meeting on Fishery Administration in Rome in November 1966 which should make available more information on the important problems of management in fishery resources and developments;
- (2) evidence from the Member Countries that formation of cooperatives in the developing countries must be considered carefully in each area in relation to the interest and capability of the fishermen, otherwise such cooperatives are almost sure to fail;
- (3) the fishery associations only being established in some areas;
- (4) the unlikelihood that such a survey of cooperatives could be accomplished by available and qualified FAO personnel during the next inter-session period; and
- (5) the complexity and cost of the operations involved in conducting such survey and the many competing claims on the FAO's limited budget.

In considering the problems of management in relation to the success or failure of fishery cooperatives in the region, and the alternatives in planning fishery developments, the Council noted the following:

In view of the problems of successful operation of cooperatives in developing fisheries, the Council drew the attention of FAO and Member Countries to:

- (1) the need for particular areas to consider the encouragement of the formation of fishery associations as an initial step toward local development of the fisheries;
- (2) the need to make available training in the managerial skills needed for successful formation and operation on fishery cooperatives and associations; and
- (3) the need for FAO to develop information and case studies on associations and cooperatives for guidance of Member Countries having an interest in those developments.

FISHERY CREDIT

The Council noted that considerable interest was still evident among Member Countries regarding the scheduling of a seminar on Fishery Credit by the FAO at an early date. Mr. E. Holliman advised the Committee that an FAO meeting in Rome on Fishery Administration was scheduled for November 1966 and would provide some recent information on fishery credit.

FISH MARKETING SUB-COMMITTEE

In line with the changes in the Rules of Procedure concerning establishment of sub-committees, the Council found no further need for establishing a sub-committee on fish marketing.

STATISTICS

REGIONAL FISHERIES CENSUS

The Council was given an excellent summary by Dr. T. Yamamoto of the problems and developments in planning a regional fisheries census in relation to the 1970 World Census of Agriculture. It was pointed out that the FAO resources and staff in statistics were not available to conduct such a regional fisheries census; however, considerable interest has been demonstrated by several of the Member Countries in better fisheries data collection and statistical surveys. In view of the importance of the fisheries census in relation to improving fisheries data collection in a number of Member Countries, the need for further action by the Council was considered under the agenda item on a fisheries statistics sub-committee.

FISHERIES STATISTICS SUB-COMMITTEE

Concerning the status and progress of the Working Party on Statistics, it was reported that there had been no meetings or correspondence by the Members of the Working Party; therefore there was no report.

After careful consideration of the recommendation of the Executive Committee concerning the establishment of a Standing Sub-Committee on Fishery Statistics, the Council adopted the following recommendation:

In reviewing the need for further actions and support of fishery statistical programs the Council finds no necessity of continuing the Working Party on Fishery Statistics or of establishing at present a Standing Sub-Committee on Fishery Statistics. The Technical Committees I and II recognize the significance of adequate fishery statistics in relation to assessment, exploitation, management, and economics. These Technical Committees constitute appropriate means of communication and support for fishery statistical programs.

The Council wishes to emphasize, however, the substantial and urgent need for improved fishery statistics and data collection in a number of Member Countries. Also the Council recognizes the essential role undertaken by the FAO in assisting countries in developing and standardizing statistical survey and classification methods.

The Council recommends that Member Governments should give full support to the development of adequate fishery statistics in cooperation with FAO. Further, the Council urges FAO to provide adequate support for the FAO Regional Fishery Statistician, including provision for necessary travel to Member Countries, in this important cooperative endeavor. To this end and recognizing the many relevant factors, the Council suggests the following terms of reference should be included in his inter-sessional work program for 1966-68:

- (1) to work out an appropriate program of improvement of fisheries statistics in the region, having regard to the requirements of Member Governments, and to report progress to the 13th Session of the Council;
- (2) to formulate, in consultation with Member Governments, a uniform framework for fisheries statistics which is likely to be acceptable to the region, taking into account particular features of fisheries in the region and bearing in mind definitions of survey items and classifications which have already been developed by FAO, for consideration by the 13th Session of the Council; and
- (3) to facilitate implementation of the fisheries census proposed by the 11th Session of IPFC and to report the progress to the 13th Session of the Council.

CHAPTER VI

SUMMARY OF RECOMMENDATIONS

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A. TO MEMBER GOVERNMENTS

1. Indian Ocean Resources Study, a cooperative research and development project to be financed partly by participating countries partly through a Trust Fund. (Ch.II, p. 73)
2. Research programmes on Rastrelliger to be strengthened and extended. (Ch.II, p. 78)
3. With FAO assistance to promote intra-regional development of training in exploratory and experimental fishing. (Ch.II, p. 79)
(Ch.III, p.121)
4. Recommendations related to development of the study of fishery aspects of CSK. (Ch.II, pp.82-86)
5. New Zealand requested to supply information on 45 ft. concrete fishing boats. (Ch.III, p.120)
6. To note developments in use of advanced sonar techniques for fish detection. (Ch.III, p.123)
7. Recommendations on Fresh Fish Handling. (Ch.IV, pp.143(2),
143(1), 144(3,4,
5), 145(6,7,9)
8. To give full support to the development of adequate statistics. (Ch. V, p. 200)

B. TO FAO

1. Director-General to convene a Sub-Committee to review structure and function of Far East Regional Fisheries Office. (Ch.I, p. 23)
2. To give continuing emphasis to the development of its fishery education and training activities. (Ch.I, p. 26)
3. Establishment of one or more educational centers in Indo-Pacific Region. (Ch.I, p. 26)
4. To appoint a consultant to prepare a Report based on the Symposium. (Ch.I, p. 27)
5. Director-General to convene meeting of the Working Party on Indian Ocean Pelagic Fisheries Resources in Rome, January 1967. (Ch.II, p. 73)
6. Director-General to convene, if and when desirable, a meeting of the Working Party on Pelagic High Seas Fishery Resources. (Ch.II, p. 73)
7. Director-General to draw attention of UNESCO to problems in connection with benthic studies. (Ch.II, p. 77)
8. Participation in activities of Working Party on Economics of Fish Culture. (Ch.II, p. 80)
9. Director-General, in consultation with UNDP and Governments of Malaysia and U.K. to appoint a consultant group to examine the potentialities of the Tropical Fish Culture Research Institute and to review proposals for internationalization, as well as to seek means to provide financial support to any international fish culture institute which may be recommended. (Ch.II, pp.81-82)
10. FAO to cooperate with AICF and CSK in preparation of species synopses. (Ch.II, pp.83-84)
11. FAO to assemble information in fiscal taxes applied to fuel, gear and engines and ascertain extent of exemption etc. (Ch.III, p.122)
12. Seminar on fresh fish handling. (Ch.IV, p.143(8))
13. Far East Regional Fisheries Officer to advise on specific research problems of fish processing. (Ch.IV, p.146)
14. FAO to circularize Member Governments to ascertain their interest in fish protein concentrate. (Ch.IV, p.146)
15. To provide adequate support for the Regional Fisheries Statistician; define terms of reference for work program 1966-1968. (Ch.V, p. 200)

C. TO EXECUTIVE COMMITTEE AND SECRETARIAT

1. To circularize Member Governments on Australian proposal for the Amendment of the Agreement. (Ch.I, p. 19)
2. Publication of Council's 12th Session documents. (Ch.I, p. 20)
3. Preparation of a schedule of resolutions of 11th & 12th Sessions on which there had been no action and draw attention of Member Governments to need for action. (Ch.I, p. 22)
4. Council Working Papers to be distributed 2 months before the Session. (Ch.I, p. 22)
5. To accept a continuing charge with regard to education and development, to maintain contact with FAO on this question and collaborate in any plans for the establishment of the education center. (Ch.I, p. 27)
6. Indian Ocean Resources Sub-Committee to consist of representatives of interested Member Governments. (Ch.II, p. 73)
7. Secretary to keep Member Governments informed of latest developments in production of fish protein concentrates. (Ch.IV, p. 146)
8. Secretary to maintain contact with Member Governments on developments in fish processing. (Ch.IV, p. 146)
9. Secretary to provide technical information on production of salt suitable for fish curing. (Ch.IV, p. 146)

D. TECHNICAL COMMITTEES

1. Trawling Working Party to organize a Symposium on "Demersal Fisheries". (Ch.I, p. 27)
2. Working Party on Coastal Aquiculture to arrange for papers on this subject to be prepared for 13th Session. (Ch.I, p. 28)
3. Working Party on Pelagic Fisheries Resources to assist FAO Committee on Fisheries Working Party on Rational Utilization of the Fishery Resources of the Indian Ocean. (Ch.II, p. 72)
4. Expansion and continuation of Working Party on Trawling. (Ch.II, p. 76)
5. Establishment of Working Party on Economics of Fish Culture. (Ch.II, p. 80)
6. Working Party on CSK Fishery Aspects. (Ch.II, p. 85)

APPENDIX I

LIST OF DELEGATES AND OBSERVERS

<i>Member Government</i>	<i>Name</i>	<i>Designation</i>	<i>Address</i>
Australia	Dr. G.L. Kesteven (Delegate)	Assistant Chief	CSIRO, Division of Fisheries and Oceanography, P.O. Box 21, Cronulla, N.S.W., Australia.
	Dr. A.M. Rapson (Alternate)	Chief, Division of Fisheries	Department of Agriculture, Stock and Fisheries, Port Moresby, Papua
	Mr. A.C. Bogg (Alternate)	Director	Dept. of Fisheries and Fauna Conservation, Box 901 E, Adelaide, South Australia
Ceylon	Mr. L.F. Tisserasinghe (Delegate)	Acting Director	Fisheries Department, P.O. Box 531, Colombo 3, Ceylon
France	Monsieur M. Legand (Delegate)	Chief, Oceanographic Section	Centre O.R.S.T.O.M. B.P. 4, Noumea, New Caledonia
India	Dr. G.N. Mitra (Delegate)	Fisheries Development Adviser to the Government of India	Ministry of Food, Agriculture, Community Development and Cooperation, Department of Agriculture, New Delhi, India
Japan	Dr. T. Ino (Delegate)	Senior Research Officer	Research Division, Fisheries Agency, Ministry of Agriculture and Forestry, 2-2 Kasumigaseki, Chiyoda-ku, Tokyo, Japan

<i>Member Government</i>	<i>Name</i>	<i>Designation</i>	<i>Address</i>
Japan (Cont'd)	Mr. S. Hamanaka (Alternate)	Consul of Japan	Consulate General of Japan, 1742 Nuuanu Ave. Honolulu, Hawaii
Korea	Mr. Lee, Bong Nai (Delegate)	Director	Fisheries Research and Development Agency, 16-2ka, Namhang-Dong, Pusan, Korea
	Mr. Koh, Dong Jae (Alternate)	Chief, First Fishing Section	Office of Fisheries, 49-4 Hoehyun-Dong, Chung-Ku, Seoul, Korea
Malaysia	Mr. Soong Min Kong (Delegate)	Director of Fisheries	Fisheries Division, Ministry of Agriculture and Co-operatives, Jalan Swettenham, Kuala Lumpur, Malaysia
	Mr. D. Pathansali (Alternate)	Acting Senior Research Officer	Fisheries Research Institute, Glugor, Penang, West Malaysia
	Mr. Chin, Phui Kong (Adviser)	Fisheries Officer	Fisheries Branch, Department of Agriculture, P.O. Box 1064 Jesselton, Sabah, East Malaysia
New Zealand	Mr. A.C. Kaberry (Delegate)	Director	Fisheries Division, Marine Department, Wellington, New Zealand
Philippines	Mr. S.B. Rasalan (Delegate)	Acting Deputy Commissioner and Officer-in-Charge	Philippine Fisheries Commission, P.O. Box 623, Intramuros, Manila, Philippines
	Prof. A.S. Timbol (Adviser)	Assistant Professor of Fisheries	College of Fisheries, Mindanao State University, Philippines
Thailand	Mr. Prida Karnasut (Delegate)	Director-General	Department of Fisheries, Ministry of Agriculture, Rajadamnern Avenue, Bangkok, Thailand

<i>Member Government</i>	<i>Name</i>	<i>Designation</i>	<i>Address</i>
Thailand (Cont'd)	Dr. Deb Menasveta (Alternate)	Fisheries Biologist	Investigation & Research Division, Department of Fisheries, Ministry of Agriculture, Rajadamnern Avenue, Bangkok, Thailand
	Dr. Arporn Sribhi- bhadh (Adviser)	Fisheries Biologist	Investigation & Research Division, Department of Fisheries, Ministry of Agriculture, Rajadamnern Avenue, Bangkok, Thailand
	Prof. Jinda Thiem- medh (Adviser)	Dean, Dept. Aquiculture	College of Fisheries, Kasetsart University, Bangkok, Thailand
U.K.	Dr. D.N.F. Hall (Delegate)	Fisheries Advisor	Ministry of Overseas Development, Eland House, Stag Place, London, S.W.1, U.K.
	Mr. W. Wenban-Smith (Alternate)	First Secretary	British High Commission, Police Cooperative Bld. 1 Jalan Suleiman, P.O. Box 1030, Kuala Lumpur, Western Malaysia
	Dr. G.A. Prowse (Adviser)	Director	Tropical Fish Culture Research Institute, Batu Berendam, Malacca, Western Malaysia
(for Hong Kong)	Mr. E.P. Ho (Adviser)	Assistant Director of Fisheries	Agriculture & Fisheries Department, Cambridge Court, 84 Waterloo Road, Kowloon, Hong Kong
	Mr. W. Lai-Yee Chan (Adviser)	Acting Senior Research Officer	Fisheries Research Station, Shek Pai Wan Road, Aberdeen, Hong Kong
(for Fiji)	Mr. L.C. Devambez (Adviser)	Fisheries Officer	Department of Agriculture, Suva, Fiji
U.S.A.	Mr. J.C. Marr (Delegate)	Area Director	U.S. Bureau of Commercial Fisheries, P.O. Box 3830, Honolulu, Hawaii 96813

<i>Member Government</i>	<i>Name</i>	<i>Designation</i>	<i>Address</i>
U.S.A. (Cont'd)	Mr. J.A. Dassow (Alternate)	Supervisory Research Chemist	Technological Laboratory, U.S. Bureau of Commercial Fisheries, 2725 Montlake Boulevard East, Seattle, 2, Washington 98102, U.S.A.
	Mr. R.S. Shomura (Adviser)	Acting Deputy Area Director	U.S. Bureau of Commercial Fisheries, P.O. Box 3830, Honolulu, Hawaii 96813
	Mr. R.C. Wilson (Adviser)	Acting Chief	Branch of Technical Assistance, U.S. Bureau of Commercial Fisheries, Washington, D.C. 20240
	Mr. W.W. Sabbagh (Secretary)	Conference Administra- tive Officer	Office of International Conferences, Department of State, Washington, D.C. 20520, U.S.A.
Vietnam	Mr. Cao Thien Buu (Delegate)	Deputy Direc- tor of Fisheries	Directorate of Fisheries, P.O. Box 340, Saigon, Vietnam
	Mr. Tran Van Tri (Alternate)	Chief Marine Fisheries	Directorate of Fisheries, P.O. Box 340, Saigon, Vietnam

NON-MEMBER GOVERNMENTS

<i>Non-Member Governments</i>	<i>Name</i>	<i>Designation</i>	<i>Address</i>
Brunei	Dr. E. Birkenmeier (Observer)	State Fisheries Officer	Commission of Develop- ment's Office, Brunei
Canada	Mr. W.F. Hampton (Observer- unofficial)	President	College of Fisheries, Navigation, Marine Engineering & Electro- nics, St. John's Newfoundland, Canada

OBSERVER ORGANIZATIONS

<i>Organization</i>	<i>Name</i>	<i>Designation</i>	<i>Address</i>
Pacific Science Association (PSA)	Dr. T. Ino (Observer)	Senior Research Officer	Research Division, Fisheries Agency, Ministry of Agriculture and Forestry, 2-2 Kasumigaseki, Chiyoda-ku, Tokyo, Japan
South Pacific Commission (SPC)	Mr. M. Legand (Observer)	Chief Oceanographic Section	Centre O.R.S.T.O.M. B.P. 4, Noumea, New Caledonia
UNESCO	Dr. R. Serene (Observer)	UNESCO Regional Taxonomic Expert South East Asia	c/o National Museum, Stamford Road, Singapore 6

VISITORS

<i>Name</i>	<i>Designation</i>	<i>Address</i>
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Mr. F.N. Goto	Manager	United Fishing Agency, Ltd. 218 No. Nimitz Highway, Honolulu, Hawaii 96817
Mr. H.D. Hart	Vice President	Bumble Bee Seafoods, Inc. P.O. Box 238, Honolulu, Hawaii 96813

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<i>Name</i>	<i>Designation</i>	<i>Address</i>
Mr. G.S. Hashimoto	President	Tuna Boat Owners Association 2455 Huene Street, Honolulu, Hawaii 96817
Mr. J.R. Holloway, Sr.	Supervisor	Division of Fisheries, Department of Agriculture, Government of American Samoa, Pago Pago, American Samoa
Mr. Robert T.B. Iverson	Fishery Research Biologist	U.S. Bureau of Commercial Fisheries, P.O. Box 3830 Honolulu, Hawaii 96813
Mr. W.A. Kanakanui	Manager	Tuna Boat Owners Association P.O. Box 238, Honolulu, Hawaii 96813
Mr. T.R. Kendall	Oceanographer	Undersea Engineering & Construction Co., 1110 University Avenue, Honolulu, Hawaii
Dr. J.J. Magnuson	Chief, Behavior- Physiology Program	U.S. Bureau of Commercial Fisheries, P.O. Box 3830 Honolulu, Hawaii 96813
Mr. B. Muir	Professor of Biology	University of Hawaii Honolulu, Hawaii
Dr. G.I. Murphy	Professor	Department of Oceanography University of Hawaii Honolulu, Hawaii 96822
Mrs. Nam Hai	Fishery Biologist	1256 Lauhala Street Honolulu, Hawaii 96813
Mr. K. Okada	President	U. Okada & Co., Ltd. 1000 So. Queen Street Honolulu, Hawaii 96814
Mr. A. Otani	Manager	M. Otani Co., Ltd. 218 No. Nimitz Highway Honolulu, Hawaii 96817
Mr. T. Otsu	Chief, Albacore Ecology Program	U.S. Bureau of Commercial Fisheries, P.O. Box 3830 Honolulu, Hawaii 96813

VISITORS (Cont'd)

<i>Name</i>	<i>Designation</i>	<i>Address</i>
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Mr. G.R. Seckel	Chief, Trade Wind Zone Oceanography Program	U.S. Bureau of Commercial Fisheries, P.O. Box 3830 Honolulu, Hawaii 96813
Dr. D.W. Strasburg	Chief, Research Submarine Program	U.S. Bureau of Commercial Fisheries, P.O. Box 3830 Honolulu, Hawaii 96813
Mr. M. Takata	Director	Division of Fish and Game 400 S. Beretania Street, Honolulu, Hawaii 96813
Dr. A.L. Tester	Professor	Department of Zoology University of Hawaii Honolulu, Hawaii 96822
Mr. DeWitt Gilbert	Press	Pacific Fisherman 71 Columbia Street, Seattle, Washington, U.S.A.
Dr. R. Van Cleve	Dean, University of Washington	College of Fisheries, University of Washington, Seattle, Washington 98105
Mr. J.S. Campbell	Secretary	Fishing Industry Board New Zealand
Dean J.W. Cobble	Dean and Director	College of Agriculture, University of Rhode Island Kingston, Rhode Island U.S.A.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

<i>Name</i>	<i>Designation</i>	<i>Address</i>
Mr. F.E. Popper	Director of Program Coordination and Operations	Department of Fisheries, FAO of the United Nations, Via delle Terme di Caracalla, Rome, Italy
Mr. H.A. Vogel	FAO North American Representative	FAO North American Regional Office, 1325 C, Street Southwest, Washington, D.C.
Mr. H. Kristjonsson	Chief, Gear Technology Section	Fisheries Resources and Exploitation Division, Department of Fisheries, FAO of the United Nations, Via delle Terme di Caracalla, Rome, Italy

IPFC SECRETARIAT

<i>Name</i>	<i>Designation</i>	<i>Address</i>
Mr. J.A. Tubb	Secretary of IPFC	Regional Fisheries Officer FAO Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Road, Bangkok, Thailand
Dr. T.V.R. Pillay	Technical Secretary IPFC Technical Committee I	Chief, Fish Culture Section, Inland Fisheries Branch, Fisheries Resources and Exploitation Division, Department of Fisheries, FAO of the United Nations, Via delle Terme di Caracalla, Rome, Italy
Dr. G.N. Subba Rao	Technical Secretary IPFC Technical Committee II	Fisheries Officer, FAO Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Road, Bangkok, Thailand
Mr. E.S. Holliman	Technical Secretary IPFC Technical Committee II	Chief, Fishery Economics and Development Branch, Fishery Economics and Products Division, Department of Fisheries, FAO of the United Nations, Rome, Italy

IPFC SECRETARIAT (Cont'd)

<i>Name</i>	<i>Designation</i>	<i>Address</i>
Dr. T. Yamamoto	Technical Secretary IPFC Working Party on Statistics	Regional Fisheries Statistician, FAO Regional Office for Asia and the Far East, Phra Atit Road, Bangkok, Thailand
Mrs. A. Soulier	Conference Officer	Technical Assistant (Fisheries), FAO Regional Office for Asia and the Far East, Phra Atit Road, Bangkok, Thailand
Miss M.T. Iordanow	Interpreter	Via del Plebiscito 112 Rome, Italy
Miss C. Corajoud	Interpreter	15 rue de Remusat Paris 16, France
Mr. J. Sala	Interpreter	16 rue de Corneille Declercq Brussels 9, Belgium
Mr. G. Kaminker	Interpreter	1924 Bryant Place, Baldwin Long Island, New York, New York 11512, U.S.A.

IPFC - ARRANGEMENTS COMMITTEE

<i>Name</i>	<i>Designation</i>	<i>Address</i>
Mr. R.T.B. Iversen	Fishery Biologist	U.S. Bureau of Commercial Fisheries, P.O. Box 3830, Honolulu, Hawaii 96813 U.S.A.
Mr. E.C. Jones	Fishery Biologist	U.S. Bureau of Commercial Fisheries, P.O. Box 3830, Honolulu, Hawaii 96813 U.S.A.

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Mr. E. Lee	Assistant Area Director for Administration	U.S. Bureau of Commercial Fisheries, P.O. Box 3830 Honolulu, Hawaii 96813 U.S.A.
Mr. T.A. Manar	Chief, Publication Services	U.S. Bureau of Commercial Fisheries, P.O. Box 3830 Honolulu, Hawaii 96813 U.S.A.
Mrs. H. Nishimura	Librarian	U.S. Bureau of Commercial Fisheries, P.O. Box 3830 Honolulu, Hawaii 96813 U.S.A.
Mr. W.T. Tanaka	Marine Superintendent	U.S. Bureau of Commercial Fisheries, P.O. Box 3830 Honolulu, Hawaii 96813 U.S.A.

APPENDIX II

NOMINATIONS FOR PERIOD BETWEEN 12TH AND 13TH SESSIONS (1966-1967) TO IPFC

*Note: Where fresh nominations have not been received, those for the period between 11th and 12th Sessions have been carried over.

<i>Member Governments</i>	<i>Administrative Correspondent</i>	<i>Technical Committee I</i>	<i>Technical Committee II</i>
AUSTRALIA	Assistant Secretary (Fisheries) Department of Primary Industry, Canberra, Australia	Dr. G.L. Kesteven Asst. Chief of Div. CSIRO, Div. of Fisheries & Oceanography, P.O. Box 21 Cronulla, N.S.W., Australia	Mr. C.G. Setter Asst. Secretary (Fisheries) Department of Primary Industry, Canberra A.C.T., Australia Dr. J.R. Vickery, Div. of Food Preservation, CSIRO, Ryde, N.S.W., Australia
BURMA	*The Secretary, Ministry of Agriculture and Forest, Rangoon, Union of Burma	* _____	* _____
CAMBODIA	*Mr. Sao-Leang Directeur du Service des Peches, Direction des Peches, B.P. 46, Phnom-Penh, Cambodia	Mr. Suon-Saroeung Direction des Peches, B.P. 46, Phnom-Penh, Cambodia	Mr. Sva-Kret Inspecteur Technique des Peches, B.P. 46, Phnom-Penh, Cambodia
CEYLON	Director of Fisheries P.O. Box 531 Colombo-3, Ceylon	Dr. T.P. Goonawardne Research Officer, Department of Fisheries, P.O. Box 531, Colombo-3 Ceylon	Mr. G.F.P. Vitharne General Manager, Ceylon Fisheries Corporation, Colombo, Ceylon
FRANCE	Monsieur Le Directeur des Peches Maritimes, Secretariat General de la Marine Marchande, 3 Place Fontenoy, Paris 7eme, France	Monsieur M. Legand Chef de la Section d'Océanographie de l'Institut Français d'Océanie, B.P. No. 4 Noumea, New Caledonia	Monsieur M. Grandperrin Océanographe Biologiste, Section d'Océanographie de l'Institut Français d'Océanie, B.P. No. 4, Noumea, New Caledonia

<i>Member Governments</i>	<i>Administrative Correspondent</i>	<i>Technical Committee I</i>	<i>Technical Committee II</i>
INDIA	Dr. G.N. Mitra Fisheries Development Adviser, Ministry of Food, Agriculture, Community Development and Co-operation, New Delhi, India	Mr. K. Chidambaram Deputy Fisheries Development Adviser, Ministry of Food, Agriculture, Community Development and Co-operation, New Delhi, India	Dr. A.N. Bose Director, Central Institute of Fisheries Technology, Ernakulam, Cochin, India
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<i>Member Governments</i>	<i>Administrative Correspondent</i>	<i>Technical Committee I</i>	<i>Technical Committee II</i>
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NEW ZEALAND	Mr. A.C. Kaberry Director, Fisheries Division, Marine Department, Wellington, New Zealand	Mr. A.C. Kaberry Director, Fisheries Division, Marine Department, Wellington, New Zealand	Director, Fisheries Division, Marine Department, Wellington, New Zealand
PAKISTAN (For West and East)	*Director, Marine Fisheries Department, Fish Harbour, Karachi-2, West Pakistan	*Dr. Nazir Ahmad, Director of Fisheries, West Pakistan Government 2 Sauda Road, Lahore, West Pakistan	*Director, Marine Fisheries Department, Fish Harbour, Karachi-2, West Pakistan
		Mr. Munirul Islam Deputy Director, Marine Fisheries Department, Chittagong, East Pakistan	
PHILIPPINES	Dr. Herminio R. Rabanal, Acting Chief, Freshwater Fisheries Div., Philippine Fisheries Commission, P.O. Box 623, Intramuros, Manila, Philippines	Mrs. Priscilla Caces-Borja Supervising Fishery Biologist, Philippine Fisheries Commission, P.O. Box 623, Intramuros, Manila, Philippines	Dr. S.V. Bersamin Chief, Fisheries Utilization Division, Philippine Fisheries Commission, P.O. Box 623, Intramuros, Manila, Philippines
THAILAND	Dr. Andhi P. Isaranakura, Fisheries Technical Officer, Dept. of Fisheries, Ministry of Agriculture, Rajadamnern Avenue, Bangkok, Thailand	Dr. Deb Menasveta Fisheries Technical Officer, Dept. of Fisheries, Ministry of Agriculture, Rajadamnern Avenue, Bangkok, Thailand	Mr. Sant Bandhukul Deputy Director-General, Dept. of Fisheries, Ministry of Agriculture, Rajadamnern Avenue, Bangkok, Thailand

<i>Member Governments</i>	<i>Administrative Correspondent</i>	<i>Technical Committee I</i>	<i>Technical Committee II</i>
U.K. (for Hong Kong)	Mr. E.P. Ho Assistant Director (Fisheries), Cambridge Court, 84 Waterloo Road, Second Floor, Kowloon, Hong Kong	Mr. W. Lai-Yee Chan Senior Research Officer, Fisheries Research Station, Shek Pai Wan Road, Aberdeen, Hong Kong	Mr. E.P. Ho Assistant Director (Fisheries), Cambridge Court, 84 Waterloo Road, Second Floor, Kowloon, Hong Kong
(for London)*	U.K. Liaison Officer, British Embassy, Ploenchitr Road, Bangkok, Thailand		
U.S.A.	<hr/>	# Mr. J.C. Marr Area Director, U.S. Bureau of Commercial Fisheries, P.O. Box 3830, Honolulu, Hawaii 96813, U.S.A.	Mr. J.A. Dassow Supervisory Research Chemist, Technological Laboratory, U.S. Bureau of Commercial Fisheries, 2725 Montlake Blvd. East, Seattle, Washington 98102, U.S.A.
VIETNAM	Monsieur le Ministre de l'Agriculture, 59, Nguyen-binh-Khiem, Saigon, Vietnam	Mr. Le-van-Dang Chef du Service des Peches Continentales, P.O. Box 340 Saigon, Vietnam	Mr. Tran-van-Tri Chef du Service des Peches Maritimes, P.O. Box 340 Saigon, Vietnam

*No Administrative Correspondent has been designated but copies of correspondence, etc., relating to policy and operations should go to:

- (1) Dr. R.W. Phillips, Director of International Organization Staff, Office of Assistant Secretary for International Affairs, Foreign Agriculture Service, Department of Agriculture, Washington, D.C. 20250, U.S.A.
- (1) Agricultural Attache, American Embassy, Bangkok, Thailand.
- (1) Mr. H.G. Ainsworth, Counselor of Embassy for Economic Affairs, Liaison Officer, U.S. Embassy, Rome, Italy.
- (12) Mr. H.A. Vogel, Regional Representative, FAO Regional Office for North America, 1325 C, Street Southwest, Washington, D.C., U.S.A.

(Reference FAO Manual, Chapter VI, Section 615)

JOINT IPFC/IOC MEETING
PARTICIPANTS

12th Session, IPFC, Honolulu, Hawaii, 3-17 October 1966

Dr. G.L. Kesteven	Australia
Mr. M. Legand	France
Dr. T. Ino	Japan
Mr. Dong Jae Koh	Korea
Mr. D. Pathansali	Malaysia
Mr. S.B. Rasalan	Philippines
Mr. A.S. Timbol	Philippines
Dr. D. Menasveta	Thailand
Dr. A. Sribhibhadh	Thailand
Mr. J. Thimmedh	Thailand
Dr. D.N.F. Hall	United Kingdom
Mr. W. Lai-Yee Chan	Hong Kong
Mr. L.C. Devambez	Fiji
Mr. J.C. Marr	U.S.A.
Mr. R.S. Shomura	U.S.A.
Mr. Tran Van Tri	Vietnam
Mr. Cao Thien Buu	Vietnam
Dr. E. Birkenmeier	Brunei
Dr. R. Serene	UNESCO
Dr. T.V.R. Pillay	FAO

LIST OF DOCUMENTS

WORKING PAPERS:

- IPFC/C66/WP 1 Provisional Agenda
- 1(Fr.) Ordre du jour provisoire
- 2 Report of the Executive Committee
- 3 Status of the Industry
- 4 Summary of Resolutions and Recommendations
- 5 Unit stocks of shrimps and prawns in the IPFC Region and Unit Fisheries exploiting them
- 6 Unit Fisheries of Japan
- 7 The Tropical Fish Culture Research Institute, Batu Berendum, Malacca, Malaysia
- 8 Intersession Report (1965-66) of Technical Committee II (Technology)
- 8(Add.1) Addendum to Intersession Report (1965-66) of Technical Committee II (Technology) - Japan, Australia
- 9 Report of the 1st Meeting of the Working Party on Fresh (Wet) Fish Preservation, Bangkok, Thailand, - 5-8 July 1966
- 10 Reports of IPFC Observers to International Meetings, February 1965 - June 1966
- 11 Report of the IPFC Working Party on Trawling, Bangkok, Thailand, 27-30 June 1966
- 12 Technical Committee II (Technology)
Provisional Agenda - Annotations to the Agenda
- 13 The possible scope of the Fisheries Census suggested by the Eleventh Session of IPFC
Formation of a Frame for the Fisheries Census
- 14 Fisheries Statistics in the Countries in Asia and the Far East.
- 15 Unit Fisheries of Thailand (Marine)

- IPFC/C66/WP
- 16 Preparation of illustration of the commercially important animals in Asia and the Far East
 - 17 Approximate inventory of trawlers in the Indo-Pacific Area
 - 18 Inter-session Report (1964-66) of Technical Committee I (submitted to the 12th Session of the Indo-Pacific Fisheries Council)
 - 18(Add.1) Research Project Summaries: Thailand (Marine and Freshwater Projects)
 - 18(Add.2) Addendum to Inter-session Report (1964-66) of Technical Committee I - Australia
 - 19 Studies on Tuna Taxonomy
 - 20 11th Pacific Science Congress, Tokyo, August-September, 1966. Resolution of Interest to the Indo-Pacific Fisheries Council
 - 21 Report of the Working Party on Tuna
 - 22 Craft and Gear Development
 - 23 Background notes for Spanish mackerel, (*Scomberomorus* spp.) from Thai waters, Studies 1954-1965
 - 24 Improvement of Coastal Fishing Boats of Thailand
 - 25 Promotion of Research in Fish Processing
 - 26 Trawl Catch Summarization Program. FORTRAN IV
 - 27 Technical Committee I. Provisional Agenda
 - 27(Add.1) Technical Committee I Agenda
 - 28 FAO Committee on Fisheries Working Party on Rational Utilization of the Fishery Resources of the Indian Ocean
 - 29 Introduction of Aquatic Animals into Hawaii
 - 30 Eighth FAO Regional Conference for Asia and the Far East
 - 31 Technical Committee II - Publication of Technical Papers
 - 32 Technical Committee II - Program of work for the Inter-session Period Between 1966-68
 - 33 Proposals for the Amendment of IPFC Rules of Procedure (Submitted by the Government of Australia)

- IPFC/C66/WP 34 Technical Committee I - Papers relating to Agenda Items
- 35 Rational Utilization of the Fishery Resources of the Indian Ocean
- 36 Communications with Member Governments
- 37 Nominations for period between 12th and 13th Sessions 1966-1967 to IPFC
- 38 Report of Special Committee on the Tropical Fish Culture Research Institute, Malacca
- 39 Terms of Reference of Technical Committees
- 40 Report of the Working Party on *Rastrelliger*
- 41 Technical Committee II: Session Report Part 2
- 42 Technical Committee II: Report No. 3
- 43 Technical Committee II: Report No. 1
- 44 Symposium on Fisheries Education
- 45 Secretary's Report on Credentials
- 46 Technical Committee I: Session Report
- 46(Add.1) Technical Committee I: Session Report
- 47 Notes on the Development of a Practical Mass Culturing Technique of the Giant Prawn *Macrobrachium rosenbergi*
- 48 Working Party Report on Summary Review of the Resolution and Recommendations Adopted by the Indo-Pacific Fisheries Council during the Period 1956-64
- 49 Technical Committee II: Session Report

INCIDENTAL PAPERS:

- IPFC/C66/INC 1 Provisional Programme
- 1(Fr.) Programme Provisoire
- 1(Rev.1) Provisional Programme
- 1(Fr.)(Rev.1) Programme Provisoire
- 2 Provisional List of Delegates and Observers
- 3 Provisional List of Documents

IPFC/C66/INC	4	Bus Schedules
	5	Order of the Day. Monday, 3rd October, 1966
	6	Mailing of Documents
	7	Order of the Day. Tuesday, 4th October, 1966
	8	Order of the Day. Wednesday, 5th October, 1966 Thursday, 6th October, 1966
	9	Return Travel
	10	Technical Committee I - Program
	11	Order of the Day. Friday, 7th October, 1966
	12	Opening Statements
	13	Order of the Day. Saturday, 8th October, 1966
	14	Order of the Day. Monday, 10th October, 1966
	15	Order of the Day. Tuesday, 11th October, 1966
	16	Order of the Day. Wednesday, 12th October, 1966
	17	Order of the Day. Thursday, 13th October, 1966
	18	Order of the Day. Friday, 14th October, 1966

TECHNICAL PAPERS:

Subject

IPFC/C66/TECH	1	A contribution to the study of the growth of members of the Genus <i>Stolephorus</i> Lacepede in Singapore Straits. by Tham Ah Kow	Marine Biology
	2	On the Possibilities for further Development of the South East Asian Fisheries. by K. Tiews	Fisheries Development
	3	Preliminary studies on the keeping quality of fish sausage. by S.V. Bersamin and N.G. Macalincag	Food Technology

		<u>Subject</u>
IPFC/C66/TECH	4 Preliminary studies on Temperate Assessment of Fish at all stages in the distribution chain. by S.V. Bersamin and E.P. Tongco	Food Technology
	5 The artificial inducement of spawning in the Grass Carp, <i>Ctenopharyngodon idella</i> Val. by C.F. Hickling	Fish Culture
	6 Preliminary review of the more important fisheries of the Western South Pacific and the Eastern South Indian Ocean. by B.B. Jones	Resources
	7 Preliminary results of trawling investigations off Penang. by D. Pathansali, K.S. Ong, S.S. Latiff and J.L. Carvalho	Exploratory Fishing
	8 Protein substitutes for animal feeds from seaweed. by S.V. Bersamin, R.B. Banania and R. Rustia	Seaweeds
	9 Studies on the possible sources of microbial contamination of processed fishery products. by T.S.G. Iyer, D.R. Choudhuri and V.K. Pillai	Food Technology
	10 A Note on the possibilities on manufacture of Bombay paste. by P. Vasudeva Prabhu and R. Venkataraman	Food Technology
	11 Ice Storage Studies on Indian Pomfrets. by R. Venkataraman, P. Vasudeva Prabhu and D.J. Mankad	Food Technology
	12 Studies on Doma - Quality of the Doma meal from fresh fish to that of room temperature spoiled ones. by D. Ramananda Rao	Food Technology
	13 Belly Depth Studies for Shrimp Trawls. by H.N. Mhalathkar and H. Krishna Iyer	Fishing Gear
	14 Utilization of Sardine Oil for the Industrial purposes - Part I - Factice for use as a filler in rubber compounding. by M.N.N. Kaimal and P. Madhvan	Food Technology

		<u>Subject</u>	
IPFC/C66/TECH	15	Observations on the Gonad Maturity Stages of Female <i>Rastrelliger kanagurta</i> Cuvier. by D. Pathansali	Marine Biology
	16	A note on a species of <i>Pneumatophorus</i> Jordan and Starks, found in Malaysian waters and the problem raised. by D. Pathansali	Marine Biology
	17	Etude des "Trey Plathou Chamhoy" (les Poissons Bouillies). by Suon Saroeung	Food Technology
	18	An assessment of marine prawn fishery resources of Kanyakumari District South West Coast of India. by M.J. George and K.H. Mohamed	Resources
	19	Fluctuations in the prawn landings in Chilka Lake. by M. Subrahmanyam	Resources
	20	Observations on efficacy of Grass Carp, <i>Ctenopharyngodon idella</i> (Val.) in controlling and utilizing aquatic weeds in ponds in India. by S.B. Singh, K.K. Sukumaran, K.K. Pillai and P.C. Chakrabarti	Fish Culture
	21	On the induced spawning of Pla Sawai, <i>Pangasius sutchi</i> . by S.W. Ling, A. Sithimunka and S. Pinyoying	Fish Culture
	22	Distribution and migration of albacore (<i>Thunnus alalunga</i>) in the Pacific Ocean. by T. Otsu and H.O. Yoshida	Marine Biology
	23	Distribution of juveniles of four species of tunas in the Pacific Ocean. by B.E. Higgins	Marine Biology
	24	Notes on the maturation of tunas in the Indian Ocean. by S. Kikawa and M.G. Ferraro	Marine Biology
	25	Pelagic fishes caught on R/V Anton Brunn cruises 2 and 5 (International Indian Ocean Expedition). by R.S. Shomura	Exploratory Fishing

Subject

IPFC/C66/TECH	26	A continuous-transmission, frequency-modulated sonar for the study of pelagic fish. by H.S.H. Yuen	Fishing Gear
	27	Gillraker analysis of the Indo-Pacific chub mackerel, <i>Rastrelliger neglectus</i> (van Kampen). by V. Hongskul	Marine Biology
	28	A Report on Handling and Marketing of Fish in Pakistan. by S.A. Jaleel and S.A. Kabir	Food Technology
	29	A Report on the Collection and compilation of Fisheries Statistics of Pakistan. by S.A. Jaleel and S.M.A. Salam Kazmi	Statistics
	30	Socio-economic activities for the uplift of Fishermen's Community of Pakistan. by S.A. Jaleel and S.M.A. Salam Kazmi	Socio-economics
	31	Estimates of the growth of skipjack tuna (<i>Katsuwonus pelamis</i>) in the Hawaiian Islands. by B.J. Rothschild	Marine Biology
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IPFC/IOC MEETING ON FISHERY ASPECTS OF CSK

IOC/66/A Provisional Programme

B Provisional Agenda

- IOC/66/WP 1 Report of the CSK Assistant International Coordinator for Fisheries to the Third Meeting, CSK Coordinating Group, Tokyo, 18-20 August 1966.
- 2 Recommendations approved by the Third Meeting of the International Coordinating Group for the Cooperative Study of the Kuroshio and Adjacent Regions (Tokyo, 18-20 August 1966).
- 3 Joint IPFC/IOC Meeting on Fishery Aspects of CSK.

MINUTES

IPFC/C66/M	1	Minutes of the Opening Ceremony and First Plenary Meeting
	2	Minutes of Second Plenary Meeting
	3	Minutes of Third Plenary Meeting
	4	Minutes of Fourth Plenary Meeting
	5	Minutes of Fifth Plenary Meeting
	6	Minutes of Sixth Plenary Meeting
	7	Minutes of Seventh Plenary Meeting
	8	Minutes of Closing Plenary Meeting