

REPORT OF WORKSHOP

SPC/FAO Training Workshop in Fisheries Management and Statistics

(Nadi, Fiji Islands, 15-19 November 2004)



SECRETARIAT OF THE PACIFIC COMMUNITY
NOUMEA, NEW CALEDONIA



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REPORT

**Noumea, New Caledonia
2005**

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EXECUTIVE SUMMARY

A Training Workshop in Fisheries Management and Statistics was held in Nadi, Fiji, from 15 to 19 November 2004.

The training was initiated and organised by SPC in conjunction with FAO in response to a strategic plan developed by Pacific Island countries and territories and approved at the third SPC Heads of Fisheries meeting in August 2003. In the strategic plan, there are six goals: to enhance the capacity of fisheries agency staff in managing sustainable fisheries, to assist in collecting and analysing data, to assist countries with practical and enforceable fisheries regulations, to assist with the involvement of stakeholders, to assist in raising public awareness and to assist in setting up marine protected areas.

The training workshop was the first of a series organised as part of the strategic plan. It was also the first workshop in which representatives from Pacific Island countries and territories were provided with the opportunity to work together, thanks to funding support from the Food and Agriculture Organisation (FAO) of the United Nations, the Commonwealth Secretariat, the Western Pacific Regional Fishery Management Council and the European Union.

Topics covered included data collection and analysis, fisheries regulations, public awareness, the involvement of stakeholders, fisheries management, marine protected areas, aquaculture and the structure of fisheries agencies. All topics included extensive participant discussion and many included practical exercises in data analysis and fisheries management.

After presentations given at the meeting, participants voted overwhelmingly to use the PROCFish-developed socio-economic manual with modifications. The result of this vote is that the expressed need of Pacific Island countries and territories for a simple method of assessing subsistence fisheries (including an estimation of fishing effort) will be met by PROCFish. Participants were assured that there would be future training associated with the use of the manual. Participants also expressed a need for additional workshops designed for those with different levels of experience and that the provided practical exercises on the analysis of fisheries data were most useful.

CONTENTS

<u>ACKNOWLEDGEMENT</u>	<i>III</i>
<u>EXECUTIVE SUMMARY</u>	<i>IV</i>
<u>A) BACKGROUND</u>	1
<u>B) OPENING FORMALITIES</u>	2
<u>C) TRAINING AND WORKSHOP SESSIONS</u>	3
<u>1. INTRODUCTION TO FISHERIES MANAGEMENT</u>	3
<u>2. THREATS TO FISHERIES</u>	3
<u>3. FISHERY STATISTICS</u>	4
<u>4. CATCH AND EFFORT DATA</u>	4
<u>5. SOCIO-ECONOMIC MANUAL</u>	5
<u>6. THE ANALYSIS OF FISHERIES DATA</u>	6
<u>7. THE IMPORTANCE OF SUBSISTENCE FISHERIES</u>	7
<u>8 & 9. COLLECTING DATA FROM SUBSISTENCE FISHERIES</u>	8
<u>10. FISHERIES TOOLS (INPUT AND OUTPUT CONTROLS)</u>	12
<u>11. FISHERIES REGULATIONS AND THEIR ENFORCEMENT</u>	12
<u>12. FISHERIES MANAGEMENT PLANS</u>	14
<u>13. RESOURCE ASSESSMENT AND MONITORING</u>	14
<u>14. AN ECOSYSTEM APPROACH TO FISHERIES (EAF)</u>	15
<u>15. MARINE PROTECTED AREAS (MPAS)</u>	15
<u>16. SMALL TO MEDIUM ENTERPRISES (SME) IN COASTAL FISHERIES</u>	16
<u>17. AQUACULTURE AS AN IMPORTANT COMPONENT OF COASTAL FISHERIES MANAGEMENT</u>	17
<u>18. INVOLVING FISHERS AND OTHER STAKEHOLDERS IN FISHERIES MANAGEMENT</u>	18
<u>19. PUBLIC AWARENESS</u>	18
<u>20. THE STRUCTURE OF FISHERIES AGENCIES</u>	19
<u>D) CLOSING REMARKS AND SUMMARIES</u>	21
<u>E) APPENDICES</u>	23
<u>LIST OF PARTICIPANTS</u>	23
<u>PROCFish - COFish Project Update November 2004</u>	33

A) Background

The Training Workshop in Fisheries Management and Statistics was aimed at meeting two goals: –

1) to enhance the capacity of fisheries agency staff to manage sustainable fisheries and 2) to assist fisheries agency staff in their efforts to collect, store, retrieve and analyse basic fisheries data and/or indicators to monitor the status of fish stocks. These goals are part of the *Strategic plan for fisheries management and sustainable coastal fisheries in Pacific islands*, a document developed by SPC island countries and territories. It is the first initiative implemented under the Regional Strategy Plan since its endorsement at the third SPC Head of Fisheries (HOF) meeting in August 2003.

With financial support from the Commonwealth Secretariat to SPC, the training was a result of consultations between SPC and FAO. The Coastal Fisheries Management Section of SPC has worked closely with the FAO Sub-Regional Office for the Pacific Islands (SAPA) in Apia during the planning of the training. The joint effort was encouraged under the two organisations' memoranda of understanding, in which they are required to work together in projects of common interest. Other assistance was provided by the European Union, which funded 6 participants, the Western Pacific Regional Fisheries Management Council (WPRFMC), which funded the participation of US territories, and SPC, which funded the participation of French territories.

B) Opening formalities

Message from FAO: Following an opening prayer by Mr. Ueta Fa'asili of SPC (the meeting coordinator), a message from the FAO Sub-Regional Representative for the Pacific (Dr. Vili Fuavao) was presented by Mr. Masanami Izumi of FAO. Mr. Izumi welcomed all participants and resource persons. He said that this meeting was the second opportunity to work together with SPC (the first such opportunity was in March 2003) on coastal fisheries management for our member countries in the region. He said that this is a good example of regional cooperation and FAO will continue to support such activities in future. FAO has been promoting the Code of Conduct of Responsible Fisheries (CCRF) since October 1995 to ensure sustainability of marine resources. The CCRF emphasises the importance of having fishery statistical information for understanding the status of our resources and to assist in implementing management measures. To further strengthen data collection, FAO is implementing a regional project trust funded by the Government of Japan on improving coastal fishery statistics in the region. FAO wished participants all the best for a successful workshop.

Opening address: Mr. Saimone Tuilaucala (Acting Director of Fiji's Fisheries Department) delivered the main opening address. In his address, he stressed the importance of fisheries resources in providing food security, economic development, employment and foreign exchange. A major challenge is keeping a balance between fisheries development and management in order to ensure fish supply for future generations. He emphasised the importance of coastal area management in the provision of food security and poverty alleviation, especially in rural areas. Challenges that the countries face include an increase in populations with a corresponding increase in fishing effort and the use of overly efficient fishing methods. In addition there is the complexity of dealing with multi-species fisheries, harvesting within sustainable limits, collecting information from resource users, raising awareness and the implementation of legislation after proper consultation with stakeholders.

Mr Tuilaucala said that although there is huge potential in the tuna industry, there are limited returns to the national economy. Despite the high value of subsistence fisheries, there has been little research and data collection. Guiding principles for future work should be to include the involvement of communities (and traditional knowledge), government agencies (and scientific information), NGOs, fishing industries and marketing bodies. Fisheries management involves the management of the users of fisheries resources. Mr Tuilaucala ended his opening address by saying that, fisheries management is about managing the people that harvest the fish, not the fish stocks.

Introduction to the training: The meeting coordinator, Mr Ueta Fa'asili, spoke briefly on the origins of the training. He said that the training was established in response to initiatives arising from the Regional Policy Meeting on Coastal Fisheries Management held in Nadi, Fiji, in March 2003, which aimed at identifying main constraints and problems in coastal fisheries management in Pacific island countries. The outcomes of the meeting included 11 recommendations, one of which gave rise to this training workshop. Following the regional meeting in March 2003, a field study was conducted to review the capacity of fisheries agencies to address the problems identified and determine what types of assistance was necessary.

As a result of these initiatives, a Regional Strategic Plan was developed. In the plan, there are six goals; to enhance the capacity of fisheries agency staff in managing sustainable fisheries, to assist in collecting and analysing data, to assist countries with practical and enforceable fisheries regulations, to assist with the involvement of stakeholders, to assist in raising public awareness and to assist in setting up marine protected areas

Several strategies were proposed to achieve these goals, including the organization of regional training courses and workshops particularly on practical fisheries management and fisheries statistics. This Regional Strategic Plan was endorsed by SPC Third Heads of Fisheries Meeting held in 2003 and this training workshop is the first of a series to address this part of the plan.

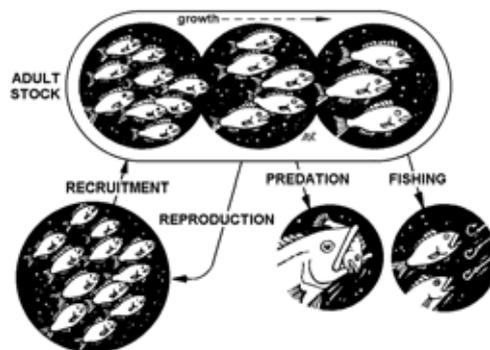
C) Training and workshop sessions

1. Introduction to Fisheries management

Dr. Michael King, SPC fisheries consultant, made an introductory presentation on fisheries management. He said that there is a general agreement that inshore stocks of seafood are declining in many Pacific islands. Although few countries have data to verify this, Guam, which has a good inshore data collection system, has suffered a reduction in inshore catches of about 70% over the last 15 years.

He said that results from previous SPC surveys suggest that 78% of all countries are most concerned about overexploitation. Strictly, overexploitation occurs when a stock has been fished down to levels where reproduction cannot replace the numbers of fish dying (including those being caught). The relationship between stock size, reproduction and recruitment was suggested in reference to the following diagram.

Dr King said that in addition to over-exploitation, stocks of seafood are being threatened by many other causes and these are to be discussed in the following session. The conventional view of a fishery in terms of maximum sustainable yield is useful in that it suggests a truism – that is, the yield from a fish stock will increase with increasing fishing effort only up to a certain point, after which catches will decline. Discussions on this presentation were delayed until after Session 2.



2. Threats to fisheries

Dr. Michael King led a discussion on threats to fisheries in Pacific islands. He said that during the last 10 to 15 years there has been a shift in emphasis in the management of fish stocks from “development” to “conservation.” This has been in response to the many threats to the sustainability of populations of seafood species.

Recent surveys suggest that causes of declining catches include overexploitation, growth in human populations, a shift from subsistence to commercial fishing, the use of overly-efficient and damaging fishing methods and environmental degradation. Key environmental disturbances included the destruction of nursery areas (mangrove areas and corals) as well as siltation from coastal development and poor land management practices.

Discussions

Guam said that fishermen had been blamed for coastal environmental degradation in Guam. However, a recent study undertaken by the University of Guam showed that 90% of degradation was due to land-based sources (eg run-offs). A local action strategy to target pollution was started and 10% of the island was set aside as a marine reserve. An educational outreach and awareness programme has helped with implementation. There has since been a notable change in biodiversity and fish size in Guam.

In terms of the definitions of subsistence and commercial fisheries, there has been a dramatic increase in the costs of putting food on tables and subsistence recovery costs must be considered. There is a need to redefine subsistence fisheries and consider the costs involved. Most fishermen are forced to do more fishing to cover these costs. By-catch issues involving purse seiners and the impact of night fishing have been problems. The Guam Fishermen's Cooperative has been encouraged to set its own rules (under the voluntary data collection scheme) which helps with enforcement and monitoring.

The Marshall Islands enquired about information on fish size limits in relation to the use of by-laws. There is little biological data to implement some management measures, such as placing size limits on species. Biological assessments of reef fish are needed. In response, Dr. King explained that size limits can be based on other sources of information for the species, including details on the same species from overseas countries in similar latitudes. Marshall Islands suggested the use of integrated coastal management that takes account of land-based environmental problems. Fisheries management does not cover land-based issues, and this needs to be considered in future SPC work.

Kiribati said that there should be different size limits for male and female groupers, and that there is a need for biological information. PNG also mentioned that they currently use equations developed by FAO in calculating the size restrictions they impose on their groupers. Nauru questioned whether aquaculture and mariculture can be a tool of fisheries management. Samoa uses community-based management, which is facilitated by the Fisheries Department, as a way to address problems. Guidelines on socio-economic studies and surveys on fisheries are needed. Tokelau acknowledged SPC for its work on inshore fisheries management in Tokelau.

In response to a query on MPAs, Dr. King responded that many forms of MPAs exist – some areas are permanently closed, some are seasonal closures and some (such as Ra'ui) are closed for some years and then opened to fishing. In reference to traps, Dr King said that fence traps have had an impact on the mullet populations in Tonga and the use of similar traps is widespread across the Pacific.

PNG wanted to know which of the measures, MSY or MEY, would be suitable for prawn fisheries. Dr. King responded that if the fishery was a commercial trawl fishery (producing an export commodity) it would make sense to manage the fishery to maximise profits.

3. Fishery statistics

Mr. Izumi of FAO provided a briefing on FAO activities relating to data collection. Some important aspects of the Code of Conduct of Responsible Fisheries relating to data collection were emphasised. Data should be collected on a timely basis and updated regularly. Countries should make an effort to collect reliable and accurate data. The data gathered from annual fishery statistic questionnaires distributed to countries worldwide is used to compile the FAO annual statistics year book, FISHSTAT database, the Status of Fisheries and Aquaculture (SOFIA), Country Fisheries Profiles, Aquaculture Country Profiles, National Aquaculture Sector Overviews etc. FAO is currently implementing a regional project on improving coastal fishery statistics in the Pacific (GCP/RAS/183/JPN). Some workshops have been carried out under the project in 2001, 2003 and the current workshop as well as a study on the status of fishery statistics in Palau and Marshall Islands, etc. Mr Izumi introduced the FAO-sponsored resource persons and their presentation topics.

4. Catch and effort data

Mr. Shunji Sugiyama of the FAO Regional Office for Asia and the Pacific in Bangkok, Thailand, presented a paper on the information requirements for policy-development, decision-making and responsible fisheries management.

Mr Sugiyama said that it is necessary to have a clear understanding of why information is collected. Fishery data and information can be used for assessment, for developing sound policies, for better decision making, for tracking the performance of management plans, for planning, and for informing the public on the need to support management.

Some typical problems include poor quality of the information, limited or non-use of the information and limited support for data collection. Causes of the problems are the difficulties in data collection, lack of capacity, a weak linkage between management objectives and information, little attention to socio-economic aspects and an invalid framework for a data collection system. He said that there is a need for a data collection system that requires less money and fewer people, and which employs new approaches and generates relevant and sufficiently accurate data. Options proposed include a back to basics (why, what and how), logical approach. Fishery data and information system should be guided by the information requirements.

Mr Sugiyama introduced a simple desktop exercise (i.e. important policy, management objectives, and necessary actions) to check the need for information to be collected. Data required for each objective are compared with the existing data. FAO reference materials related to data collection systems were introduced. FAO's planned project 'for implementation of the strategy for improving information on status and trends of capture fisheries' was outlined.

Discussions

Guam reported that they have introduced local fisheries management practices that involve volunteers for data collection. Comments from local fisherman are also utilised. Additionally an awareness programme about the data collection program has been implemented. MPAs based on different ecosystems have been set up and villagers have commented favourably on the improvement in biodiversity, fish abundance and sizes.

Tokelau affirmed the importance of public awareness to allow people to understand the management process. PNG asked about the time intervals to be used for collecting catch and effort data (yearly, monthly, or weekly). Mr. Sugiyama answered that it was variable depending on the different country requirements regarding policy, fishery and staff resource availability etc. He stressed the importance of utilising the information from the collected data to improve management strategies.

Special FAO evening session on FISHSTAT

A special evening session on FAO fishery statistics activities (FISHSTAT and annual fishery statistics questionnaire) was conducted by FAO. Mr. Sugiyama demonstrated the FISHSTAT database and its operation systems, and explained details of annual fishery questionnaire forms. Some of FAO technical publications relevant to data collection and fishery statistics were introduced.

5. Socio-economic manual

Following a brief introduction on the SPC's PROCFish Project and its activities by Ms. Mary Power of SPC, Dr. Mecki Kronen of SPC made a presentation on the manual for socio-economic surveys of subsistence and small scale artisanal fisheries in the South Pacific. This manual represents the concerted efforts of experts from SPC's Reef Fisheries Observatory and SPREP's International Water Programme. The manual has been designed following the request of the region for such a tool. A survey of Fisheries Authorities in the region was conducted that produced 8 major questions common to all fisheries authorities that had returned the needs assessment survey (13 from a total of 17 countries). Before going to describe the manual, Dr Kronen surveyed the participants to see what major questions they themselves thought would supply the critical information required. The question results were almost identical to those that emerged from the survey of Fisheries Authorities.

The socio-economic survey was designed to provide answers to all of these 8 questions in the shortest and most efficient way. Experiences gained and research undertaken in the framework of previous projects were used to select best approaches and methods to date.

The software package that is currently being developed by Mr. Franck Magron from PROCFish/C was mentioned as a useful tool to help countries with data entry and analysis. It is planned to make available this software package on-line as well as in a hard copy format. The joint database and analysis was highlighted as one of the major advantages in developing such regional tools for survey collection and analysis as this would not be possible at the country level due to financial, human resource and time restrictions. Similar to the manual, the software needs to be seen as a guideline in terms of providing outputs as described in the manual and in response to the 8 major questions posed by the regional Fisheries authorities. However, data entered will also be made available in an Excel spreadsheet so that each fisheries service can explore and process data as desired.

Dr. Kronen stressed that this manual is to be understood as a guideline that provides the minimum data set pertinent to answer the 8 major questions mentioned above. She also highlighted that such a tool needs to take into account the variations between capacities, needs and requirements of all the PICs. It may therefore be necessary to tailor the survey to meet exactly the needs of questions to meet their particular needs.

Examples for local or country specific surveys were provided. For example, surveys on the live reef fish trade, mud crabs survey in New Caledonia), and several surveys that are ongoing in Guam in both inshore and offshore fisheries including the impact of by-catch dumping.

Participants were encouraged to share their experiences in conducting socio-economic fisheries survey and to highlight problems and challenges that they have already encountered in doing so. Doubts about data accuracy and reliability were mentioned. She expressed that it is important to determine how to get correct responses from the people and there is a need for awareness work in this. In this context, also the information policy that has been adopted by the last Heads of Fisheries Meeting (2004) was mentioned and that ensures data confidentiality. For example, information that is stored and used by SPC's data base and that relates to a particular country will only be provided to any other user at the discretion of the country concerned.

It was stipulated that more discussions will be held in the evening session on day three.

6. The analysis of fisheries data

Dr. King provided an overview of the use of fisheries catch and effort data. He stressed, however, that fisheries management includes aspects of sociology, economics and politics as well as biology. Also fisheries management involves the management of people rather than fish. He discussed the difficulties of measuring fishing effort, the units of which vary from fishery to fishery (e.g. units of 100 hooks in a tuna longline fisheries and the number of hours spent in the water for a beche-de-mer fishery). Indications of over-exploitation include decreasing catch rates and a reduction in the mean size of individuals in the catches.

Some catch and effort data based on a beche-de-mer fishery were analysed by participants. Participants worked in groups to produce graphs that were discussed and interpreted.

Discussions:

Niue asked about information that could be collected from tuna longline fishing boats to determine fishing effort. French Polynesia said that log books were used to get effort data and catch weight data could be confirmed from what is sold at factories. Dr. King said that log books need to be simple and that the number of hooks per set and the number of sets made per trip were the basic requirements to estimate fishing effort.

Guam noted the impact of technology. The use of fish finders, for example, has allowed boats to fish more effectively causing CPUE to appear to remain stable even though there is overfishing. It was questioned how to deal with such an impact in managing fisheries. Dr. King responded that such technology creep is a problem in many fisheries; he described a method of applying correction factors to adjust data values. Vanuatu expressed the belief that the workshop should concentrate on inshore stocks rather than on tuna.

Regarding an aquarium fish programme, Dr. King explained that data is easiest to obtain from the export agency, which has a licence and is required to keep records of species composition and catch amount. The effort data would have to be collected at the village collection level. Fiji mentioned that there were aquarium dealers that have particular forms to fill and have to adhere to CITES requirements. The collection is regulated by having particular sites fished at different times.

Fiji suggested that accurate information on breeding seasons for commercially important species would assist managers in making the right management decisions.

7. The importance of subsistence fisheries

Ms. Aliti Vunisea of SPC made a presentation on the nature of subsistence fisheries, in particular on how to involve owners and users of the resource in management. She said there is a need to consider traditional institutional knowledge, skills and legislation, customary rules, emerging issues, and the commercialisation of fisheries.

She said that in Pacific islands, there is a great reliance on subsistence fisheries. However, there are many differences between and within countries such as fishing time taken, frequency of fishing, gender participation, complexity of the fishery (commercialisation, target species, tourism, competition for resource use etc.). For Tokelau, Kiribati and Tuvalu, for example, fisheries remain a major activity and the main source of food.

There is a wealth of information on traditional fishing methods in the Pacific islands. She said that in her own village, for example, people go out fishing for mud lobsters when it rains as this is the time that the crustaceans come out of their burrows. There are such special fishing practices in most communities and these may, at times, have impacts such as excess and wasted catches that are given to the pigs.

Subsistence fisheries have also been affected by changes in fishing methods, and technologies. There is increased commercialisation and women sell more of the catch at markets. The fishery is dynamic in its marketing and distribution. Examples include gifts, payments, traditional and religious functions and exchange even across international borders. There are also developments in post-harvest activities.

In marketing, there is a greater involvement of middle sellers, and various networks in the country are used to market resources. There is little infrastructural support. The fishers are usually locked into a cycle; for instance, goods are bought on credit and income from fish sales is spent on paying off their credit and covering boat and transport costs.

Responsibility for coastal development is the responsibility of different government agencies (e.g. Ports Authority, Environment Department, Fisheries Department) and due to multiple uses of the coastal zone, there are some conflicts between users. New fisheries (e.g. the live reef fish industry and the aquarium industry) compete for resources, and should have guidelines. Customary and state rights also need to be considered in the process. Impacts of these new fisheries are not fully known and the rewards of participating are very alluring.

To further develop current fisheries, value-adding is necessary. Various community-based management practices exist in various forms in countries, and their success depends on leadership, institutional respect and support. There are difficulties in collecting information, such as knowing the right time to interview, the type of data to collect, the right questions to ask and the right way to ask the question. It is also challenging to convince people to conserve fish stocks when they do not have alternative sources of employment.

Subsistence fishing is a way of life in the Pacific. It has a sporadic nature (fishers may also be farmers or housewives). There is a greater trend towards commercialisation. Some aspects to consider include the dynamics of marketing, costs involved and dietary plans. Another challenge is to include the impacts of management on the people in the area. Current evaluations may include information on how stocks have changed in abundance and diversity, but the impacts on the people are not considered.

Discussions:

Vanuatu said that it had a growing aquarium trade since an exporter began operation two years ago. Because of its small size, the industry was thought not to have a huge impact until the Fisheries Department started receiving complaints last year.

Marshall Islands asked whether any information is available on size limits on collection of shells (e.g. Cowrie is an important resource that women use in making handicrafts). PNG said that stock assessment is also very important in community-based management – if there is any indication of catch rates reducing, there is a need for management.

Vanuatu commented that marine ornamental species had no size limits and it is important to work out some management measures for this trade.

Marshall Islands said that communities were advised on the need to protect future stocks of shells. Fiji said that it considers the fishery in which women fishers sell at markets as an artisanal one.

8 & 9. Collecting data from subsistence fisheries

In this session, Dr. King emphasized that subsistence fisheries in Pacific islands were based on many different species and fishing methods, and outlined the difficulties of collecting catch and effort data. Heads of Fisheries have emphasized the need for a common methodology that could be used (with minimal modification) by all Pacific islands.

A rapid statistics survey of fisheries in the Marshall Islands

Ms. Florence Edwards of the Marshall Islands Marine Resources Authority (MIMRA) gave a powerpoint presentation on a rapid statistics survey for coastal fisheries in the Marshall Islands implemented under the MIMRA/OFCF Fisheries Management Project in Arno Atoll.

Ms. Edwards outlined the MIMRA's outer island fisheries development activities and its rapid statistic survey on Arno. MIMRA buys fish from various atolls (e.g. Arno Atoll Fishermen Association) and sells to consumers in Majuro Atoll and Kwajalein Atoll. Fish are sold according to grades. On Arno, there are twelve villages. The community-based management organisations are represented by their leaders at the Arno Atoll Council. Information has been collected from the communities through interviews, workshops on awareness and fisheries management, and surveys.

The basic survey used was simple with information provided by fishermen. A survey is carried out four times per year, targeting every season, on Arno. The MIMRA gives out the questionnaire forms to the fishers. Although returns were initially poor, monetary incentives USD 10/sheet) resulted in return of 80% of the questionnaires. She described the analyses and parameters calculated from the data (fishing methods, fishing group members) collected. Constraints are isolation, overtime work, money incentives, language, limited staff and limited funds.

Discussions

Tokelau expressed the importance of traditional leaders' involvement in the fishery management process. In response to Tokelau's queries, Ms. Edwards answered that the leaders (traditional leaders, council members) selected fishers to represent the communities and encouraged them to return their completed questionnaire; they know the local fishers and their fishing activities and know if the information given in the questionnaire is correct.

Tokelau further asked how the programme was going to continue with payment incentives. Mr. Terry Keju of MIMRA responded that the monetary incentives were only for this year. Niue said that money incentives were given by the SPREP's International Waters Project in Niue for a similar purpose and some problems were created.

Samoa said that it had a similar experience with payments. Initially, a village refused to participate in the community-based management programme unless there were monetary and other benefits to the village. However, they later wanted to participate after observing the success of the programme in other villages. PNG said that monetary incentives can create bias in data collection and might actually result in an increase in fishing effort.

Guam expressed some concerns on representation of villages in terms of five fishers per village as this did not reflect the size of the village. Fiji said that its islands are scattered and it is very difficult to collect data from these places. To overcome this problem, the Fisheries Division has set up a rural fisheries service centre where fish are bought and catch data are recorded at the same time.

The village fishery survey and creel surveys in Samoa

Ms. Anama Solofa of the Samoa Fisheries Division made a presentation on the 2000 Village Fishery Survey and the 2002/3 Fisher Creel Survey. The Fisheries Division carries out a market and roadside survey and collects information on volume and value, fishing effort, species composition, length weight relationships, fishing methods and fishing areas. The Fisheries Division issues export certificates to those wanting to take fish out of country. Resource assessments are made for substrate cover, fish and invertebrate density, bleaching and coral substrate recover.

Ms. Solofa described the 2000 Village Fishery Survey carried out on value and consumption of fishery products under the AusAID Fisheries Project. Artisanal and commercial inshore data were collected under the survey which covered 20% of all Samoan villages (8,377 fishing households, 11,700 fishers). The survey results showed that the most common fishing methods were diving and spear fishing followed by gleaning. Much of the fishing was performed in lagoons. The total catch was 7,169 tons and the mean CPUE was 2kg/person/hour (29% of the catch was from outside the reefs). Villages with fisheries management plans (and marine reserves) had higher catch rates. The mean seafood consumption was 57 kg per capita (77% finfish and 23% invertebrates). Canned fish consumption was 14 kg per capita. The value of the subsistence fishery was 45 million tala.

The Fisher Creel Census funded by AusAID was conducted in 2002/2003. Data were obtained by interviews, observations of daily fishing activities and monitoring catch landing. In the survey, 877 fishers from 112 villages were interviewed (40% Savaii, 60% Upolu). 25% of households were engaged in fishing. The survey showed a high incident of part-time fishers (3-4 day frequency). Spear fishing was the most common fishing method, followed by hooks, lines and net fishing. A high proportion of the catch was eaten by the family and only a small proportion was given away.

Discussions

In response to a question from the Marshall Islands, Ms. Solofa explained that there is a feedback mechanism established in Samoa in which information is provided to the communities at annual meetings and 6-monthly reviews with communities. In response to Guam's query on discards, she replied that there are no discards in subsistence fishery since all of the catch is used for family consumption.

Niue asked how MPAs were established. In Samoa's case, villages are provided with information to assist them in establishing MPAs. Not all villages in the CBFM programme have MPAs. Marshall Islands commented that scientific data would assist in establishing areas suitable for MPAs.

Ms. Vunisea said that the approach in Fiji is one in which the Fisheries Department provides technical support and advises on the work to be done by NGOs and other institutions. The Fiji Locally Managed Marine Areas (FLMMA) usually involves extensive consultation work before a management plan is developed.

PROCFish socio-economic manual

Dr. Kronen presented and discussed with the participants all major questionnaire sheets of the socio-economic manual, i.e. household survey, finfisheries and invertebrate fisheries surveys components.

Additional information that is needed is to be collected using the key informant and general information data sheets was discussed also. It was again highlighted that the information can be collected in the framework of a wide range of approaches, including snapshot to long-term monitoring surveys. Survey results can also be used to compare communities, regions or countries as to detect communalities and differences. Each country needs to decide the interval at which it wants to perform a survey if the objective is that of a regularly updated census. Usually, intervals of five years are viable and appropriate. Socio-economic surveys can also be complemented with creel surveys if desired. Samoa supported this point by sharing its experiences in mobilising the next national survey. The Samoan example also served to demonstrate that national capacities may be fully utilized during the preparation, implementation and analysis of such a national survey and that this human resource and other requirements needs to be taken into account.

Discussions

Tuvalu asked how households were selected. PNG said that random sampling (i.e. by numbering houses) could be used. Dr Kronen said that random sampling is the most appropriate approach for this kind of survey. However, PROCFish also suggests to use survey sampling methods which are currently used and established in any of the countries concerned. The sample size of any such survey depends on the scale at which the survey is to be conducted, for instance at the village level only, or comprising a greater region or even at the national level. Wallis and Futuna commented that it cannot be regarded as a national survey if only four sites are selected. Dr Kronen said that the PROCFish-developed manual can be amended to suit any needs, i.e. the method described and offered can be implemented regardless of survey scale.

PNG asked about the determination of statistical errors. Cook Islands said that it has conducted a household survey with random sampling methods used by the Statistics Department. Dr. Kronen introduced a sample household survey for discussion, i.e. an easy to use table that is included in the manual and that helps identifying sample size of any survey scale. This table is promoted by comparative manuals developed for instance by SocMon, WorldFish etc..

Solomon Islands asked if the survey determined whether all the boats owned by a family were actually used for fishing. Also, there are difficulties in verifying that people are giving correct answers and not trying to please you. Dr. Kronen explained that answers prompted by the survey format will bring forward direct links between fishers and boats, i.e. fishing that is supported by the use of boats, and those that are not. Data reliability and accuracy always depends on the skills and communication between the surveyor and the interviewee. Dr. Kronen stressed the need to recruit skilled surveyors and to train surveyors prior to implementing the survey.

Samoa stressed why the manual did not include any questions on remittances. Niue and Tuvalu commented on the questions regarding the giving of fish and believed that the focus should be on who gives rather than who receives. Guam was concerned that the number of fishers by time, proportion of fishers, type of fishers, frequency were not taken into account in the questionnaire. Also, the age limit of 15 year olds for fishers appeared too old. Samoa suggested that tilapia could be included in the category of fresh fish in the questionnaire. Wallis and Futuna also suggested the inclusion of crabs and other species (e.g. coconut crabs) in the list.

Tonga queried the relationship between fishing effort and consumption patterns. Samoa commented that the questions HH9 and HH10 needed to be quantified. Regarding the HH4, Fiji and Tuvalu suggested that other equipment should be included in the questions (e.g. hiring, cost-sharing).

Samoa suggested that the finfish survey questionnaire should include the costs of fuel used. French Polynesia also requested that the horse power of the boats used should be included. Vanuatu said that log sheets in the countries could provide additional important information such as fuel. Nauru asked if inland waters could be included in the questionnaire. Vanuatu suggested that boat specifications data should be included.

Regarding the invertebrate component, Wallis and Futuna said that some invertebrates were targeted mainly for commercial purpose (e.g. beche-de-mer, pearl, trochus, lobster) and that this should be specified in the questionnaire.

Dr. Kronen explained that many of these concerns are questions and items that are of national or sometimes even only of local importance but do not generally apply for the common situation in the PICTs. The manual aims at providing the minimum data set needed to answer the most important questions that have been voiced by the regional fisheries authorities. Any information though that is considered necessary can easily be included, i.e. the manual promotes a survey format that is a basic guideline and open for additions.

The definition of “an adult” follows the internationally recognised system of 15 years and over. Dr. Kronen mentioned that experimental surveys were made to include children (elementary school children of ~ 10 years) in fisheries surveys. Results obtained from these test surveys are published in the SPC Women in Fisheries Information Bulletin 14 September 2004 (pp 9-18) that can be accessed on the SPC webpage. However, it has to be stressed that surveying of young children and teenagers involves various difficulties.

At the conclusion of the session, Mr. Fa’asili informed the participants of the need to indicate their choice to either; a) use the PROCFish-developed manual, b) use the manual with some modifications, or c) develop new methodologies.

Special Session for PROCFish country attachments

Ms. Mary Power of SPC (Coordinator of PROCFish Project) provided background information on the PROCFish Project and its activities. The project has been in the design phase for five years. The first phase is now nearly completed and the second phase is about to commence. The project utilises region-wide comparative assessments as standardised methodology and it is envisaged that results will be made available to all interested countries. The indicators or proxies identified in the project could be useful for local and national reef fishery management. Tool kits are being developed for this purpose. It is also intended to increase the capacity of the region in survey methodology.

Ms Power said that the PROCFish project which integrates ecological and socio-economic aspects of marine resources is the first attempt to have a regional approach to monitor trends in the region. Data collection this far has targeted the development and use of standardised methods with a multi-disciplinary approach. A large database is now available and the current focus is to have this information finalised and reported back to the countries. The project is trying to work on data sets that could be a benchmark for the region.

Ms Power said that training and capacity building are a major component of the project activities and has thus far included a number of six-month field attachments. However, the first field activities were conducted in Fiji and Tonga without any field attachments. She said that it has been a difficult task to collect information from all the sites. The constraints faced have included the remoteness, isolation and spatial spread of sites as well as the sheer volume of work.

Additional session on reproductive cycles in marine species.

This additional session, presented by Dr King, was included at the request of participants who believed that reproductive studies were necessary to provide managers with information needed to protect stocks during spawning times and to set legal minimum lengths.

Dr King said that traditional knowledge could often be used to identify spawning areas and times for some species (particularly for those species that form spawning aggregations). Alternatively, monthly samples from local markets could be dissected and the reproductive stage of their gonads assessed.

Data based on a trevally species were provided for participants to analyse. Participants produced graphs to illustrate the reproductive cycle and to estimate the mean size at first spawning. The exercise was also used to demonstrate the use of “running means” to smooth data and see trends more clearly.

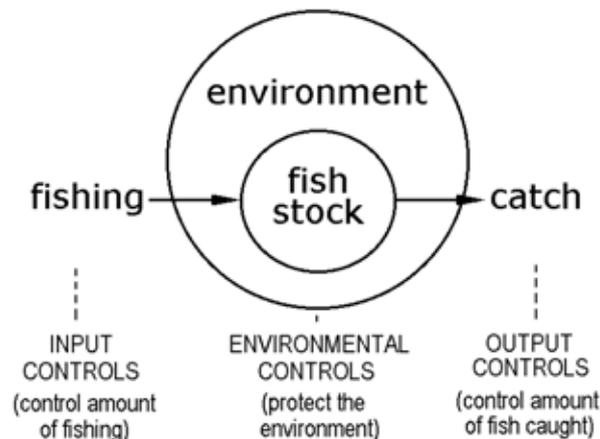
Discussions

Wallis and Futuna noted that, in reproductive studies, it was easier to work with crustaceans (e.g. lobsters) because they carry eggs externally. The problem with many species is to define reproductive maturity.

Dr. King discussed the difficulties with assessing gonad development in a variety of species including bivalve molluscs and prawns (the latter being a crustacean which does not carry its eggs externally).

10. Fisheries tools (input and output controls)

Dr. Michael King presented a session on the tools that are available for use by fisheries managers. He said that managers have a range of controls that can be used in the management of fisheries, and used the diagram shown below to illustrate this.



Input controls involve limiting the amount or type of fishing - e.g. the issuing of fishing licenses and restriction on the use of certain fishing gears. Output controls involve controlling fish catches – eg by setting size limits, minimum mesh sizes on nets and the rejection of females. An increasingly important need is to protect fish habitats.

Dr King said that some of these controls are more applicable to commercial fisheries and many are unreasonable in the case of subsistence fisheries. However, many communities are applying restrictions on certain fishing gear and are setting up community-owned MPAs to ensure the sustainability of their fisheries resources. He noted that many traditional fishing methods (such as fish drives) are also environmentally destructive, and many of these are now causing problems because of increasing populations and the larger number of fishers involved.

Discussions

Nauru asked whether it was better to catch smaller fish and protect larger individuals (because of their increased egg production). Dr King said that it was true that there is a cubic relationship between length and egg carrying capacity – that is, when the length of a fish doubles, its volume increases by 8 times. Therefore large fish contribute greatly to spawning success. However, small fish have to be protected to allow enough of them to reach reproductive sizes.

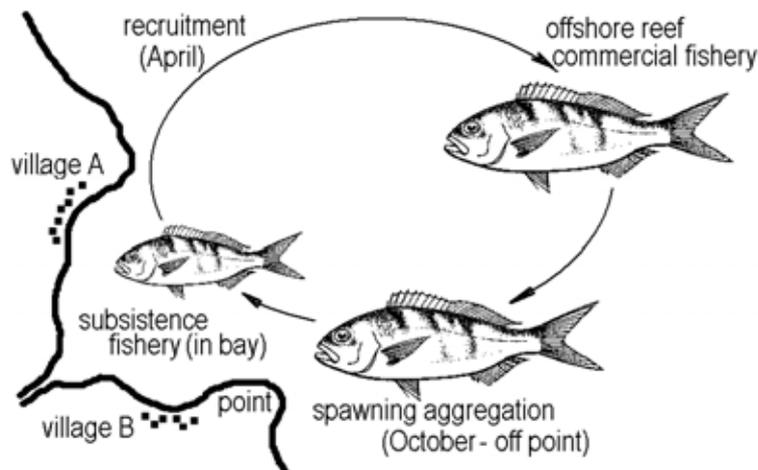
11. Fisheries regulations and their enforcement

Dr King led this session on regulations and enforcement. He noted the difficulty in enforcing regulations because of large coastlines, many islands, many fishing methods, and a great variety of species in the catches. In many rural areas there is also a resentment of what is perceived as government “interference” in community affairs.

Dr King led a discussion on who should enforce fisheries regulations – fisheries officers, police or communities? In the case where fisheries officers are the enforcers, there is a conflict with their primary roles as data and information collectors. He said that public education to raise the awareness of the need to manage resources was required and that penalties and fines should be regarded as a last resort.

Dr King said that the cost of enforcement is often high and should be considered in all fisheries management plans. Involving fishers and other stakeholders in fisheries management is one way of ensuring public support and compliance with regulations. He said that in many cases alternative regulations are easier to enforce. He gave the case of applying size limits to beche-de-mer. It would be a lot easier (from an enforcement viewpoint) to make it illegal for a small number of processors to buy undersize beche-de-mer than to make it illegal for many hundreds of fishers to catch undersize animals.

Dr King provided an exercise on fisheries management based on the hypothetical fishery suggested in the diagram below. Five groups worked on the exercise and each presented its suggested management plan to the meeting. A common theme was the involvement of all stakeholders, the application of controls on nets (used in the inshore fishery) and the protection of the spawning aggregations. Sociological issues and the need to compromise were discussed.



Discussions

Guam and Fiji both highlighted the importance of involving communities in fisheries legislation and enforcement. In Fiji, fisheries wardens are appointed from communities to enforce regulations, and they are officially recognised. Training is needed for fisheries wardens to ensure that they know what they are doing; one problem is that the fishers have higher-powered boats than the wardens have. There have been cases in which communities have confiscated boats and equipment used in illegal fishing activities and handed them over to the police.

Marshall Islands said that there are concern on the implementation of traditional laws and by-laws with conflict between the authorities of the traditional leaders or the State. The system is complicated by MIMRA having the authority to enforce regulations and delegate their authority to village councils.

Guam agreed that fisheries officers involved in data collection should not be involved in enforcement as it would affect people's attitude and willingness to provide information. Other sectors, such as tourism, also rely on fisheries. Guam has put in place several enforcement measures to save time and cost; one of these involves infringements in which penalties have to be paid without going through the judicial system. Because of the loss of tradition and customs, people in communities report on outsiders coming in to fish but will not report on their own community members, who are often the worst offenders. There is a need to balance education, awareness and enforcement.

Niue reported that there is a need to have rules under its national fisheries legislation but to also work with communities as the Fisheries Department lacks the capacity to enforce regulations.

Mr Tuilaulala, Acting Director of Fisheries, Fiji, gave a description on legislation and how it progresses through cabinet. He cited the example of the humphead wrasse, which was found to be a severely depleting species after 10 years of survey work in Fiji. He noted the importance of consulting with different sectors (e.g. Fijian Affairs, Environment Department, NGOs) to ensure their support when such a proposal as banning fishing on humphead wrasse was submitted to the Minister for approval and presentation to the cabinet. He said that the work requires background information, consultation results, and proposed solutions that are not too technical but in a form that is understood by politicians. Sometimes, the process requires going back to the Attorney General's office to sort out legalities. Then, a cabinet paper is presented for cabinet approval. In the case of the humphead wrasse, there was intensive lobbying in the international community for its inclusion under CITES. Support was given by the US, Australia and other Pacific island nations. After gazetting, the regulation including a ban on capture and export of the species was distributed widely for public information.

12. Fisheries management plans

Dr. King led a session on fisheries management plans. He said that the development of management plan means being proactive rather than reactive; that is the manager takes the initiative rather than responding to crises as they occur. He noted that in the case of community based fisheries management, plans were often developed and prepared by the communities themselves with the government authority (e.g. Fisheries Department, Environment Department etc.) acting as a facilitator in the process.

Dr King provided advice on the contents of management plans and said that these usually included a background on the fishery, threats to the fishery, aims or objectives of the plan, strategies to achieve the objectives, and a description of proposed actions, including recommended regulations.

13. Resource Assessment and Monitoring

Mr. Samasoni Sauni of SPC gave a powerpoint presentation on resource assessment and monitoring. He said that contributions of the inshore fishery to the region are highly recognised, but poorly understood. The multi-species and multi-method nature of the fisheries makes management very difficult and western-style management approaches have resulted in little success. He said that communities should be involved and existing traditional knowledge used in fisheries management.

Mr Sauni said that surveys should be repeated over time to detect changes; this provides a form of "audit" and compares information "before" and "after" various changes and developments. All areas and communities cannot be surveyed, and surveys may differ according to management needs.

He said that "What should indicators indicate?" is a question that needs to be addressed before monitoring is undertaken. Indicators may relate to ecological health and change (e.g. abundance, ecological importance, habitat formers and habitat modifiers). The socio-economic importance of species must be also considered.

Mr Sauni said that survey methods include Rapid Assessment Protocol, Rapid Appraisal Techniques, Coral Reef Assessment and Monitoring Program, Reef Check, Global Reef Monitoring Network and SPC Protocol (distance methods for fish, mixed methods for invertebrates). Community-based monitoring methodologies include PRA/RRA (Participatory Rapid/Resource Assessment, PART (Participatory Aquatic Resource Techniques) and REA (Rapid Ecological Assessment Techniques).

Mr Sauni described some case studies in Fiji (Verata: BCN-USP, Ono Island: WWF-South Pacific, Muaiyuso, Ono. Votua etc.) as well as work in Tonga. In these cases, the communities participated in the stages of work before a management plan was put in place. The PROCFish Project takes a multi-disciplinary approach. Figures and data from Lakepa village in Labasa were presented and discussed. He said that it is preferable to use common methods that can be used to compare data sets of the country with those from neighbouring countries.

Mr. Sauni introduced the monitoring work on MPAs in the Cook Islands. Methods used for baseline and monitoring were line transects and quadrants and an underwater video camera was used in the survey. Baseline surveys were conducted before establishing MPAs. While high recruitment was observed, there was a corresponding increase in fishing pressures around MPAs. Thus, although a lot of fish were seen in MPAs, there were very few in adjacent areas. In cases where MPAs were eventually opened to fishing, the gains in protection and recruitment from over two years were lost within one or two days of intensive fishing pressure.

Mr Sauni said that in Vanuatu, old transect methods were used. Time-consuming methods of counting and identifying fish underwater have been replaced by using the PROCFish-finder and the SPC Protocol for assessing reef fish resources.

Discussions

Fiji asked for guidance on survey times, for the beche-de-mer fishery, for example. Mr Sauni said that there is no set times for such surveys and it depends on the needs and resources.

Marshall Islands asked whether there is any way to give the information back to the communities. Mr Sauni said that in Fiji, this is achieved by involving communities in planning, development, fieldwork, analysis and monitoring of the resources. Another concern mentioned by Fiji related to the need for standardised survey methods to be used in all areas; they could be assisted by SPC in developing such methodology.

14. An ecosystem approach to fisheries (EAF)

Dr. King provided a brief presentation on the need for an ecosystem approach to fisheries management. He said that environmental issues that threaten fisheries must be addressed in fisheries management plans. That is, the conventional approach of controlling fishing effort and catches must be broadened to include the protection of fish habitats.

Dr King said that the biggest problem in achieving EAF was often the lack of cooperation between the different government agencies responsible for the environment and fisheries. In addition, government agencies including those responsible for public works, forestry and agriculture were often the worst offenders in some types of environmental degradation.

Discussions

Guam noted that if, for example, a road is to be built there is a process to go through involving several agencies in order to obtain a permit. Each agency has about 2 weeks to make their comments on the likely impacts.

Samoa noted that it is important that there are objectives, aims and strategies, and these are appreciated by all parties. The Marshall Islands claimed that its fisheries agency is not standing alone; they have a working group involving other agencies that work on the plans with their community programmes.

15. Marine protected areas (MPAs)

Dr. King provided a powerpoint presentation on Marine Protected Areas (MPAs). He said that the aims of MPAs proposed by environmental agencies (maintenance of biodiversity, protection of marine habitats) and fisheries agencies (increased fish stock sizes) are similar. The difficulty, in many Pacific islands, is getting these agencies to work together.

He discussed the placement of reserves in relation to one proposed during a recent visit to Nauru. Longshore currents will often determine where larvae drift and settle, and he discussed a simple method of measuring these currents using plastic drift bottles.

Dr King said that many fish larvae can swim rather than drift, and can detect nearby reefs to settle. Many tropical species are territorial and move elsewhere in response to overcrowding. There is indirect evidence that MPAs do increase fish abundance in adjacent fished areas.

Dr King went through the key lessons learnt in establishing MPAs; these include the involvement of all stakeholders and the development of a legal framework. In addition, MPAs need to be integrated into broader coastal management regimes. In the case of community-owned reserves, it is important to set reasonable (and not overly ambitious) boundaries, that communities can live with.

16. Small to medium enterprises (SME) in coastal fisheries

Mr. Semisi Fakahau, Chief Programme Officer, Enterprise and Agriculture Section, Special Advisory Services Division, Commonwealth Secretariat, made a presentation on Small to Medium Enterprise (SME) development as an essential component of coastal fisheries management and development.

Mr. Fakahau stated that under the Commonwealth Secretariat Strategic Plan 2004/05 – 2007/08, the new focus of the Enterprise and Agriculture Section's work programme is on supporting Commonwealth Secretariat member countries to strengthen agricultural (including fisheries) and enterprise competitiveness, particularly at the SME level. He said that the new focus on coastal fisheries SME development is complementary to other activities undertaken jointly by the SPC and Commonwealth Secretariat on coastal fisheries resources management.

He said that SMEs are important in formulating national economic strategies, in fostering capacity and employment, in technological and managerial development, in developing export capabilities, in advancing women and youth and in improving domestic markets.

Mr. Fakahau said that an SME is a business, an activity undertaken by an individual or group to generate income with the aim of making a profit. A business sells goods or services to customers and always ensures that the flow of money into the business is larger than money flowing out of the business in order to continuously make a profit. There are two flows through such businesses; (i) product flow – to catch or buy fish and make it available to the market (ii) cash flow - customers pay for fish and related expenses. It is important that the business owner ensures that there is always enough cash flowing through the business to pay the expenses and continue catching fish to be sold at a profit. He said that it is important to understand that the profit motive of fisheries SMEs may contradict national strategies on sustainable management and development of coastal fisheries resources. A good example of this is the decline in fish stocks due to the shift from subsistence to commercial fisheries. It means that should the fish stocks continue to decline, it would reach a stage where the resources become over-fished causing the businesses to become bankrupt due to diminished product and cash flows. This highlights the fact that, from a fisheries resources and business management point of view, the business can only be sustainable if the resources are sustainable.

Mr Fakahau said that to be able to effectively address the above problem, Fisheries extension staff need to have a good understanding of how business works in order to be able to deal with the impact of commercial fishing on resources. They should be able to provide advice on both business aspects as well as resources management to the business owners. He said that PNG has taken the lead on this with assistance from the Commonwealth Secretariat. The Commonwealth Secretariat funded a coastal fisheries SME development training programme in PNG, which began by training fisheries extension officers on business awareness and planning to become SME trainers as well as extension advisers of business owners. He also stated that there is a need for statistical data to complement advice given to aspiring SME business owners with new business ideas.

Mr. Fakahau said that the Commonwealth Secretariat, SPC and the Government of PNG are currently undertaking preparatory work to introduce the PNG coastal fisheries SME training model into other Pacific island countries in early 2005.

17. Aquaculture as an important component of coastal fisheries management

Ms Lynette Kumar, Associate Professional Officer, FAO/SAPA gave a PowerPoint presentation on the importance of aquaculture in coastal fisheries management.

Ms Kumar stated that fish was an important source of protein in most Pacific islands as well as of high economic significance. In the Pacific, as elsewhere, increasing populations are resulting in increased demand for fishery products. World capture fisheries production has remained stagnant in the last decade, and there has been a decrease in the per-capita supply. Consequently aquaculture is becoming increasingly important to fill the gap between supply and demand.

She provided a brief background on global and regional aquaculture production trends and the growing importance of aquaculture in food production (including species produced) and the live organism trade (live seafood and ornamental products) as well as in conservation and fishery/stock enhancement. She also described the social and economic benefits derived from aquaculture. Some positive impacts of aquaculture include addressing socio-economic needs, nutrition and health, income generation, foreign exchange and the use of degraded lands. Negative impacts include use of chemicals, loss of genetic diversity, introduction of unwanted alien species, potential spread of diseases and parasites, dependence on wild species for feed, conflicts in resource use, and degradation of coastal wetlands.

Aquaculture production in Pacific remains low. The two major cultured products are pearls from Cook Islands and French Polynesia, and shrimp from New Caledonia. Seaweed farming (*Kappaphycus* sp) is also well established in Kiribati. There is however, a growing interest in developing aquaculture in the region for both food security/alternative source of income and stock enhancement purposes. Potential species include tilapia, carp, prawns, giant clams, seaweeds, trochus, and sea cucumbers. Melanesian countries are showing growing interest in developing inland freshwater aquaculture. The marine aquarium trade has also grown in the last few years and Pacific islands are major suppliers. There is immense potential in supplying cultured products (including live rocks) to this industry.

She also mentioned the “Coral Gardens” project initiated by the NGO – FSPI in Fiji as an example where aquaculture was used as part of a wider coastal management in the Coral Coast. Cultured corals were being transplanted to enhance degraded reef areas. Commercialisation of this activity for the aquarium trade is also envisaged.

Constraints to aquaculture development include a lack of aquaculture tradition in the Pacific, lack of legal frameworks at national levels to support its development, lack of funds, capacity, seed sources, feed materials, marketing channels, and a lack of technical assistance and skills. Countries also vary considerably in their geophysical characteristics and natural resources. Aquaculture is however recognised as a sustainable option to declining inshore fisheries in the Pacific and efforts are being made to develop this potential. It is important to consider both ecological and economic impacts in any aquaculture development. Negative impacts often result from poor planning. She also recommended use of FAO’s Code of Conduct for Responsible Fisheries series on aquaculture development as a guide in developing aquaculture in the Pacific.

Discussions

Niue asked about live rocks. Ms Kumar replied that most of the live rock is collected from the wild and there are now attempts to culture rocks. Aquaculture policy and guidelines tend to be the problem in the region, and this may be a reason for failure, especially in environments like those in atolls. Fiji stated that it has aquaculture in all of the three habitats mentioned. Lack of funds to support aquaculture is a problem. There is also a lack of legislation in aquaculture; the pearl industry, for example, is having problems with water leases.

Guam talked briefly on aquaculture and the progress in Guam. Nauru said that SPC has assisted them to develop aquaculture; after a workshop by the SPC aquaculture section from, tilapia, which have been regarded as pests for a long time, are now accepted by local people. Fiji claimed that the new breed of tilapia introduced by SPC has become very popular and these aquaculture activities are regarded as good for food security.

18. Involving fishers and other stakeholders in fisheries management

Dr Michael King and Autalavou Taua lead a session on the co-management of fisheries. Dr King discussed the importance of involving stakeholders (particular fishers) in fisheries management. Fisheries co-management results in the ownership of management plans, as well as an increased compliance with rules and regulations.

Dr King said that in the case of commercial fisheries co-management can be installed by the formation of management advisory committees (MACs). The membership of such committees will include stakeholders such as fishers, boat builders, and processors as well as the government. Dr King gave an example of the MAC used in the Samoan tuna fishery.

Dr King said that in the case of subsistence fisheries, several countries are encouraging community-based fisheries management (CBFM). Dr King and Mr Taua described the process used in Samoa. Before embarking on CBFM, it is important to establish whether the government is willing to empower communities and whether communities are willing to take actions to manage their resources. There also needs to be some degree of community control of adjacent fishing grounds. It should be recognised that there are some things that CBFM cannot do. It cannot provide short term solutions and it is ineffective in addressing extensive and terrestrial-derived environmental problems; for the latter, ICM is required.

19. Public awareness

Mr. Teriihautoa Luciani of SPC provided a presentation on public awareness. He outlined the activities (including training attachments) of the SPC's Fisheries Information Section for the member countries and territories. The Section also assists in publishing reference materials (e.g. posters for fish and shellfish, ID cards for fish, pamphlets etc.). The SPC Suva Office provides training opportunities, graphic work, video production, radio production and media print production. The Section uses the private sector to produce awareness materials and explores other avenues to get information and awareness out to people. Mr Luciani said that extracts from a course paper used at the USP's Coastal Fisheries Management Courses on Public Relations have been given out as resource paper.

Mr Autalavou Taua of Samoa also gave a presentation on public awareness. He mentioned the use of brochures, posters, information sheets and educational materials. He emphasised the need to provide assistance with school curricula on subjects such as marine environmental studies. He said that articles and presentations for television, local newspapers, and radio can be used to raise public awareness.

Mr Taua also talked about the bottom-up community approach used in Samoa. He said that there are several steps involved in raising awareness. There is an initial contact with the village to explain the CBFM programme. Then there is a meeting between the village leaders and fisheries department at which it is decided whether to accept or reject the programme. If accepted, there are group meetings that utilize the problem-solution tree process. He acknowledged that information gathering is a two-way process and the knowledge of village fishers, both male and female, is very valuable for fisheries management.

He said that it is important to maintain the interests of communities by making regular contact. These contacts include exchanges of information and reviews of village fisheries management plan.

Discussions

Aliti Vunisea of SPC emphasised the points made by Mr Taua. She added further points relating to awareness and working with communities that may provide more effective communication and outputs. She gave an illustration of involving community members in a group exercise in identifying stakeholders. The exercise can be used to replace questions about stakeholders in questionnaire forms.

Vanuatu said that dynamite fishing is increasing and wondered about the causes. Mr Taua said that it is a matter of constantly raising awareness in communities about the negative effects of such actions.

The Marshall Islands asked how fisheries management ordinances (eg the issue of licences) could be complemented by community fisheries management strategies (eg. size limits). Mr Fa'asili suggested that the fisheries management ordinances should be included in the condition of the licences.

Mr Samasoni Sauni of SPC said that there are different and conflicting strategies between government and fisherfolk due to their different agenda. Governments worry about sustainability whereas fishers care more about their livelihood and food. The approach of co-management should be one of reconciliation between these two parties and utilised as a tool for community management.

Fiji asked whether problems identified by villages are confirmed by scientific surveys. And how long does it take between initial contact and returning the management plan to the village. Are the same people involved in surveying and reporting to the communities ? In Fiji, they are experiencing delays in reporting due to constraints.

Mr Taua said that fishing communities made their own judgements but scientific advice was provided by fisheries staff. The process is a long one and the time between initial contact and returning the management plan to the village is about 13 weeks. Mr Fa'asili said that there is a difference between the methodologies used in Fiji and in Samoa. In Samoa, a management plan is prepared by the community. In Fiji, FLAMMA works and implements plans and surveys as they go along. Both are good ways.

PNG asked if an offending villager of the same community was given the same penalty as someone from outside. In PNG experience shows, village offenders are let go while outside offenders are given severe punishment. Mr Taua said that in Samoa, the offender is fined by the village councils (a fine of pigs or canned fish etc.) whereas offenders from elsewhere are punished through the national by-law system.

Fiji asked about working with schools and whether the awareness raising was included in the formal curriculum and is examinable. Tokelau also expressed interest in curriculum work. Mr Taua said that fisheries staff was invited to schools to give talks on the marine environment. Dr King said that fisheries staff in Samoa had sat in on Education Department curriculum development meetings to produce a curriculum text book with local and Pacific island examples. Ms Solofa from Samoa said that a book was launched early this year and included fisheries management and environmental issues.

Nauru asked about installing community-based fisheries management in cases where there were open access fisheries. Dr King replied that some countries such as Tonga had proposed setting up special management areas that the community would control. He requested Tonga to make a comment on this issue. Tonga said that there was talk about it, but nothing had been done.

20. The structure of fisheries agencies

Dr King gave a brief session on the need for fisheries agencies to re-examine their goals and structure in the interests of effectiveness. He said that one of the activities requested in the strategic plan approved at the Heads of Fisheries meeting was the provision of assistance with the organisational structures and HRD plans of fisheries agencies. The fact that the aims of many agencies have changed to stress conservation rather than development means that their missions, operations and structure may need updating.

Dr King said that the process should be participatory and is disruptive in that it involves all fisheries staff for up to four weeks. Nevertheless it is a worthwhile and necessary exercise. The full process involves revising the mission statement of the agency, setting appropriate goals, setting verifiable targets, listing the outputs required and identifying the appropriate activities.



Discussions

Nauru asked if there were any reports giving examples of organisations goals and structures and noted that there were many political obstructions to such re-organisations. Dr King said most fisheries agency had an annual work plan that included organisational charts. However the process has to be repeated for each individual country.

PNG said that fisheries department was previously under a government ministry and then transferred to become a corporation. Fiji said that its fisheries structure was developed as part of a review of their corporate plan. It has helped in the re-organisation of the department and redefined the work programmes of the various functional units of the department. It has made work more streamlined and has resulted in the more efficient use of financial resources.

D) Closing remarks and summaries

Wrap-up: The training coordinator, Mr Ueta Fa'asili, summarised the topics covered in the 5 days of the training workshop. He briefly discussed the topics relating to fisheries management and fishery statistics. Topics discussed for fisheries management included...

- Introduction to Fisheries Management
- Threats to Fisheries
- Importance of subsistence fisheries
- Fisheries regulations and enforcement
- Fisheries Management
- Resource assessment and Monitoring
- Ecosystem approach to fisheries (EAF)
- Marine protected areas (MPAs)
- Small to Medium development (SME)
- Aquaculture
- Involving fishers and other stakeholders
- Public awareness, and
- Structure of fisheries agencies

And those related to fishery statistics included ...

- Fisheries statistics
- Catch and effort data
- Social-economic manual
- Analysis of Fisheries data
- Common system of data collection and
- Collecting data from subsistence fisheries.

During the training, three approaches were used. There were presentations by resource persons on various topics followed by general discussions. In addition, participants were divided into groups to carry out practical exercises (including analysing catch and effort data, devising fisheries regulations and developing a management plan). The practical part of the training was found to be most useful by the participants. The coordinator noted that participants had different levels of experience and skills; some were familiar with particular topics and some found them fairly new. It was pleasing to note that the more experienced participants helped less experienced ones in the conduct of group practical exercises.

One of the outcomes expected from the training was to find out how the countries would come up with a common system of data collection. The Regional Strategic Plan required SPC to develop a simple manual to help countries in their fishery data collection. The common system was introduced by explaining the collection data form developed under the socio-economic manual by Dr Mecki Kronen of SPC. This session took most of one-day session. At the end of the session, a question was put to the participants through a questionnaire on how they found the collection data form and the socio-economic manual relevant to their needs. Ninety-two percent of training participants felt that the data collection form developed under the socio-economic manual would meet their needs but require modifications to suit particular situation in each country. Eight percent felt that there was a need to develop a new data collection form. Questions were asked how countries would learn to use the manual. The coordinator advised the participants that upon the endorsement of the socio-economic manual by the participants, training will be arranged for countries on the use of the manual.

Niue questioned whether modifications to the manual would be done at a regional or national level. The coordinator advised the participants that modifications would need to be done at national level to suit each country's situation.

The coordinator felt that it was a successful training and that everyone had contributed to its success although experienced participants contributed more than the others. He briefly acknowledged the contribution of the co-organizer (FAO) and the other training sponsors (Commonwealth Secretariat, WPRFMC and the European Union), and the support of the SPC staff as well as the assistance of his support staff from SPC and that of the training consultant – Dr. Mike King. He also thanked the Acting Director of Fiji Fisheries for allowing his time to open and close the training.

At the end of the coordinator's wrap-up, participants were urged to provide comments by filling in the evaluation forms that were designed to develop and improve future training programmes of Regional Strategic Plan. The coordinator had hoped that participants would take home they learnt from the training and apply them in the management of fisheries in their own respective countries.

Words from sponsors: Mr John Calvo of the WPRFMC thanked all participants. He thanked everyone and emphasised the importance of networking and keeping in touch to ensure contact between managers around the region. Despite distances that exist, problems and challenges are the same. He was pleased that the WPRFMC had the opportunity to contribute to the training.

Mr. Masanami Izumi, Fishery Officer of the FAO Sub-Regional Office for the Pacific Islands spoke on behalf of FAO and thanked everyone for participating at the workshop. He especially thanked SPC staff for the work that went into organising the joint meeting. He advised that FAO membership in the SPC regional was 7 members 10 years ago, and it is now 14.

Closing remarks: Closing remarks were delivered by Mr. Saimone Tuilaucala, Acting Director of Fisheries Department, Ministry of Fisheries and Forests in Fiji. He emphasised the importance of fisheries statistics and information in fisheries management. He said that the 5 day meeting had been intense and had covered a wide range of areas and topics. The challenge is to apply the lessons learned to manage our declining resources. One of the key tools involves the use of catch effort data that provides baseline information on the state of our resources. In shifting effort away from fisheries, the importance of aquaculture cannot be disregarded. Although not covered in details during the training, value-added processing is also an area that needs to be supported and encouraged.

He said that people in the Pacific have the answer to fisheries management; community participation is the key to workable management. With the shift from the development to management, the focus in fisheries sector work has really changed. Now with the emphasis on conservation, the primary role is to rely on the communities.

Mr. Tuilaucala thanked the American and French territories as it was the first time all territories have attended a regional training. As a host, Fiji thanked everyone for their contributions. He thanked the sponsors for providing funding, and providing the opportunities for countries to attend the training. He thanked SPC, the training coordinator, Mike King, and everyone that was involved in the organisation of the training. Finally he thanked the participants without whom the meeting would not have been possible.

Response to closing remarks: In response to Mr Tuilaucala's closing remarks, Peter Jacob of Nauru thanked Fiji for being the host of the training. He also thanked the messages from the various resource people. He reminded people on the importance of managing people and not only managing the resources.

Closing Prayer: As a tradition amongst the Pacific island countries, Acting Director of the Department of Economic Development and Environment from Tokelau (Mose Pelasio) closed the training with a prayer.

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Pacific ACP and OCT Regional Oceanic and Coastal Fisheries Development Programme - Coastal Component

PROCFish - COFish Project Update November 2004

Purpose of the Project

“Providing the basis for better management of reef fisheries in the region thereby improving future food security, rural income, and social and environmental stability by providing the baseline information on which Pacific Islands can take action”

Participating Countries

PROCFISH I (03 / 02 to 03 / 07)
Fiji Kiribati New Caledonia PNG French Polynesia Samoa Solomon Islands Tonga Tuvalu Vanuatu Wallis & Futuna

PROCFISH II (05 / 04 to 05 / 07)
Cook Islands Federated States of Micronesia Marshall Islands Nauru Niue Palau

Expected Outputs

- First ever region-wide comparative assessment of the status of reef fisheries using standardised methodology.
- Application and dissemination of results in country reports comprising a set of "coastal fishery resource profiles" for the sites in each country to provide information for coastal fisheries development and management planning.
- Development of a set of indicators/proxies, or fishery status reference points, for use as guidance when developing local and national reef fishery management plans and monitoring programs.
- Toolkits (Manuals, Software and Training Programs) for assessing & monitoring reef fisheries and increased capacity in using standardized survey methodologies across Fisheries Departments in participating countries
- Data / Information management systems – Regional and National DBases
- ♣ Not specified but proposed - Develop follow up projects that utilize this information to address specific challenges commonly experienced by fisheries departments and target communities, working towards sustaining and improving resource management in the region (involving SPC Coastal Fisheries Programme more widely).
- ♣
- ♣ **What is different about this project:** PROCFish/C is the most comprehensive, interdisciplinary assessment of reef fisheries to ever be undertaken in the region. The **interdisciplinary** nature of the project, combined with the **scale** and **scope** of the project (regional scale but site-based) makes this a very innovative approach to reef fisheries management in the region and even globally. Yes – we are using traditional survey techniques – standardized so that each site is treated the same and yes - there has been some work of this nature done in the regional previously, but this has been mostly ad hoc / localised or single site focus – what we are doing is different for 3 reasons: 1. we are applying the same technique across the whole region and amassing a significant body of information not currently available that will be of value to the countries and 2 ; we are looking at both the ecological and socio-economic aspect of marine resource use at the same sites, and most importantly –3. we are taking this a step further than the traditional approach – as well as being able to use the information for describing the resources / habitats / socio-economic environment / status we will be taking this information at a comparative scale across the region to attempt to determine the links between the different factors to try to find a “suite of indicators” that can be used in country to monitor fishery / resource status and input into fishery management policies and actions.

What has been achieved (Mar '02 to Aug '04):

A considerable amount of targeted outputs have been achieved in the first 2.5 years.

Data and Information Collection and Management: The in-country field work had been extensive (Attachment) involving on average, a dedication 25-30 working days per team member per site (including preparatory time). The project incorporates four sites per country. A significant body of data and information has been accumulated. An information management system and repository has been developed to house this and facilitate data access and analysis (pending agreement on a policy for data access and sharing). At this point we now have sufficient dataset to permit us to i) determine what should be the most useful content for country reports and, ii) start to explore the best mechanisms for analyzing the regional data set to determine what combination of resource and socio-economic indicators provide the most accurate assessment of the status of reef fisheries for ongoing monitoring and management.

Capacity: National personnel have been involved in project activities both on long-term (up to 6 months) attachment to the project and through shorter term engagement by participation in all aspects of fieldwork. The PROCFish/C team also provided training on the standardised methodologies to participants of the 2004 SPC-Nelson Training Course.

Tool kits: We have developed a Standard Set of Methodologies for Resource and Socio-Economic Assessment and data analyses. These are being made available in the form of Manuals and accompanying software to Fisheries Departments and other organizations in the region. Training in the use of these tool-kits and in survey implementation is an ongoing activity of the project.

What next? The main focus of activities for the remainder of the project is outlined in the table below. As we are almost at the mid point of Phase I of the project, we will focus the remainder of this project year (Sept 04 to March 05) on completing field work in Kiribati and Tuvalu and on consolidation; writing reports for those countries where work has been completed (Nov '04 to March '05) and testing the analysis options for developing indicators from the regional data set and refining these analyses.

	2002 / 03 YR 1	2003 / 04 YR 2	2004 / 05 YR 3	2005 / 06 YR 4	2006/07 YR 5
PROCFISH					
Fiji	█	█			
Kiribati		█	█		
New Caledonia		█	█		
PNG				Site Select	█
French Polynesia		█	█		
Samoa			Site Select	█	
Solomon Islands				Site Select	█
Tonga	█	█			
Tuvalu		█	█		
Vanuatu		█	█		
Wallis & Futuna			Site Select	█	
COFISH					
Cook Islands			█	█	
Federated States of Micronesia				Site Select	█
Marshall Islands				Site Select	█
Nauru			Site Select	█	
Niue			Site Select	█	
Palau				Site Select	█
Country Reports			█	█	█
Final Analysis / Reporting and complete any outstanding fieldwork				█	█

Note: Fieldwork Schedule is tentative subject to discussion with countries.

Field trip completion schedule March 2002 to November 2004

Country	Sites	Starting date	End date	Activities
Tonga (Vava'u)	Mataika, Ovaka	26/02/02	23/03/02	Socio-economic survey Fish and invertebrate resource assessment
Tonga (Tongatapu)	Ha'atafu, Manuka	22/06/02	6/07/02	Socio-economic survey
Tonga (Tongatapu)	Ha'atafu, Manuka	28/07/02	11/08/02	Socio-economic survey Fish resource assessment Invertebrate resource assessment
Tonga (Ha'apai)	Koulo, Lofanga	24/11/02	15/12/02	Socio-economic survey Fish resource assessment
Fiji (Viti Levu)	Muaivuso	2/08/02	10/08/02	Socio-economic survey
Fiji (Lau group)	Nukunuku, Nasaqalau	7/09/03	21/09/02	Socio-economic survey
Fiji (Viti Levu)	Dromuna	3/10/02	22/10/02	Socio-economic survey
Fiji (Lau group)	Nukunuku, Nasaqalau	26/10/02	18/11/02	Fish resource assessment Invertebrate resource assessment
Fiji (Vanua Levu)	Lakeba, Nakawaqa	9/11/02	23/11/02	Socio-economic survey
New Caledonia	Oundjo	25/11/02	7/12/02	Fish resource assessment
Fiji (Viti Levu)	Dromuna, Muaivuso	25/01/03	11/02/03	Invertebrate resource assessment
Vanuatu	Efate, Malekula, Epi islands	14/02/03	28/02/03	Site selection
New Caledonia	Oundjo	12/03/03	14/03/03	Fish resource assessment
Fiji (Viti Levu)	Dromuna, Muaivuso	14/04/03	27/04/03	Fish resource assessment
Fiji (Viti Levu)	Dromuna, Muaivuso	12/05/03	23/05/03	Socio-Economic survey
Fiji (Vanua Levu)	Mali, Lakeba	08/06/03	03/07/03	Fish & Invertebrate resource assessment
Kiribati	Christmas Island	20/06/03	09/07/03	Site Selection and Research and development of Kiritimati bonefish management plan and regulations

New Caledonia	Thio	25/06/03	26/06/03	Socio-economic survey in Thio
New Caledonia	Thio	29/06/03	06/07/03	Socio-economic survey in Thio
Fiji (Vanua Levu)	Lakeba, Mali island	14/07/03	24/07/03	Socio-Economic survey
Vanuatu (Efate)	Paunangisu, Moso	14/07/03	01/08/03	Finfish survey in Paunangisu and Moso villages
Vanuatu (Efate)	Paunangisu, Moso	21/07/03	04/08/03	Invertebrate survey in Paunangisu and Moso villages
Tuvalu	Funafuti	30/08/03	09/09/03	Site selection and collection of data from Fisheries Division
Tuvalu	Funafuti	30/08/03	13/09/03	Site selection
French Polynesia	Tikehau, Mataiea	27/09/03	14/10/03	Finfish & invertebrate surveys
Vanuatu (Efate)	Paunangisu, Moso	13/10/03	27/10/03	Socio-economic survey
Wallis & Futuna	Wallis, Futuna	18/10/03	28/10/03	Site selection
New Caledonia	Oundjo	03/11/03	14/11/03	Finfish survey
Vanuatu (Malekula)	Maskelynes, Uri-Uripiv	14/11/03	08/12/03	Finfish and invertebrate surveys
Vanuatu (Malekula)	Maskelynes, Uri-Uripiv	28/11/03	12/12/03	Socio-economic survey
New Caledonia	Ouassé, Oundjo	12/01/04	23/01/04	Invertebrate survey
French Polynesia	Tikehau, Mataiea, Raivavae, Fakarava	17/01/04	15/02/04	Socio-economic survey
New Caledonia	Thio	02/02/04	07/02/04	Invertebrate survey
New Caledonia	Oundjo	15/02/04	21/02/04	Finfish survey
New Caledonia	Thio	02/03/04	05/03/04	Finfish survey
French Polynesia	Raivavae, Fakarava	6/03/04	30/03/04	Finfish & invertebrate surveys
New Caledonia	Thio	29/03/04	31/03/04	Finfish survey
New Caledonia	Moindou	05/04/04	06/04/04	Finfish survey
New Caledonia	Moindou	03/05/04	07/05/04	Finfish survey

New Caledonia	Thio	10/05/04	14/05/04	Finfish survey
New Caledonia	Lifou	07/06/04	17/06/04	Finfish survey
New Caledonia	Ouasse	21/06/04	25/06/04	Socio-Economic Survey
Kiribati	Kuria, Abemama	04/05/04	04/06/04	Finfish & invertebrate surveys
Kiribati	Abaiang	19/06/04	03/07/04	Finfish survey
New Caledonia	Ouassé	02/08/04	13/08/04	Finfish survey
Kiribati	Christmas Island	05/08/04	19/08/04	Socio-Economic Survey
Tonga	Ha'apai Tongatapu	08/08/04	27/08/04	Invertebrate Surveys
Kiribati	Christmas Island			FinFish and Invertebrate Surveys
New Caledonia	Oundjo	08/11/04	19/11/04	Finfish survey
Tuvalu	Funafuti Niutao Nukufetau Vaitup			Socio-economic Survey
Tuvalu	Niutao Funafuti			FinFish / Invertebrate Survey
Kiribati	Abiang	15/11/04	28/11/04	Invertebrate Survey