



SPREP/IWP



# **Report on the Sub-Regional Meetings to Identify Coastal Management Training Needs**

**Pago Pago, American Samoa, 18 - 19 July 1994**

**Saipan, Northern Mariana Islands, 25 - 26 July 1994**

**Honiara, Solomon Islands, 1 - 2 August 1994**

Apia, Western Samoa

March 1995

Copyright ©  
South Pacific Regional Environment Programme, 1995

The South Pacific Regional Environment Programme  
authorises the reproduction of this material, whole or in part,  
in any form provided appropriate acknowledgement is given.

Original Text English

Published in March 1995 by:  
South Pacific Regional  
Environment Programme  
P.O. Box 240  
Apia, Western Samoa



Printed by:  
Commercial Printers  
Apia, Western Samoa

P 1 4/95 - 2C

Printed with financial assistance from the  
Canadian International Development Agency (CIDA)

Layout by Wesley Ward, SPREP.

SPREP Cataloguing-in-Publication Data

Sub-Regional Meeting to Identify Coastal Management Train-

1995  
1. Coastal management  
2. Samoa  
3. Training  
4. Meetings  
I. SPREP  
II. CIDA  
III. Wesley Ward  
IV. Commercial Printers  
V. P.O. Box 240  
VI. Apia, Western Samoa  
VII. P 1 4/95 - 2C

**Report of the  
Sub-Regional Meetings  
to Identify  
Coastal Management Training Needs**

- *Pago Pago, American Samoa, from 18-19 July 1994.*
- *Saipan, Commonwealth of the Northern Marianas Islands, from 25-26 July 1994.*
- *Honiara, Solomon Islands, from 1-2 August 1994.*

**Published in Apia, Western Samoa  
in March 1995**

---

# Contents

Contents.....	ii
1. <b>Introduction</b> .....	1
2. <b>Overview of SPREP and the Coastal Management and Planning Programme</b> .....	3
2.1 General.....	3
2.2 Coastal Management and Planning Programme.....	4
2.3 Discussion Summary.....	6
3. <b>Country and Territory Reports to the Meetings</b> .....	7
3.1 Pago Pago Meeting.....	7
3.2 Saipan Meeting.....	19
3.3 Honiara Meeting.....	34
4. <b>Training Requirements and Suggestions</b> .....	42
4.1 Training Requirements.....	42
4.2 Training Formats.....	43
5. <b>Summary and Conclusions</b> .....	45
<b>Annexes</b> .....	46
Annex 1: Participants Lists.....	46
Annex 2: Exerts from "Coastal Protection in the Pacific Islands: Current Trends and Future Prospects".....	49
Annex 3: GIS Information.....	52

---

# 1. Introduction

Effective coastal management cannot be achieved within the region without adequately trained personnel within countries and territories to develop, implement and administer such programmes. With the financial assistance of the Canadian International Development Agency (CIDA), three two-day sub-regional meetings were held to focus on coastal management related training needs as identified by SPREP member countries and territories. The key issues discussed at each meeting were:

1. What are the major coastal management and planning issues within each country or territory?
2. How is coastal management and planning conducted in each country or territory?
3. Which government agencies are responsible for coastal management and planning within each country or territory?
4. From a national perspective, what coastal management and planning training assistance is required?

To facilitate a more open exchange of information it was decided to hold three sub-regional meetings - Polynesia, Micronesia and Melanesia groupings - instead of a regional meeting. This permitted the groups to be smaller, and the discussions informal and franker than usually occurs at regional level meetings.

The Pago Pago meeting was attended by representatives from: American Samoa; Cook Islands; Niue; Tonga; Tuvalu; and Western Samoa. The Saipan meeting was attended by representatives from: the Federated States of Micronesia; Guam; Kiribati; Nauru; Palau; and Northern Marinas Islands. The Honiara meeting was attended by representatives from: Fiji; Solomon Islands; and Vanuatu. A few observers also attended. The participants list is attached in Annex 1.

All of the meetings followed the same format:

1. Opening
2. An overview of SPREP
3. An overview of SPREP's Coastal Management and Planning Programme
4. Presentations by each country/territory representative

5. General discussion of coastal management within countries/territories and the region
6. Discussion of general and specific coastal management training needs (both long and short-term)

Each country or territory was requested to include information in their presentations based on a list of questions circulated prior to the meeting. They were for use as a guide in preparing country reports. Those questions were:

1. What are the names, titles and addresses of the people preparing the country report? What other government offices/agencies / etc were consulted in preparing the report?
2. Which offices/ etc have coastal management and planning responsibilities? Provide a brief description of the offices/etc. Include number of staff; specific responsibilities; legislative mandate; responsible to who (eg independent authority; division within a department).
3. What difficulties do the offices/etc responsible for coastal management and planning come across in carrying out their duties?
4. How are such difficulties dealt with?
5. How does coastal management and planning operate in the framework of national development?
6. Is coastal management and planning effective in your country? Why, or why not?
7. Please note the relevant coastal management and planning related legislation and regulations currently in place and their purpose? Are they successful, why?
8. What sort of coastal management and planning projects or programmes are currently in operation?
9. What coastal management and planning training and/or technical advice does your country currently require? Identify short-term and long-term training needs.
10. What assistance for coastal management and planning do you feel SPREP should be providing? Specify what training assistance you believe SPREP should provide.

---

The structure of this report follows that of the meetings. The following section presents the brief overview of SPREP and SPREP's Coastal Management and Planning Programme and a summary of the related discussions from the three meetings. This is followed by the country and territory reports presented to the three meetings. The final section summarises the training needs as identified by the representatives and provides suggestions for action.

---

## 2. Overview of SPREP and the Coastal Management and Planning Programme

### 2.1 General

The South Pacific Regional Environment Programme is a regional organisation established by the governments of 22 Pacific island countries and territories (American Samoa, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Marianas Islands, Palau, Papua New Guinea, Pitcairn, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, Wallis and Futuna and Western Samoa); and four developed countries (Australia, France, New Zealand and the United States).

SPREP began as a programme within the South Pacific Commission, based in Noumea, New Caledonia, in 1978. SPREP's office and staff moved from Noumea to Apia, Western Samoa, early 1992. In June, 1993, the agreement establishing SPREP as an autonomous inter-governmental organisation was signed.

#### 2.1.1 Aim

*SPREP's mission is to assist Pacific island countries and territories to protect and improve their shared environment, and to manage their resources to enhance the quality of life for present and future generations.*

#### 2.1.2 Objectives

The *SPREP Action Plan* sets out the mandate for its activities and provides a framework for environmentally sound planning and management for the region. The 1991-95 Action Plan is a regional strategy, identifying many aspects of environmental assessment, management and law.

SPREP is responsible to its member governments and administrations for overall technical coordination and supervision in implementing the Plan, which aims to:

1. Further assess the Pacific environment, especially where humans influence ecosystems, and the effects on their own environments;
2. Improve national and regional capabilities, links and funding to carry out the Action Plan;
3. Provide integrated legal, planning and management methods to protect and use natural resources in an ecologically sound way;
4. Provide more training, education and public awareness for improving the environment;
5. Encourage development that maintains or improves the environment;
6. Protect the land and sea ecosystems, and the natural inhabitants that need help;
7. Reduce pollution on land, in fresh and sea water, and in the air; and
8. Encourage the use of Environmental Impact Assessment and other methods to stop or lessen the effects of humans on the environment.

#### 2.1.3 Programmes

SPREP's Work Programme deals with:

1. Conserving Biological Diversity (South Pacific Biodiversity Conservation Programme);
2. Global Climate Change and Sea Level Rise;
3. Environmental Planning and Management;
4. Coastal Management and Planning;
5. Managing Pollution and Pollution Emergencies;
6. Environmental Information, Education and Training; and
7. Regional Environmental Concerns.

---

### 2.1.4 Structure

SPREP's controlling body is its annual SPREP Meeting. This comprises representatives of the 26 member states and territories, who meet once a year to review the previous year's activities, approve a Work Programme and Budget for the next financial period, and consider institutional, staffing and other matters affecting the organisation. The Secretariat is responsible for executing the policies and directives of the SPREP Meeting, for formulating and implementing projects under the Action Plan, for providing advice and assistance to member governments and administrations either directly or through consultants, and for securing appropriate donor assistance.

## 2.2 Coastal Management and Planning Programme

### 2.2.1 Background

Since the inception of SPREP in 1978 there have been a range of marine and coastal related activities carried out in various member countries, most since 1983. These were initially in the areas of coastal resource surveys, reef and lagoon surveys, management and planning, training courses, information exchange and coastal resource management related research. Many of these activities were carried out with the support of partner organisations and institutions.

SPREP's early activities were guided by the "*Action Plan for Managing the Natural Resources of the South Pacific Region*" developed during the **Conference on the Human Environment in the South Pacific** which took place in Rarotonga, Cook Islands, in 1982. SPREP was then reporting to both the South Pacific Forum and the South Pacific Conference, with executive oversight provided by a Coordinating Group comprising SPC, SPEC (now called the Forum Secretariat), UNEP and ESCAP. SPREP has also been the South Pacific centre for the UNEP Regional Seas Programme, currently supported by UNEP's Ocean and Coastal Areas Programme Activity Centre (OCA/PAC) in Nairobi, Kenya.

The early work programme for SPREP was not divided into separate programmes as it was believed that no activity should stand on its own; as a matter of principle, each activity was seen as only a step in achieving a broader and more general regional goal. *The Inter-Governmental Meeting (IGM)* in 1988 recommended that the multifarious, separate project proposals for the 1989-1990 Work Programme be integrated into wider regional projects and activities under eleven integrated programme elements, one of which was "**Coastal Resources Management and Planning.**"

The Secretariat at the beginning of 1988 consisted of four technical staff comprising the Coordinator, Environmental Education and Information Officer, Protected Areas Management Officer, and the Project Officer (Scientist). The Project Officer (Scientist) was responsible for the Coastal Resources Management and Planning programme area in addition to a number of the other programme elements; this imposed limitations on what could realistically be achieved in the work programme.

For the 1990 IGM the Secretariat had undertaken to integrate ongoing and new coastal resource related projects of the SPREP Work Programme into a coordinated regional programme for Coastal Resource Management and Planning in the South Pacific. This programme consisted of: (1) training and workshops; (2) coastal resource surveys; (3) coastal resource management plan development; and (4) coastal management related research.

### 2.2.2 Current Coastal Management and Planning Programme

The programme is currently directed by the 1991-1995 Action Plan for Managing the Environment of the South Pacific Region. Projects are identified through the *National Environmental Management Strategies (NEMS)* process and through specific requests from member countries and territories that do not have NEMS, or similar strategies. There are still, however, a number of projects being completed from the previous system whereby SPREP members submitted a broad range of projects to SPREP each year. As evidenced by the programme name change, the emphasis has altered slightly from "*coastal resources management and planning*" to "*coastal management and planning*".



---

The present and proposed emphasis of the programme is to promote and develop appropriate integrated coastal management within the region.

The Action Plan identifies the programme's goal as assisting "...SPREP members to manage and plan for the multiple-use, ecologically sustainable development and conservation of coastal areas, habitats and resources." (Action Plan, 1993:15). The specific objectives of the programme are listed as:

1. Strengthen national capabilities to formulate and implement coastal management and planning programmes through training, workshops and participation in project activities.
2. Develop and implement coastal management and planning programmes, including appropriate institutional mechanisms, administrative arrangements and legislation as required.
3. Improve the understanding within the community, private and government sectors of coastal environments and resources, coastal conservation and development, as well as the process and benefits of coastal management planning.
4. Develop expertise within countries and provide examples of the process and benefits of coastal management planning.
5. Coordinate coastal management and planning activities in the South Pacific region, noting the importance of considering projected sea level rise.
6. Undertake coastal management and planning activities, including coastal resource surveys and management plan development.
7. Assist SPREP members to take all appropriate measures to prevent, reduce and control coastal disposal causing pollution and coastal erosion causing environmental damage in the area covered by the SPREP Convention.

The *Coastal Management and Planning Programme* is structured to provide a broad range of assistance to member countries and territories. The present programme consists of:

1. Coastal habitat surveys involving training; linked to
2. The development of coastal management plans;

3. Commissioning studies on urgent coastal issues, with an emphasis on developing appropriate guidelines;
4. Holding in-country and regional workshops and meetings on issues of importance to SPREP members; and
5. Developing and promoting proposals for long-term coastal planning and management in the region, with an emphasis on developing appropriate integrated coastal management.

During the last year, the programme has concentrated on coastal habitat surveys (always involving a training component), linked to management plan development. Wherever possible all training activities involved one or more participants from other countries. In addition, a number of broader issues were addressed, including the development of an Integrated Coastal Management proposal for the region. The programme is still evolving as the needs of the region change.

The programme presently has two officers - The *Coastal Management Officer* and a temporary *Assistant Coastal Management Officer*. The Assistant Coastal Management Officer was seconded from the Federated States of Micronesia's National Marine Resources Division for one year, finishing in December 1994. Her responsibility is to assist the Coastal Management Officer in performing his duties. This attachment is the first of what is proposed (funds permitting) to be an on-going "on the job" training programme for member government coastal management officers.

The main external problem faced by the Coastal Management and Planning Programme concerns the lack of institutional capacity and mechanisms, legislation, trained personnel and financial resources in-country for coastal management.

The responsibilities for coastal management and planning usually falls across a number of government agencies, between which exists minimal coordination. It will be essential to establish effective coordination and where appropriate, integration, of coastal management and planning activities within countries. Integrated Coastal Management is seen by SPREP and its member countries and territories as a mechanism through which this can be achieved.

---

The key internal constraint to further developing the Coastal Management and Planning Programme concerns the lack of financial support for Integrated Coastal Management within the region. Despite having been identified at international fora as an essential component for sustainable development, especially within small island states, there has been a reluctance by international funding agencies and development partners to fund ICM.

## 2.3 Discussion Summary

At all three meetings it was apparent from the discussion following the presentation of the overviews of SPREP and the Coastal Management and Planning Programme that there was not a clear understanding of SPREP, its activities, or how countries and territories request SPREP's assistance. Explanations were provided concerning how countries and territories should request assistance from SPREP.

Many of the participants were also under the misunderstanding that SPREP is a funding body. The mechanism by which SPREP deals with country and territory requests, and the process of locating and acquiring funds to carry out those requests was explained.

The issue of consultants, especially the selection process, was raised at two of the meetings. SPREP's consultant selection process was clarified.

---

## 3. Country and Territory Reports to the Meetings

### 3.1 Pago Pago Meeting

This meeting was attended by 17 people including representatives of American Samoa, Cook Islands, Niue, Tonga, Tuvalu, Western Samoa, and SPREP.

Chief of Staff, Mr Aleni Ripine, of the Office of the Governor, officially opened the meeting, with the opening prayer lead by Rev. Masalosalo. The Director of the American Samoa Economic Development Planning Office, Mr Alfonso P. Galea'i, addressed the meeting, noting the American Samoa Government's considerable interest in coastal management and especially the subject of the meeting.

SPREP's Coastal Management Officer, Dr Andrew Smith, commenced discussions by outlining the objectives of the meeting, and requested that proceedings be as informal as possible to facilitate an exchange of information. This was accepted by the participants. Dr Smith then presented information on SPREP and on SPREP's Coastal Management and Planning Programme (see previous section).

Presentations by the country and territory representatives were then made. These are provided below with a summary of the ensuing discussions.

#### Western Samoa

*(Presented by Sailimalo Pati Liu,  
Environment Planning Officer, Division of  
Environment and Conservation,  
Department of Lands, Survey and  
Environment)*

- *Name of division consulted in preparing this report.*

The Division of Environment and Conservation (DEC) of the Department of Lands, Surveys and Environment.

- *Which offices/etc have coastal management and planning responsibilities?*

The DEC mandate under the Lands, Surveys and Environment Act 1989 specifically with regards to Division 5, requires prior written Ministerial consent to perform any work of any description being carried out on the foreshore and seabed, and Division 6, controlling pollution of waters, but also in terms of integrated coastal management. The other provisions of part VIII particularly management plans as per Division 4. This Act also provides for EIA which is an important tool for managing sustainable development in coastal zones.

The Act is currently under amendment. As presently enacted the coastal management, management planning and EIA functions are operated by the DEC with decisions being taken by the Land Board and Minister of Lands Surveys and Environment in respect of foreshore and seabed development, the Environment Board and the Minister in terms of management plans, and the department and Minister in respect of EIA. The relative duties and powers of each of these entities varies with each function. The amendment seeks to standardise this situation by establishing a revamped Environment Board with the Minister as its Chair. All functions will be carried out by the DEC with final decision-making for other minor matters being made by the Board.

- *What difficulties do the offices/etc responsible for coastal management and planning come across in carrying out their duties? How are such difficulties dealt with?*

The Act is difficult in itself with the seemingly arbitrary involvement of too many levels of authority. In addition some functions are duplicated in other legislation, eg, sand mining with PWD under the Police Offences Act. Apart from legislative difficulties there is a problem in that while the constitution vests all foreshore and seabed in the government, villages consider these areas to be part of their customary lands and do not flow government law, direction or policy in respect of them. It is a large challenge for a small government agency to deal with 360 or so villages independently.

---

Perhaps even more significant is the almost total lack of reliable/useful data on sediment budgets and beach dynamics. Without such data it is impossible to adequately license sand extraction, other than by "suck it and see" experimentation.

The DEC is in the process of receiving sand licensing responsibilities from PWD and establishing its own tow-tier system of management (DEC to manage commercial mining and assist villages to manage their own lesser needs). This will require much liaison and negotiation with village Pulenuu. It will also require a commitment of staff time and resources to both collect data, monitor beaches and mining activities and assist villages.

Data collection has begun through SOPAC training of local staff in beach profiling and a SOPAC project to assess sediment budgets from one of the areas of greatest commercial demand.

- *How does Coastal management and planning operate in the framework of National development?*

Coastal management currently occurs in isolation of national planning. National planning, such as it is, exists in two forms, National Development Planning, and the National Environment and Development Management Strategy. It is hoped that these two exercises can be combined in the near future. The NEMS identifies coastal management as an important activity, and already two district level projects are underway with villages which can be classed as integrated coastal zone management projects. National policy development will occur under NEMS. In Samoa, it is not considered appropriate to undertake national ICZM, rather it is necessary to be at a village and district level within the context of national policy.

- *Is coastal management and planning effective in your country?*

Coastal management and planning is not yet effective in that it is only just beginning on all levels. In addition it is a slow process, particularly at the village level which can only proceed with adequate knowledge of issues and with village support and commitment. Current progress is promising.

- *What sort of coastal management and planning projects or programmes are currently underway?*

Saanapu/Sataua SPBCP project, Aleipata District ICZM project, the Beach Sand Licensing project, the Beach Monitoring project, the Dredge Management project and the Coastal Management Public Awareness project.

- *What coastal management and planning training and/or technical advice does your country currently require?*

Follow up work with beach profiling, especially with new EOs. More advanced training in coastal sediment systems and geomorphology and related data collection and assessment (eg interpretation of aerial photography, jet coring). General training on lagoon and reef ecosystems. General training in the area of extension work with village authorities and negotiation and mediation techniques.

- *What assistance for coastal management and planning do you feel SPREP should be providing?*

Provision of assistance to both DEC staff and village representatives to undertake training, particularly in-country, but also at the regional level. Establishment of regular series of training programmes for different levels, for instance, managers to village level operations, provision of schemes to network expertise between countries in the region and also including regional institutions as USP (eg exchange programmes, regular meetings), revisions of communication networks to bring together regional expertise and experience and provision of network of experts in the region able to be brought in-country for critical / emergency situations.

- *Discussion Summary*

Further elaboration was requested concerning the duties of the Land Board and the Environment Board. The Environment Board approves proposals that the Director of Lands Survey and Environment Department feel that the Division of Environment and Conservation (DEC) is not able to deal with (eg major developments). The involvement of the Land Board is minimised to limit political involvement.

*Is beach profiling conducted on all of Western Samoa's coasts?* Due to staff limitations it is currently concentrated around the Apia area and other areas experiencing erosion. Eventually they would like to have sites covering all of Upolu and Savaii. It was noted that the beach profiling involves the Apia Observatory and the Survey Division.

*How involved is DEC with the issuing of sand mining licences?* Issuing is currently done by Public Works, however, under the 1989 Act DEC should be involved with licence issuing. Since DEC was established the issue of sand mining has been a major problem. Guidelines are currently being developed, as well as searching for alternatives to sand. They are currently worried about the commercial take, but not the subsistence usage. There are no limits at present; but there is a need for data.

*Has DEC worked with the mayors to control sand mining?* It is difficult to ban mining without providing an alternative. It is recognised that limitations are needed, and they are working with companies to educate them to the problems. The community needs to encourage the *pulini'u* to take some control.

The comment was made that trying to ban sand mining when no alternative is provided will result in non-compliance by people. It was also noted that the use of grass in front of houses, rather than sand, is being encouraged.

*Is there any revegetation of coastal areas?* There has been some work in conjunction with Public Works Department to encourage revegetation.

*Has DEC used television for education purposes?* Not yet; only radio and newspapers.

*Does Western Samoa have any solid waste disposal problems along the shoreline?* Yes; DEC is currently looking at this issue.

*Does DEC have a specific staff training policy? No specific, consolidated staff training programme?* They work with the Education Department to include units in school courses. It was felt that it was important to have some human resources training in place. The Public Service is currently setting up a scheme whereby one or two students will be supported to undertake environmental science. There is a two year bonding system for students sent overseas for training.

## Kingdom of Tonga

*(Prepared by: Mr. A'sipeli Palaki,  
Conservation Officer (Marine), Haveluloto,  
Tonga Tapu, Tonga)*

### • Names of divisions consulted in preparing the statement

Environmental Planning Division & Mineral Resources, Department of Natural Resources, Ministry of Lands, Survey and Natural Resources.

### • Which offices have coastal management and planning responsibilities?

Mineral Resources Unit & Environmental Planning Unit of the Ministry of Lands, Survey and Natural Resources; Forestry and Fisheries involved only if request is directed to them by the above offices while implementing projects.

### • Brief Description.

1. Mineral Resource Unit consists of 7 officers and 6 daily paid labourers.

#### *Responsibilities:*

- a) Mineral resources (hydrocarbon, silver and gold) survey and assessment - CCOP/SOPAC;
- b) Hydrological survey, drilling, and assessment, etc;
- c) Sand mining control and monitoring;
- d) Coastal zone management and planning;
- e) Aerial photography.

2. Environmental Planning Unit consists of 8 officers, 12 daily paid labourers.

#### *Responsibilities:*

- a) Marine and terrestrial parks / reserves, monitoring, up-keep, patrolling;
- b) Beautification and upgrading of coastal area;
- c) Any environmental issues in Tonga, eg education, scientific survey, EIA, coastal management, etc.

- *Legislative Mandate.*

Land tenure: "coastal area" is 50 ft inland from the high water mark is government property and all government land and property is authorised by the Minister for Lands, Survey and Natural Resources.

1. *Mineral Resources Act* (Geology)
2. *Parks and Reserve Act* (EPU)
3. *Fish and Bird Preservation Act* (Fish Act).

- *The Land Tenure System in Tonga*

The Minister for Lands, Survey and Natural Resources has been authorised to handle and control government land. He allocates coastal land area for settlement and development etc. There is no clear cut policy for the management of the coastal zone. Lack of resources eg. funding for research, education, etc.

Difficulties can be handled by the setting of a policy for the wise management of the coastal area in Tonga, and is the responsibility of the Mineral Resources Unit/EPU. There's a need to seek donors to fund project proposals. A need to educate the community.

- *National Development Objectives*

There are seven of them. The first priority is to achieve sustainable economic growth whilst the last aims to "ensure the continued protection of resources" - coastal zone resources is included in this.

Coastal management is effective in Tonga as the local people and community are now becoming aware of the importance of coastal areas through education. Other Ministries, as well as the Prime Minister's, have agreed on the importance of wisely managing the coastal area.

- *Legislation*

*Land Act:* 50 ft from high water inland belongs to government or the Minister for Lands, Survey and Natural Resources, ie the coastal area is our Ministry's responsibility. Not really successful because some of the coastal area is subdivided and allocated to people, companies, industry, etc.

*Parks and Reserves Act:* covers the coastal area. It is successful, but more enforcement is needed. Removal of sand (sand mining) and cutting of mangroves.

- *Coastal Management and planning projects currently in operation*

Replenishment and rehabilitation of mangroves and other coastal trees in some areas where it is needed, eg:

1. mangrove replanting: Fangautu Lagoon;
2. replanting of *toa, niu, louhumi* at Houma coastal area - Forestry/SPREP project;
3. replanting of coconut trees, etc, by many land owners as directed by the EPU, Haatape Resorts, etc.

Sand mining:

1. sustainable mining of sand;
2. monitor and assess to balance the extraction rate with the process of sand aggregation;
3. other possibility is to substitute limestone quarry material (very fine one) as sand;
4. proposal to dredge sand from the ocean rather than coastal areas.

Public awareness/education.

- *What coastal management and planning training and/or technical advice does your country currently require?*

1. In-country workshop in Tonga to promote awareness of the coastal environment:
  - a) A community workshop - participants from various communities to participate;
  - b) Government/agencies/NGOs/company etc. workshop;
  - c) Schools workshop.
2. Regional workshop on Coastal Zone Management hosted by the Tongan Government. ICZM in September 1994 in Tonga:
  - a) local resource people should undergo short-term training so that they can conduct community programmes, etc;
  - b) technical advisor from SPREP is needed.

- *What assistance for coastal management and planning do you feel SPREP should be providing?*

1. Funding;
2. Technical advisor;
3. Programming;
4. Training assistance: short courses coastal management engineering.

---

- *Discussion Summary*

*Is the land owned and/or controlled by the King?* All land in the Kingdom is Crown Land with four tenure categories: three Hereditary Estates of (i) the King, (ii) the Royal Family, and (iii) the Nobles and Matapule; and the fourth category (iv) is Government land. It is only from the last two categories (iii) and (iv) that people's allotments are drawn

The comment was made that the real test of legislation comes with implementation. This is when real opposition occurs, rather than during the review period.

*Does Tonga have a specific staff training policy?* The Ministers identify the areas that require personnel trained, and then a committee decides amongst the competing requests which will be funded. Trainees are bonded to work for the Government for a time equal to the length of their training.

#### Tuvalu

*(Prepared by: Filipo Taulima, Public Works Department, Ministry of Labour Works Communication, Funafuti, Tuvalu)*

- *What other government offices/agencies/etc were consulted in preparing the report?*

Director of Works, Mr. T. Apisai, Public Works Department; the Town Council or island councils, local authorities, Land Office and Environmental Officer.

- *Which offices/etc have coastal management and planning responsibilities?*

Public Works Department: two qualified engineers to ensure that the administration and coordination of coastal management with various agencies is well served. Public works department is the executing agency for the coastal project. Island council has the sole power or by-law for foreshore licenses. Removing materials from the shore need to obtain license from local authority island council. There is no legislation regarding coastal zone management.

- *What difficulties do the offices/etc responsible for coastal management and planning come across in carrying out their duties?*

Lack of technical and specialised personnel in the coastal zone management. Personnel (I like Coastal Designer).

- *How are such difficulties dealt with?*

To overcome such difficulties the Government in its own capacity recruits overseas personnel to provide the technical expertise.

- *How does coastal management and planning operate in the framework of national development?*

Island council identified priority areas of protection and submit through their representatives in parliament for approval. The Government will then decided on the most critical cases then submit project proposals to aid donors for funding. Public Works will then formalise design procedures and design the most appropriate type of wall structure suitable for our conditions, without any scientific research on the impact of the wall on other parts of the island.

- *Is coastal management and planning effective in your country? Why, or why not?*

It is not very effective.

- *Please note the relevant coastal management and planning related legislation and regulations currently in place and their purpose? Are they successful, why?*

Council by-laws: are not very effective, not very successful. This is due to the fact that landowners have full power over their coastal areas. Because of the limited land area and the fact that the islands are generally narrow (particularly the atolls) and with little top soil, erosion is not desirable particularly on the beaches fronting the villages. Sand mining is not permitted.

- *What sort of coastal management and planning projects or programmes are currently in operation?*

Coastal Protection Project - protecting the eroded shore of some islands in the Tuvalu group more information - Coastal Erosion in Tuvalu.

- *What coastal management and planning training and/or technical advice does your country currently require?*

My country requires training in all aspects of integrated coastal management.

1. Short term: National training for local communities, local supervisors.
2. Long term: For technical personnel in terms of coastal designer.

- *What assistance for coastal management and planning do you feel SPREP should be providing?*

SPREP should assist in areas where Tuvalu is lacking, as mentioned above.

---

• *Discussion Summary*

*What's Tuvalu's population growth rate?*  
About 2.3 % [source: SPC 1993 Pocket Statistical Summary].

*Do you have waste problems?* Yes.

*Could you explain a bit more about the island councils?* There are nine islands; and each has one council.

*Does Tuvalu have a staff training policy?* A committee decides who will get scholarships after the Ministers decide what the country's needs are. There is no bonding system used. There are a lot of graduates but not many jobs available in the country.

## Niue

*(Prepared by: Mr. B. L. Pasisi, Fisheries Advisor, Fisheries Division, Department of Agriculture, Forestry & Fisheries, Niue Island, based on personal knowledge, brief discussions with the Environmental Unit and comments from Mr. A. Mitihepi (NGO-participant in last two coastal management meetings)*

Niue Island (approximately 100 miles<sup>2</sup>) is a raised coral atoll, extending up to a plateau of approximately 250 feet above sea level. With two main shelves extending around the island, the lower approximately 80-100 feet and the other the top plateau (250 feet), there has been little concern in the past with coastal management around the immediate coastline.

Due to its location however (91.1<sup>0</sup>S, 169.55<sup>0</sup>W), frequent cyclones have caused considerable damage to the coastal inhabited areas and hence spurred ideas and discussion on various aspects of damage causes and effects. The fact that the high surrounding cliffs of Niue are solid limestone rock means we are not susceptible to soil/sand erosion by the sea, however, locals have noted over years of experience that various areas around the island are particularly susceptible to extreme wave action during cyclones and hurricanes.

Currently there is no Coastal Management Programme (CMP) as such in Niue, ie. that to date, a strategic plan or comprehensive documented Coastal Management Programme has not been formulated. While this is the case however, information from the Environment Office (Dept. Community Affairs) indicates that a programme is in the take off or drafting stages, and will be aided by legislative assistance from SPREP.

Currently, there is no legislation in place under a coastal management programme, although other related legislation (eg for fresh water, Fisheries 1994 Bill, Fisheries Protection Act) has been drawn up and are in the finalising stages.

Although there is no coastal management programme as such, the various departments such as the Public Works Department do consult and discuss coastal protection issues before planning and developing the island's coastal infrastructure. This has been based mainly on the fact that cyclone damage along the coastline to the infrastructure has proved costly.

Since its introduction to the region, the coastal management programme and planning responsibilities have been the responsibility of the environmental unit, under the Government Department of Community Affairs. It appears that in the future this responsibility may be shared or taken over by the Fisheries Division under the Department of Agriculture, Forestry & Fisheries.

The major difficulties faced so far in this area are:

1. It has yet to be made distinctly clear who will take on the specific responsibilities for the coastal management programme, and this is probably attributable to the lack of staff in both the Environmental Unit as well as the Fisheries Department.
2. Lack of staff: Environmental officer - 1; Fisheries staff - 2.

To overcome these difficulties I believe the above two mentioned departments have been working together to some extent, as well as using members from Non-Government Organisations (NGOs) to help out (eg to attend regional workshops). One other difficulty seen to be expressed by a number of people is the defining of the boundaries of a Coastal Management Programme.

With respect to National development, the coastal management programme will obviously play a major role in aiding this development especially with reference to coastal infrastructure development (eg where to develop, strengthen, design, etc.). As mentioned above, although there is no CMP as such in place, the basic aspects that will be incorporated into the framework of a strategic coastal management plan are being incorporated by the concerned departments into development plans.



---

This is undoubtedly attributable to Government and public awareness of environmental protection issues, particularly through SPREP funded workshops in various areas (eg water quality, environmental impact assessment, etc.). Coastal management we believe will be effective in Niue once in place because the basic aspects that will form the basis of a management programme are already being used in one way or another by the various government departments concerned.

In the near future, Niue will require technical advise and training in a number of areas. Particular needs at the present time include technical advise on current patterns, wave actions and reef dynamics to assist in the development of the current wharf harbour and other boating assess channels to be blasted. I believe technical assistance such as stated above should be provided by SPREP as well as training in the various areas that will be incorporated into most countries' coastal management programmes. Niue will also probably require some technical assistance in formulation of a comprehensive coastal management plan which will also be training in itself for those involved.

The above country statement is aimed to draw a basic picture of the current situation in Niue, related to coastal management.

Apologies must be made here to the other participating countries, as well as SPREP, for the limited amount of detail in some areas provided. This has been due mainly to staff, time, and communication restraints. We are more than willing, however, to provide any additional information of interest to anybody.

- *Discussion Summary*

*Does Niue have a staff training policy?* No specific programme in place. There is a two year bonding system for students sent overseas for training. There is a problem of high school students not being aware of what subjects are needed to obtain scholarships.

#### **Cook Islands**

*(Prepared by: Edith Ngariu, Education Officer, Cook Islands Conservation Service)*

- *Introduction*

This report has been compiled with the assistance of Teariki Rongo-Director of the Cook Islands Conservation Service (CICS) and Wayne King, the Planning Officer for CICS.

The report identifies the role of the Cook Islands Conservation Service in coastal management programmes in the Cook Islands.

The Cook Islands Conservation Service was established as a government measure in response to national environment concerns. The Conservation Act established the CICS as a Corporation, independent of day to day Public Service administration, and responsible through a Conservation Council to the Minister of Conservation. The service currently has a staff of 21 of whom 18 are based in Rarotonga. Most of the staff are Cook Islanders with an Australian AVA volunteer (environmental education) and a NZVA (wildlife).

Included in the current work programme of the CICS is the Foreshore which is staffed by Vaitoti Tupa - Senior Conservation Officer. The Conservation Council directs a lot of their business towards the activities or development in the foreshore zone.

To operate the coastal zone management programme, the CICS works closely with the Ministry of Marine Resources and the Ministry of Finance-Planning Division.

- *Background*

Most of the population of the Cook Islands live in the coastal zone. It is this zone which is sensitive to environmental pressure from upland and inland use of both land and sea resources. Environmental damage in the coastal zone is particularly marked on Rarotonga and Aitutaki, possibly as a consequence of the higher population pressures on these islands.

Penrhyn and Manihiki have been identified as having similar problems, in particular problems related to waste which will affect the pearl industry. There is a desire to maintain a clean and healthy lagoon to foster the development of a lucrative industry.

The need for improved planning for the utilisation of the coastal resources, with careful integration of economic development and environmental protection to ensure development is ecologically sustainable is very much a priority issue.

In the outer islands, local By-Laws apply but they proved deficient for handling those problems which arise from developmental projects formulated and implemented on these islands. Therefore, there is a need for an examination of the legal provisions and to secure greater coordination on environmental protection activities.

The Conservation Service wants to prepare and implement individual island plans based on the environmental concerns of that island. It also recognises the fact that geomorphologically, the islands of Mauke, Mangaia, Mitiaro and Atiu are *makatea* islands with unique problems related to inappropriate land use practices. Therefore, it is essential that appropriate programs be provided to assess the situation to ensure the maintenance of existing resources.

- *Situation*

With only two permanent professional officers, the CICS is most conscious of its lack of trained staff to discharge its responsibilities under the Conservation Act comprehensively and efficiently. Consequently, heavy emphasis has been placed on staff training and the service is now seeking assistance for more staff training overseas.

Like any other government department, the CICS operates on a very limited budget. However, it does have access through regional organisations (SPREP) to fund some of its programmes. Funds can also be secured through bilateral and multilateral discussions with the Ministry of Finance for foreign aid.

There is a general lack of public awareness of environmental issues and the Education section of the CICS utilises existing media agencies to overcome this situation. The programme includes printing of such issues in the Cook Islands News, regular advertising on Radio Cook Islands and CITV as well as news coverage of the issues raised.

The education section also tries to incorporate environmental issues into the school curriculum by introducing environmental educational programmes like Adopt-A-Beach. The CICS also utilises other organisations to promote environmental awareness. Such organisations include women's groups, church groups, youth/uninformed organisations, cultural groups, village committees as well as traditional leaders.

There is much difficulty in enforcing legislation due to various reasons. Political interference hinders decision making and there is a lack of trained staff to carry out the responsibilities in the Conservation Act.

The NEMS clearly states how coastal management and planning operate in the framework of National development. Having only just being implemented, it is not yet known if the programme is effective and successful. However, results should be available within the next six months.

- *Legislation*

There is a considerable body of formal legislation of environmental import in the Cook Islands and there are also the traditional rules and practices called *Ra'ui*.

Listed below are the relevant Coastal Management and planning legislation currently in use.

*Conservation Act*: applies only to Rarotonga and Aitutaki. Provides legal capability for good environmental management and development of protected areas and reserves.

*Marine Resources Act*: provides for sustainable development of fisheries resources and accession to regional conventions such as the Driftnet Convention signed in November 1989.

*Cook Islands Act, 1915*: taking and reserving land for public purposes such as Recreation Reserves, establishing Native Reserves for the protection of historic sites or areas of scenic interest, water supply sources, recreation grounds.

*Outer Islands Local Government Act*

*Local Government Act, 1989*

*Harbour Control Act*

*Ra'ui*: applied by traditional village leaders and enforced by the Island Council. Conservation of food resources

- *Projects*

Currently in progress is the Coastal Zone Management Programme for the Cook Islands (Rarotonga, Aitutaki, Mauke, Manihiki, Penrhyn and Mangaia). The programme aims to improve the protection of the coastline including lagoons and reefs against degradation. It covers the islands of Rarotonga, Mauke, Aitutaki, Manihiki, Penrhyn and Mangaia.

- *Training and Requirements*

The CICS recognises that without specialist advisers, the Coastal Zone Management Programmes will not function well. Therefore, it has identified areas where SPREP should provide assistance. Such assistance includes:

1. On job training in consultations and Coastal Zone Management Planning.
2. On job technical assistance in GIS and Coastal processes.

3. Assisting to implement Coastal Zone Management Plans by in-country consultation and works, not by coordinating and consultancies.

- *Discussion Summary*

*Is the beach profiling still going on?* Yes, but involves only one person from the CICS.

*Any problems of sand mining?* It costs about NZ \$120 for a truck load of sand; and is managed by family businesses who own the land concerned. The problem is mainly on Rarotonga. A major problem concerns the cultural relationships - family ties - affecting the enforcement of the legislation and regulations.

A comment was made that the Cook Islands Conservation Service appears well established relative to the other countries, but have a limited budget. There is a need to look at staff effectiveness with any programme in countries

*Does the Cook Islands have a staff training policy?* There is a bonding period of two years for every year spent away training.

#### American Samoa

- *Name, title and address of the person/people completing the country report. Names of office/agencies/departments/divisions/etc consulted in preparing the statement.*

Lelei Peau, Manager, American Samoa Coastal Management Program, Government of American Samoa

- *Which offices/etc have Coastal Management and Planning responsibilities? Provide a brief description of the office/etc. Include number of staff; specific responsibilities, legislative mandate (note title of appropriate legislation), responsible to who (eg independent authority; division within a department; etc.)*

*Public Law No 21-35* (American Samoa Code Annotated (ASCA) Sections 24.0501 *et seq.*) establishes the American Samoa Coastal Management Program (ASCMP).

The Office of Development Planning of the ASG created by 10.0104 ASCA, was selected as the "designated territorial agency", as required by Section 306 (c) (5) of the Coastal Zone Management Act, for the implementation of the coastal management program. It became the lead agency for all program implementation, as defined in 15 Code of Federal Regulations 923.47, which stated that the lead agency shall receive, administer, and account for all grants to the territory under the coastal management program.

The ASCMP is charged with preserving, protecting, developing and enhancing "coastal resources". The ASCMP coastal zone management area includes all the landward areas of American Samoa owned or leased by the Federal government. Given ASCMP's dual role of preserving and developing, it has become the clearinghouse for the building permit system on the islands. As such, the agency works to ensure that economic development of the island is not achieved at the expense of the long term integrity of the island's limited resources.

- *What sort of difficulties does your office/etc responsible for Coastal Management and planning come across in carrying out their duties?*

As you may have guessed, all is not perfect in Paradise. We also have our fair share of problems: A look at our experience in American Samoa, may perhaps offer a few lessons for those of us who are responsible for planning the development of this vast and diverse stretch of ocean.

The environmental problems which American Samoa experiences today are exacerbated by the high population growth rate and a growing dependence on commodity and petroleum product imports.

With only 55 square miles of land for Tutuila, American Samoa's largest island and home to 95 % of the total population of 47,000, the 3.7 % population growth rate is indeed alarming. While detailed data is unavailable, some estimates suggest that the aquifer/federal government drinking water system is already operation at close to 85 % of its sustainable capacity. Although this is not meant to suggest that drinking water will be the primary limiting factor for future development, it is illustrative of the struggle that infrastructure planners face in keeping up with the accelerated pace of development and infrastructure demand

Of great concern and cause for increased social tension is the growing shortage of land available for human use. Tutuila's steep topography limits human settlements to a narrow coastal strip, with the exception of a broad, ancient lava flow known as the Tafuna plain, to which the flood of new residential and industrial/commercial activity has recently shifted.

The current, and projected, development pressures on our islands' land and water resources is nothing short of phenomenal, the same holds true for islands throughout the Pacific Basin. The population increase in American Samoa if plotted on a line graph, will look as steep as the mountains which define our tiny islands, and which severely limit the amount of useable land available for our people. This steep increase in population growth will continue to place an enormous strain on our natural resources.

---

Other environmental problems include:

*Solid Waste:* The present landfill site is no longer adequate, it burns continuously, and is creating numerous problems for nearby residents. At present, the government is negotiating with the landowner on possible solutions.

*Sandmining:* The sand mining issue continues to be a problem, particularly in enforcement. This is primarily the case because the existing law under Parks and Recreation Department does not give room for minor sandmining for the purpose of domestic needs, such as a child's sandbox or small construction projects. Although we have instituted better enforcement procedures on major sand mining activities, a solution still needs to be found, and educating the public is a primary goal.

- *How are such difficulties dealt with?*

It was within this setting that the American Samoa Coastal Management Program (ASCMP) was established in 1980. Like most, if not all resource management programs in the Territory, ASCMP from the very beginning has been a fully federally funded program. Despite this lack of local contribution the program's funding, significant effort was invested in securing the understanding and support from the traditional and elected leaders for the program's policies and objectives.

The ASCMP had been in operation for eight years when, in 1988, it initiated the establishment of a new coordinated, inter-agency decision-making process for the review of land use permit applications. The new initiative, became known as the Project Notification and Review System (PNRS).

Three major benefits of the revised PNRS are:

1. major timely review of land use permit applications by providing coordination on all aspects of regulatory requirements of the various resource management agencies represented on the inter-agency PNRS Committee,
2. more meaningful environmental review by bringing together the collective experience of some 7 or 8 professionals, to bear on a development proposal rather than a single person as was previously the case; and
3. a reduction in expense for the public by requiring early review of a project proposal at the site planning stage, rather than at the stage when building blueprints were already approved by the Department of Public Works, as was previously the case under the old system.

This eliminated expensive modifications to architectural plans, or in the event of project denial, eliminate the expense for such plans entirely.

All persons, both private citizens and ASG representatives, proposing to build or modify a structure, or to conduct any activity which affects, or may affect, the natural, cultural, or historic resources of the Territory, must apply for a land-use permit. Depending upon the type and nature of the structure or activity, a dredging, filling, or excavation clearance, zoning variance, building permit, and/or business license may also be required. Other Federal requirements may also apply.

- *How does coastal management and planning operate in the framework of national development*

ASCMP is a voluntary program which is 100 % federally funded without any local appropriation. All the rules and polices are written within the federal guidelines, with of course the local perspective.

- *Is coastal management and planning effective in your country? Why or why not?*

The strength of ASCMP is derived from the coordinated contributions of individual ASG agencies whose operations and technical expertise form the backbone of the Territory's permitting system. The revised Project Notification Review System was established as a one-stop shopping effort.

Yet clearly, effective management and planning requires the cooperation and clear direction from higher authority and the support from the general public. The support from all government agencies as instructed under statute remains to be seen. The enforcement of specific environment regulations pertaining to agency's responsibilities still needs to be improved through commitment and action taken in the field.

Life may not be as perfect as one may expect in an island setting. While ASCMP continues to sort out its priorities, development still takes its course, the agency exists to promote and protect the environment and ensure the economic viability of the islands resources. In addition, we have a major responsibility that we are confronted with everyday that is educating the public on the significance of our fragile environment for present and future generations.

- *Please list the relevant coastal management and planning legislation and regulations currently in place and their purpose?*

On the federal level, perhaps the most pertinent coastal management legislation is the *Coastal Zone Management Act* or the CZMA as it is most often referred to.

---

The objectives of the Act are to:

1. preserve, protect and where possible to restore or enhance the Nation's coastal resources;
2. encourage and assist states and territories in the development and implementation of management programs;
3. improve cooperation among federal, state, territorial and local governments; and
4. encourage the public and governmental participation in the development and implementation of coastal management programs

Other federal laws that have been instrumental in ensuring that coastal management programs are implemented accordingly include the Clean Water Act, particularly Section 404, which deals with the disposal of dredged or fill material and Section 10 which deals with permitting for all structures and work within the three mile limit from the high water mark on the shore and on a navigable watercourse of the US.

On the local level, with the passing of the CZMA, states and territories were encouraged to develop and implement coastal management programs, the American Samoa Coastal Management Program Act was passed by the American Samoa Fono in 1990, after existing under executive order since 1980. The Act established Program, declared all the islands, coastal waters and submerged lands within the boundaries of the territorial seas as the coastal zone management area. The Act also required ASCMP to develop and implement a system for the issuance of land use permits.

The system that has evolved is today known as the Project Notification and Review System, headed by a PNRS Board whose members include all of the regulatory agencies on the island that review permits for development projects on the island. These agencies bring to the board their own mandates during the review. These include American Samoa Power Authority's Septic Tank Standards, Public Works Uniform Building Code, Dept. of Parks and Recreation Historical Preservation Commission, Development Planning's Zoning Board Regulations, ASCMP Policies, American Samoa Environmental Protection Agency / Environmental Quality Commission's Water Quality Requirements, Department of Marine and Wildlife Resources Powers and Duties, Village Soil Conservation Laws, etc.

The above listed mandates, rules, regulations and standards have allowed ASCMP to share responsibility for managing our small island's coast. The PNRS is an efficient permitting system, and it is not without its problems, but it is by far the best permitting system that the territory has ever had.

- *What sort of coastal management and planning projects or programs are currently in operation?*

*Utulei Shoreline Project:* Phase III of the ASCMP Adopt a Beach Program for Utulei Beach, will be to contract with an engineering firm with experience in coastal processes and erosion control to conduct studies and make recommendations pertaining to erosion and shoreline control and protection along Utulei Beach. The project will include shoreline erosion studies and, should the studies indicate the need, engineering recommendations for rebuilding and protecting the beach.

*Tualauta Baseline Study:* The Tualauta Baseline project is the first of a series of master planning efforts in the territory. We hope to generate some momentum and gain support for such plans from this study in order to do planning work in other areas. Tualauta county was determined during the last census count to be the fastest growing area in the territory. Given the increase in population and scarcity of developable land in the territory, it is essential that development standards are designed in order to address the current situation and determine the future of our island environment. These standards will be used by the PNRS in their assessment of land use permit applications.

*Solid Waste Collection Centre:* There are serious institutional problems with American Samoa's solid waste collection system. While there are some limited recycling opportunities on island (primarily aluminium cans) there is little money available for improvement of the system. What little grant money is available is mostly for studies rather than implementation.

To address these problems we are currently constructing simple, low technology solid waste collection stations (SWCS) within the Special Management Areas (SMA). The strategy is to have one site each for the eastern and western sides of Tutuila, and one Bay area due to their large and dense population.

*Tafuna Lowland Rainforest Park:* A 20 acres lowland rainforest is being negotiated between ASCMP and the Haleck family to be protected for future generations. ASCMP is proposing to first, obtain a 55 year lease from the Haleck family, second, construct a fence around the property to secure the rainforest area, third, establish a trail and finally construct visitor facilities at the site.

*Coastal Hazard Assessment and Mitigation Program:* The CHAMP is set up to institute new regulations and permit processing procedures for the villages in order to prepare, mitigate and respond to any natural disasters phenomena.

---

The CHAMP includes: (1) the development of new territorial regulations and procedures to implement ASCMP's statutory responsibility for the "development of strategies to cope with sea level rise and other coastal hazards; and the development of village hazard mitigation plans and regulations."

The village hazard mitigation planning process will result in hazard mitigation plans and regulations for the villages of American Samoa, a significant increase in public awareness of hazard mitigation, and the development of a village-based implementation and regulatory system.

*Wetland Management Program:* It consists of the development of (!) village ordinances for wetland areas on Tutuila and in the Manu'a Islands, and (2) special management area designations for two wetland areas in the Manu'a Islands as a foundation for special management area designation, and the development of village-based management and regulatory systems for these special management areas.

*Marine Debris:* Marine debris problem in the Territory is largely a result of an inadequate municipal solid waste management system. While vessels contribute somewhat to the problem, most marine debris is from land-based sources. This project includes two components: (1) development of new legislation to establish advance disposal fees for and/or restrictions on selected imports, and increase in fines for "accumulated solid waste" and dumping, and an enterprise fund to support municipal solid waste management; and (2) a village-based litter and marine debris reduction planning effort aimed at developing village-based management, regulation, and enforcement. The Marine Debris Project is built upon existing ASEPA regulation, enforcement, and public education activities but will be specifically aimed at reducing the marine debris problem.

*5-year Environmental Education Project:* The purpose of the plan is to develop a comprehensive, integrated environmental education plan for ASCMP. The plan will be developed by (1) identifying existing environmental education programs on American Samoa, and defining gaps or duplication among those programs; (2) assessing special areas of need for environmental education among the populace; and (3) identifying traditional methods and knowledge which might form the basis for or be integrated with environmental education efforts.

- *What coastal management and planning training and/or technical advice does your country currently require?*

In the short term, we would like to see more emphasis in developing a training model to focus on enforcement of environmental regulations within the island context.

American Samoa Coastal Management Program's greatest challenge has been the clash between the Western style regulatory approach to resource management and the *mutai* system of land management. Regulation and enforcement at the village level in American Samoa are the domain of traditional leaders and are achieved through a consensus building process alien to Western society.

Long term needs should focus on integrated CZM to incorporate traditional norms and values. CZM will only survive through an integrated approach that is based on the existing culture's framework.

- *What assistance for coastal management and planning do you feel SPREP should be providing?*

ASCMP would like to seek technical assistance from SPREP to set up a GIS. WE are currently working towards identifying a funding source and have SPREP set up the system and provide some staff training.

- *Discussion Summary*

A comment was made that the key to the programme was enacting the legislation. For the first eight years no one was taken to court, but now a number of people are being prosecuted. Another aspect of the programme which has been of considerable value was the bringing together of the various agencies through the permitting system. Enforcement remains the number one problem, especially when it is the government who offends.

*What type of qualifications do the AMCMP staff have?* In 1989 there were only two professional staff. The Program does have funds to bring in professionals. All of the professional staff have university backgrounds, including the Samoan professional staff. Seven of the Samoan staff have high school degrees, but have received on-the-job training.

Some of the enforcement staff will soon be attending a three week training workshop in Hawaii, focussing on EIA and map reading. This is a pilot project between PIN and AMCMP. The program is still short about two to four professional staff. Efforts are being made to increase high school students interest in environmental studies. The setting up of a fund for scholarships is being attempted, as is an internship programme.

---

## 3.2 Saipan Meeting

The meeting was attended by 21 people including representatives of the Commonwealth of the Northern Marianas Islands, the Federated States of Micronesia, Guam, Kiribati, Nauru, Palau, the Pacific Islands Network (PIN), and SPREP.

Mr Manuel C. Sablan, Administrator of CNMI's Coastal Resources Management, officially opened the meeting. SPREP's Coastal Management Officer, Dr Andrew Smith, commenced discussions by outlining the objectives of the meeting, and requested that proceedings be as informal as possible to facilitate an exchange of information. This was accepted by the participants. Dr Smith then presented information on SPREP and on SPREP's Coastal Management and Planning Programme.

Presentations by the country and territory representatives were then made. These are provided below with a summary of the ensuing discussions.

### Commonwealth of the Northern Marianas

*(Prepared by: Susan Snow-Cotter, Natural Resource Planner reviewed and commented on by Peter Barlas, Assistant Administrator and John Firey, Coastal Coordinator)*

The Coastal Resource Management Office (CRMO) is the lead coastal and resource management agency in the CNMI. CRMO heads up an inter-agency Board of Agency Directors who are responsible for the technical review and approval of development proposals occurring within any of the four designated Areas of Particular Concern (Wetlands, Port and Industrial, Shoreline and Lagoon and Reef) or for projects which meet the Major Siting criteria.

Major Sitings are defined as developments located anywhere on the islands which have the potential to significantly impact coastal resources or meet certain infrastructural thresholds. The CRM Regulations list several types of projects which are automatically considered to be "Major Sitings" such as mining operations, infrastructure development and industrial facilities.

Any project can be declared a "major siting" by the documented consensus of the CRM Program agencies. The Board of Agency Directors are comprised of the heads of the Department of Public Works, Department of Natural Resources, Department of Commerce and Labor, Division of Environmental Quality, Commonwealth Utilities Corporation and the Historic Preservation Office.

In addition to its regulatory agency role, CRM also conducts public education programs, resource planning and enforcement responsibilities. CRMO has its main office on the island of Saipan with small field offices on the neighbouring islands of Tinian and Rota. CRMO currently has twenty employees.

CRMO derives its authority from *Public Law 3 - 47* and *CRMO Rules and Regulations*. P.L. 3-47 was enacted in 1983, although a Coastal Program was already operating in the Commonwealth under an Executive Order since 1979. CRMO is administratively located under the Governor's Office. A proposed government reorganisation plan could place CRMO under the Department of Natural Resources or Planning and Budget.

Since CRMO was established prior to the development boom of the late 80's/early 90's, most of its regulatory programs were already fairly well established and accepted by the community. Although CRMO has jurisdiction over most major development projects, many projects do not fall under CRM purview and require permits from the Division of Environmental Quality, the Zoning Office and/or the Department of Public Works.

The CNMI lacks a Master Plan and therefore, cumulative impacts of development must be mitigated within the CRM regulatory system. The current Zoning Law which has been in effect for approximately one year maybe repealed. CRMO may now be in the position of revising and adopting portions of the Zoning Law and incorporating them into CRM Regulations.

CRMO receives the bulk of its funding from the federal Office of Ocean and Coastal Management (OCRM) and is subject to specific program requirements of the US government. CRMO also derives funds from application fees and enforcement fines. No local funding is utilised to run the CRMO program.

---

Political pressure is ubiquitous on all small islands and CRM deals with these permitting problems by trying its utmost to keep the technical review of permits based on natural resource issues. It is also important that each Board agency focus on issues under their jurisdiction and not get involved in cross-jurisdictional issues. CRM attempts to treat government projects the same as private projects, however, government projects often get reviewed in an expedited fashion. CRM utilises extensive permit conditions to address specific project concerns and act as mitigation against the potential impacts of a project.

CRMO is the main developmental permitting agency in the CNMI. The recent government reorganisation may shift responsibilities for development permitting, but it is presently unclear how this might be accomplished.

CRM permitting is generally effective, but like all regulatory programs, could certainly use improvements. Local technical expertise is often times insufficient to adequately review the range of development permits which are sought. Expatriate technical staff are often relied on for much of technical review. Unfortunately, the expatriate staff are often short-term and do not have the benefit of local knowledge to complement their expertise. Rapid turn-over of both local and expatriate staff is a continuing problem.

CRMO planning, public education and enforcement have historically taken a back seat to permitting. Now that development rates have slowed CRM has had the opportunity to focus efforts at improving these other program areas. In a short time, CRM planning, public education and enforcement have all been improved markedly.

In addition to ongoing permitting, enforcement and public education programs, the CRMO office is presently undertaking a Non-Point Pollution Marine Monitoring Program, a Coastal Hazards Mapping and Management Report and a Watershed Protection Plan for the Magpo Wetland in Tinian.

CRMO is always on the look-out for applicable case studies to compare with project proposals which we are reviewing. Impacts and feasible mitigation for dredging projects in coral reef environments, wetland enhancement techniques, beach erosion control, stormwater control, water desalinisation and impacts of reverse osmosis brine on aquifers and nearshore environments, aquaculture, etc. would be very helpful to our program.

A database of experiences with different types of development projects would be advantageous to us as well. All islands could periodically submit project summaries and evaluations based on their experiences, good or bad. SPREP could then enter these into a database and supply them to islands as the need arises. We have found that it is often very difficult to get case studies or recommendations for project review which are relevant to tropical island environments.

Other areas which we need training assistance include coral reef monitoring techniques, natural resource damage assessment techniques / economic valuation, innovative wetland management, public education (developing videos and other materials), GIS training, reference library data base development, site plan/blueprint evaluation, stormwater calculation/best management plan application, technical map/document interpretation, and telecommunication capability development.

- *Discussion Summary*

*What sort of educational backgrounds does the staff of CRM have?* Three have Master's degrees - environmental planning and engineering; coastal zone management; and natural resources management. The permit manager has a biology degree.

*Did you say your zoning plan is being repealed?* Yes; the separate zoning plan has been repealed. Zoning is a contentious issue.

A comment was made that the CRMO is the only review agency on island; it is highly regulatory; the lead agency; but does little planning.

In reference to training policies it was noted that there are currently a number of scholarship students in the US, who are bonded to come back and work for the government. A request was made for training scholarships in coastal zone management.



---

**Federated States of Micronesia**

*(Presented by: Moses A. Nelson, Administrator, Division of Marine Resources, Department of Resources & Development, FSM National Government; and Joe Konno, Executive Director, Chuuk EPA, Chuuk State, FSM)*

- *Which offices/etc have coastal management and planning responsibilities?*

National and State Governments:

1. Environmental Protection Agencies (national & state)
2. Marine Resources Divisions (national & state)
3. Planning (national & state)
4. Transport and Communications (national & state)
5. Public Works (states only)

- *What difficulties do the offices/etc responsible for coastal management and planning come across in carrying out their duties? How are such difficulties dealt with?*

Administrative mostly. No allocation of the CZM responsibility to a specific office. No discreet funding for this to a specific office. No discreet funding for this activity by the different levels of governments.

- *How does coastal management and planning operate in the framework of national development? Is coastal management and planning effective in your country? Why, or why not?*

CZM planning is relatively new to the Government. Policy land and at present it is difficult to assess the effectiveness of such. The FSM States are at variable stages of developing CZM plans and its premature to pass judgement.

- *Please note the relevant coastal management and planning related legislation and regulations currently in place and their purpose? Are they successful, why?*

*FSM title 18/ territory, economic zones and ports of entry 1980*

*FSM title 19/ Admiralty and Maritime 1980*

*FSM title 23/ Resource Conservation 1980*

*FSM title 24/ Marine Resources 1980*

*FSM title 25/ Environmental Protection 1983*

*FSM title 26/ Historic Sites and Antiquities 1980*

**FSM EIA regulations**

**SM Earthmoving regulations 1988**

*FSM Marine and Fish Water Quality Standard Regulations 1983*

*Chuuk Environment Protection Act 1993*

*Pohnpei Environmental Protection 1992*

*Kosrae State Law 5-66, 1991*

*Kosrae Island Resources Management Plan 1993*

*Yap title 20. Land Planning Act*

*Yap Environmental Protection Act*

- *What sort of coastal management and planning projects or programmes are currently in operation?*

The four FSM entities are currently working on CZM plans but are at differing stages of developing such plans:

1. Kosrae has a land use plan which the legislature has adopted parts of.
2. Yap has draft plan but has not implemented it. Needs more input from the community etc.
3. Pohnpei has just completed the first draft of its CZM plan but must now go through the public hearing stages.
4. Chuuk has decided to create a plan and with organisation the relevant departments and agencies involved in a very short time.

- *What coastal management and planning training and/or technical advice does your country currently require? Identify short-term and long-term training needs.*

Long term training: scholarships for studies at the tertiary level.

Short term training:

1. Short, term (specific courses) training activities to be done in partnership with the community colleges.
2. Impact Assessment on coral reef damage by groundings.
  - a) how much damage
  - b) value of damage per species of coral, age of coral heads
  - c) long term impact/appropriate compensation and long term monitoring.

---

- *Discussion Summary*

*What sort of projects do you have problems with?* Both developers and government projects. In many cases the process for review isn't clear, which is exacerbated by the lack of expertise and funds. Some of the states have appropriate laws and/or regulations, but at times lack commitment from the governments - again staff and funding problems, coupled with political support problems. Many of the politicians are also the developers, so there is a need for education and awareness amongst the politicians.

*What is the land tenure situation?* It varies from state to state. Yap and Chuuk recognise traditional rights to coastal areas; whereas Pohnpei and Kosrae states don't. Even within the states there is variation.

A comment was made that education needs to be incorporated into other coastal management activities, for example, even with developed countries with high levels of education and training they still have problems; high levels of education doesn't necessarily solve coastal management problems.

It was noted that the College of Micronesia in Pohnpei does have marine science courses and are looking at coastal management courses. In addition, at high school level marine activities are also being included.

There is currently a problem of there scholarships being available, but mostly in areas other than marine and coastal activities.

## Palau

*(Prepared by: Demei O. Otobed, Chief Conservationist, Koror State, Republic of Palau)*

- *Names of entities consulted and/or are associated with some aspect of coastal management*

1. Palau Environmental Quality Protection Board
2. Babeldaob Road Project
3. Bureau of Public Works
4. Bureau of Natural Resources and Development
  - a) Division of Marine Resources
  - b) Division of Agricultural and Mineral Resources
  - c) Division of Conservation and Entomology

5. National Emergency Management Office (NEMO)
6. Bureau of Foreign Affairs, Ministry of State
7. Bureau of Land and Surveys
8. ROP Planning and Statistics Office
9. NGO's
  - a) Palau Conservation Society
  - b) Palau Resource Institute
  - c) The Environment, Inc.

- *Offices that may have some coastal management responsibilities*

1. Office of Planning and Statistics - this office is manned by three (3) employees. The responsibilities of this office is the overall planning and gathering of statistical data for the Republic. It works very closely with the Master Development office. This office reports directly to the President of the Republic (Authority Executive Order by President).
2. National Emergency Management Office (NEMO) - Three (3) employees - is responsible for coordinating and carrying out duties related to national emergencies. (Authority in Executive Order by President).
3. Bureau of Public Works - with about 400 employees, works directly under the Ministry of Resources and Development. The work of this bureau is building and/or maintaining the existing facilities. The work may include the building and construction of roads.
4. Bureau of Natural Resources and Development - two (2) employees. This Bureau works under the Ministry of Resources and Development and this Bureau oversees the responsibilities of the following divisions.
  - a) Division of Marine Resources - with twenty-two (22) employees. Among other things, formulates, establishes and implements guidelines and conservation measures to safeguard against exploitation and over harvesting of fish and other marine resources.
  - b) Division of Agriculture and Mineral Resources. This Division oversees the agricultural, forestry and mineral management program. It has nineteen (19) employees.

---

c) Division of Conservation and Entomology - prepares plans and directions for the Republic of Palau's conservation and entomological programs. This deals with conservation law enforcement program with seven (7) employees.

5. Babeldaob Road Project - this project has twenty (20) employees and is responsible for building the Babeldabo road. This project reports directly to the ROP President.

6. Palau Environmental Quality Protection Board - this Board oversees the protection of the human environment. The responsibilities are contained in 24 PNC 103 - there are fourteen (14) staff working for this board. The Board membership is seven (7).

7. Marine Protection Division - staff is one (1), it is under the Bureau of Public Safety.

- *What difficulties do the offices/etc responsible for coastal management and planning come across in carrying out their duties?*

In the Republic of Palau, the coastal zone is not delineated, but is viewed as an important integral part of the total environment. Because this area is not clearly delineated and several agencies are involved in its protection, including the sixteen (16) states, may create some sort of difficulties, although not unsurmountable.

- *How are such difficulties dealt with?*

Whatever difficulties encountered are solved by coordination among the various agencies including consultation with the 16 states.

- *How does coastal management and planning operate in the framework of national development?*

The Republic of Palau's Master Plan is soon to be developed, in this plan the coastal zone is treated as a part of the total environment.

- *Is coastal management and planning effective in your country?*

Yes, it is somewhat effective, however, its effectiveness depends on the agencies carrying out their responsibilities under the law. Failure to do so results in coastal zone or any other zone's destruction.

- *Please note the relevant coastal management and planning related legislation and regulations currently in place and their purpose? Are they successful, why?*

Again, since the coastal zone is treated as an important part of the total environment of Palau, the following list of legislation doesn't necessarily restrict the applicability of legislation to coastal zone alone, but rather the environment in general.

1. *34 PNC 2001 - Div. 3: Plant and Animal Control* - deals with the control and the regulations on the prevention of introduction of pest into the Republic and movement of same within the Republic. The control of monkeys, rats, other animals, ie, parrots and psittacene birds are included in this law.
2. *34 PNC 5101 - fire control* - this controls the use of fire in Palau and may hit a part of the control area.
3. *19 PNC 101 - deals with Historical and Cultural Preservation Act*, both tangible and intangible.
4. *10 PNC 301 Fisheries Zones and Regulation of Foreign fishing* - control foreign fishing in Palau.
5. *24 PNC Environmental Protection:*
  - a) *EQPB - Protection of the human environment*
  - b) *Wildlife Protection*
    - Endangered Species Act.
    - Turtle Protection.
    - Dugong Conservation.
    - Trochus
    - Fishing with explosives, poison or chemicals.
    - Conservation of birds
    - Preserve and Protected areas.
      - i. Ngerukeuid Island Wildlife Preserve
      - ii. Ngerumekaol Grouper Spawning Reef Area.
    - Natural Heritage Preserves System - designation and management Heritage Reserves.
    - Marine Protection Act of 1994 - regulating the taking of certain species of marine and terrestrial organisms; to prohibit or limit certain fishing methods, etc.

- *What sort of coastal management and planning projects or programmes are currently in operation?*

Major project in Palau in the coastal areas is dredging corals for road construction. This activity is controlled and managed by EQPB with consultation from Division of Conservation and Entomology, Agriculture and Forestry and Marine Resources Departments. Now it also involve the US. Fish and Wildlife and the Army Corps of Engineers. Timber cutting, fishing, shelling, clamming, etc., are going on.

- *What coastal management and planning training and/or technical advice does your country currently require? Identify short-term and long-term training needs.*

Since the Islands of Palau are small, it really is hard to correctly delineate the coastal zone. We may need training with this as a short-term training need, also a thorough inventory of the living and non-living organisms in the zone once delineated. Assistance and training are both needed in this area. Monitoring capability is needed. Long-term training - we need money for training outside of the region to attain degrees or certificates on coastal zone management or other disciplines which can be used for coastal management.

- *What assistance for coastal management and planning do you feel SPREP should be providing?*

Short-term training; maybe some sort of long-term training (college level), etc. If money is available for helping enhancement/restoration programs for damaged coastal zones. SPREP can serve to disseminate coastal zone management knowledge and other information to the rest of the region.

In the absence of a good materials, the Republic is engaged in dredging the coastal zone for corals/sand for road construction and repair work. We need to find an alternate source of road materials, ie, a mobile - type or stationary rock crusher that crushes rocks into desirable size suitable for road construction and repair, and further can be used for other construction work. If this is done, then many of the effects of dredging can be prevented.

- *Discussion Summary*

*Does Palau have a training policy?* The situation is confusing, as it is not yet divorced from the Trust Territory of the Pacific Islands. The leaders currently look at the environment as something to exploit. Through the master plan it is hoped to set up a fund for environmental scholarships.

It was further noted that science students are a rare breed. Palau is currently preparing a curriculum framework.

Palau is now moving to a 10-year planning period rather than the previous 5-year period. The Compact with the US comes into force from 1 October this year. They will then move away from the US Army Corps of Engineers and US EPA control.

The Palau Community College is reorganising following its change from being the Micronesian Occupational College and will perhaps offer environment related courses. It may be possible for the Board to pass on the mandate to the PCC to permit them to develop appropriate courses, and encourage them to respond to national level needs.

#### Kiribati

*(Prepared by: Tererei Abete, Environment Coordinator, MENRD; Naomi Biribo, Mineral Officer, MENRD; Craig Wilson, Environmental Specialist, MENRD; Tapetulu Merang, Ag. Civil Engineer, PWD; Paul Jones, Urban Physical Planner, LSD, MHARD)*

- *Offices responsible for Coastal Management and Planning*

There are three main Ministries which are involved in coastal planning and management.

Public Works Division which is a division of the Ministry of Works and Energy has a Civil Engineering Section which constructs coastal protection infrastructure, among other things. The Section has two Engineers, two Technicians (surveyors and cost estimates), one Foreman, three Leading Hands, four Tradesman, five Operators of heavy plants, six Drivers and four Handymen. PWD is not mandated by law but it is the only government agency responsible for implementing development projects because it is the only department that has the in-house resources and capacity within the whole country.

The Lands and Survey Division (LSD) under the Ministry of Home Affairs and Rural Development (MHARD) has a Physical Planning Unit (PPU) with two Officers and a Survey Section with three Surveyors. The PPU has the sole responsibility of serving the Land Planning Boards, including the development of land use policies and raising public awareness.

---

The Lands and Survey Division and the Ministry are legislatively mandated under the Land Planning Ordinance 1973 which provides control over land use and development, the Foreshore and Land Reclamation Ordinance. The LSD is responsible to the Minister of MHARD through the Central Land Planning Board.

The Environment Unit (EU) and the Mineral Unit (MU) are both sections of the Ministry of Environment and Natural Resources Development (MENRD) and hence both are also responsible to the Secretary of ENRD. The EU has one permanent staff plus three short term contract officers.

The EU which was established in 1991 is responsible for environmental management and public awareness conservation and protection of natural resources, however, it is not supported by any special legislation. The MU which was established in 1992 is singularly manned with the responsibility of managing mining of minerals such as phosphate, sand, gravel and corals, and its enacted by the Mineral Development Licensing Ordinance.

- *Difficulty and Partial Solutions*

Kiribati has not yet developed an integrated coastal protection and management policy. The Coastal Zone Management Subcommittee (CZMS) which came into existence in 1993 is just developing a policy along those lines. The preparation of a coastal zone management plan for the capital, South Tarawa, is being proposed to the Government of New Zealand for funding assistance.

Extraction of sand, gravel, and beach rock is not controlled. Only designated foreshores are commonly known to be lawfully prohibited for mining purposes, however, enforcement is lacking. Additionally, the government has not yet designated alternative mining sites for the extraction of construction and landfill material. The MU has been collecting data on the amount of material extracted from the foreshores of South Tarawa with a purpose to designate alternative sites for mining. LSD is in the process of designating critical foreshores to be free from mining of landfill and construction material.

Removal of coastal vegetation, in particular mangroves and foreshore communities, is not controlled on private land since the government can only legally control developments on its own land and government leased land. As a result approximately 20 % of mangrove and coastal forests have been removed due to "developments".

Only approximately 20 % of the land area of South Tarawa has been designated for land use planning purposes. In the remainder, councils essentially let private landowners do as they wish. The notion of planning for the public interest is relatively new. Individuals and local communities illegally reclaim land with the construction of seawalls and dredge boat channels (in the lagoon) to provide access for fishing boats.

Coastal areas are still being regarded as waste dumps and toilets as it was the tradition during pre-colonial times. Clean-up campaigns, associated activities and public awareness raising on coastal protection and conservation are now currently ongoing, however, they are restricted due to a lack of ongoing funds.

Lack of data, development standards (ie, setbacks, etc.); appreciation of problems; and enforcement personnel. LDS is seeking funding of a Geographical Information System (GIS) set-up. In-country training workshops and awareness raising seminars are on-going.

Lack of resources (both human and financial) are common difficulties encountered in coastal protection and planning management. In every request for coastal protection and manpower training, a project proposal is developed to attract potential donors. In most cases, external funding is not possible and as a result, local funding has to be provided that is just enough to construct cheap and temporary infrastructures which in turn exacerbate coastal erosion.

- *Seventh National Development Plan (7NDP)*

One of the 7NDP policies and strategies is putting more emphasis on environmental protection for sustainable economic development. Noting the country's very limited natural resource base of which marine resources is an important asset, it is necessary therefore to control overfishing, protect mangroves and minimise coastal erosion and pollution at sea.

It is also realised that efforts must be made to ensure that all national development activities are in harmony with environmental policies, the development and implementation of appropriate legislative measures to protect Kiribati environment and heritage is considered a high priority.

Since relevant legislation like environmental impact assessments of private and government development projects and necessary policies such as coastal management and protection are lacking and inadequate, the objective of sustainable development is a long way from achievement. Changes in the coastal environment are evident in the name of "development" but its ecological sustainability is questionable.

However, the general public, private developers and more encouragingly, government departments are becoming environmentally conscious of their future projects. Project proposals are being submitted for environmental assessments. Project donors give favourable support towards sustainable projects. In the short term, efforts are being geared slowly towards the framework of national development but of course it takes time and resources to arrive at the goals. As it is the case in developing countries, the lack of qualified and experienced manpower, as well as financial support, are the main constraints of the national sustainable development effort.

- *National coastal management and planning legislation and regulation*

*Foreshore and Land Reclamation Ordinance:* It vests the ownership of the foreshore and the seabed in the State. The Minister (of MHARD) may by notice designate any part of the foreshore and any sand, gravel, reef mud, coral, rock or other like substance cannot be removed from any such area without a license from the Chief Lands Officer. As previously stated, a number of areas had been designated by enforcement is lacking. In cases where licenses had been issued, management and control of these licenses is lacking. First, the licenses are free and they are not properly recorded for management and control purposes.

*The Mineral Development Licensing Ordinance:* It has provisions for the grant of licenses to search for and to win minerals. It contains a number of environmental protection requirements and there are opportunities to include those environmental protection requirements and there are opportunities to include those environmental requirements considered necessary. How successful it is, is not yet known since there is hardly any mineral mining activity. In fact we do not any have mineral mining activity. We do not any have minerals worth mining. Coral mining is not even encouraged.

*The Land Planning Ordinance 1973:* provides control over land use and development. Through the Central Land Planning Board and its Local Boards, permission is granted to develop or redevelop land. With representation from the Environment Unit at these Boards, specified developments are now receiving at least some environmental scrutiny. General Land Use Plans and specific management strategies of designated areas are being prepared by or on behalf of the CLPB. It is anticipated that eventually all of the South Tarawa will be designated and management strategies prepared for these areas. The success of the management strategies will be a result of political and community will to implement such development controls.

- *Current Coastal Management and Planning*

There is neither existing management nor planning that is specifically coastal in nature except the General Land Use Planning. There is a proposal in the pipeline to prepare a coastal zone management plan for South Tarawa only as it houses a third of the population, as well as all environmental problems.

- *Short Term and Long Term Training Needs*

Short term training or in-country government training is required in integrated planning (environmental, economic and social); water and sanitation and; coastal developments standards in line with population pressure and on-going public awareness.

Long term training is required in more specialised fields such GIS operation, urban/town planning, environmental engineering and coastal mapping and management.

- *Training and Assistance need from SPREP*

The following target areas are:

1. community education and involvement
2. institutional strengthening/capacity building (part, Central government)
3. upgrading local Government Standards

Possible programs shall include:

1. coastal management and guidelines
2. population/environment linkages
3. EIA workshops
4. Biodiversity programs

---

- *Discussion Summary*

*Does your ordinance only apply to government land? Yes.*

A comment was made that community involvement and discussions are needed prior to any plan development. One problem experienced within community involvement in many Pacific islands is that people only tend to respond when an issue starts to affect them personally.

## Guam

*(Prepared by: Randel L. Sablan, Planner II, Environmental Planning & Review Section, Guam Environmental Protection Agency (GEPA))*

- *Agencies and Programs Responsible for Coastal Management and Planning*

This summary does not include US Federal Government agencies such as the Coast Guard, NOAA, US EPA, US Army Corps of Engineers and others. The summary is intended to provide an overview of local or Territorial agencies and programs, however, most agencies and programs outlined hereafter operate on federal grants and under the authority established in federal law. In several cases programs were patterned after similar federal programs. In addition, this summary was not prepared in consultation with the agencies listed below and represent the views and concerns of the preparer and his supervisor.

1. *Bureau of Planning, Guam Coastal Management Program (GCMP)*

Personnel: 10

The Bureau of Planning, GCMP is responsible for the review and coordination of development, land-use and environmental issues. The program utilises a network of Government of Guam agencies (ie Guam Environmental Protection Agency, Department of Land management, Department of Public Works, Department of Parks and Recreation, and the Department of Agriculture) for management, regulatory, and enforcement functions.

Its primary objective is to pursue local and national objectives included in the Coastal Zone Management Act as reflected in the GCMP's 16 enforceable development and resource policies. Actions affecting Guam's natural resources are scrutinised to assure intelligent utilisation and conservation of those resources.

The program is divided into as many as 11 different sub-programs or functions, six (6) of the more standard functions include: Economic and Natural Resource Management; Federal Activities and Project Coordination (Federal Consistency Review); South Pacific Applied Geoscience Commission (SOPAC) representation; Public Information Efforts; and management of a Geographic Information System.

The Program also represents the Bureau and Coastal Management Program objectives through membership on the Development Review Committee (DRC). The DRC is the technical review arm of the Territorial Seashore Protection Commission (TSPC) and Territorial Land Use Commission (TLUC) which are responsible to administer, permit, and hear variance requests in accordance with Guam's *Zoning Law, Subdivision Law, Territorial Seashore Protection Act*. The TLUC/TSPC also issues wetland and other special area development permits.

The objectives outlined above are carried out under authorisation by the *United States Coastal Zone Management Act of 1972 (P.L. 92-583, as amended by P.L. 94370) Government of Guam Executive Order (EO) 90-09 Establishing the Development Review Committee*, and EO 90-13, *Protection of Wetlands*. The program is largely responsible to the Governor of Guam and the National Oceanic and Atmospheric Administration (NOAA) of the Federal Government.

2. *Department of Land Management, Planning Division*

Personnel: Planners - 14;

Personnel assigned to Seashore Activities - 4

The Department of Land Management, Planning Division (DLM-PD) is responsible for the administrative duties of the TLUC and TSPC. The Division (the Territorial Planner) serves as the chair for Territorial Seashore Reserve Task Force which is responsible for developing Guam's Territorial Seashore Reserve Plan under the authority of EO 92 - and as required by the *Territorial Seashore Protection Act of 1974*. The Territorial Planner also serves as the designated Executive Secretary of the TSPC.

---

3. *Department of Agriculture, Division of Aquatic and Wildlife Resources (DAWR)*

Personnel: 9

The DAWR is a member of the Development Review Committee and provides technical reviews and recommendations to the TLUC and TSPC on applications for development within the Territorial Seashore Reserve.

Protection of endangered species is accomplished through various fish, bird and wildlife management and research programs at the direction and guidance of the US Department Fish and Wildlife. The DAWR is also responsible for the management of all fish and wildlife resources of the territory through objectives of protecting habitat, including nesting, foraging, spawning habitat, and the prevention and control of introduced or foreign species.

Coordination and consultation with the various Government of Guam and Federal agencies is conducted through planning groups, committees, task forces, and commissions. The Division serves in a pivotal role when development is considered near or in marine and coastal resources areas. Reviews of Environmental Impact Assessments / Statements are conducted by the Division for most marine related development. Plans and efforts to establish conservation areas and wetland areas of particular concern in the coastal zone originate with the Division.

4. *Guam Environmental Protection Agency, Environmental Planning and Review Section (EPR)*

Personnel: 3

Guam EPA's Environmental Planning and Review Section is responsible for several programs that are directly related to marine and coastal resource management and protection. The section is responsible for coastal wetlands management and protection which is accomplished through delineation efforts, permit reviews and enforcement duties. Through the 401 Water Quality Certification (401 WQC) process the section is able to regulate or prevent adverse impacts associated with development in the coastal zone. The 401 WQC process is required for all US Army Corps of Engineers permits in waters of the United States.

EPR is also a member of the DRC and reviews all applications that are filed with the TSPC for seashore related clearances and permits. Permits are for seashore clearance range from constructing structures within or immediately adjacent to the Territorial Seashore Reserve, dredging, blasting, beach cleaning, marine intake and outfall structures among others. GEPA has, with the assistance of the DAWR and the University of Guam, established a Coral Reef Damage Restoration Fund for coral reef impacts related to any number of destructive activities and maritime accidents. The Section also participates in marine hazard clean-up activities and in the development of planning documents to facilitate clean-up and recovery of oil spills.

The Section has established the requirement for Environmental Protection Plans (EPPs) which originally were founded on the need to protect marine and coastal resources for construction related siltation (soil erosion) that might potentially damage coral reefs. Nearly all construction both near the coast and inland must develop EPPs to address soil erosion and other construction generated pollution impacts that pose significant threats to marine water quality. The Section also represents the Agency and the administrator on many committees, task forces, work groups and commissions dealing with regional marine and coastal water quality and resources issues.

• *Difficulties in Coastal Management and Planning*

The most significant difficulty experienced in providing appropriate coastal management and planning involves divergent views and no established public policy with regards to resource protection and ecosystem diversity in an environment of rapid economic growth.

The very basic premise that a tourism driven economy depends largely on coastal resources and the need to develop the same resources in sensitive and unique areas appears to be typical of most emerging tropical tourist destinations (nations).

Conflicts between use (exploitation), wise use and conservation are repeatedly tested wherein government resource agencies and developers must arrive at best solutions to proposed development plans.



---

Some of the issues that require extensive evaluation involve lagoon dredging for swimming holes, stormwater management and elimination of both non-point and point source pollution, loss of coastal strand vegetation, issues related to control of algae blooms in highly used beach areas, beach cleaning (mechanical raking and sifting), motorised recreational use of lagoons, traditional fishing rights and fisheries resource protection and regulation, local and regional large scale fishing industry management, small boat harbour development, submerged land leases (exclusive submerged land lease rights), and tourism related attractions and construction in the Seashore Reserve. Off-shore drilling and mineral mining are currently not issues in the Territory.

Most difficulties are related to decision making bodies or processes that rely less on technical scientific merits and more on proponent plans with an emphasis on alleged economic benefits. The economic benefits often result in benefits for developers and minority interest parties as opposed benefits in the community's best interest.

Benefits are evaluated more for the immediate and short term values as opposed to long term sustainability for a given resource(s). Most of the problems are typical resource problems based on the fact that coastal development depends in part on actual resource use, while human use and development often cause damage to sensitive marine resources. The various mechanisms for evaluating seashore or coastal related development projects are well established through both federal and local processes, however, political and economic consideration and to a large extent decisions by non-science or technical bodies contribute to a general lack of responsible decision making.

- *Managing Difficulties*

In recent years government coastal and marine resource agencies have been supported by non-profit or non-governmental organisations in promoting wise use of marine resources. Because agency personnel must act within the strict confines of technical advisement and/or to administer rules and regulations for permits, the opportunity to foster a broader agenda for responsible and sustainable coastal development and conservation is not effectively accomplished.

Planning and management personnel are also faced with few resources and time for more comprehensive formulation of new and needed policies or plans. Coping with the present system requires consistent efforts to evaluate and provide recommendations that represent the various mandates of each agency in a clear and concise manner.

- *Coastal Development and the National Framework for Development*

National development, private interest or public capital improvement projects are subject to the Territorial Seashore Protection Act of 1974 (TSPC). Currently, all private development to be located within the Territorial Seashore Reserve (TSR) must comply with the law and obtain permits based upon development plans. The review and approval / disapproval process as mentioned above is well established through the TSPC. A substantial number of public projects, have in the past, received TSPC approval, however, this requirement is not consistently applied.

In some cases the requirement for plan review and approval is not accomplished due to emergency declarations by the Governor and the projects often involve repair or reconstruction of storm damaged infrastructure. There still remain a number of projects which do not meet the requirements of the TSPA, for various reasons. Differences of opinion exist in this matter since all development is subject to the law with the exceptions specifically stated therein.

One possible contributing factor to inconsistent government compliance with the TSPA is that the Territory does not have a formal Territorial Seashore Reserve Plan (TSRP). The TSPA is necessarily broad in order to allow for the formulation of regulations and a formal plan. A TSRP is currently in the formative stages at the direction of the Governor and by the newly formed Territorial Seashore Reserve Plan Task Force (planning committee). It is anticipated that the plan could be completed several years from now.

The plan is needed in order to minimise conflicts, possible litigation, and to establish a unified policy throughout government. Theoretically, there should be less need for legal interpretations when a plan is agreed upon and a set of supportive administrative and enforcement regulations. It might also be appropriate to reevaluate the TSPA of 1974 to see if the law meets current policy, management, and planning needs. Under the current planning effort this has not been proposed.

---

The plan should establish that all development in the TSR receive clearance from the TSPC.

The TSPC is directly assisted by the DRC which is comprised of 13 government agencies of which Guam EPA, the Bureau of Planning GCMP, and the Department Agriculture, DAWR among others are member agencies. It is standard procedure, through the requirements of EO 90-10, that all development address environmental protection issues by means of study, alternative analysis, reducing anticipated impacts and mitigation in an Environmental Impact Assessment / Statement (EIA/EIS).

- *Effectiveness of Coastal Management and Planning*

From a broad perspective coastal management and planning efforts by a number of government agencies, both federal and local, have been effective in Guam. As with any developing nation, in this case island territory, there has been a need to develop infrastructure of a major scale for the last 20 to 50 years. Coastal highways, waste water treatment plant outfalls, harbours, port facilities, recreational facilities, tourism facilities and hotels, fishing, and all of the expected impacts of rapid population growth on a small island, especially in the past five years, are all well represented in Guam.

Some development has caused long term damage to coastal resources and in some cases resources have been lost forever. In other examples coastal development has enhanced the islands marine resource qualities and the standard of living for residents who directly or indirectly depend on those resources.

Overall, valuable lessons have been learned with regard to coastal resource, however, the effectiveness of coastal management, planning, and resource protection have not all come about as a result of a single coastal management program. There are arguably significant initiatives that have originated in several different government agencies and under other marine related programs that have served to effectively guide development in the coastal zone.

It must be stressed that accomplishments in coastal planning and management to date, although relatively effective, have been accomplished without a formal Territorial Seashore Reserve Plan. Resource conservation issues, marine preserves, and comprehensive marine resource regulations also have not been formulated to the extent that would be expected given Guam's growth and development over the past 20 years, or since TSPA passage in 1974.

- *Relevant Coastal Management Legislation*

1. *Territorial Seashore Protection Act of 1974*
2. *Territorial Planning Commission "Flood Hazard Area and Wetland Rules and Regulations"*
3. *Ocean Shores: Territory Beach Areas Act*
4. *Public Access to the Ocean Shore Act*
5. *90-13 Protection of Wetlands*
6. *Guam Water Pollution Control Act of 1967*

Many of these legislative mandates and regulations have not been as effective as originally intended. Ineffectiveness is largely due to the fact that variances and exceptions are allowable given certain conditions, however, the final analysis and decisions are often rendered in clear opposition to scientific and social planning findings that certain proposals should not have been approved. In several cases Guam is destined to commit mistakes that could have been avoided if historical examples were applied.

Technical considerations by non-technical boards and commissions tend to over simplify and generalise consequences of actions in favour of mostly irrelevant data and in spite of cautions about long term costs both environmentally and socially. The result is that permitting and enforcement agencies are delegated the job of minimising impacts when impacts could have been avoided for good reason.

Generally, patterns for prudent coastal planning have been followed as required by law, yet a closer examination of many management and planning efforts would reveal that the basic intent of Guam's coastal zone law has not been realised in favour of the higher beneficial uses of public resources.

---

- *Coastal Management and Planning Projects Currently in Operation*

A list of several of the more recent planning efforts and studies underway is presented below, however this list is not complete:

1. Ecological Risk Assessment (ongoing)
2. Territorial Seashore Reserve Plan (being formulated)
3. Recreational Water Use Master Plan (largely completed)
4. Various National Pollution Discharge Elimination System Permits (NPDES Permits) new permits and renewal requests
5. New ocean outfall for treated waste water (PUAG)

- *Technical Training Needs*

There currently is a need for qualified technical coastal resource managers in Guam. Coastal resource managers are needed to guide planning efforts and to establish procedures for enforcing existing regulations and laws. There are a number of marine or coastal type management and enforcement programs in Guam, however, the ability to make these programs compatible and to present a consistent policy in line with various program objectives is needed.

Certain planning gaps still have not been filled and in other areas there are problems of duplication of effort or effort being applied by entities which are not well prepared to or required to promote coastal planning initiatives. By far the greatest training need is in the area of coastal zone management.

There are well qualified personnel in Guam who work in programs related to marine environmental protection and management. However, evidence of plans detailing a systematic evaluation and implementation plans for coastal resources, coastal hazards, environmental sensitivity indexing, baseline surveys, coastal land use and compatibility guidelines as well as a number of other issues are lacking. The types of training assistance that SPREP might provide are unknown at this time as a full knowledge of training opportunities (offered by SPREP) have not been presented to date.

A description of the types of training would be helpful in the near future in order to attempt to match training opportunities to Guam's training needs.

- *Opportunities for SPREP Training and Guidance*

SPREP might assist in the coastal zone planning goals that Guam has already initiated in public law. A review of Guam legal mandates and regulations pertaining to coastal management and development issues might reveal that current efforts need to focus on long range plans and operational methods of assuring that existing laws are effectively implemented (maximised). Training of current public resource managers with an emphasis in coastal development might be worthwhile.

While Guam is staffed with professional resource type managers, marine environmental protection individuals and has access to the University of Guam advanced marine study programs, the need to train existing personnel in short term and intensive training programs specifically aimed at certain needs could be useful.

UoG recently established a professional masters program in environmental science, however, to what extent this program will serve the needs of comprehensive coastal management and planning has yet to be demonstrated at the government agency level. Definite training needs for Guam could be formally established, yet as far as SPREP is concerned it is not known what types of training opportunities are being offered at the time. Hopefully, the SPREP Sub-Regional Training Meeting in July of 1994 will help to clarify and better match training needs with training opportunities.

- *Discussion Summary*

A comment was made on the issue of GIS in response to the indication of most countries / territories that they wanted such systems. Guam noted that they have had GIS hardware and software for three years and have yet to use it. It was noted that if GIS systems are obtained by countries then they must have trained and experienced users, and a clear understanding of what it can and cannot do, otherwise its potential will never be realised. GIS is just another tool for coastal managers and planners, and isn't a panacea for all problems.

---

## Nauru

*(Prepared by: Andrew Pitcher, Special Project Officer, Department of Island Development & Industry, Republic of Nauru)*

### • Introduction

This meeting is a result of the successful First and Second Coastal Protection Meetings held in Apia and Suva earlier this year which helped to outline and identify coastal management strategies and coastal protection practices or a lack thereof at the national and regional levels.

One important conclusion and recommendation of the participants at the Coastal Protection Meetings was the need for more training in the field of coastal management and planning, giving justification for this sub-regional meeting of which its primary aim is to identify coastal management training requirements.

In particular for Nauru which has many coastal problems such as, sand erosion, water pollution, reef damage, receding coastlines, beach pollution, beach degradation, dying reef corals, fish poisoning, onshore facilities damage, storm waves damage to habitats, coastal road damage and erosion, seawall/revetments damage during rough seas, and property damage during storms just to name a few. From the feedback received at the coastal protection meetings it is obvious these problems and more are experienced to some extent by all member countries.

This report is compiled by Mr. Andrew Pitcher, Special Project Officer from the Department of Island Development & Industry with assistance from Mr. Joseph Cain, Senior Project Officer I, Mr. Anton Jimwery, Senior Project Officer II, The Directorate of Lands & Survey, and Mr. Graham Baines an environmentalist working as a field specialist on the Nauru Rehabilitation Study Team.

### • Project Office

The Project Office of the Department of Island Development & Industry has the responsibility of protecting the coastal zones and is the principle office responsible for most Government development projects including those in the coastal zone. With help from consultancy advice from local and external specialists, regional and international institutions, and in collaboration with the Directorate of Lands & Survey and the Department of Public Works and other offices/agencies, most of the decisions affecting coastal zone development are processed through the Project Office at the Dept. of ID. & I.

The Secretary for island Development & Industry is in charge of the Project Office which has three Senior Project Officers each having different disciplines, two Special Project Officers, two Project Officers and two Project Assistants. Senior Project Officer I, Mr. Joseph Cain and Special Project Officer, Mr. Andrew Pitcher are the officers responsible for coastal protection, while management and planning of some projects will be a team effort.

### • Coastal Management and Planning

Currently there is no Coastal Zone Management and Planning office in place on Nauru. Development on the coastal fringe is not treated any differently as would any development project further inland away from the coastlines. Advice from the Coastal Protection Officers is sought if there is a need with regards to any coastal development project. Advice may be sought from external consultants through environmental impact assessments (EIA) if coastal protection officers are not able to offer advice.

The Coastal Protection Officers from the Department of Island Development & Industry are responsible for research, planning and obtaining advice on the protection of buildings, facilities and any other man-made structures on the coast from damage incurred from rough seas whilst giving consideration to and conserving and protecting the natural beaches and coastal environment.

### • Physical Geography

To understand the nature of Nauru's situation it is better to give a brief description of the physical formation of the island. Nauru is a raised coral atoll with a circumference of about 19 km with the highest point of elevation being 72 metres above sea level. It has two distinct physiographic regions comprising a coastal terrace up to 400 metres wide and ranging from 1 - 5 metres above sea level that encircles the island and an elevated interior.

The coastal plain consists of a fringing reef which extends 100 - 200 metres offshore with an outer slope dipping 34 degrees into deeper water, and a beach approximately 15 metres wide. At the inner edge of the coastal plain the land either slopes upwards for about 35 metres or there is a line of high limestone cliffs. The elevated central area is an undulating plateau 20 - 60 metres above sea level and represents about 85 % of the total land area. This elevated central area is where the phosphate mining is taking place and is at present uninhabitable.

---

- *Settlements*

Aside from two expatriate settlements which are situated on the raised terraces and the Buada Lagoon District which surrounds an inland lagoon, all other remaining population and human activity is located on the coastal fringe, this accounts for approximately 90 % of the total population living on the coastal terrace.

- *Land*

Nauru has a very complex land tenure system and it is often a tedious and difficult job to get all the rightful landowners together at one time to decide upon the fate of a particular plot of land.

In order to build a house or use a piece of land for any purpose there are strict rules and requirements that need to be satisfied or complied with:

1. *Surveying of land and pegging:* The Directorate of Lands & Survey must be contracted to conduct a survey of the land in question and prepare appropriate maps.
2. *Determination of land:* Lands & Survey together with the Nauru Lands Committee must determine the rightful landowners of that particular plot of land and prepare a landowner register.
3. *Signatures of landowners:* Before a piece of land can be developed for any purpose, all shareholders (owners) must sign a land transfer/lease giving consent for the purpose intended for the land.
4. *Public notice through Gazette:* A public notice through the Government Gazette must be released.

These steps are necessary before any clearing and building can proceed on a piece of land including coastal land.

- *Construction Procedures*

A project or any development plans by the government is processed through the Project Office of the Department of Island Development & Industry. One very important factor contributing to the success of any construction project is the availability of suitable land and the Lands & Survey office must be consulted for the allocation and availability of land. Depending on the nature of the project coastal land may be preferable and the coastal protection officers should be involved in the planning stages.

- *Legislation*

There is no specific legislation governing the coastal zone as a separate area from any other area. The Lands Act 1976 refers to any land as land starting from the high water mark, in towards the interior - encompassing the whole land mass.

The land is divided into two distinct categories aptly termed 'Phosphate Land' and 'Coconut Land'. Both categories of land are equal in terms of legislation although there is no building except for mining purposes on phosphate land as it is expected to be mined therefore it is a future source of revenue for the landowners or if it has already been mined it is uninhabitable. Coconut land is usually land on the coastal terrace and is used for every human activity including building homes and other structures.

- *Conclusion*

As there is no formal Coastal Management & Planning office and no legislation governing the coastal zone. Landowners build their homes and other structures as close to the coastline as they please (providing it is their land). This in itself is one of the major problems as due to the lack of land people are building too close to the coast and are even reclaiming coastal land by putting in seawalls and filling them in.

Considering there is no formal coastal management and planning office on the island, the main difficulties that the Department of Island Development & Industry has is the control of the private landowners and their use of coastal land. There is no control over the practice of building too close to the high water mark as the landowners are entitled to build wherever they please on their land.

Other difficulties are: the lack of land available; the lack of a coastal management and planning framework; the lack of public awareness of coastal problems; the lack of knowledge about coastal processes and trends; and the lack of planning and coordination between appropriate agencies in the early stages of coastal zone development projects.

The Government of Nauru is aware of the problems that are occurring on the coastal zones. Damage to onshore infrastructure and to the natural coastal environments is of grave concern to the government and the public and it is hoped that training requirements identified at this sub-regional meeting helps to highlight specific needs which will assist Nauru to develop effective coastal management and planning strategies.

### 3.3 Honiara Meeting

This meeting was attended by ten people including representatives from the Solomon Islands, Fiji, Vanuatu, Forum Fisheries Agency and SPREP.

SPREP's Coastal Management Officer, Dr Andrew Smith, commenced discussions by outlining the objectives of the meeting, and requested that proceedings be as informal as possible to facilitate an exchange of information. This was accepted by the participants. Dr Smith then presented information on SPREP and on SPREP's Coastal Management and Planning Programme.

Presentations by the country representatives were then made. These are provided below with a summary of the ensuing discussions.

#### Solomon Islands

*(Prepared by: Sango Mahanty,  
Environment and Conservation, MFEC)*

- *Agencies Involved in Coastal Zone Management and their Roles*

In a small island environment, most activities interact with or have an affect on the coastal environment. In this context, it is no surprise that management of coastal areas is spread across a number of agencies within government. A brief summary of the key agencies, their roles and responsibilities is provided below.

1. *Environment and conservation Division, Ministry of Forests, Environment and Conservation.*

The ECD coordinates implementation of the National Environment Management Strategy. The Strategy contains a number of programs to improve coastal management, including the development of management plans for areas experiencing degradation and better management of marine resources.

The Division has two EIA staff, though there is currently no legislation to back up the work of these officers. The establishment of comprehensive environmental legislation has been given a high priority in NEMS and will assist in ensuring ELA happens before development projects proceed.

The Solomon Islands, with assistance from SPREP, has an active marine turtle conservation program which is carried out by ECD and Fisheries. As a result of surveys under the program, the Division is now working with The Nature Conservancy and local communities to establish a marine conservation area in the Arnavon Islands, Isabel Province. The islands are an important Hawksbill turtle rookery, but the conservation project aims to improve the management of other marine resources of commercial importance.

2. *Forestry Division, MFEC*

Logging can have significant affects on the coastal environment. The forestry legislation and standard logging agreement is the main vehicle for managing the environmental impacts of forestry activities. The legislation also provides for protection of mangrove areas from logging. Apart from this, the Forestry Division is not active in coastal management and conservation issues.

3. *Geology Division, Ministry of Energy, Mines and Minerals*

The Geology Division is the Solomon Islands focal point for SOPAC and has been involved with a SOPAC study of coastal erosion at Ranandi Beach, Honiara. They have also assisted the Solomon Islands College of Higher Education with pollution monitoring at the Noro Fish Cannery in Western Province.

4. *Fisheries Division, Ministry of Agriculture and Fisheries*

The Fisheries Division is active in marine research and the management of marine resources. The Fisheries Act aims to assist the management of these resources by placing constraints on the harvest of various resources, including endangered species such as marine turtles and crocodiles.

The Division is also involved in the marine turtle conservation program outlined earlier.

5. *Physical Planning Division, Ministry of Lands and Housing*

Physical Planning Division is responsible for planning issues generally, including in coastal areas, and they administer the Town and Country Planning Act. The Division is preparing a separate paper on its activities.

6. *Environmental Health Division, Ministry of Health and Medical Services*

The Environmental Health Division has a total staff of 55, most of whom are posted to the Provinces. The Division is responsible for routine monitoring and surveillance of coastal water pollution in Honiara and other provincial centres.

The Division does not have specific legislation to address coastal pollution though references are made in the Environmental Health Act 1980, Public Health Regulations 1970 and the River Waters Act. The proposed Environment Act will also assist the Division in its work.

7. *Solomon Islands College of Higher Education*

The College has an important role in environmental education within the country. The School of Natural Resources has certificates in Forestry and Agriculture and runs short environmental courses from time to time. The School is currently developing a short course in Integrated Coastal Zone Management. An advisory committee with representatives from relevant agencies has been established to advise on course content and design.

▪ *Problems and Issues in Coastal Zone Management in the Solomon Islands.*

A number of issues were highlighted in input to the country paper:

1. A need for improved coordination and collaboration between agencies responsible for coastal management (some steps are being taken in this direction, with a joint monitoring project at Noro and the Advisory Committee on Coastal Management established by SICHE School of Natural Resources);
2. A need for relevant environmental standards;
3. Lack of relevant legislation (this is being partially addressed in the development of a Environment Act);
4. Where legislation is there, enforcement can be a problem, especially in remote areas;
5. Relative lack of staff with relevant technical knowledge and skills;
6. Need for more resources (facilities, equipment and finance); and
7. Need for improved community awareness of coastal management issues and legislation regulating activities in coastal and marine areas.

• *Training needs in Coastal Zone Management*

Agencies identified the following training and technical assistance needs:

1. Environmental pollution monitoring and control;
2. Waste management in coastal areas;
3. EIA, particularly on the kinds of development projects relevant to the Solomon Islands eg logging, mining, tourism development, processing industries, etc.
4. Geographic Information Systems for coastal management;
5. Coastal erosion monitoring and control;
6. Extension skills/techniques and skills to raise community awareness of coastal management issues; and
7. Resource people and technical resource materials for the proposed SICHE short course on ICZM.

• *Discussion Summary*

The comment was made that there was a problem with coordination and communication between the government agencies involved with coastal management.

It was noted that the Solomon Islands Forestry are using a GIS.

*Are there any coastal protection works in the Solomon Islands?* Only that adjacent to the town area. Beach sand extraction is causing erosion in some areas, but most coastal areas are under customary control.

*Is there any legislation that requires developers to fund activities?* In the draft Bill the developers are asked to fund the costs of outside technical assistance when required.

The Solomon Islands' government used to have a bonding system for trainees sent away, but not at the current time. For training periods over 12 months the person must resign from the government, except where the training is recognised by the government as of a technical nature needed by the country.

The Solomon Islands College of Higher Education (SICHE) is preparing a short course for later this year in coastal management, open to resource owners and managers.

(Prepared by: *Esaroma Ledua, Senior Fisheries Officer, Fisheries Division, Ministry of Primary Industry, Suva, Fiji*)

• *Introduction*

The Fiji archipelago is composed of approximately 300 inhabited islands. Its 200 miles Exclusive Economic Zone is huge and human population is approximately 0.74 million. The sea is the highest producer of animal protein for the diets of the Fiji populations and marine products are the third largest income source for the country.

Although the sea or the coastal zones of Fiji are very important to its people in terms of food supply, employment, and leisure activities, management of resources and control of activities within or associated with the coastal zone is weak.

As far as management and ownership are concerned, there is always conflicts between the state and traditional custodians. The different interpretations of the Fisheries Acts and the traditional ownership system that was in place before Fiji was ceded to the United Kingdom are the major causes of conflicts.

Fiji has developed rapidly in the last 20 years. The promotion of agricultural activities, industries and harvesting of marine products for commercial and export purposes is now felt to pose some adverse impact on the coastal zones of Fiji. Weak and unenforced guidelines are the major drawbacks.

Since Fiji needs revised and new guidelines to manage its coastal zones effectively, this paper will discuss problems, constraints, alternatives, etc, in order to gain further insight into the importance of the coastal zone and highlight points which may help induce decision makers to formulate, implement, and enforce such measures.

• *Discussion*

*Coastal Pollution:* Since pollution is by definition damaging, the obvious remedy seems to be to stop discharging the polluting substance to the sea. Many developed countries in recent years put in place a number of measures but, unfortunately, pollution problems are not easily solved.

Different sectors of the environment (land, sea, and air) are not isolated from one another and a significant fraction of the waste entering the sea are derived from rivers or the atmosphere. This is not a reason for ignoring direct inputs to the sea or for failing to control them, but much wider issues must also be taken into account.

Waste disposal must be managed in such a way as to reduce environmental damage in all environmental sectors, not simply the sea. This demands careful assessment of the impact of a particular discharge. Both quantifying and assessing an impact introduces technical problems and calls for clear thinking about what is meant by pollution.

It has to be accepted that, for purely practical reasons, it is impossible to eliminate pollution completely. The distressing loss of sea birds and marine life due to oil pollution is due entirely to human errors or equipment failures, leading to accidental spillage's or to deliberate, but usually illegal, discharges of waste oil or oily water at sea.

It is not difficult to devise safeguards to reduce oil pollution, but the only way to prevent all losses of sea birds and marine life caused by this source is to stop transporting or using oil at sea, which would eliminate the use of oil and oil products in all countries and effectively ground all aircraft. Most people would regard this as too high a price to pay. This is an extreme example of the impracticability of abolishing a form of pollution, but a similar argument could be used for many other pollutants.

Since it is impracticable to eliminate oil pollution by ceasing to use oil, some other substances which are damaging to the environment can be withdrawn from use and replaced by less damaging substances. This is an attractive solution to pollution problems, but care has to be taken to ensure that the replacement is not itself damaging. These problems are not easily solved, for example copper leaching from antifouling paints was replaced by tributyltin which has proved to be even more damaging. Organochlorine pesticides, DDT and the drins, as well as lead can cause serious damage to marine life as well as humans and these in many countries are carefully controlled.



In many developed countries, waste discharge requires some form of official consent or license. When a new discharge is proposed, the discharger must provide a detailed EIA (Environmental Impact Assessment) or EIS (Environmental Impact Statement) which predicts the effects of the proposed discharge on the surrounding area. On the basis of this, a permit may be issued or denied or modifications of the discharge be required. The accuracy and the reliability of the EIA and EIS are questionable.

Another approach to reducing environmental damage in the sea is to insist that waste discharges should be treated by the best available technology to minimise the release of damaging substances. This may seem a logical principal, but it has proved controversial. The use of the best available technology may be over protective if a small quantity of non-persistent waste is discharged into a large body of water, or it may give inadequate protection if several different sources discharge into a limited environment.

The technology is used to remove the noxious constituents of the waste may result in damaging consequences in a different environment; and finally, a strict insistence on the use of the best available technology pays no regards to the cost of the treatment. The high and sometimes unnecessary cost of using the best available technology has led to some resistance to its widespread introductions.

The best practicable environmental option is to involve industrial societies because they inevitably produce a great variety of wastes in large quantities. By fostering industrial processes that produce little or no waste and by withdrawing mainly due to lack of guidelines on resource use, waste disposal control, lack of coordination and consultations between the industry - developers - government and the members of the public.

It is very important for Fiji to seriously look into the importance of its coastal zone and urgently devise guidelines for resource utilisation, waste disposal into the coastal zones, habitat destruction, recreational demands, protection and particularly damaging substances (such as certain pesticides) from use, it is possible to reduce pollution.

#### • *The Seriousness of Pollution Damage*

Overriding priority is given to controlling a pollutant which possess a threat to human life. In the sea, conservative pollutants (most immediately mercury), pathogenic bacteria and viruses, and radioactivity are in this category. Human exposure to harm from marine pollution is from eating contaminated seafood, and humans generally appear to be particularly sensitive to tainting or stale flavours in seafood, or even to the suggestion that seafood is tainted and reject it.

Since the principal risk is from eating contaminated seafood, coastal communities whose diets include a significant amount of marine organisms are most at risk. This is particularly true to cumulative poisons such as mercury and it is not surprising that the best known cases of mercury poisoning that originated from contamination of the sea should have involved fishing communities in Japan who subsisted almost entirely on food from the sea.

#### • *Coastal Pollution - Fiji*

*Sewage Treatment In Municipalities:* Fiji's cities and towns have central collectors, primary and secondary treatment facilities. Suva and Lautoka cities could be the only heavily populated centres but sewage discharge into receiving waters has not raised public concern. It hasn't reach a stage where it could be regarded as being in bad shape.

It is understandable that human sewage contains enteric bacteria, pathogens, and virus, and the eggs of intestinal parasites. Contamination of food or drinking water while swimming may pose a public health hazard. Generally the faecal contamination is measured by the levels of the bacterium *Escherichia coli* (coliform count). *E. coli* is not a pathogen but is always present in human intestine and appears in the faeces. The coliforms does not reflect the level of contamination by pathogens directly, merely the level of faecal contamination but that itself is a good measure of risk to which the human population is exposed.

Filter feeding animals, most conspicuously bivalve molluscs, flourish in waters enriched by a neighbouring input of organic wastes (a good example is the Kinoya coastal area near Suva), but they accumulate the human pathogens on their gills and this may be transmitted to the consumers. The risk is obviously greatest if the bivalves are freshly harvested and eaten uncooked.

Sewage disposal may also cause phytoplankton blooms and several species of dinoflagellates contains dangerous neurotoxins which can be accumulated in bivalves and some plankton eating fish and this may lead to paralytic shellfish poisoning.

*Heavy metals and Hydrocarbons:* There is a lot of forestry or agricultural spraying going on in Fiji especially the use of EL 40, Gramoxone (Bipyridium pesticide), Roundup (Foliar Applied Herbicides) etc. Sugarcane and rice farming in Fiji utilises a lot of chemical sprays. So far their impact on the marine life and extent of damage as far as Fiji is concerned is not known and no clear guidelines on its safe usage in order to be environmentally friendly.

Chlorinated hydrocarbons are extremely insoluble in water, with a saturation concentration of no more than 1 ppb, but they are soluble in fats and absorb strongly. Their distribution in the sea is therefore far from uniform. The organochlorine enrichment of the surface film may be of considerable importance to surface living organisms. Since the sea is the site of the interchange with atmosphere, organochlorines may be transferred to air in aerosol droplets.

Chlorinated hydrocarbons are difficult to excrete and hence they tend to accumulate in the body. Because they are lipid soluble they tend to occur in much higher concentrations in fatty tissues than other tissues.

*Industrial Effluents:* Suva and Lautoka cities are the major locations of industries. Level of pollution produced and its impact on the marine life and coastal zones is not known.

It is possible that the existence of such localised inputs may reflect in the raised mercury content of local plankton and mussels. Organic forms of mercury are more toxic. As with metals, bivalves take up mercury from the surrounding water more quickly. Concentrations of 1 ppm in the fish muscle are common and may be as high as 4.9 ppm.

*Oil Spills:* There has been reported cases of minor oil spills in Fiji in the past. Some cases resulted in fish kills and also being blamed for causing fish poisoning in some areas of Fiji. When liquid oil is spilled on the sea, the composition changes from the time it is spilled. Light fractions evaporate, water soluble components dissolved in the water column, and immiscified and dispersed as small droplets. Emulsified oil is in microscopic droplets and therefore present in a large surface area at which bacterial attack can take place.

*Health problem:* Fiji at the moment is still fortunate that all coastal areas are still safe for swimming and no cases of "swimmer's itch", or illness (gastroenteritis) being reported. Currently there is no monitoring programme in place to evaluate levels of *E. coli* in the water as well as marine products within the discharge site.

- *Habitat Destruction*

*Dredging and Spoil Disposal:* Dredging in the coastal zone around Fiji is very minor and only restricted to areas where wharfs and jetties are placed. Dredging is only carried out to deepen anchorages and moorings.

*Sand and Gravel Removal:* Minor amounts of sand and gravel are removed from the coastal zone throughout Fiji. Sand is in abundance and adverse impact or scar is most unlikely.

*Live Coral Extractions:* Few companies started extracting live coral outcrops from selected reefs around the main island of Fiji (Viti Levu) within the last six years. It is quite difficult to evaluate negative effects of such practice as there is no monitoring programme in place. Corals are slow growing species and sizes that are currently harvested should be at least around 30 years old and it would take similar periods of time to regenerate and be replaced. Coral reefs support a lot of marine life through the provision of food, shelter, incubation area, larval development, playing ground, home, refuge, etc. It is therefore important that coral reefs be protected.

*Mangrove Removal:* The mangrove ecosystem is very important to many marine life. It is a nursery ground to many tropical and subtropical organisms and provides an abundant amount of food to almost all trophic levels of the food chain. Fiji in the last couple of years, especially in urban centres, have removed and reclaimed large proportions of mangroves to extend the town and city boundaries. The latest destruction which is still in progress is the site in front of Suva cemetery. The site has been cleared of mangrove in order to provide storage space for ocean line containers.

- *Agencies Consulted in Preparing Statement*

1. Lands Department
2. Agriculture Department
3. Department of Environment
4. Public Works Department
5. Marine Department
6. Forestry Department

---

- *Office Responsible for Coastal Management and Planning*

There is an overlap in responsibilities between the Department of Fisheries, Forestry Department, Marine Department and the Department of Environment. Fisheries resources are managed by the Fisheries Department. Mangroves are regarded as forests and the Forestry Department issues licenses for logging. Dredging of coastal areas is managed by the Marine Department. The monitoring of environmental parameters by the Department of Environment. Sand and gravel by the Lands Department. The current practices see very little consultation between the departments mentioned above.

It is difficult to come up with the number of staff and specific responsibilities as they have other roles within their departments apart from their involvement in coastal management work.

- *Coastal Management Difficulties*

1. No department has the sole control over the management of the coastal zone
2. Conflict over the ownership between the state and the traditional fishing right owners - especially within the inshore region or inside the demarcated areas.
3. No control on the use and disposal of chemicals and other industrial waste into the coastal zones.
4. Lack of power on the members of the public to protest against habitat destruction.
5. Inter-departmental information sharing and dissemination is poor.
6. Lack of trained personnel in coastal management

- *How are Difficulties Dealt With*

The difficulties and conflicts on most occasions are solved through arbitration or in a court of law. The court decides on compensation to be awarded to fishing right owners, etc. Other difficulties may take time to find acceptable solutions.

- *Coastal Management & Planning - National Development*

It is unfortunate that coastal management and planning does not exist in the framework of national development. Only fishery resources and utilisation are covered in the Fisheries Acts. Department of Environment and other departments need to cooperate and design management plans that would be effective and minimise risk.

- *Effectiveness*

Although fisheries resources and utilisation measures are covered in the Fisheries Acts, unfortunately enforcement of these acts is not possible due to various reasons. Another cause of ineffectiveness is the lack of consultation, coordination, and a clear line of responsibilities between each department.

- *Coastal Management Planning - Legislation & Regulations*

As mentioned above, only fishery resources and their utilisation are legislated, but are less effective due to various constraints. Constraints include: lack of funds to police effectively and to monitor activities; illegal practices due to ignorance and low levels of education which leads to misinterpretations of the Fisheries Acts - especially in the coastal communities.

- *Coastal Management and Planning Projects*

The Fisheries Department recently during massive resource surveys found that sedentary animals like trochus, giant clams, sea cucumber, pearl oysters, etc, have been fished beyond sustainable levels.

The government, with the assistance of donor agencies like ACIAR, FAO/UNDP, AIDAB and JICA, has established a mariculture base on Makogai Island to look at the possibility of artificially producing juveniles of over-exploited species for restocking purposes as well as looking at the commercial viability of sea ranching, which is hoped will deviate or reduce fishing pressure on natural populations. Apart from this the fisheries Department and the Tui Levuka have signed an agreement and have declared part of Makogia Island a Marine Reserve.

Unfortunately there is no management and planning project on other areas of the coastal zone for example, waste disposal, habitat degradation, water quality monitoring etc.

---

- *Technical Advice and Training Needs*

There is a need for training of personnel to organise coastal management and planning legislation and regulations, organise monitoring programmes, organise public education programmes, etc. Right now we have very few qualified people in this field and there is a need for formal training for first degrees and post graduate qualifications as this would be of long term benefit to Fiji. Good management regulations and legislation could only be formulated if only people get the necessary know-how.

- *Assistance SPREP Should Provide*

SPREP should be of great assistance to Fiji by providing short term consultants or sending staff to short term courses that would provide hands-on training on the following: water quality assessments; chemical and heavy metal testing on marine products, etc, in order to be able to quantify levels contaminations at various locations. These trained personnel may then design and propose management programmes to the government and identify long term training needs. Right now we have very little knowledge about the level of contaminants on our coastal zone and have no data to predict what will happen in future.

Other training needs:

1. Resource assessment and management;
2. Formulation of management plans;
3. Environmental Impact Assessment;
4. Funding support for in-country training, ie the bringing in of each department management team - in a workshop style meeting. This may help improve coordination, information dissemination and consultation between departments concerned.

- *Discussion Summary*

*How does the Education Board determine scholarships?* The Ministers determine the priorities.

It was noted that the costs associated with developing a GIS for Fiji would be too high.

A comment was made that it is clear that there is again a problem with communication between agencies involved with coastal management related activities; a problem of who takes the lead.

## Vanuatu

*(Prepared by: Martin Sokomanu, Coastal Management Officer, Department of Lands & Survey, Ministry of Lands and Natural Resources, Port Vila, Vanuatu)*

The Lands and Surveys, Environment and Conservation and Geology and Mines are responsible for coastal management planning in Vanuatu, all these three departments are under the Ministry of Lands and Natural Resources.

These three Departments are responsible for coastal management and planning, the Coastal Management section which is new to these departments is currently looked after by an officer from the Lands and Surveys (Martin Sokomanu) who is the Coastal Management Officer but at present there is not yet an established office for Coastal Management, but hopefully in the near future we will be able to set up such an office or a section within the Departments responsible with its own staff who will be able to carry out duties regarding coastal protection within the region.

As a Coastal Management Officer I have experienced some difficulties in convincing customary land owners in trying to stop them from selling sand and coral to big commercial businesses in town. The reason is very simple, there is no legislation which allows an officer to work alone. The reason being because the Coastal Management Section is very new and that the village people were not aware of such a Section existing within the departments.

The only way I can get to them is through the Chiefs of the villages. From there the chiefs then act using their power to carry out bans on their beaches. These bans are very effective and can go on up to five years if a particular area where the sand mining or coral mining is taking place is in a very bad state.

The current problems the Coastal and Management Section is faced with are as follows:

1. Lack of Departmental coordination on coastal management issues;
2. Lack of finance (funding);
3. Lack of appropriate equipment/tools;
4. Lack of staff;
5. Lack of information and awareness of coastal management problems.

---

There has not been any proper coastal management and planning in Vanuatu. Therefore this process has not been very effective due to a lack of funds and expertise to carry out proper planning.

Vanuatu does not have specific legislation dealing with coastal management, although there are scattered provisions under certain laws which do not provide specific provisions relating to the management of coastal areas, eg, *Foreshore Development Act* (1975), *Maritime Regulations* (1981), (1982) and (1986) and *Mines and Minerals Act* (1986).

- *Coastal Management needs for Vanuatu*

1. A more governmental co-ordination and cooperation on coastal management issues;
2. Provide legislative mechanisms for coastal management;
3. Provide training, education and public awareness to improve the understanding of coastal management to the people of Vanuatu.
4. Encourage the use of Environmental Impact Assessment (EIA) and other methods to lessen the effects of humans on the environment and the coastal areas;
5. Dissemination of appropriate information to the interested developers in coastal management
6. Researches into coastal management to identify problems and collate accurate information on their causes and effects including sea-level rise events.

- *Vanuatu's Coastal Management Needs - Regional Organisations (SPREP)*

1. SPREP to review and assess currently available information (literature, guidelines, programmes, training, etc.) concerning coastal management regionally and internationally, and assesses their relevance to the region;
2. SPREP to assist member countries to review and assess all management policies, plans, approaches and institutional frameworks relevant to coastal management;
3. To establish a contingency fund for urgent response to coastal management problems;
4. To coordinate regional and international organisations dealing with coastal activities in the region;

5. Collect data and information from national, regional and international institutions on coastal management and disseminate to its member countries;
6. To assist its member countries in providing training for coastal management programmes.

- *Discussion Summary*

Vanuatu's training policy includes the provision of a person's salary for up to a year, then the trainee goes onto leave without pay; but they still retain their government job. There is a bonding system of two years.

*Is there an issue with career paths?* It was felt that this is an area which needs to be looked at in the Solomon Islands public service, or qualified people will be lost to the private sector. But no matter how well a department may plan a career path, it is up to the Public Service Commission.

There is a lot of movement and turnover of people. There is an associated problem that the government and regional agencies do not inform people of what career opportunities are available. It was noted that in Fiji there is a job evaluation programme every few years, through which new positions are pointed out. It is up to department heads to advise the government what new areas are required.

---

## 4. Training Requirements and Suggestions

This section summarises and groups the specific training requests from each country and territory into common requests for long-term, short-term and general training needs. It also summarises the suggestions provided by the three meetings on how training can be most effectively conducted, based on participants previous training experiences.

### 4.1 Training Requirements

#### 4.1.1 General needs

1. Development of and enforcement of coastal management laws and regulations (American Samoa, Vanuatu, Niue and Nauru).
2. Training in coastal processes and monitoring (coral, reef and lagoon ecosystems, beach profiles, etc.). (Cook Islands, American Samoa, FSM, Western Samoa and Nauru).
3. Public and community awareness campaigns to promote understanding of coastal zone management (Tonga, FSM, Cook Islands, Vanuatu, Niue, Solomon Islands and Fiji).
4. Development of a coastal management plan and all aspects of ICM (eg incorporating traditional norms and values, hence tailoring it to meet local conditions). (American Samoa, Niue, Tuvalu, Western Samoa, Tonga, Guam, FSM, Kiribati, Nauru, and Cook Islands).
5. Implementation of coastal management plans. In some of the island countries, coastal management plans have been completed, however, they have not been implemented due to a lack of funds, staff or technical expertise (Cook Islands and FSM).
7. Need for formal training for certificate level, first degrees and post graduate qualifications within and outside the region (Fiji, FSM and Palau).
8. Technical training for Geographic Information System (GIS [refer to Annex 3 for more information on GIS]). (American Samoa, Niue, Cook Islands, CNMI, Kiribati and Solomon Islands).
9. Environment education techniques. There was a general feeling that the need for public awareness is very strong, however, there was a lack of training for people to actually go out and run the programmes. There is a need for educating trainers (Cook Islands, Niue, FSM and Solomon Islands).
10. Technical training in environment and coastal engineering and design. Most people working in this area do not have the right educational or technical background; those that do are usually expatriates (Kiribati, Tuvalu and Tonga).
11. Environmental Impact Assessments (EIA) eg. damages caused by vessel groundings; coastal infrastructure development. (Fiji, Vanuatu, Solomon Islands, FSM and Kiribati).
12. Natural resource damage assessment (reef blasting, ship groundings), disaster reduction programmes and contingency response planning and contingency response fund. (CNMI, FSM, Fiji, Vanuatu and Nauru).
13. Network of technical scientific and practical database information on coastal management to be based in the region and which is easily accessible. (FSM, Western Samoa, CNMI and Vanuatu).
14. Research to identify problems and collate accurate information on causes and effects especially with regards to sea level rise (Vanuatu).
15. Assistance to correctly delineate the coastal zone (Palau).
16. Innovative wetland management (CNMI).

---

#### 4.1.2 Short Term Training Needs

17. Hands on training for water quality assessment, chemical and heavy metal testing on marine products (Solomon Islands, Kiribati and Fiji).
18. General training in the area of extension work with village authorities (ie negotiation and mediation techniques and methods for reaching the public to make them aware and gain support). (Western Samoa, FSM, Tonga, Tuvalu, Solomon Islands).
19. Inventory of living and non-living organisms. (Palau);

#### 4.1.3 Long term training needs

20. Assistance to identify alternative sources of sand and road construction materials (Palau and Western Samoa);
21. Training on environmental pollution management, monitoring and control (eg waste management pollution, impact of sewage outfall, etc). (Kiribati, FSM and Solomon Islands).
22. Technical training in stormwater calculations, coastal mapping, economic valuation coastal sediment systems and geomorphology and related data collection and assessment (eg interpretation of aerial photography jet coring, site plan reading, blue print evaluation, etc). (CNMI, Nauru, Niue and Western Samoa ).
23. Training in rehabilitation, enhancement and restoration of damaged coastal zones. (Niue, Nauru, FSM, Vanuatu).

Many of the above needs reflect those identified in the First and Second Coastal Protection Meetings (see Annex 2).

## 4.2 Training Formats

The meeting participants suggested a number of "do's and don'ts" during the three meetings. The following summarises those suggestions.

1. Careful consideration is required in determining whether training activities be conducted on a regional, sub-regional or in-country level. For effectiveness, the participants strongly recommended in-country training. One of the key limiting factors with this approach is the costs involved with in-country training across a number of countries.

When regional, or sub-regional training is conducted it was pointed out that it is usually essential to have in-country follow-up, otherwise the level of application of lessons learnt is significantly reduced. Any regional or sub-regional training needs to have components relevant to the situations existing in the countries/territories of each participant.

Wherever possible, course materials or questionnaires (to assist with country report preparation) should be sent out prior to any training to encourage participants to come prepared. Training organisers need to specify as much detail as possible concerning the type and level of person requested to attend to enable countries to nominate appropriate people.

2. The participants at each of the meetings appreciated the sub-regional format for these meetings. It was felt that the sub-regional format was an appropriate way to discuss issues due to the similarity of problems and issues within regional sub-groups; and the smaller meeting sizes encouraged franker discussion amongst participants.
3. In-country training needs very careful planning and preparation. It was felt that for non-professional staff an emphasis is needed on training conducted in the field, and to minimise classroom formats. It was felt that any theory, wherever possible, should be passed on in the field work situation. Maximum use of case studies in-country should be used. The use of the vernacular during in-country training should be encouraged.
4. The issue of trainers was raised. It was emphasised that they must be skilled communicators and able to teach. The use of trainers from outside the region must be treated with considerable caution. The use of local trainers should be encouraged, but they shouldn't be used just because they are local, they must have the necessary skills.

For in-country training there needs to be close consultation with the country concerning selection of trainers. Another approach suggested involved holding a regional or sub-regional workshop to "train the trainers", then follow-up with in-country training where the trainee trainer is supported in conducting the training or others.

- 
5. More consideration should be given to training through exchanges of staff between countries' programmes. It was pointed out that many graduates in the region badly need practical experience (eg in conducting or assessing EIA's - they may know the theory but not the practical aspects). Many are promoted to management positions before they are able to achieve that experience. Exchange programmes may be a way of gaining more experience than could be obtained just in their own countries.
  6. Where possible, training should be objective oriented, that is, have specific, practical tasks that need to be achieved during the training, and are of relevance to the situation of the participant. The objectives should be realistically achievable and the participants fully aware of just what skills they will go away with. Certificates of achievement should be awarded where appropriate.
  7. More involved training should be planned to be conducted over a number of stages to allow follow-up after each stage.
  8. Donor driven training of little or no relevance to country needs should be rejected. Regional agencies need to be more forceful in advising donors about the constraints and available resources for training in the region.
  9. Any materials (books, manuals, etc) necessary for training must be available in the countries for later reference.



---

## 5. Summary and Conclusions

The sub-regional meeting format proved to be quite successful: each meeting expressed their approval of the approach. The smaller groups allowed a better flow of information, and the similarity of issues in each sub-region facilitated discussion.

The specific requirements of each country and territory varied, however, there were some common issues and needs that emerged from the meetings.

1. The general lack of coordination between in-country government agencies involved with the different aspects of coastal management. But at the same time it was recognised that there is a slowly emerging awareness of the need for coastal management and a coordinated or integrated approach to it. It was felt that this awareness could be further advanced through the process of in-country, high-level Integrated Coastal Management training workshops.
2. Through-out the region the enforcement of legislation and regulations associated with coastal management was considered a major problem. The need for both enforcement training, as well as training in extension and community awareness methods was identified.
3. For effectiveness, the participants strongly recommended in-country training whenever possible. A number of suggestions on improving training, both regionally and in-country, were expressed by the participants and are listed in the previous section. The key concern with regional training was that follow-up training occurred in-country.
4. There was a desire for a programme of staff exchanges between countries / territories. This evolved from the recognition by participants that many of their coastal management related problems are common to other countries in the region, and that some expertise is available within the region through other countries' programmes that could be shared.
5. Each meeting expressed a desire for GIS systems and training. There appeared to be some misunderstanding as to just what GIS can and cannot realistically do. An annex has therefore been attached to this report concerning GIS within the region (Annex 3).
6. Raised at each meeting was the need for further EIA training, especially at the in-country practitioner level. Not only training in scoping and conducting EIA's, but also in assessing EIA reports was urgently requested.

The information obtained during these three sub-regional meetings is currently being used to revise the education and awareness component of SPREP's regional proposal for an Integrated Coastal Management project. Other suggestions that fall into other programme areas, such as GIS and EIA, have been passed onto the responsible programme officers. Specific training requests that fall outside SPREP's mandate have been forwarded to the appropriate agency (eg GIS mapping and coastal processes and monitoring training to SOPAC).

---

# Annexes

## Annex 1: Participants Lists

### Pago Pago Meeting

#### *American Samoa*

Lelei Peau  
Manager  
Coastal Management Program  
Economic Development Planning Office  
American Samoa Government  
Pago Pago, AS 96799  
American Samoa  
Tel: (684) 633-5155  
Fax: (684) 633-4195

Larry Ward  
Environmental Planner  
ASCMP

Gene Failauga  
Coastal Hazards Specialist  
ASCMP

Karla Kluge  
Wetlands Specialist  
ASCMP

Apolu Aitaoto  
Senior Planning Facilitator  
ASCMP

Joe Tavale  
Community Liaison Officer  
ASCMP

Peniamina Siatunuu  
Conservation Officer  
ASCMP

Pauline Filemoni  
Summer Intern  
ASCMP

Kathy Ross  
Technical Assistant  
ASCMP

Vaialalua Aiavao  
Environmental Protection Agency  
Office of the Governor  
American Samoa Government  
Pago Pago, AS 96799  
American Samoa

#### *Cook Islands*

Edith Ngariu  
Education Officer  
Cook Islands Conservation Service  
Cook Islands  
Tel: (682) 21256  
Fax: (682) 22256

#### *Niue*

Brendon L. Pasisi  
Fisheries Advisor & Senior Research Officer  
Department of Agriculture, Forestry & Fisheries  
P.O. Box 74  
Alofi South  
Niue  
Tel: (683) 4302 / 4032  
Fax: (683) 4079

#### *Tonga*

A'sipeli Palaki  
Marine Conservation Officer  
Environmental [Protection] Unit  
Ministry of Lands, Survey & Natural Resources  
Kingdom of Tonga  
Tel: (676) 23-611

#### *Tuvalu*

Filipo Taulima  
CESS UN Water Project  
Public Works Department  
Ministry of Labour Works Communication  
Funafuti  
Tuvalu  
Tel: (688) 20-303

#### *Western Samoa*

Sailimalo Pati K. Liu  
Acting Assistant Director  
Division of Environment & Conservation  
Department of Lands, Survey & Environment  
Western Samoa  
Tel: (685) 26681/35800  
Fax: (685) 23176

### Saipan Meeting

#### *Commonwealth of the Northern Marianas Islands*

Manuel C. Sablan  
Administrator  
Coastal Resources Management  
Office of the Governor  
Saipan, MP 96950  
CNMI  
Tel: (670) 234-6623/7320  
Fax: (670) 234-0007

Peter Barlas  
Assistant Administrator  
Coastal Resources Management

Susan Snow-Cotter  
Natural Resource Planner  
Coastal Resources Management

---

George Baldwin  
Coastal Advisor  
Coastal Resources Management

Jack M. Aguon  
Special Assistant  
Coastal Resources Management

Jessica Tomokane  
NPS Monitoring Biologist  
Coastal Resources Management

John Furey  
Coastal Coordinator  
Coastal Resources Management

Martin R. Castro  
Permit Manager  
Coastal Resources Management

Martin Zeleznik  
Environmental Scientist  
CNMI Division of Environmental Quality  
P.O. Box 1304  
Saipan, MP 96950  
CNMI  
Tel: (670) 234-1011  
Fax: (670) 234-1003

Joseph K. Ruak  
Information & Education Assistant  
Division of Fish & Wildlife  
Saipan, MP 96950  
CNMI  
Tel: (670) 233-9095 / 9729  
Fax: (670) 233-3386

#### *Federated States of Micronesia*

Moses A. Nelson  
Administrator  
Division of Marine Resources  
Department of Resources & Development  
FSM Government  
Palikir  
Federated States of Micronesia

Joe Konno  
Executive Director  
Chuuk EPA  
P.O. Box 400  
Federated States of Micronesia  
Tel: (691) 330-2395  
Fax: (691) 330-2233

#### *Guam*

Randel L. Sablan  
Planner II  
Guam Environmental Protection Agency  
130 Rojas St. IT&E Harmon Plaza  
Harmon  
Guam, 96911  
Tel: (671) 646-8863 / 4 / 5 / 6  
Fax: (671) 646-9402

#### *Kiribati*

Tererei Abete  
Environment Coordinator  
Ministry of Environment & Natural Resources  
Development  
P.O. Box 64  
Bairiki, Tarawa  
Republic of Kiribati  
Tel: (686) 21099  
Fax: (686) 21720

#### *Nauru*

Andrew Pitcher  
Special Project Officer  
Department of Island Development & Industry  
Republic of Nauru  
Tel: (674) 444-3181  
Fax: (674) 444-3791

#### *Palau*

Demer O. Otobed  
Conservationist  
Division of Conservation/Entomology  
P.O. Box 117  
Republic of Palau, PW 96946  
Tel: (680) 488-2487  
Fax: (680) 488-1475

#### *Pacific Island Network Agents*

Riyad Mistry  
Coastal Resource Management Agent  
PIN / CMI  
P.O. Box 1258  
Majuro  
Republic of the Marshall Islands 96960  
Tel: (692) 625-3236  
Fax: (692) 625-3236

Pamela Baker  
Coastal Resources Specialist  
Sea Grant Extension Agent / PIN  
College of Micronesia - FSM  
P.O. Box 159  
Kolonias  
Pohnpei, FM 96941  
Federated States of Micronesia  
Tel: (691) 320-2480  
Fax: (691) 320-2479

Melissa Upton  
Information & Education Specialist  
PIN Representative  
Division of Fish & Wildlife  
Saipan  
CNMI  
Tel: (670) 233-9095 / 9729  
Fax: (670) 233-3386

#### *Honiara Meeting*

#### *Fiji*

Esaroma Ledua  
Senior Fisheries Officer  
Fisheries Department  
Ministry of Primary Industries  
P.O. Box 358  
Suva  
Fiji  
Tel: (679) 361122  
Fax: (679) 311233

#### *Solomon Islands*

Sango Mahanty  
Environment & Conservation Adviser  
Ministry of Forests, Environment and Conservation  
P.O. Box G24  
Honiara  
Solomon Islands  
Tel: (677) 21521  
Fax: (677) 21245

---

Steve Likaveke  
Chief Physical Planner  
Physical Planning Division  
Ministry of Lands and Housing  
P.O. Box 938  
Honiara  
Solomon Islands  
Tel: (677) 23983/23145/23143  
Fax: (677) 20094

Tom Lolemae  
Chief Health Inspector  
Environmental Health Division  
Ministry of Health and Medical Services  
P.O. Box 349  
Honiara  
Solomon Islands  
Tel: (677) 25513

Carlson Shady Tara  
Senior Health Inspector  
Environmental Health Division  
Ministry of Health and Medical Services  
P.O. Box 349  
Honiara  
Solomon Islands  
Tel: (677) 20830

Alexander Pazamakini  
Lecturer in Environmental Science  
Solomon Islands College of Higher Education  
P.O. Box G23  
Honiara  
Solomon Islands  
Tel: (677) 30758  
Fax: (677) 30390

#### *Vanuatu*

Martin Sokomanu  
Coastal Management Officer  
Department of Lands and Surveys  
Ministry of Lands and Natural Resources  
Port Vila  
Vanuatu  
Tel: (678) 22427  
Fax: (678) 25973

#### *Observers*

Andrew Richards  
Research Coordinator  
Forum Fisheries Agency  
P.O. Box 629  
Honiara  
Solomon Islands  
Tel: (677) 21124  
Fax: (677) 23995

#### **For All Meetings:**

#### *SPREP*

Andrew Smith  
Coastal Management Officer  
South Pacific Regional Environment Programme  
P.O. Box 240  
Apia  
Western Samoa  
Tel: (685) 21 929  
Fax: (685) 20 231  
Email. [sprep@pactok.peg.apc.org](mailto:sprep@pactok.peg.apc.org)

Lucille Apis  
Assistant Coastal Management Officer  
SPREP

---

## Annex 2: Exerts from "Coastal Protection in the Pacific Islands: Current Trends and Future Prospects"<sup>1</sup>.

In response to a request by the 24th South Pacific Forum, held in Nauru (10-11 August, 1993), SPREP, in consultation with SOPAC, convened two meetings of regional officials and distinguished experts to assess the needs of the region, examine various systems of coastal protection, and prepare a detailed report, with recommendations for consideration at the 1994 meeting of the Forum. The following exerts from the proceedings are the meeting statements and recommendations relating to training and education needs for coastal protection and more generally coastal management.

### "First Coastal Protection Meeting

The First Coastal Protection Meeting was held in Apia, Western Samoa, 21-23 February 1994, and attended by 29 regional officials and experts. The meeting developed six summary statements and identified eight general needs categories for effective coastal protection in the region.

### Second Coastal Protection Meeting

The Second Coastal Protection Meeting was held in Suva, Fiji, 16-20 May 1994. The meeting was attended by 43 regional officials, experts and observers representing 17 countries and territories.

Once again the areas of expertise of the participants covered the range of disciplines represented at the first meeting.

...Each country representative reported to the meeting experiences and problems concerning the eight coastal protection needs identified during the first meeting. From the ensuing discussion recommendations for action were proposed and the content of the report to the Forum determined.

### Summary Statements

The meetings recognised that the need for *effective coastal protection systems* in the region was due to increased use of, and pressure on the coastal zone for infrastructure, commercial, residential and recreational uses.

The meetings agreed that healthy coral reefs and undisturbed beaches and mangroves are Nature's form of protecting a coastline and are the best and most effective coastal protection systems. However, with increased use and pressure on the coastal zone, and due to the lack of proper management the meeting noted that man-made protection structures now needed to be considered in certain situations.

The meetings agreed that effective man-made protection structures in the region required consideration of the broad context and long-term planning rather than just a "quick-fix" site-specific response to a problem at a particular time.

The meetings agreed that man-made protection structures are often "asset protection" rather than "coastal protection" since such structures can lead to degradation of the coast.

The meetings agreed that environmental impacts should be studied and assessed prior to development activity in the coastal zone.

The meetings agreed that there already exists within the Forum Countries, and other island countries and territories represented at the meetings, a limited pool of expertise in the area of coastal protection and that every effort at both national and regional level be made to develop, strengthen and utilise this pool of expertise.

The meetings agreed that aid donor support has, and will continue to be, vital to economic development in the coastal zones of the region. Donor support is vital and must be sought for the provision of effective management and protection of the coastal zones in the future.

---

<sup>1</sup> SPREP/SOPAC 1994. Coastal Protection in the Pacific Islands: Current Trends and Future Prospects. *Proceedings of the First and Second Regional Coastal Protection Meetings: Held on 21-23 February 1994 in Apia, Western Samoa, and on 16-20 May 1994 in Suva, Fiji.* South Pacific Regional Environment Programme, Apia and South Pacific Applied Geoscience Commission, Suva. SOPAC Miscellaneous Report 177.

The meetings agreed that substantial costs would be incurred in order to satisfy the needs identified. The meetings suggested that in order to assist with the provision of sufficient funding for coastal protection programmes, appropriate economic or financial instruments should be sought.

The meetings agreed that in order to ensure the early provision of effective coastal protection systems in the region the many needs were grouped together into eight major categories.

### Needs and Priorities

The eight general areas of needs are as follows:

**Need 1:** *Mapping and Data Collection to Better Understand Physical and Biological Processes in Coastal Zones.*

It is increasingly important in the coastal zone to survey physical and biological processes and in particular the effects of geological and other natural hazards. For improved management it is essential to establish baseline conditions against which the effects of development can be monitored and where necessary to plan effective coastal protection.

**Need 2:** *Integrated Management of Coastal Zones*

The early provision of effective coastal protection can best be achieved through integrated management of coastal zones, often referred to as Integrated Coastal Zone Management (ICZM). ICZM is a comprehensive, multi-sectoral, integrated approach to the planning and management of coastal areas. It encompasses a process of assessment, planning and management for the sustainable development, multiple use and conservation of coastal areas, resources and ecosystems.

**Need 3:** *Education and Public Awareness*

Responsible actions by individuals at all levels of society can be of great assistance in achieving effective coastal protection. Public education and awareness are essential for the effective implementation of management policies and compliance with regulations.

Included in this category are the needs for:

**Need 4:** *Regulatory Regimes*

Many diverse regulatory regimes relating to the coastal zone exist in the region which relate to coastal protection.

**Need 5:** *Consideration of Social and Cultural Practices*

Effective coastal protection needs to take into consideration social and cultural factors, especially traditional values.

**Need 6:** *Assessment of Coastal Sand and Gravel Resources*

Often unsustainable mining of coastal derived sand and gravel, particularly from beach mining, is occurring for construction, fill and cultural purposes. This practice must be discouraged, and in some instances prevented, whilst at the same time realistic and practical alternatives identified.

**Need 7:** *Consideration of Economic Issues*

The aim of effective coastal development is to provide for the use of existing and future coastal development and resource uses on a cost effective and sustainable financial and environmental basis.

**Need 8:** *Coastal Engineering*

Man-made or engineered structures are a consequence of continued reclamation and protection of assets in and adjacent to the coastal zone. A large number of alternatives have been tried and many have been less than successful. Most have been expensive and have tended to have detrimental effects on adjacent areas. Any proposed system should be critically evaluated in the region in the light of local physical processes, previous experiences and cost. Appropriate innovation should be encouraged.

### Recommendations

It was recommended that

"... the following draft resolutions be submitted to the Forum Officials Committee. The Committee is invited to consider them for submission to the Forum for inclusion in its communique and in discussions with the Forum's dialogue partners.

- 
- 1.1 The Forum recognise the considerable economic importance of sound management of activities in the coastal zone.
  - 1.2 The Forum endorses the development and strengthening of national capacity for management of the coastal zone in island member countries in cooperation with SPREP and SOPAC, building on the pool of expertise already existing within the region.
  - 1.3 The Forum calls on those members with extensive expertise and resources for the geological and biological understanding, management and integrated resource assessment of tropical coastal systems to strengthen and enhance the capacity of the other members.
  - 1.4 The Forum endorses strengthening of the SOPAC Coastal Program related to mapping, data collection, information management and training activities of the organisation.
  - 1.5 The Forum endorses the strengthening of the SPREP Coastal Management and Planning Programme, including the establishment of an Integrated Coastal Zone Management Project.
  - 1.6 The Forum endorses the establishment of guidelines for sound engineering practice in coastal zones of the Pacific island region.
  - 1.7 The Forum endorses the need for detailed engineering assessment, including economic evaluations, of new coastal protection systems.
  - 1.8 The Forum supports the establishment and strengthening by member governments and regional organisations of integrated information systems with consistent data standards.
  - 1.9 The Forum promotes the exchange of relevant coastal management data, in particular historical data, between member governments.
  - 1.10 The Forum supports the establishment of a mechanism with non-Forum countries to obtain easy access to relevant data for the purposes of coastal management.
  - 1.11 The Forum encourages the development and strengthening of national education and public awareness programmes relevant to coastal management.
  - 1.12 The Forum encourages mutual sharing of education materials between members, utilising the resources of regional agencies where appropriate.
  - 1.13 The Forum strongly encourages member countries to continue to develop and implement regulatory regimes to facilitate coastal management.
  - 1.14 The Forum encourages its member governments to place urgency on developing and strengthening national environmental impact studies and assessment procedures.
  - 1.15 The Forum calls on its development partners to give priority to resourcing coastal management."

---

## Annex 3: GIS Information

### Introduction

GIS is a tool: it organises computer hardware, software, geographic data and personnel to efficiently capture, store, update, manipulate, analyse, and display all forms of information. The system can also hold and use data that describes specific places and areas on the earth's surface and allows one to identify the spatial relationships between map features.

A GIS does not store a map in any conventional sense; nor does it store a particular image or view of geographic area. What it actually does is to store data that can be utilised to create the desired view for making a more informed decision about a particular area.

### Answering Questions

There are basically 5 generic questions a GIS can answer;

*i. Location*            **What is at...?**

At a particular location, the GIS can give a description of place name, post or zip code, or geographic reference such as latitude and longitude.

*ii. Condition*        **Where is it...?**

Instead of identifying what exists at a given location, you want to find a location where certain conditions are satisfied (e.g. a mangrove swamp at least 1,500 square meters in size, within 100 meters of the lagoon reefs, etc)

*iii. Trends*            **What has changed since...?**

This question may involve (i) and (ii) and seeks to find the differences within an area over time. It may also use remote sensing data to do this.

*iv. Patterns*            **What spatial patterns exist...?**

For instance, was the red tide or algal bloom the major cause of death among residents living next to the oyster farm? You may want to know how many anomalies there are that do not fit the pattern and where they are located

*v. Modelling*            **What if...?**

This type of question is to determine what happens for instance, if a section of the mangrove is cut down or if there is a rise in the sea level. Answering this type of question requires both geographic and other information.

### GIS and Coastal Management Planning

When used in Coastal Management Planning, GIS can support and assist with:

- i. coordinating coastal management and planning activities, especially when considering various projections of sea level rise;
- ii. providing information about coastal areas as well as land-sea interface information for planning and management; and
- iii. undertaking coastal management planning activities, including coastal surveys and management plan development.

### Limitations of GIS

GIS is a tool for making better decisions, it is not an end in itself. The following are some of the limitations to the utilisation of the GIS:

- i. The cost of a GIS systems is quite high (i.e. a "complete" ARC-INFO GIS system requires a minimum of 2 computers, a colour plotter, tape or CD drives, a digitising table, map storage, archiving system, etc);
- ii. The more sophisticated the system, the more user-unfriendly;
- iii. Because GIS is relatively new in the Pacific region, GIS expertise is limited, especially in-country;
- iv. The GIS equipment is very sensitive to climatic conditions, especially high humidity; and



---

v. GIS is very useful when there are available and accurate maps and other data which are compatible and able to be digitised. For most countries, there is a lot of available maps and data however it is held outside the region, is not uniform or belongs to an outside source. Accessing the information can become difficult due to copyright.

SPREP is developing a regional environment GIS programme which displays different aspects of the environment. SOPAC's GIS programme covers non-living resources such as the contours and profiles of the seabed, while the FFA and SPC are developing GIS capabilities in the fisheries area. The University of the South Pacific at Suva has GIS training facilities fully staffed which offers GIS undergraduate courses as well as short courses.

#### GIS in the Pacific islands

Five SPOCC organisations (SPREP, SOPAC, SPC, FFA and USP) recently signed an MOU in July this year to exchange spatial information and to assist member countries in developing access to GIS. A GIS and Remote Sensing User Group has been established between the five SPOCC organisations and others. In addition, the Users will establish and contribute to a master catalogue of data and information being coordinated by SOPAC and ensure all Users are up to date with new developments.

---

#### More information

For further information, contact:

##### SPREP

BOX 240  
Apia, Western Samoa  
tel: (685) 21929  
fax: (685) 20231  
email: sprep@pactok.peg.apc.org

##### SOPAC

SOPAC Technical Secretariat  
Private Mail Bag, GPO  
Suva, Fiji  
tel: (679) 381 377  
fax: (679) 370 040

##### FFA

P.O. Box 629  
Honiara  
Solomon Islands  
tel: (677) 21 124  
fax: (677) 23 995

##### SPC

B.p. D5  
Noumea Cedex,  
New Caledonia  
tel: (679) 262000  
fax: (679) 263818

##### USP

P.O.Box 1168  
Suva, Fiji  
tel: (679) 313900  
fax: (679) 302548

---

