


SOUTH PACIFIC COMMISSION

SIXTH TECHNICAL MEETING ON FISHERIES

Suva, Fiji

23 - 27 July 1973

REPORT

SPC Library  
  
33493  
Bibliothèque CPS

Noumea, New Caledonia  
November 1973

LIBRARY  
SOUTH PACIFIC COMMISSION

(899/73)

LIBRARY  
SOUTH PACIFIC COMMISSION

## TABLE OF CONTENTS

	<u>Page</u>
Agenda	(i)
Introduction	1
Country Statements	3
Review of SPIFDA Activities	7
Review of Fiji Tuna Programme	8
Fisheries Education	9
The Main Factors reducing the Rate of Fisheries Technical Progress in the Territories and steps that can be taken to overcome these Factors	11
Review of Proposed Long-Term Projects	11
What Regional Activity, if any, should replace SPIFDA	14
UNDP/SPC Relationships	15
What should be the Future Role of the South Pacific Commission in Fisheries Development	15
Other Business	16
Summary of Recommendations	19
 <u>APPENDICES</u>	
I. Report of Working Party on Fisheries Education	25
II. Report of Working Party on Development of Skipjack Tuna Fisheries in the South Pacific Ocean	31
III. A. Summary of SPC Special Project on Outer Reef Artisanal Fishing	39
B. Summary of FAO/UNDP Outer Reef Fishery Development	41
C. Summary of SPC Special Project on Inshore Fisheries Development (Reef, Lagoon and Mariculture)	43
D. Summary of FAO Proposals for Aquaculture Development	45
IV. List of Participants	47
V. List of Working Papers	51
VI. Opening Ceremony:	
A. Speech by the Hon. D.A. Brown, Minister for Agriculture, Forests and Fisheries	53
B. Message from the Hon. G.F.D. Betham, Secretary-General of the South Pacific Commission	55

## AGENDA

1. Country statements. Progress to date and future plans.
2. Brief review of SPIFDA activities.
3. Review of tuna programmes.
4. The value of technical meetings and seminars contrasted with within-region fellowships.
- 4A. Fisheries education.
5. The main factors reducing the rate of fisheries technical progress in the Territories and steps that can be taken to overcome these factors.
6. Review of long-term projects.
7. What regional activity, if any, should replace SPIFDA.
8. UNDP/SPC relationships.
9. What should be the future role of the South Pacific Commission in fisheries development.
10. Other business.
11. Conclusions and Recommendations.

## INTRODUCTION

1. With the approval of the Twelfth South Pacific Conference and Thirty-fifth Session of the Commission, provision was made within Item 692 of the 1973 Budget for a Fourth Meeting of the South Pacific Islands Fisheries Development Agency Consultative Committee.

2. Advice was received, however, that the United Nations Development Programme and the Food and Agriculture Organization of the United Nations both considered that it was unnecessary to hold a meeting of the SPIFDA Consultative Committee in 1973, having regard to the termination of the project late in 1973.

3. Paragraph 7 of the Report of the Twelfth South Pacific Conference reads as follows:

"The Conference noted that SPIFDA has completed the feasibility study phase and, thanks to the substantial contributions of the Territories concerned, has begun practical sub-projects aimed at increasing the productive capacity of marine resources. The Conference further noted that although the Project was suspended and then reviewed by a UNDP Mission, the recommendation of that Mission was that the Project should be supported adequately with funds and personnel. The Conference therefore recommended that the Mission's report be accepted by UNDP and that, if the means to continue the Project cannot be provided by UNDP, the Commission prepare for submission to the next Conference a report on the feasibility of continuing the Project with its own resources and with assistance from such other sources as may be found."

4. Paragraph 4 of the Proceedings of the Thirty-fifth Session of the Commission reads as follows:

"The Commission strongly supported the Conference Recommendation without taking a firm decision on the continuation of this Project until the report of the feasibility study can be made available to the Thirteenth Conference and Thirty-sixth Session."

5. In view of the terms in which these reports were expressed, the Secretary-General of the South Pacific Commission believed that it was essential to obtain the views of the Fisheries Officers of Pacific countries and territories on the part which should be undertaken by the South Pacific Commission, following the termination of the SPIFDA project.

6. The Secretary-General therefore decided, after consultation with the Programme Research and Evaluation Council, to utilize the funds allocated in the 1973 Budget for a meeting of the SPIFDA Consultative Committee for the purpose of holding a Sixth Technical Meeting on Fisheries.

7. In accordance with the recommendation of the Fifth Technical Meeting on Fisheries, and with the concurrence of the Government of Fiji, the Sixth Technical Meeting on Fisheries was held in Suva from 23 to 27 July 1973.

8. The Meeting was attended by representatives of nine Pacific countries and territories, together with observers and consultants from the United Nations Development Programme, the Food and Agriculture Organization of the United Nations, including the staff of SPIFDA, the University of the South Pacific, the University of Papua New Guinea, the James Cook University - Townsville, Office de la Recherche Scientifique et Technique Outre-Mer (ORSTOM) - Noumea, the US National Oceanic and Atmospheric Administration - Honolulu, and the Department of Primary Industry - Australia. The Meeting was directed by Mr Alan Harris, Programme Director (Economic), South Pacific Commission. (See Appendix IV for the list of participants.)

9. The Meeting was opened by the Minister for Agriculture, Forests and Fisheries, Government of Fiji, the Hon. D.A. Brown. A copy of the Minister's opening address is given in Appendix VI A. Mr Harris read a message from the Secretary-General, South Pacific Commission, which is given in Appendix VI B.

10. Dr Hubert Squires, Assistant Director (Fisheries) Ministry of Agriculture, Forests and Fisheries, Fiji, was unanimously elected Chairman and Mr Sam Rawlins, Fisheries Development Officer, GEIC, was unanimously elected Vice-Chairman.

11. A Drafting Committee was appointed consisting of Mr Peter Wilson (TTPI), Mr René Grandperrin (New Caledonia and Wallis/Futuna), with Mr Alan Harris assisting.

12. The draft Agenda which had been circulated was considered and a revised Agenda prepared and adopted.

COUNTRY STATEMENTS

13. A list of the working papers and country statements appears in Appendix V but a brief review of the country programmes was made by each delegate and a summary of the main points of these appears below.

American Samoa

14. Fisheries development programmes are administered by the Office of Marine Resources, headed by a Director, three fisheries biologists, trainees, technicians, crews and volunteers - a total staff of 40, with a budget of about US\$ 300,000. The main emphasis is on local commercial fleet development in all its aspects, including skipjack and bottom-fish for supply to the local population and cash income to the fishermen. Experiments are being made on the culture of Poecilia mexicana, a coryhaline viviparous fish for use as live bait for skipjack fisheries. Provision is made for development of sport fisheries and a 5-year programme is aimed at providing the necessary amenities. Commercial fisheries training will begin in the Community College of American Samoa this year.

British Solomon Islands Protectorate

15. The country's skipjack fishery potential appears now to have been proved and a Joint Venture Agreement was signed on 4 November 1972 between representatives of the Government and the Taiyo Fishing Company of Tokyo. Excellent employment opportunities are provided for Solomon Islanders both at sea and on shore. The freezer and canning plant at Tulagi is nearly complete. A training programme for Solomon Islanders by the Taiyo Fishing Company is now being undertaken. Catches have been fairly good, the majority of these being sent to American Samoa for canning with a small quantity going to Japan. The parent company, Taiyo of Tokyo, undertook an experimental deep-sea longlining venture for 3 months based in Honiara, with 9 Solomon Islanders on board, earlier this year. Catches were reasonably good.

16. Local interest in beche-de-mer continued, 1972 exports being ten times those in 1971.

17. A Chinese entrepreneur has started a small shark-fin industry. The Coral Seas Fishing and Trading Company, now under largely new ownership, continues its operations and has plans for expansion in mind, it buys crayfish from local fishermen. A small crocodile farm has been started by local people near Auki, Malaita.

18. The Fisheries Ordinance (No. 13 of 1972) was passed in August last year, as were Regulations made under it.

19. A Fisheries Officer and an Assistant Fisheries Officer (a U.N.A. volunteer) took up post in September last year.

### Fiji

20. The Fisheries Division comes within the framework of the Department of Agriculture. It is headed by the Assistant Director of Agriculture (Fisheries) and has a total staff of 90. There is a considerable shortage of senior directive and supervisory staff. In 1972 the recurrent budget was F\$ 90,000 with a capital development estimate of about F\$ 80,000.

21. The main activities are extension work for the small fisheries unit schemes; provision of boat transport facilities for fish, ice, etc, and management of these units; research and development for skipjack fisheries, up to the present in conjunction with FAO.

22. Aquaculture experiments continue with grass carp breeding, improvements of tilapia stock, oyster culture and brackish water ponds at Ravi Ravi for rabbitfish and mullet culture.

23. Beche-de-mer extension work in identification and processing is continued and some small-scale fish canning experiments were conducted with the assistance of a FAO consultant. The Fisheries Division has its own gear, engineering and ferro-cement boat-building sections. The Division has one 82-foot (25 m) research vessel, two 50-foot (15 m) and one 35-foot (10.5 m) carrier and extension vessels, three 25-foot (7.5 m) fast patrol launches and two 19-foot (6 m) outboard cabin boats for extension work. Future work will, in addition to consolidation of present work programmes, include investigations into deep-water bottom fishing, study of mangrove swamp fisheries, investigations of spanish mackerel resources and harbour development.

### Gilbert and Ellice Islands

24. The professional staff of the Fisheries Department, with headquarters at Betio, consists of a Chief Fisheries Development Officer, three Fisheries Development Officers, one Marine Biologist and two Fisheries Assistants. Vessels comprise one 13 m steel survey vessel, three 9 m glass-fibre launches, four locally constructed 6.5 m dories awaiting delivery of engines and miscellaneous small craft. Budget for short and long-term projects is in the order of A\$ 600,000. These projects include skipjack and longline tuna investigations, development of a dory fleet, assessment of long-line bait resources, fish handling and processing investigations and developments, limited lobster resource assessment, development of fisheries complex at Funafuti and work to upgrade existing subsistence fisheries.

### New Caledonia

25. There is no fisheries department in New Caledonia. All activities in this field come under the Department of Merchant Marine. The French Overseas Technical and Scientific Research Organization (ORSTOM) functions independently with funding from France. The New Caledonia Administration has made considerable counterpart funding to the SPIFDA aquaculture programme at Baie St. Vincent amounting to nearly 15 million CFP in 1972 and 4 million in 1973 (115 CFP = A\$ 1). The Department of Merchant Marine has undertaken experimental imports of oysters - Ostrea edulis and Crassostrea gigas. Part of the C. gigas stock was made available to the New Hebrides to initiate experiments in that territory. ORSTOM carries out oceanographic research, studies of tuna and skipjack populations and investigations into deep-water commercial fish outside the reef of such genera as Etelis and Pristipomoides, which are of considerable value. Work is in progress on a catalogue of fishes of New Caledonia, which will list more than 500 species.

### New Hebrides

26. The Condominium does not at present have a fisheries service. One person, a technical assistance volunteer employed by the French Administration, is developing oyster culture work and beche-de-mer exploitation. The Condominium Agricultural Service and the British Administration carry out small ad hoc investigations and extension work, as does the French Administration.

27. It is hoped to undertake some studies of artisanal skipjack fishing, bottom fishing and lobster developments in 1974 and 1975.

### Papua New Guinea

28. Fisheries operate within the Department of Agriculture, Stock and Fisheries. There are two sections: research, working within the Division of Research and Surveys and extension, licensing and inspection working within the Division of Development and Planning. The research programme, with a staff of eleven biologists plus support staff, operates currently on a budget of approximately A\$ 300,000 p.a. of which slightly more than 50% is allocated to skipjack research. There are commercial fishing operations for skipjack, prawn trawling, barramundi, lobsters, reef fishes for local consumption, tilapia. Fish pond production of carp is mainly confined to the Highlands.

29. Research and development activities will be extended to include wider investigations of pelagic resources such as northern bluefin, mackerel tuna, and spanish mackerel, full exploitation of the tilapia resource, saltfish production and pearl oyster farming.



### Trust Territory of the Pacific Islands

30. Fisheries development, research and management is directed by the Marine Resource Division (MRD) with headquarters in Saipan. Under the direction of the MRD are active district programmes in Palau, Truk and Ponape. A programme will be started in Yap this year. Technical assistance is provided by headquarters staff to all territories of TTPI as requested. The Division has an annual budget of US\$ 500,000, plus grant funds of US\$ 100,000 for special projects. Congress of Micronesia has appropriated US\$ 500,000 for a development loan fund administered from Saipan, and a further US\$ 300,000 loan fund for district administration. At headquarters in Saipan there is a professional staff of four. Based in the field is a staff of biologists, two consultants and several Micronesian trainees at Palau. In the other districts there are District Fisheries Specialists in charge of each district programme, assisted by boat-building, engineering, refrigeration and other specialists as required. Each district has a Micronesian staff of from six to twenty persons.

31. Programmes aim to develop local artisanal fishing for pelagic and demersal species, together with supplying the necessary infrastructure of refrigeration, marketing, boat construction, engineering support, etc. Also, culture research programmes on oysters and fish continue and provision of sport fishing and diving facilities will be continued. Crown-of-thorns starfish control is monitored and continued where necessary.

### Kingdom of Tonga

32. Tonga has one Government-owned 90-foot Japanese longliner, fishing for tuna, manned by a Tongan master and crew and a Japanese fishing master. There is an Australian company processing spiny lobster and operating a ferro-cement freezer barge. The remainder of the fishing effort is based on local canoes and skiffs using fixed traps, handlines, gill and surround nets and some trolling gear. Collected for local consumption are clams, bivalves, holothurians and echinoderms.

33. The fisheries development programme is aimed at providing improved supplies of fish for the local markets. Plans include improved refrigeration and handling techniques to avoid wastage, and development of artisanal fisheries which will allow exploitation of hitherto underutilized resources such as deep water demersal fisheries and skipjack and little tuna which occur in seasonal abundance. There are good areas of brackish and fresh water which might usefully be used for aquaculture. Consideration will be given to the establishment of joint venture agreements or the establishment of bases for foreign fishing companies.

## REVIEW OF SPIFDA ACTIVITIES

34. The Project Manager (Professor François Doumenge) gave a brief review of SPIFDA activities since the beginning of the project, with particular emphasis on the events of the last year.

35. He referred to the work of the various consultants who had been employed on the project. Many territories had modified their programmes in the light of recommendations made by these experts. The Project Manager referred to the very long delays which had occurred in the distribution of consultants' reports and the inadequate time allowed for consultants' field visits and for the writing of reports. He also felt that considerably greater value would have resulted if the recruitment of consultants had been more carefully planned to ensure that their field visits had been better co-ordinated. Special mention was made of the work of Mr John Fyson, Boat Design expert. The Meeting shared the view expressed by the Project Manager of the value of Mr Fyson's work.

36. The Project Manager then referred to the recommendation made by the Second Consultative Committee concerning the second phase of the SPIFDA project, which commenced when the consultants' reports were finally received. The Second Consultative Committee had proposed a complete plan of work with detailed proposals for a number of sub-projects with appropriate counterpart contributions from the territories involved. Although this programme had been supported by FAO and the UNDP representative at the Meeting, subsequent budgetary problems in UNDP had resulted in a restriction of the original programme. There were also constitutional difficulties in relation to the sub-project proposed in the TTPI and other administrative delays.

37. Following the special mission by Dr R. Croker in May 1972, the Third Meeting of the Consultative Committee proposed a modified programme utilizing funds available for expenditure up to the end of 1973, and also recommended a supplementary programme which would be implemented if the project were to be extended and additional funds made available.

38. The modified programme was finally agreed to and two additional consultants appointed to carry out this programme. One consultant (Mr Dan Popper, fish culturist) arrived in New Caledonia in March 1973 to work at Baie St. Vincent and Fiji aquaculture demonstration centres for a period of twelve months. The second consultant (Mr Ted Ritchie, oyster culturist) did not arrive in Fiji until July 1973, but will remain there for twelve months.

39. The Project Manager referred to his own impending departure from the project at the end of October 1973, and indicated that he was currently preparing his final report.

40. The Meeting reviewed the programme and accomplishments of the South Pacific Islands Fisheries Development Agency during the life of the project, and recognised and highly commended the work of its Project Manager, Professor François Doumenge, whose dedication and untiring efforts contributed greatly to the success of the South Pacific Islands Fisheries Development Agency. The Meeting recommended that a letter of commendation be forwarded by the South Pacific Commission to FAO and UNDP.

#### REVIEW OF FIJI TUNA PROGRAMME

41. The UNDP/FAO Fiji Tuna Fisheries Project Manager, Mr Robert Lee, briefed the Meeting on the results of the programme to date. He provided details on baiting and fishing techniques and on species taken during baiting and offshore fishing trials.

42. At the conclusion of his presentation, a short question-and-answer period brought forth a discussion on the importance of live bait for successful island skipjack fishing operations.

43. Desirable characteristics of bait fish were discussed along with past work which has been attempted to develop successful baitfish farming.

44. The possibility of using fresh water species was briefly discussed as was the desirability of initiating a project to study the feasibility of farming certain species of apogonids which have been used for bait very successfully by Okinawan skipjack fishermen for years.

45. Professor Doumenge also reported on how certain bait species had been taken in surprising numbers by fixed trap nets positioned near mangroves and suggested how such a technique might be utilized to take bait in commercial quantities.

## FISHERIES EDUCATION

46. Dr. E. Balasubramanian, Observer from the University of Technology, Lae, spoke of the status of University education in the territory of Papua New Guinea and outlined categories of fisheries education. He stated that there is a need for various levels of fisheries education and draft proposals for this have been submitted to his Government. The Observer stated that some areas of Papua New Guinea, while having a tradition of subsistence fishing, required re-training in commercial fishing. Extension workers with a background of sociology in addition to their own fisheries technical know-how would be required.
47. Professor McInerney of the University of the South Pacific, Suva, gave a broad outline and background of fisheries education in Fiji. He outlined the levels of fisheries education: diploma, degree and post-graduate. He said that fullest use would be made of existing educational agencies, i.e., Fiji College of Agriculture for the natural science disciplines, and the Derrick Technical Institute for engineering and related disciplines. The Fiji Fisheries Division will provide the practical fisheries training. Diploma course training would be of two years' duration and the expected intake would be 15 students per annum, rising to 20 by 1975. The degree level course would be general and would not provide specialized courses in Fisheries; the specialized training would be gained by direct contact with qualified people in the University. Contact with the Fiji Division of Fisheries would be maintained throughout the period of training. The post-graduate intake was likely to be small. A Canadian Government scholarship scheme will be introduced in 1974, and it is estimated that five scholarships per annum for Pacific territories would be provided. Suitable possible applicants should apply direct to Professor F. E. McInerney, University of the South Pacific, P.O. Box 1168, Suva, Fiji.
48. Professor Cyril Burdon-Jones, School of Biological Science, University of Townsville, said that his University provided under-graduate and graduate training to advance levels in marine biology, with special application to fisheries work, to suitably qualified candidates. Modern facilities for fisheries research were available at the University, including an up-to-date research vessel (see Report of Working Party on Fisheries Education at Appendix I).
49. Fiji Fisheries Division explained levels of fisheries training in Fiji and the manner in which the Department was proceeding.

50. The participants discussed the question of fisheries education in general and it was recommended and accepted that a working party be set up to review the possibility of inter-territorial integration of marine resources training.

51. The delegate from Papua New Guinea outlined his country's fisheries training development, and the particular needs in areas where no fishery in a commercial sense exists. The delegate stressed the importance of extension workers in the field working at the fishermen's level.

52. The SPC representative stressed the difficulties and the cost of getting extension workers and specialists to various areas. Remoteness and distances between territories has an inhibiting effect in providing efficient training services. Education through the media of films and better use of existing facilities was recognised. The James Cook University, for example, has adequate scientific facilities and staff, and assistance can be given in training, if requested.

53. The Report of the Working Party on Fisheries Education is attached as Appendix I.

54. The Meeting adopted the following recommendations: "The Meeting recommended that the South Pacific Commission should:

- (a) take appropriate action to ascertain the fisheries educational needs of Pacific territories and countries;
- (b) consider the advisability of establishing and supporting a working party on fisheries education;
- (c) register and publicise through governmental agencies and all other interested organizations its approval and support of training programmes already being established in Pacific educational institutions;
- (d) seek ways of improving the funding of these courses and training programmes so that, if need be, they can be refined and extended to meet regional requirements.

THE MAIN FACTORS REDUCING THE RATE OF FISHERIES TECHNICAL  
PROGRESS IN THE TERRITORIES AND STEPS THAT CAN BE TAKEN  
TO OVERCOME THESE FACTORS

55. The Meeting recognized that lack of money and personnel were the major factors hindering fisheries development in the region. Problems existed in getting reports out to the people who can use them, in avoiding duplication of services and facilities, and providing co-ordination of fisheries development activities. The importance was stressed of having consultants who can work in areas as long as they are required to achieve development objectives.

56. It was decided that a new concept of SPC fisheries activities should be formulated in line with recent changes in territorial and regional programmes.

57. The Papua New Guinea representative suggested that a directory of experts be compiled. This was agreed to by SPC.

REVIEW OF PROPOSED LONG-TERM PROJECTS

58. The SPC representative defined the new concept of long-term projects which envisaged periods of from 1 to 5 years.

59. He also stated that the Australian and New Zealand Governments have provided a substantial voluntary contribution for the SPC work programme in 1974 and explained the terms under which this aid was to be given. The Meeting proceeded to discuss the papers concerning the SPC outer reef and inshore fisheries projects and two draft projects prepared by FAO (~~see~~ summaries of these papers at Appendix III).

60. Dr Rao introduced the draft paper "Aquaculture Development in the South Pacific Islands after termination of SPIFDA". The SPIFDA Project Manager, Professor F. Doumenge, reviewed the project in detail concluding that, with an additional two years' work, he was confident that a realistic assessment of the economic future for aquaculture could be made. (Appendix III D.).

61. The FAO proposal calls for the provision of experts and equipment for the present projects in St. Vincent Bay and Fiji and allowed for fellowships, transport and maintenance of facilities.

62. Dr. Rao pointed out that the project would establish techniques in New Caledonia and Fiji and then extend this expertise to other areas. The project included provisions for visits by experts to other areas to survey the prospects for aquaculture.

63. The proposal was submitted to the Meeting at this early stage for comment as UNDP had indicated that it might support a project of this type.

64. Mr R. Baird, SPC Fisheries Officer, then introduced and reviewed the SPC project on inshore fisheries development. This project will be submitted to the South Pacific Conference for consideration for funding in 1974. (Appendix III C.).

65. The project was divided into a number of sub-projects including lobster holding and collecting, recognition of beche-de-mer species, molluscs, turtle farming and fish cultivation.

66. The merits of each sub-project were discussed in detail and it was the opinion of the Meeting that effort should be focussed on lobster holding, transport and population studies, and turtle farming. However, it was felt that SPC might also consider back-up assistance to other sub-projects.

67. The Meeting also proposed that consideration should be given to the use of experts in addition to volunteers on these sub-projects and that SPC should examine the possibility of obtaining these experts on loan from member governments.

68. The Meeting recommended that support be given to this project, and further recommended that

- (a) in view of the great importance placed upon turtle conservation and the prospective value of turtle farming, the turtle sub-project should be expanded to provide that more consultant services should be made available throughout the duration of the project to permit visits to interested territories;
- (b) because the lobster potential is considered as an under-developed resource in most of the territories of the region, the lobster sub-project should be considerably expanded, and consultant services should be available to supervise the sub-project, and to advise interested territories;

- (c) additional support should be given to the beche-de-mer sub-project by providing for inter-territorial study visits to facilitate development of this industry.

69. Mr R. Baird, SPC Fisheries Officer, then introduced and reviewed the draft proposal for "Special Project on Outer Reef Artisanal Fishing", which would be submitted to the South Pacific Conference in September. (See Appendix III A and Recommendation no.4).

70. Dr. Rao, FAO, followed this with the introduction of the FAO proposal for "Outer Reef Fishery Development" and suggested that, as these projects were in some ways complementary, they should be considered together. (See Appendix III B)

71. During discussion it was pointed out that when the UNDP Regional Fisheries Adviser was appointed he would be able to consider the detailed content of the proposed FAO project. Further, it was considered by the Meeting that, as the UNDP proposal would probably not commence for 18 months to 2 years, it was desirable for the SPC proposal to go ahead.

72. It was stressed that the SPC proposal was aimed at fisheries development in areas where facilities for development were not at present available or were extremely limited and it was further pointed out that support facilities for maintenance of vessels and equipment and arrangements for effective marketing of the catch were essential if the projects were to succeed.

73. In view of the detailed planning required in considering the two proposals, a working party was formed to consider the details of operations and budget requirements, the areas in which the projects might operate and the sources of funds which might be available for financing the construction of dories.

74. Outer Reef Artisanal Fishing Project. The Meeting recommended that support be given to this project, and further recommended that

- (a) additional expenditure be added to the project to permit the purchase of two further aluminium diesel-powered boats, which would be used in tests against existing dory fleets in order to assess the value of alternative hull design, power units and materials.
- (b) having regard to the present and proposed high level of investment in dories, the utmost importance should be attached to the investigation of alternative boat designs.



75. It was noted that in regard to loans for the provision of dories in American Samoa, to date all loans were being successfully repaid by the fishermen concerned.

76. The Chairman asked for discussion of projects additional to those already considered and representatives called for the provision of a catalogue of fishing gear and equipment suppliers and information on the available markets for various marine products.

77. Mr Harris, SPC Programme Director (Economics), responded that it should be possible for existing SPC staff to provide such a catalogue, but if an evaluation of the gear was required it would be necessary to obtain a feedback of information on the efficiency of the products from the representatives using them.

78. Further discussion was directed towards the possibility of providing funds to assess possible markets for fisheries products from the South Pacific Commission area. The provision and distribution of a list of personnel involved in fisheries work in the SPC area was also requested.

79. The TTPI representative asked if the Meeting would consider a proposal for investigation of the feasibility of cultivating bait fish for the tuna live bait pole fishery. Following discussion it was suggested that TTPI should submit a proposal to SPC for applied research to be carried out on the culture of suitable bait species.

#### WHAT REGIONAL ACTIVITY, IF ANY, SHOULD REPLACE SPIFDA

80. The UNDP representative said that the decision to discontinue SPIFDA had been made necessary by a shortage of funds for regional projects. He expressed his thanks for the admirable work carried out by Professor F. Doumenge. In reply to a question from Mr Harris he said he was unable to give a definite answer on when more funds might become available. In response to questions, the UNDP Adviser outlined the tasks to be undertaken by the Regional Fisheries Development Adviser who was soon to be appointed.

81. It was agreed by the Meeting that in view of SPIFDA's termination, SPC should consider taking a larger role and greater responsibility for regional development. The Meeting recommended that a statement to this effect should be included in the report of the Meeting (see para. 84).

### UNDP/SPC RELATIONSHIPS

82. On the question of UNDP/SPC relationships, the degree of communication and co-operation needed was discussed in some detail. It was hoped that a maximum of co-operation could be achieved between the two organizations, but it was felt that it was not practical at this time to be too specific regarding details of co-operation because of the changing nature of conditions in the SPC area.

83. The position of UNDP/FAO Regional Office is as follows:

- (a) UNDP assistance to SP IFDA will cease;
- (b) UNDP/FAO will appoint a Regional Fisheries Adviser;
- (c) UNDP/FAO will concentrate on strengthening individual country programmes;
- (d) UNDP/FAO will defer any decision on specific projects until the Regional Adviser has had a chance to make his recommendations;
- (e) UNDP/FAO will co-operate closely with SPC, South Pacific Bureau for Economic Co-operation and other regional development organizations.

### WHAT SHOULD BE THE FUTURE ROLE OF THE SOUTH PACIFIC COMMISSION IN FISHERIES DEVELOPMENT

84. The Meeting

- (a) recognised the assistance rendered by the South Pacific Commission in encouraging Pacific territories to establish their own territorial programmes, and in organizing and sponsoring the South Pacific Islands Fisheries Development Agency during the past three years, during which time this Agency has played such an important part in the development of various territorial fisheries programmes;
- (b) also recognised that, with the closing of the SP IFDA programme, a decrease in regional fisheries activities might develop which could seriously retard many territorial fisheries programmes;

- (c) considered that with the development of fisheries programmes in most territories during recent years, the role of the South Pacific Commission in assisting with the development of fisheries programmes should now be revised in the light of existing conditions;
- (d) further considered that primary assistance to the territories by the South Pacific Commission in future will require more technical support of a long-term basis than has been possible in the past with the limited fisheries staff and budget. Therefore, the Meeting recommended that the South Pacific Commission note the growing importance of fisheries in the region and greatly increase the scope of its technical assistance programme by providing a larger percentage of South Pacific Commission operational funds and personnel towards this effort;
- (e) in view of the extended role proposed for the South Pacific Commission in fisheries development, recommended that the second post of Fisheries Officer, approved by the Twelfth South Pacific Conference and Thirty-fifth Session of the Commission, should be continued and filled, if adequate funds were available.

#### OTHER BUSINESS

85. A resolution was passed on the desirability of environmental conservation and pollution control and that this aspect should receive maximum support from all territories.

86. The GEIC delegate raised the question of territorial waters. After discussion of the political content of this subject, it was agreed that the Meeting would continue to endorse the previous resolutions of the Fourth and Fifth Fisheries Technical Meetings.

87. The SPC Fisheries Officer asked for the Meeting's view on the frequency of Fisheries Technical meetings. The Meeting was unanimous that the meetings should be held annually and, where possible, in a different territory each year.

88. The Meeting discussed the question of the autonomy of fisheries departments vis-à-vis agricultural departments. It was agreed by the Meeting on 8 to 1 vote that fisheries departments operated more effectively as autonomous departments.

89. The SPC Fisheries Officer asked for the view of the Meeting on the desirability of the continuation of a Fisheries Newsletter as, upon the departure of the SPIFDA Project Manager in October, the SPIFDA Newsletter would no longer be issued. The Meeting endorsed the value of the SPIFDA Newsletter and was unanimous in its request that SPC should continue to publish such a Newsletter quarterly.

90. Many of the delegates had said that they were unaware of the provisions for assistance from the Commission to applied research, experiments and field work; for short-term experts' and specialists' services; for inter-territorial study visits and for regional travel-student training. It was agreed that the Commission would send copies of the relevant savingsgrams to the Fisheries Officers concerned.

91. A vote of thanks to the Chairman and to the Government of Fiji for its excellent arrangement of facilities, its demonstrations and its hospitality was passed unanimously.

92. Unanimous votes of thanks were also passed to the members of the working parties who had produced such excellent reports.

---

SUMMARY OF RECOMMENDATIONSSOUTH PACIFIC ISLANDS FISHERIES DEVELOPMENT AGENCYRecommendation No. 1

The Meeting reviewed the programme and accomplishments of the South Pacific Islands Fisheries Development Agency during the life of the project, and recognised and highly commended the work of its Project Manager, Professor F. Doumenge, whose dedication and untiring efforts contributed greatly to the success of the SPIFDA. The Meeting recommended that a letter of commendation be forwarded by the South Pacific Commission to FAO and UNDP.

FISHERIES EDUCATIONRecommendation No. 2

The Meeting recommended that the South Pacific Commission should:

- (a) take appropriate action to ascertain the fisheries educational needs of Pacific territories and countries;
- (b) consider the advisability of establishing and supporting a working party on fisheries education;
- (c) register and publicise through governmental agencies and all other interested organisations its approval and support of training programmes already being established in Pacific educational institutions;
- (d) seek ways of improving the funding of these courses and training programmes so that if need be, they can be refined and extended to meet regional requirements.

THE ROLE OF THE SOUTH PACIFIC COMMISSION IN FISHERIES DEVELOPMENTRecommendation No. 3

## The Meeting

- (a) recognised the assistance rendered by the South Pacific Commission in encouraging Pacific territories to establish their own territorial programmes, and in organizing and sponsoring the South Pacific Islands Fisheries Development Agency during the past three years, during which time this Agency has played such an important part in the development of various territorial fisheries programmes;
- (b) also recognised that, with the closing of the SPIFDA programme, a decrease in regional fisheries activities may develop which could seriously retard many territorial fisheries programmes;
- (c) considered that with the development of fisheries programmes in most territories during recent years, the role of the South Pacific Commission in assisting with the development of fisheries programmes should now be revised in the light of existing conditions;
- (d) further considered that primary assistance to the territories by the South Pacific Commission in future will require more technical support of a long-term basis than has been possible in the past with the limited fisheries staff and budget. Therefore, the Meeting recommended that the South Pacific Commission note the growing importance of fisheries in the region and greatly increase the scope of its technical assistance programme by providing a larger percentage of South Pacific Commission operational funds and personnel towards this effort;
- (e) in view of the extended role proposed for the South Pacific Commission in fisheries development, recommended that the second post of Fisheries Officer, approved by the Twelfth South Pacific Conference and Thirty-fifth Session of the Commission, should be continued and filled, if adequate funds were available.

REVIEW OF PROPOSED LONG-TERM PROJECTSA. Outer Reef Artisanal Fishing ProjectRecommendation No. 4

The Meeting recommended that support be given to this project, and further recommended that

- (a) additional expenditure be added to the project to permit the purchase of two further aluminium diesel-powered boats, which would be used in tests against existing dory fleets in order to assess the value of alternative hull design, power units and materials.
- (b) having regard to the present and proposed high level of investment in dories, the utmost importance should be attached to the investigation of alternative boat designs.

B. Inshore Fisheries Development ProjectRecommendation No. 5

The Meeting recommended that support be given to this project, and further recommended that

- (a) in view of the great importance placed upon turtle conservation and the prospective value of turtle farming, the turtle sub-project should be expanded to provide that more consultant services should be made available throughout the duration of the project, to permit visits to interested territories;
- (b) because the lobster potential is considered as an under-developed resource in most of the territories of the region, the lobster sub-project should be considerably expanded, and consultant services should be available to supervise the sub-project, and to advise interested territories;
- (c) additional support should be given to the beche-de-mer sub-project by providing for inter-territorial study visits to facilitate development of this industry.

### C. FAO Proposed Aquaculture Project

#### Recommendation No. 6

The Meeting noted with interest and approval that the draft FAO Aquaculture Project provided for continuation for two years of the Aquaculture Demonstration Centre at Baie St. Vincent, New Caledonia, and of the aquaculture project in Fiji, which had been initiated by SPIFDA and recommended that support be given to the proposal. The Meeting further recommended that, in the light of the FAO proposal, the proposed work on molluscs in the South Pacific Commission project for Inshore Fisheries Development could be eliminated.

### D. FAO Proposed Outer Reef Fisheries Project

#### Recommendation No. 7

The proposed FAO project on Outer Reef Fisheries was studied with care. It was concluded that the FAO project as drafted would be of considerable value to the region as complementary to the proposed South Pacific Commission project. The Meeting therefore recommended that the FAO project be supported. It was further noted that the FAO project did not overlap with the proposed South Pacific Commission project.

### E. Tropical Pacific Skipjack Resources

#### Recommendation No. 8

The Meeting accepted and endorsed the report of the Working Party on Skipjack Resources and, recognising the economic importance of tropical skipjack resources, recommended

- (a) the establishment of a region-wide skipjack resource assessment programme;
- (b) the establishment of an SPC sponsored standing committee on Tropical Pacific Skipjack Resources; such committee to include tuna specialists from SPC territories and countries and other outside specialists as needed. The Commission should determine the composition of the Committee, with an SPC officer serving as Executive Secretary. The role of the Standing Committee shall include formulation, implementation and evaluation of the skipjack resource assessment programme;



- (c) that funds be made available in January 1974 for the initial meeting of the Standing Committee and for preliminary implementation of the programme.

#### F. Other Projects

##### Recommendation No. 9

The Meeting recommended

- (a) the compilation by the South Pacific Commission of a catalogue of fishing gear and equipment;
- (b) the provision of funds to investigate possible markets for fisheries products from the South Pacific Commission area;
- (c) the compilation by the South Pacific Commission of a list of personnel involved in fisheries work in the South Pacific Commission area.

#### OTHER BUSINESS

##### A. Environmental Pollution

##### Recommendation No. 10

The Meeting strongly supported the proposed programme for the conservation of natural resources being submitted to the South Pacific Conference, and in particular, emphasised the need for suitable films and other audio-visual aids in this field.

##### B. Ciguatera Investigation

##### Recommendation No. 11

- (a) The Meeting recommended that, in view of the serious marketing and public health aspects of ciguatera amongst Pacific food fish, integration and further extension of research into the causes of ciguatera should be undertaken. Support funding for a concentrated effort is urgently needed.
- (b) The Meeting noted that a limited project for further work in this field was included in the South Pacific Commission Health Programme, and strongly supported this project.

- (c) The Meeting further recommended that all data concerning cases of fish poisoning (ciguatera) be transmitted to the South Pacific Commission.

C. Organisation of Fisheries Departments

Recommendation No. 12

The Meeting recommended the desirability of separating Government fisheries departments from agricultural departments throughout the countries and territories of the South Pacific.

D. Territorial Waters

Recommendation No. 13

The Meeting continued to endorse the previous resolutions of the Fourth and Fifth Technical Meetings on Fisheries in relation to the definition of territorial waters.

E. Future Meetings

Recommendation No. 14

The Meeting recommended that Fisheries Technical Meetings should in future be held annually in order to assess progress on the proposed long-term projects and to facilitate exchange of information. The Meeting further recommended that future meetings be held whenever possible in territories with fisheries programmes of interest.

APPENDIX IREPORT OF THE WORKING PARTY ON FISHERIES EDUCATION  
IN THE SOUTH PACIFIC

Working Party: Dr E. Balasubramanian  
Professor C. Burdon-Jones  
Mr G. Graham  
Professor T.E. McInerney  
Mr P. Wilson

1. Review of Current and Projected Educational Needs

The present and long-term needs for a wide spectrum of fisheries education and training in the South Pacific were examined. Such training ranged from in-service instruction through diploma training, degree education and post-graduate research at M.Sc., Ph.D. and other levels.

It was evident that not one institution in the area was able to meet the demand, neither was it thought likely that such an institution was required, but that the expertise of existing institutions be made available to the South Pacific territories, and that by careful integration of expertise available and planning all aspects of training could be met.

The sub-committee stressed that the provision of skilled personnel at all levels compatible with the developmental needs of the fisheries in the South Pacific was an urgent top priority requirement. This need has been recognised by many Universities and Institutions in the area, and some courses have already been initiated.

Training programmes designed to develop a task-force at all levels have been formulated in committees elsewhere, and these are outlined below and detailed in the references.

2. Identification of Training Centres

Whilst recognising that there are many institutions other than those cited below that may be usefully involved in the development and expansion of training programmes in the South Pacific the following were already or would be imminently providing courses and aid:

- (a) University of the South Pacific, Suva, Fiji
- (b) James Cook University of North Queensland, Australia
- (c) University of Technology, Lae, Papua New Guinea
- (d) University of Papua and New Guinea, Boroko.

The involvement and integration of the contribution of further institutions or programmes would require evaluation and may be the subject of a more extended and detailed report to be submitted to the South Pacific Commission at a later date if required.

Each centre offers specialist training in discrete fields designed to suit the needs of its catchment area. There is no significant degree of overlap of effort. The training programmes that have been evolved can be extended and more closely integrated on an inter-institutional basis if required, and adequately funded.

### 3. Role of each Training Centre

The James Cook University provides for the training in Australia at present, of marine scientists with expertise in fisheries biology, who can participate and contribute substantially to the evaluation and development of marine resources. These courses are available to all suitably qualified applicants on an international basis. They are especially well suited for personnel working in Australia, South East Asia and the South Pacific.

The James Cook University is Australia's marine centre for training in marine biology and tropical marine biology in particular. It has a well designed research vessel equipped for commercial trawling and gear handling, as well as fisheries oceanography. All advanced courses offer extensive field experience and involve work at sea. The University is also equipped for research and training in pollution, and environmental quality assessment and management.

The University can also assist in the training of fisheries experts in those fields in which it has expertise, i.e.

- (a) general marine resource evaluation and analysis
- (b) pollution problems
- (c) pest-identification and control
- (d) mariculture and aquaculture

- (e) ciguatera
- (f) identification of marine organisms
- (g) identification and analysis of unusual environmental phenomena.

The University can advance the development of fisheries expertise in the South Pacific by providing:

- (a) consultants
- (b) in-field training on a short-term basis in remote Pacific areas if adequately funded
- (c) data relevant to fishery development, ecology, larval development, food webs, population analysis, pests, parasites, life histories, long-term effects of pollutants.

The James Cook University is currently training under-graduates and post-graduates suitable for fisheries work. It can also be a recruiting ground for skilled voluntary labour, as supported by existing government schemes.

The University is further prepared to consider participation in short-term courses to be held at a suitable venue for field experts, on the following subjects:

- (a) environmental quality evaluation and management, pollution
- (b) ciguatera
- (c) mariculture and aquaculture
- (d) vertebrate and invertebrate taxonomy
- (e) other subjects where needs defined and if expertise available.

Participation in the above activities will require adequate funding by some extra-university body.

The University of Technology, Lae, sees its role as basically:

- (a) fisheries technology
- (b) fisheries industry development and management.

At present, within Papua New Guinea, the fishing industry is comparatively small and primarily serves internal markets, but is already providing a significant overseas market.

The present professional staff in the institution and in the Department of Agriculture, Stock and Fisheries, is expatriate and to be replaced.

It is planned that training at Lae should also provide training in environment management (including pollution); sociological relations and policy formulation.

This training is to be offered at the degree and diploma level and will embrace three elements:

- (a) Fisheries Technology which will include a basic science and fishery science training in fish culture, gear technology, boat technology, marine engineering, seamanship, navigation, fish processing and refrigeration.
- (b) Fisheries Management, e.g. economics, business management, administration, marine laws, political and social science and rural sociology.
- (c) Environmental Science, i.e. climatology, hydrology, limnology and pollution control.

The University of the South Pacific and several co-ordinating Fiji agencies provide fisheries training on a regional basis, and designed to serve the needs of the 10 countries within the University of the South Pacific catchment area. The scheme provides the following spectrum of fisheries training at present:

- (a) Post-graduate work in marine biology to M.Sc. and Ph.D. level. This is only available to a limited number of students.
- (b) B.Sc. level training in the marine biological sciences.
- (c) Diploma in Tropical Fisheries intended mainly for the training of extension field officers. Over the next 5 years most of the resources will be directed into the Diploma training.
- (d) A variety of in-services and short-term courses.

#### 4. Conclusions and recommendations

The sub-committee resolved that sufficient existing and projected courses had been initiated and planned to meet the immediate and long-term needs of the South Pacific Commission region, but did not preclude the possibility of modifying the existing programme or projected programmes to meet the specific needs of the Commission if these could be identified and adequately funded.

It is recommended that the SPC should take appropriate action to ascertain the fisheries educational needs of Pacific territories and countries.

- (a) Define more clearly its further needs.
- (b) Consider the advisability of establishing and supporting a working party on fisheries education.
- (c) Register and publicise through governmental agencies and all other interested organizations, its approval and support of training programmes already being established in Pacific educational institutions.
- (d) Seek ways of improving the funding of these courses, and training programmes so that if need be they can be refined and extended to meet regional requirements.

#### References

- Balasubramanian and Reynolds, 1973. Requirements for fisheries training in Papua New Guinea.
- Burdon-Jones, 1973. Opportunities for training in Tropical Marine Science (under revision).
- Lindsay, 1972. Fisheries training in the region served by the University of the South Pacific.
-

REPORT OF THE WORKING PARTY ON DEVELOPMENT OF SKIPJACK TUNA  
FISHERIES IN THE SOUTH PACIFIC OCEAN

Working Party: Mr R. Shomura  
Dr S. Swerdloff  
M. R. Grandperrin  
Mr R. Lee  
Mr R. Stone  
Mr P. Hodgkinson

I. Background

The skipjack tuna is probably the most important fish species involved in the future developmental plans of many island communities of the Pacific Ocean. This is especially true in the South Pacific where the skipjack tuna is expected to meet much of the protein needs of the island populace and also form the supply base of a major industry.

In the world markets, the demand for tuna has undergone a tremendous growth in the last several decades. In the 1950's and 1960's the demand was met by the rapid development and expansion of the longline fisheries in the world's oceans and by the modernization of the purse seine fishery in the eastern Pacific. Assessment studies of the commercially important species, e.g. yellowfin tuna, bigeye tuna, albacore and bluefin tuna indicate that in most areas substantial increases in landings cannot be expected with increased effort. This, however, is not true for the skipjack tuna. Although the current annual yield of skipjack tuna landed by the several fisheries operating in the Pacific Ocean exceeds 250.0 thousand tons, assessment studies indicate that the yield can be increased several folds without damage to the resource base.

In response to the demand for tuna, several new fisheries for skipjack tuna have been initiated and existing ones expanded. This development has been especially notable in the western Pacific. The Japanese pole-and-line fishery has shown a phenomenal growth with an expansion of its operation into southern waters; present catches from the waters south of the main Japanese islands have been reported to exceed 30.0 thousand tons annually.



For the island communities, participation in the development of skipjack tuna fisheries has a high probability of success. Of the two principal methods of fishing commercially for surface tunas, the pole-and-line method is more readily adaptable for application by the islands than the purse seine method. The purse seine requires considerable capital for the purchase and maintenance of vessel and gear. Further, purse seine fishing for skipjack tuna in the central and western tropical Pacific has not been totally successful to date. Full participation in a purse seine fishery for skipjack tuna in the central and western Pacific by island territories is not likely, at least in the immediate future. The pole-and-line method, on the other hand, can be implemented immediately by island territories with adequate supplies of naturally-occurring baitfish. Relative to purse seine fishing, the pole-and-line method includes less initial capital outlay, lower overhead and operating costs, trips of shorter duration, and lesser demands of harbor and port facilities. Further, pole-and-line fishing is a proven method of catching skipjack tuna in the tropical waters of the Pacific.

In the current climate of increased demand for tuna and the increased activity of fishing nations to harvest the skipjack tuna resources of the Pacific, it is urgent and timely that the island territories of the South Pacific implement immediately their plans to initiate skipjack fisheries or expand existing ones.

It should be emphasized that the development of a full understanding of the status of the skipjack stocks in the Pacific will require a common data base; thus, standardization of the data collected and method of collection is essential. Further, there is a definite and urgent need for interchange of information and cooperative management of skipjack resources between:

1. the various territories in proximity to the stocks;
2. the SPC territories and the external countries already exploiting the resources; the island communities have not previously had access to skipjack resource data collected by the larger countries.

## II. Data Collection of Catch and Effort Statistics

The purpose of collecting data from a fishery vary from meeting the need to measure economic growth and success of the fishery for the purposes of business to providing the basis for management of the resources. Although the demands of business may only require the collection of total production by a time unit, e.g. week, month or year,

it would be prudent to collect statistics which would meet the needs of stock assessment. Too often, fisheries management efforts are applied after the resources have been overexploited. Also, for many fisheries, data are not collected from the initial stages of development; a period considered important in the eventual evaluation of the stock.

It is recommended that all countries and territories in the region implement a programme to collect adequate fishery statistics. These data should be from each fishery in the area and should include information which will provide for proper inter and intra-regional comparisons.

The collection of catch and effort data on a routine basis will be most applicable for areas where the fishery has one or several centralized points, e.g. fishing harbor or a central marketing place. Under these conditions data collection will be relatively easy. The collection of fishing data from casual fishing effort, e.g. non-commercial effort, however, will be too difficult in most areas for routine assessment. For these, the fisheries officers should consider implementing a suitable sub-sampling system to obtain estimates of total catch.

The basic data needed on a regional basis, the means to collect these data and the approach for processing and disseminating these statistics are discussed in the following sections.

#### A. Catch

Weight and, if possible, number of tuna caught each trip should be recorded by species. A report form similar to that already in use in Papua New Guinea would meet the basic statistics needs for the South Pacific area. The data base should be the catch by boat and not be a summary of market statistics where individual boat catches may be combined. These data could be collected directly from each boat, companies or markets. For the latter two elements the condition of obtaining individual catch by boat still exists.

A number of features will influence the selection of the collection method. Each island territory should develop its collection system based on the characteristics of its fishery and marketing elements.

## B. Effort

The basic effort data should include the number of days fished by trip. It should be noted here that an important statistic often omitted from any fisheries data is the reporting of zero catches, this statistic is essential for assessment studies. Other data to be collected include the method of fishing, number of crew, size of vessel and the horse-power of engines. The latter data could be obtained from boat registrations. For island territories where boat registration is lacking, the establishment of a suitable system is urged as a priority activity.

The collection of regional catch and effort data would be considerably assisted by the use of a standardized regional reporting form, and it is recommended that the Honolulu Laboratory of the U.S. National Marine Fisheries Service be asked to design a suitable form, based on the Papua New Guinea model. It is also proposed that the South Pacific Commission be asked to arrange for the processing of data for those countries lacking the facilities to process their data, and for the dissemination of regional statistics as prepared.

## III. Regional Research Efforts

Certain population parameters can only be studied over the entire range of stock. This would include seasonal migratory patterns, sub-population distribution, maturation, spawning and, as an endpoint, magnitude of the resource and optimal sustainable yield. Region-wide data collection with centralized analysis is necessary to provide the basic information for skipjack management decisions.

Skipjack research units possessing required capabilities already exist in at least six widespread territories. It is appropriate and urgent at this time to commence with cooperative research efforts which will aid in the development of the skipjack fisheries in the island territories and also aid in understanding the skipjack resources for management purposes. Examples of several important regional programmes include:

1. Gear and other technological programmes to solve problems faced mutually by the island territories, e.g. supply and survival of baitfish and culture of suitable baitfish.

2. A regional tagging programme which would provide information of several important parameters, e.g. migration, age and growth and mortality rates. In the interest of standardization, one type of tag and one uniform technique must be adopted by all territories. Technical instruction must be given to all units by the central agency. The central agency would serve as the bank for all tagging and return information.
3. A study of the sub-population structure of skipjack tuna in the central and western Pacific Ocean. The territories could collect the necessary samples and transmit them to an interested institution for processing and analysis. Sample collection techniques are not particularly complex, but instruction is necessary to assure uniformity.
4. A programme to study the relationship between oceanographic conditions and the spatial-temporal distribution of skipjack tuna. Physical and chemical data, (e.g. water temperature, salinity and current regimes) are available in various international data banks, but analysis of these data with skipjack availability are limited.
5. A programme to study the relationship between the biological environment and the skipjack diet. The regional programme could include a cooperative collection of stomach contents and the analysis of these data. Also, the spatial-temporal variations of skipjack tuna could be compared with the standing stock. Similar studies could include all aspects of the ecology of skipjack tuna larvae.

According to the above considerations, it is therefore proposed that the South Pacific Commission sponsor a "Standing Committee on Tropical Pacific Skipjack Resources". The role of the committee would be the assessment of skipjack resources in the tropical Pacific, with concomitant exchange of information between the island communities and larger fishing nations. It is proposed that the South Pacific Commission organize this committee. The committee should consist of a small group, e.g. 6 individuals, of tuna specialists from member countries and from other countries as needed. Membership of the Standing Committee could include:

1. representatives from those island territories with developing skipjack fisheries;

2. representatives of larger nations with tropical skipjack fleets, including Japan, United States, Australia and New Zealand;
3. SPC Fisheries Officer and
4. a representative of FAO.

The committee should meet at least annually.

#### V. Dissemination of Information

The current literature on tropical skipjack fisheries is voluminous, but because of their isolation, the island territories do not have ready access to this information. It is therefore proposed that the SPC Fisheries Officer, in conjunction with important Fisheries Services (e.g. U.S. National Marine Fisheries Service and ORSTOM), collect and disseminate pertinent skipjack literature to the concerned territories.

#### VI. Recommendations

The following provides a summary of the recommendations to the South Pacific Commission made in this report.

The Working Party recommended that:

1. The countries and island territories of the South Pacific Commission area should implement plans to initiate skipjack fisheries in their area or to expand existing fisheries.
2. A data collection system should be implemented to gather appropriate statistics from the tuna fisheries of the various areas.
3. The data collected should be standardized on a region-wide basis, and the processing of data and dissemination of regional statistics should be coordinated by the South Pacific Commission.
4. The needed region-wide research effort be coordinated by a centralized agency. Research efforts identified as urgent include a regional tagging programme, identification of skipjack sub-populations, defining the relationship of spatial-temporal distributions of skipjack with the environment, and defining the relationship of the biological environment and the skipjack tuna diet.

5. The SPC sponsor a Standing Committee on Tropical Pacific Skipjack Resources. The committee to assess the skipjack resources on a timely basis and provide for the exchange of information between the island communities and the larger fishing nations. The committee to be made up of tuna specialists from member countries of the South Pacific Commission and other outside specialists as needed. The Secretary of the Standing Committee will be a representative of the South Pacific Commission. The Secretary, in consultation with other officials of the South Pacific Commission, will determine the make-up of the Standing Committee.
  
  6. SPC arrange for collection and dissemination of pertinent skipjack literature to the island territories.
-

APPENDIX III ASOUTH PACIFIC COMMISSIONSPECIAL PROJECT ON OUTER REEF ARTISANAL FISHINGS U M M A R Y

The primary goal of fisheries development programmes in the South Pacific should be satisfaction of local fresh fish demand, thus providing protein at reasonable cost. Surplus catches can be sold to foreign markets as a source of foreign exchange. Initial development can be based on indigenous crews working from relatively small craft. The American Samoa Dory Project has demonstrated the practical potential of this approach.

It is proposed that SPC undertake an artisanal experimental and demonstration fishing project in those territories which are not able, at present, to test and develop their local fisheries potential. The objectives of the project are to assess territorial resources, determine and demonstrate successful fishing techniques, prepare an economic investment prospectus, train a limited number of fishermen, and compare the cost effectiveness of two different types of fishing craft.

The project will be substantially self-contained, with provision for boats, fishing gear, refrigeration and personnel. The two boat types will be the petrol-powered 24' (7.3 m) plywood "Samoan dory" and an aluminium boat with diesel-power. A variety of fishing techniques will be used. Personnel will include a Project Manager, master fisherman and four volunteers. Trainee crews will come from the territories in which the project operates.

---

UNITED NATIONS DEVELOPMENT PROGRAMME

INTER-COUNTRY PROGRAMME FOR THE GOVERNMENTS OF FIJI, TONGA,  
WESTERN SAMOA, U.K. (SOLOMON ISLANDS, GILBERT AND ELLICE ISLANDS),  
COOK ISLANDS, AUSTRALIA (PAPUA NEW GUINEA) AND FRANCE

Executing Agency FAO

OUTER REEF FISHERY DEVELOPMENTOBJECTIVES OF THE PROJECTA. Long-term Objectives

The long-term objective of the Project is to assist Governments in the area to increase fish production for domestic consumption as well as for export.

B. Immediate Objectives

- (i) To carry out exploratory, experimental and demonstration fishing in outer reef areas.
- (ii) To try out various types of gear and craft to determine the most suitable types and train local people in operation of these gear and craft.
- (iii) To assist in development of fishery products for domestic consumption as well as export.

WORK PLAN

In Fiji, Western Samoa and Tonga a modest survey and demonstration programme involving bottom fishing along the outer face of the barrier reef with deep hand lines is proposed. It would consist of two roving crews moving from one island group to another, with a survey crew preceding a demonstration fishing team. It is proposed to use local boats only which would encourage greater counterpart participation. This sub-project would embrace all island groups in the South Pacific area, but actual field work could only be conducted in a relatively few "typical" islands. Results would be forthcoming very quickly in the form of increased fish production: snappers, groupers, jacks, etc.



In Fiji, Western Samoa, Tonga, Cook Islands and Gilbert and Ellice Islands a similar small-scale survey and demonstration programme on surface fishing for skipjack and other schooling fish is proposed. It will consist of training local fishermen in the use of pearl shell lure (otherwise known as Tahiti style fishing), multiple trolling, gillnetting and other suitable techniques. It will include sending fishermen to islands where fishing is now carried on or bringing experienced fishermen to islands where there is no fishing. Skipjack abound close to nearly all the islands in the area and find a ready sale in local markets. This sub-project would benefit every island group.

Use of the services of a boatbuilding expert in designing small boats suitable for fishing beyond the reef would be available to all territories requesting his services.

In Fiji, Western Samoa and Tonga other fishing gear and equipment including gillnetting and baitfishing, will also be tried and local people trained in these techniques as applicable.

---

SOUTH PACIFIC COMMISSIONSPECIAL PROJECT ON INSHORE FISHERIES DEVELOPMENT

(Reef, Lagoon and Mariculture)

S U M M A R Y

Although the reefs and lagoons, especially near centres of population, have been subjected to heavy fishing and in addition, there is some evidence that productivity has declined due to pollution, there are still large areas of reefs that could possibly sustain useful fisheries.

Two species in particular can probably sustain fisheries that can contribute to cash flow of islanders: lobster and beche-de-mer.

Lobsters

One of the main problems of developing lobster fisheries in the out islands is the difficulties encountered with intermittent collection for marketing. Simple live storage in ponds or cages could assist greatly in the resolution of the problem of marketing. A two year study by a volunteer or secondment of a research worker could resolve this question.

Beche-de-mer

The same worker could assist in the identification of commercial species of beche-de-mer and prepare specimens in a preserved form for circulation.

Lagoon and Mangrove Fisheries

Assistance would take the form of provision or loan of specialised gear that has proved successful in some territories. Provision for equipment supply is already made in the SPC estimates for 1974.

## Mariculture

### Molluscs

Bivalve molluscs, as primary plankton converters, could in the long term make a substantial contribution to protein requirements in some areas of the Pacific. In areas of local demand and/or tourist demand, oysters could provide income. Certain species, if successful, could also make a protein contribution as they do at present in, for instance, Manila. Similarly mussels and various species of clams could also make contributions to the economy and food requirements.

### Turtle farming

Some considerable success has been achieved with Green Turtle farming in the Torres Straits and with Hawksbill Turtle rearing in Western Samoa. In many territories where there is no great tradition of fishing but some considerable tradition of farming, such culture could produce satisfactory results in terms of protein and cash. The possibilities should be investigated in one or two territories.

### Fish

While development of cultivation of acceptable marine species of fish is still in the experimental stage, considerable promise is held out for cultivation of herbivorous species such as rabbitfish (Siganus spp.); the SPC should continue to give the maximum amount of counterpart support to installations such as that at Baie St. Vincent as a long-term project.

---

APPENDIX III DSUMMARY OF FAO DRAFT PROPOSALS FOR AQUACULTURE  
DEVELOPMENT IN THE SOUTH PACIFIC ISLANDS

Following the establishment of marine fish culture ponds in New Caledonia and Fiji, and the promising beginnings with oyster culture work in New Caledonia, New Hebrides and Fiji, it is desirable that follow-up programmes in aquaculture should continue on a regional basis.

1. Under the working plan it is recommended that studies should be made at St. Vincent Bay pond, New Caledonia, upon the following:
    - 1.1. Commercial feasibility of Penaeid shrimp farming.
    - 1.2. Study of rabbitfish (Siganus) farming.
    - 1.3. Initiate spiny lobster (Panulirus) farming.
    - 1.4. Investigate possibilities of polyculture methods involving organisms feeding at different trophic levels.
    - 1.5. Study acclimatisation of exotic species.
    - 1.6. Training of professional workers from the region and dissemination of information on successful techniques.
  
  2. Fiji aquaculture development projects
    - 2.1. Oysters. Study of breeding, culture, surveys of suitable areas and investigation of sanitary control.
    - 2.2. Fish ponds. Organization of collection of natural fry, surveys of mangrove areas, feasibility of mullet and rabbitfish farming, surveys of Penaeid shrimp stocks and areas suitable for other possible development of aquaculture.
  
  3. Surveys for aquaculture development in other Pacific islands, notably Cook Islands, Western Samoa and Tonga by experts and consultants.
-

LIST OF PARTICIPANTSAmerican Samoa

Mr S.N. Swerdloff  
Director of Marine Resources  
Government of American Samoa  
PAGO PAGO.

Fiji

Dr H. Squires  
Assistant Director of Agriculture  
(Fisheries Department of Agriculture,  
Forests and Fisheries)  
SUVA.

Mr A.P.J. Holness  
Principal Fisheries Officer  
Fisheries Division  
Department of Agriculture, Forests  
and Fisheries  
SUVA.

Mr J. Spottiswoode  
Senior Fisheries Officer  
Fisheries Division  
Department of Agriculture, Forests  
and Fisheries  
SUVA.

Mr R. Stone  
Fisheries Officer  
Fisheries Division  
Department of Agriculture, Forests  
and Fisheries  
SUVA.

Mr T. Lichatowich  
Fisheries Officer  
Fisheries Division  
Department of Agriculture, Forests  
and Fisheries  
SUVA.

Gilbert and Ellice Islands  
Colony

Mr S. Rawlins  
Fisheries Development Officer  
FUNAFUTI. ELLICE ISLANDS

New Caledonia  
Wallis & Futuna Islands

M. R. Grandperrin  
Océanographe/Biologiste  
Centre ORSTOM de Nouméa  
NOUMEA.

New Hebrides

M. M. Autrand  
Chargé des Pêches  
Résidence de France  
PORT VILA.

Papua New Guinea

Mr G.K. Graham  
Assistant Director  
Division of Research and Surveys  
Department of Agriculture, Stock  
and Fisheries  
KONEDOBU.

Tonga

Mr W. Wilkinson  
Fisheries Officer  
Ministry of Agriculture  
NUKU'ALOFA.

Trust Territory of the  
Pacific Islands

Mr P.T. Wilson  
Chief, Marine Resources  
Trust Territory of the Pacific Islands  
SAIPAN. MARIANA ISLANDS. 96950

Consultants

Professor C. Burdon-Jones  
Professor of Marine Biology  
School of Biological Science  
James Cook University  
TOWNSVILLE. QUEENSLAND. AUSTRALIA

Mr R. Shomura  
Honolulu Laboratory  
US Department of Commerce  
National Oceanic and Atmospheric  
Administration  
P.O. Box 3830  
HONOLULU.

ObserversAustralia

Mr P. Lorimer  
 Technical Adviser on Fisheries  
 Department of Primary Industry  
 CANBERRA. A.C.T.

Food and Agriculture  
 Organisation

Dr G.N. Subba Rao  
 Project Operations Officer  
 Department of Fisheries  
 Food and Agriculture Organisation  
 Via delle Terme di Caracalla  
 ROME. ITALY

Dr R. E. Fort  
 Senior Agricultural Adviser and  
 FAO Country Representative in the  
 Western Pacific  
 c/o United Nations Development Programme,  
 Office of the UNDP Regional Representative  
 for the Western Pacific  
 P.O. Box 295  
 APIA. WESTERN SAMOA

ORSTOM

Mr P. Fourmanoir  
 Centre ORSTOM de Nouméa  
 NOUMEA.

Mr R. Grandperrin  
 Océanographe/Biologiste  
 Centre ORSTOM de Nouméa  
 NOUMEA.

Papua New Guinea

Dr E. Balasubramanian  
 Head, Department of Physics  
 University of Technology  
 P.O. Box 793  
 LAE.

School of Natural  
 Resources

Professor T.E. McInerney  
 School of Natural Resources  
 University of the South Pacific  
 P.O. Box 1168  
 SUVA.

Observers (continued)United Nations  
Development Programme

Professeur F. Doumenge  
Project Manager  
UNDP/FAO/SPC South Pacific Islands  
Fisheries Development Agency  
South Pacific Commission  
P.O. Box D5  
NOUMEA CEDEX.

Mr D.M. Popper  
Aquaculture Expert  
UNDP/FAO/SPC South Pacific Islands  
Fisheries Development Agency  
South Pacific Commission  
P.O. Box D5  
NOUMEA CEDEX.

Mr T.P. Ritchie  
UNDP/FAO/SPC South Pacific Islands  
Fisheries Development Agency  
Expert in Oysterculture  
SUVA.

Mr R. Lee  
Project Manager  
UNDP/FAO Local Tuna Fishery Project  
SUVA.

South Pacific Commission  
Secretariat

Mr A. Harris  
Programme Director (Economic)

Mr R.H. Baird  
Fisheries Officer

Mr P.W. Hodgkinson  
Statistician

Mr C. Stenersen  
Interpreter

Mr G. Azariah  
Interpreter

Mlle S. Exbroyat  
Conference Officer

---



APPENDIX VLIST OF WORKING PAPERS PRESENTED AT THE MEETING

The titles of working papers and country statements submitted to the Meeting are listed below:

## FISHERIES DEVELOPMENT IN TONGA

by W. Wilkinson, Fisheries Officer, Ministry of Agriculture, Nuku'alofa. Tonga.

## PROSPECTS FOR CULTURE OF RABBITFISH IN THE SOUTH PACIFIC

by D.M. Popper, Department of Zoology, University of Tel Aviv, FAO Consultant to SPIFDA.

THE CONSERVATION OF THE HAWKSBILL TURTLE ERETMOCHELYS  
IMBRICATA IN WESTERN SAMOA

by Wayne N. Witzell, U.S. Peace Corps, Fisheries Division, Department of Agriculture, Forests and Fisheries, Apia, Western Samoa.

## OYSTER FARMING IN THE NEW HEBRIDES

by Michel Autrand, Fisheries Officer, French Residency, Vila, New Hebrides.

## CURRENT FISHERIES PROJECTS IN AMERICAN SAMOA

by Stanley N. Swerdloff, Director of Marine Resources, Government of American Samoa, Pago Pago.

THE ACTIVITIES OF THE MICRONESIAN MARICULTURE DEMONSTRATION  
CENTRE

by Peter Wilson, Chief, Marine Resources, Trust Territory of the Pacific Islands, Saipan, Mariana Islands.

A BRIEF OUTLINE OF THE FIRST YEARS OF THE PAPUA NEW GUINEA  
SKIPJACK FISHERY

by R.E. Kearney, Department of Agriculture, Stock and Fisheries, Konedobu, Papua New Guinea.

## EXPLORATORY SHRIMP TRAPPING IN THE HAWAIIAN ISLANDS

by P. Struhsaker and D.C. Aasted, Southwest Fisheries Centre, National Marine Fisheries Service, NOAA Honolulu, HI 96812.

SKIPJACK TUNA FISHING PROJECT IN FIJI  
by Robert Lee, Project Manager, UNDP/FAO,  
Skipjack Project, Fiji.

SPECIFICATIONS AND METHOD OF SETTING OF THE STICK HELD DIP  
NET USED BY THE UNDP/FAO CHARTER VESSEL SHINPO MARU NO. 2  
by Robert M. Stone, Fisheries Officer

NOTES ON PROBLEMS ENCOUNTERED IN AN ATTEMPT TO DEVELOP A  
CANOE FISHERY AT FUNAFUTI ATOLL  
by Sam Rawlins, Fisheries Development Officer,  
Funafuti.

DORY CONSTRUCTION IN BETIO SHIPYARD, TARAWA  
GILBERT & ELLICE ISLANDS DEVELOPMENT AUTHORITY  
by Ian Wallace, Ch. Eng. M.R.I.N.A.,  
Betio.

COUNTRY STATEMENT  
by GILBERT & ELLICE ISLANDS COLONIES.

COUNTRY STATEMENT  
by BRITISH SOLOMON ISLANDS PROTECTORATE.

---

OPENING SPEECHAPPENDIX VI A

by

THE MINISTER FOR AGRICULTURE, FORESTS AND FISHERIES, FIJI,  
THE HONOURABLE D.A. BROWN

On behalf of the Fiji Government it gives me great pleasure to extend a warm welcome to delegates and observers of the 6th Technical Meeting of Fisheries organised by the South Pacific Commission. It is particularly pleasing to my Government that the South Pacific Commission has seen fit to hold this Meeting in Fiji. I am sure that the deliberations that will be taking place during the Meeting and the field visits that have been planned will provide useful stimulus to the work of the Fisheries Division here.

As you are well aware all of our countries share a common heritage of being relatively small islands. For many of our people the extent of fertile agricultural land is limited, the sea therefore offers a valuable potential for economic development for all of us, and the exploitation of the resources of the sea is something that we all wish to pursue.

The work of the South Pacific Commission in this area has provided some useful information on which further plans for development can be based. But in spite of what work has been done by the South Pacific Commission and of work that we have managed to do ourselves a great deal of research, investigation and study is still needed before we can make significant headway in the exploitation of the sea.

Along with the South Pacific Commission we have been fortunate to have received valuable help from the UNDP, FAO and other agencies. All of this has contributed to the build-up of knowledge that is essential if we are to make rational and meaningful progress in our attempts to harness the wealth from the sea.

At the present time we in Fiji, are involved in a number of investigations. The most exciting one from our point of view is the feasibility study of skipjack tuna that is now nearing completion. From this we hope that some substantial developments will derive. Another is the trials that have been going on for some time with oysters. Here again the possibilities appear most promising. Another aspect that is causing us serious concern and one which offers a great deal of potential is the need to become self-sufficient in fresh fish. Our Fisheries Division is investigating this in depth and I am hopeful that significant results will be forthcoming from this study.

One of the dangers that all of us needs constantly to bear in mind is the danger of over-fishing. Experts are continually reminding us that it does not take long to denude resources of the sea if care is not taken. Just to what extent exploitation can take place at a sustainable level is something that needs to be studied very carefully. This I am told is a long term process and a very expensive one. Yet we are confronted with the urgency of carrying out developments often before the full consequences of these steps are known.

Finally, let us keep foremost in our minds that the primary end result of our work is the welfare of people - both those who fish for a living and those who buy the fish. Quite often what is of benefit to one group can be detrimental to the best interests of the others. In the process of trying to reconcile the conflicts of interests we need to be very careful that overall progress is maintained, and that no group suffers at the expense of others.

I would like to wish you a fruitful and interesting Meeting and look forward to receiving the results of your deliberations. I now have great pleasure in declaring the 6th Technical Meeting of Fisheries open.

---

APPENDIX VI BMESSAGE FROM THE HONOURABLE G.F.D. BETHAM,  
SECRETARY-GENERAL, SOUTH PACIFIC COMMISSION

I have asked Mr Harris to convey to you on my behalf my best wishes for a very successful meeting in Suva.

When the Third Meeting of the SPIFDA Consultative Committee and the Fifth Fisheries Technical Meeting were held in August 1972 there were still some hopes that it would be possible to find a way to obtain continued UNDP support for the SPIFDA project. Nevertheless, some recommendations were then made with the object of ensuring that, whatever the future of SPIFDA, there would be a strong fisheries development programme sponsored by the South Pacific Commission.

These recommendations, which included a second post of Fisheries Officer and increased financial support for the regular fisheries development programme of the SPC, were approved by the Twelfth South Pacific Conference and the Thirty-fifth Session of the Commission.

At the same time, the Conference made two very important recommendations:

Firstly, in the event that UNDP could not provide the means to continue the SPIFDA project, that the Commission prepare for submission to the next Conference a report on the feasibility of continuing the Project with its own resources and with assistance from such other sources as may be found; and

secondly, that the Planning Committee study and present to the next Conference a long-term plan for the future activities of the South Pacific Commission, concentrating on practical projects of significance to the region which could best be undertaken or sponsored by the South Pacific Commission, which would be likely to attract additional resources to the Commission, and of which the annual Work Programme would in future be a reflection.

When the Planning Committee met in May, two important announcements were made which affect very considerably the future fisheries development programme of the SPC:

Firstly, the Governments of Australia and New Zealand announced that they each would make a voluntary contribution of \$NZ 250,000 in 1974 for long-term projects adopted by the South Pacific Conference; and

secondly, the representative of UNDP announced that further UNDP finance would not be available for the SPIFDA project, which would therefore be terminated when present funding was exhausted - i.e. about the end of 1973. In lieu, UNDP proposed to appoint a Regional Fisheries Development Adviser as soon as possible, whose principal function would be to assist Pacific countries to develop country projects in the fisheries field.

The Planning Committee was given information about a number of long-term projects which were being developed. These included two projects in the fisheries field:

- (1) Outer Reef Artisanal Fisheries Project;
- (2) Inshore Fisheries Development Project (Reef, Lagoon and Mariculture).

Draft proposals relating to these two projects have been circulated to the Sixth Technical Meeting on Fisheries, and your comments, criticisms and suggestions for the improvement of these two projects will be particularly welcome.

At the same time it is desired that, in the light of the improved financial position of the SPC for 1974, and hopefully in future years, the Meeting should make a very careful examination of the SPC's regional fisheries development programme, to ensure that the programme meets as far as possible the needs of the region.

In looking at these long-term proposals it should be borne in mind that:

- (1) the total estimated annual cost of the long-term project proposals being submitted to the Thirteenth South Pacific Conference exceeds the amount of \$NZ500,000 promised by Australia and New Zealand;
- (2) it is hoped that other participating Governments and aid-giving organizations may be prompted to assist some of the projects which would have to be put to one side if no further voluntary contributions were to become available;
- (3) the need for close co-operation between the SPC and the new arrangements proposed by UNDP is evident. I, personally, would be extremely anxious that regional programmes sponsored by SPC should mesh as closely as possible with country programmes financed by UNDP, so as to avoid unnecessary duplication of effort, but at the same time make the best possible use of available resources.

The Meeting, therefore, has a most important and difficult task.

I am glad to know that there will be strong representation from Pacific countries and territories, and that the deliberations of the Meeting will be greatly assisted by a strong team of Consultants and Observers from the Australian Government (Department of Primary Industries); from the University of the South Pacific; the University of Papua New Guinea; James Cook University, Townsville; the U.S. National Oceanic and Atmospheric Administration, Honolulu; l'Office de la Recherche Scientifique et Technique Outre-Mer (DRSTOM), Noumea; the United Nations Development Programme and the Food and Agriculture Organization of the United Nations.

I wish the Meeting every success.

---