



Capacity building in the marine sector in the Pacific Islands: the role of the University of the South Pacific's Marine Studies Programme

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Abstract

Capacity building in the marine sector is a priority for Pacific Island nations, which face major challenges in the sustainable management of their marine resources under UNCLOS III and the various Conventions and Agreements stemming from UNCED. The University of the South Pacific (USP), with its 12 Pacific Island members (Cook Islands, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu) has taken up this challenge through the establishment of its Marine Studies Programme (MSP) in 1993. The MSP is one of the four focal areas identified in USP's 1998 Strategic Plan. The breadth of MSP's activities is substantial, ranging from awareness raising at the village level to sophisticated post-graduate research in marine science. The substantial regional and international cooperation, research and training involved in these endeavours require USP to respond to education, training and research needs at many levels. As USP services more than 23 million square kilometres of ocean space and less than 1.7 million people, only a small percentage of this population have access to face-to-face teaching. USP's success to date is a measure of staff dedication, innovation and the confidence of the university, its members, and its donor partners. Capacity building in the marine sector will remain a high priority for many years to come, and MSP must continue to play a leading role. © 2001 Elsevier Science Ltd. All rights reserved.

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1. Introduction

With the establishment of maritime zones under the United Nations Convention on the Law of the Sea, the sovereign territory of Pacific Island states has increased enormously during the past 15 years. While the new wealth associated with this extended area is largely untapped, the burden that it places on its custodians is overwhelming. For instance, the United Nations Conference on Environment and Development (UNCED) and its associated Agreements and Conventions have given greater responsibility to Pacific Islands. The responsibility to control and properly manage marine resources has burdened Pacific Islands. In addition, growing population pressures and the consequent pollution of sensitive coastal environments, increasing tourism, greater stress on traditional fisheries of reefs and lagoons, lucrative opportunities to give distant water fleets access to the deep sea fishery of their

economic zones, dwindling resources, an emphasis on economic development focusing on ocean resources, and development of new technology such as aquaculture and energy production from the sea, require management approaches that are not available. These developments have led to an unprecedented expansion of activities in all aspects of the marine environment [1].

Regional bodies such as the South Pacific Regional Environment Programme (SPREP), the South Pacific Applied Geoscience Commission (SOPAC), the Secretariat for the Pacific Community (SPC) and the USP have specific mandates to assist the Pacific Islands to meet their obligations according to the Agreements and Conventions they are party to. SPREP has been instrumental in producing important overviews of management, development and socio-economic issues in the coastal zone in Pacific Islands [2,3]. SOPAC is concerned with coastal protection and non-living resources in the Pacific Islands and has produced an important overview of coastal protection issues [4]. SPC has produced detailed overviews of the state of management of inshore fisheries [5,6], while the state of the

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coastal fisheries was reviewed by Dalzell et al. [7]. The status of coral reefs in the Pacific Islands has been reviewed by Grigg and Birkeland [8], and Wilkinson [9] included Pacific Islands in his overview of the status of coral reefs of the world. The University of the South Pacific is a unique regional university, and is concerned with the provision of tertiary education, research and consulting to its member countries. A detailed review of the impact of these regional arrangements is provided in South and Veitayaki [9].

All regional bodies in the Pacific Islands agree that human resources development in the marine sector is a priority [10–12]. USP is a key player in tertiary training and education, and it is the purpose of this presentation to outline the role that USP, specifically its Marine Studies Programme (MSP) is playing in building capacity in the marine sector.

2. The Marine Studies Programme (MSP)

The MSP was established following the development of a five-year plan adopted in principle by the USP Council at its meeting in Tarawa, Kiribati, in November 1991 [13]. MSP is a university-wide, interdisciplinary programme focusing on training, education, research and service to its member countries. In its 1998 Strategic Plan, USP recognised MSP as a priority development.

The mission of MSP is to provide necessary opportunities for Pacific Islanders to understand, conserve, develop, manage and utilise their living and non-living marine resources in a rapidly changing world. In addition, MSP aims to provide Pacific Islanders with the widest possible range of opportunities for research, education, training and employment in the marine sector.

2.1. Strategies

There are two parallel strategies being adopted in the mission of the MSP. The first is long term, focusing on academic programmes. The second is short term, aiming at the most important players in the coastal management decision-making process through workshops, seminars and short-term training. Pacific Islanders require both. There is a need for science-based technical expertise satisfied through the formal education process. Then, there is the need to ensure that policy- and decision-makers and members of local communities are equipped with the skills and knowledge to be effective managers of the marine resources within their realm. Usually these people are unable to attend a formal university degree programme for a variety of reasons, such as lack of secondary and tertiary prerequisites and restricted human resources preventing people from leaving their work stations. There is, therefore, the need

for long- and short-term training. Long-term needs are addressed through education programmes that initially emphasised certificate and diploma courses, and later were extended to include degree and post-graduate programmes. The short training courses have also reflected the changes taking place within the countries and contemporary marine resources management needs. This approach reflects changing human resource needs and requirements in the region and are aimed at assisting member countries in meeting their obligations under various global Conventions and Agreements (such as United Nations Framework Convention on Climate Change; Agenda 21; Convention on Biodiversity Conservation; the Rio Declaration; the Barbados Declaration, UNCLOS).

3. Goals and objectives

As a matter of policy, it is a long-term strategy to concentrate on post-graduate training and research, since these are a distinct role of USP compared with its regional partner organisations. MSP is one of the four focal areas in the USP's 1998 Strategic Plan.

It is the aim of MSP that undergraduate enrolments should level off at no more than 150 full-time equivalent students by the year 2005 (i.e. total number of course enrolments divided by six, which is the normal one-year course load). In 2000, the number is just over 100, suggesting that we are well on target. At the post-graduate level, the goal is to have up to 50 post-graduate students at any one time (approximately 10 of whom would be at the doctoral level). The institution has already reached this target, and demand continues.

Regional and international linkages are integral to the success of MSP. Indeed, most of MSP's short-term training is now offered through regional and international linkages. Regional links are facilitated through USP campuses and centres throughout the region. Undergraduate courses in Marine Studies are available through University Extension in all member countries. Then there are the links with the Université Française du Pacifique in Papeete and with Institut de Recherche et Développement in both Tahiti and New Caledonia.

The link with the International Ocean Institute (IOI), for example, provides a window to the outside world with links to IOI Headquarters in Malta as well as operational centres in Canada (IOI-Halifax), South Africa (IOI-South Africa), India (IOI-Madras), Senegal (IOI-Senegal), Costa Rica (IOI-Costa Rica), China (IOI-China), and Japan (IOI-Japan).

One of the significant spin-offs from MSP has been the establishment in 1993 of the International Ocean Institute Operational Centre for the Pacific Islands (IOI-Pacific Islands). Highlights of the IOI-PI have included participation in the Independent World Commission on

the Oceans; participation in the IOI's global training programme; development of the UN/DOALOS TRAIN-SEA-COAST Curriculum Development Unit; development of courses in Climate Change Vulnerability and Adaptation Assessment under CC:TRAIN; hosting of 187 delegates from 40 countries at the annual IOI Conference *PACEM in MARIBUS XXVII* in November 1999; and establishment of a Node under the Global Coral Reef Monitoring Network for Fiji, Nauru, New Caledonia, Samoa, Solomon Islands, Tuvalu and Vanuatu.

MSP has been successful in raising significant funding in support of its development, programmes and facilities, to a total of approximately US\$17 million over the past 10 years. Major donors have been Canada, New Zealand and Japan.

The MSP also has research links with the University of Otago in New Zealand, where the focus is on student exchange and joint research projects. There is also the link with the Marine Biotechnology Institute in Japan, which does research in the areas of marine natural products chemistry and bioprospecting. In addition, there is cooperation with the National Fisheries University of Japan, enabling MSP students and staff to participate in joint scientific cruises on board the *Koyomaru*. Furthermore, MSP has a long-standing relation with Kagoshima University in the areas of social science research.

MSP's other contributions to capacity building in the marine sector within the region has been addressed through the following activities.

4. The Pacific Islands Marine Resources Information System (PIMRIS)

PIMRIS began in 1986 with funding from the Canadian International Development Agency (CIDA); since 1993 it has been incorporated into MSP, with funding largely derived from USP's core budget. PIMRIS is a regional information network with the coordination unit at USP, overseen by a regional PIMRIS Steering Committee. It is concerned with maintenance of a regional database on marine resources shared with SPC, FFA, SPREP and SOPAC. With the advent of easy access to the Internet, PIMRIS services have expanded considerably. On-line access to global databases is possible, as well as the transfer of articles through an electronic form of inter-library loan service. The PIMRIS Coordinator conducts extensive training in the region, especially for librarians and information officers in fisheries departments, and also hosts attachments and short courses. PIMRIS is now designated as a regional input to FAO's Aquatic Sciences database (ASFA). Located in the new MSP facilities in Suva, the PIMRIS coordination unit is

rapidly growing as an important resource for undergraduate and post-graduate students, academic staff and visitors.

5. Training programmes—MSPTRAIN

Training has always been integral to MSP's activities given the limited capacity to manage regional marine resources. Moreover, attendance at courses and training are restricted by the small bureaucracies. Between 1986 and 1990, the Ocean Resources Management Programme (predecessor to Marine Affairs Programme) which was operated as a joint Forum Fisheries Agency/USP initiative, organised six in-country workshops on ocean resources management throughout the USP region. From 1990 to 1994, a Marine Public Education Programme was established in collaboration with USP's Institute of Education. The programme concentrated on improving marine-related content in school curricula and upgrading teacher's skills in marine science by initiating 'training of the trainers' curriculum development workshops. The various components of the Marine Public Education Programme have since been incorporated into all of MSP's activities.

In the Pacific Islands, training programmes should enable people to formulate cheaper and more ingenious methods of effectively managing their marine resources. These methods should effectively address the main constraints that hinder management arrangements. Ocean resources management is complicated because of the common property nature of marine resources, combined with humanity's selfish nature. This is why it has been hard for people in contemporary Pacific Islands to abide by rules and regulations to protect their resources.

Since the establishment of the Institute of Marine Resources in 1978, USP has been the venue for a variety of workshops, short courses and seminars, often in collaboration with regional and international bodies [14,15]. Since 1993, however, a more formal approach to training has been established, under the aegis of a variety of initiatives. Since 1998, all MSP training has fallen under MSPTRAIN, a section of the programme devoted to all training activities outside the formal teaching programme.

Examples of past, current and planned training activities include the following.

IOI training programme: IOI-Pacific Islands (IOI-PI) at USP has included a substantial training programme of Leaders' Seminars, short courses (up to five weeks duration) and various workshops. The focus of the IOI Training Programme has been in ocean policy, coastal zone management, coastal fisheries, resource and environmental economics, marine awareness and community-based marine resource management. While

courses are open to participants world-wide, the majority come from the Pacific Islands.

Marine awareness: IOI-PI has been very successful in the implementation of a national marine awareness training programme in Fiji, and in efforts to pass the Fiji experience on to other Pacific Island countries. This unique programme is a result of cooperation between the private sector (e.g. The Fiji Dive Operators Association), government, NGOs and the general public. A summary of the programme can be found in South [16]. Recently, the initiative was extended to the community level in line with the emphasis on community-based management systems and the need to incorporate customary and contemporary management arrangements.

IOI-PI has cooperated with a number of other agencies, including the Women and Fisheries Network, SPREP, FAO and several UN agencies. The Director of IOI-PI is a member of the IOI Planning Council, and a member of the Editorial Board of *Ocean Yearbook*. IOI-PI initiated the newsletter PASIFIKA, which is now a bi-annual joint publication of IOI-PI and MSP. IOI has been invaluable in creating a window to the international community and, consequently, in publicising the situation within the region. Through IOI, the region enjoys useful relationships with the international community, facilitating training programmes that address the needs of the region and are appropriate to developments in the international community.

IOI has contributed significantly to meeting marine training needs in the Pacific Islands. Working in association with USP has enabled IOI to deliver its programmes widely throughout the region. The association has also allowed IOI to access local expertise. IOI courses on *Coastal Fisheries Management and Development* [17], *Management Issues in Environmental and Resource Economics*, *Practical Taxonomy of Indo-Pacific Crustose Coralline Algae* and *Coastal Management with special reference to small islands* offered between 1993 and 1996 have been attended by Pacific Islanders from relevant organisations [17–20]. Joeli Veitayaki coordinated the preparation and writing of the course on Coastal Fisheries Management and Development and co-directed its delivery in 1994 and 1995. He also helped plan the Integrated Coastal Management course that was based on the IOI course he attended at the University of Malta in 1994. These two courses, with some slight modifications, have also been translated into university courses for the Marine Affairs Programme.

IOI has also organised two leaders' seminars. These were in Fiji in 1993 and PNG in 1996 [21,22]. These seminars provided opportunities for national leaders in the two countries to discuss issues related to UNCLOS. Particular issues that were explored included the ratification, regional seas, governance, multidisciplinary and integrated approaches to coastal management.

Seminars were well attended and focused on problems that senior bureaucrats are grappling with. For instance, the concept of national maritime authorities was explored, with the leaders given time to brainstorm and discuss the issues involved.

In 1995, Joeli Veitayaki was granted six months leave from normal teaching duties at USP to coordinate the Independent World Commission on the Oceans (IWCO) in Oceania. The IWCO was an IOI initiative to raise awareness and redirect global attention to UNCLOS 14 years after it was signed in 1982. It was IOI's contribution to the United Nations' International Year of the Oceans in 1998. IOI-PI was the Secretariat for the Oceania Region. As part of the awareness work, a brochure outlining some aspects of UNCLOS III and reasons why these were important to the Pacific Islands was distributed [23]. More than 1500 of these brochures were distributed—with the invitations of the Independent Commission and at the hearings. More than 1000 people attended these hearings, which offered useful discussion on the issues facing particular countries.

Instead of bringing a few people together from the different countries, it was decided to organise hearings in as many of the countries as possible within the budget provided. The rationale was to maximise the number of people who attended the hearings. Furthermore, it was more conducive for people to talk about issues that were relevant to everyone in attendance than to discuss issues specifically related to only a few. Hearings were consequently organised in Suva (Fiji), Apia (Samoa), Wellington (New Zealand), Honiara (Solomon Islands), Funafuti (Tuvalu), Majuro (Marshall Islands) and Tarawa (Kiribati).

The hearing in Suva was organised in conjunction with the South Pacific Applied Geoscience Commission's Annual Session and was attended by representatives from all the 18 member countries and the international community. The daylong session generated useful discussions from country representatives. In the other hearings, a mixture of interested people from all areas of Government, industry, the scientific community and NGOs were present. The hearings were a resounding success at raising awareness and redirecting people's attention to the Convention and the associated rights and responsibilities of nations [24].

The organisation of the marine awareness workshops and community-based management strategies beginning with the ones in Fiji has brought to full complement the development of human resources in the South Pacific [17,25,26]. Initially, courses were directed at policy makers and senior government officials. Later, university courses were developed and consolidated. It was, therefore, logical that people in coastal communities—owners and users of the coastal resources—were now targeted. The current interest in declaring marine protected and conservation areas is largely the result of

these workshops which clarified misconceptions that existed between the contemporary and licensed users of marine resources and the customary owners.

As part of Fiji's 1997 Constitutional Review, we worked on a research paper that was submitted to the Constitution Review Commission. Given the local situation in Fiji and the lack of enforcement capacity, we proposed that the ownership of coastal resources should be returned to the indigenous people who at the moment have only the right to fish [27]. We believe that customary marine tenure provides a useful basis for the empowerment of local communities so that they can be more responsible for the management of their marine resources. This seemed the most logical resource management option given the scattered nature of the islands and the vast areas covered. The Rabuka Government, shortly before the last election, agreed with our proposal and declared their intention to return ownership of customary marine tenure to the indigenous Fijians [28]. The interim Government of Laisenia Qarase now wants to formalise this. Signs are that the resources management system is working in Fiji [29–31] as people are currently developing marine protected and conservation areas.

In November 1999, IOI-PI hosted the very successful *Pacem in Maribus XXVII*, the annual IOI conference. A total of 187 delegates from 40 countries participated. The theme of the conference was "Oceans in the New Millennium—Challenges and Opportunities for the Islands". A rich volume of information was gathered during the conference, and the proceedings, as well as video and audio tapes of the entire conference, will be used as teaching tools in MSP's undergraduate and post-graduate programmes [32].

A recent and important development for IOI-PI has been its active participation in the Global Coral Reef Monitoring Network (GCRMN), which is coordinated through the Australian Institute of Marine Science. A node of GCRMN is coordinated by IOI-PI for Fiji, Nauru, New Caledonia, Samoa, Solomon Islands, Tuvalu and Vanuatu. The node will be responsible for bi-annual status of the Coral Reefs reports, the development of long-term coral reef monitoring sites in the seven countries involved, training in coral reef monitoring, and the collation and transfer of monitoring data to ReefBase, located at the headquarters of the International Centre for Living Aquatic Resources Management (ICLARM) in Malaysia.

IOI-Pacific Islands has also been involved as an observer at the Multilateral High-level Conference on the conservation and management of highly migratory fish stocks, and has published regular reports on the progress of the negotiations [33,34].

TRAIN-SEA-COAST (TSC): The TSC programme is coordinated by the United Nations Division on Ocean Affairs and Law of the Sea (UN/DOALOS) in New

York, and is concerned with the delivery of high-quality standardised training packages using the TRAIN-X (UN) methodology [35]. To date, seven USP course developers and subject experts have been trained in the methodology, although, no course has been developed or offered so far. It is anticipated that the programme will be re-vitalised from 2000 onwards through a collaboration with SPREP's International Waters Project.

CC:TRAIN: This programme is coordinated through the United Nations Institute of Training and Research, Geneva. MSP has successfully transferred the Vulnerability, Adaptation and Assessment course from the University of Waikato's International Global Change Institute (IGCI) and offered it in 1999 [36].

TRAINFISH: This TRAIN-X style programme was initiated in 1999 by the Food and Agriculture Organisation (FAO), and MSP was designated as one of the founding members of this new network of training institutes dedicated to the development of training programmes focusing on the FAO's Code of Conduct for Responsible Fishing. Unfortunately, the programme was put on hold because of funding difficulties, but may be revived in the near future in connection with SPREP's GEF-funded International Waters Project.

6. Institute of Marine Resources (IMR)

The IMR was established in 1978 at the USP's Laucala campus in Suva, Fiji. Its mandate was broad, and was concerned with training (the Diploma in Tropical Fisheries), research and consulting. The Institute ran very successfully for the first 12 years, and published many reports on issues highly relevant to the region [37]. IMR has since become a "political football" following a decision by the USP Council to move IMR to Solomon Islands in 1991. As a result, IMR has been in limbo and, even when re-opened at a new site in Aruligo, Solomon Islands in 1999, its activities were short-lived because of serious ethnic unrest. IMR is once again in limbo in Suva, awaiting the decision of the USP Council on where to re-locate.

7. Atoll research activities

For many years, MSP has had a presence in its Atoll countries through the operation of a small outpost in Tarawa, Kiribati. While the activities have paraded under different names, the intent has been to carry out research relevant to USP's Atoll member countries. Successful programmes have included the Tarawa Lagoon Management Project funded by USAID, and long-term studies on ciguatera fish poisoning, a major problem in atoll countries.

8. Dravuni Island field station

The Dravuni Island field station is located some 75 km south of Suva in the Great Astrolabe Lagoon. Established in 1982 and refurbished and expanded in 1998–99, the station has been regularly used for undergraduate classes and research by regional students, MSP staff, and international collaborators. The well-being of the station has been overseen by Astrolabe Incorporated, a Washington DC based NGO. The field station is located on pristine coral reefs and has great value for research. Long-term collaboration has been initiated with the Smithsonian Institution, the University of Tokyo and the University of Newcastle-upon-Tyne.

9. Issues and constraints

Training is a long-term process nurtured over time. It is expensive, continuous and needs regular assessment of its relevance. The main training problems faced in the Pacific include the compartmentalisation of responsibility and the duplication of effort. These issues must be constantly addressed if training courses are to be effective and efficient. At the moment, training data are varied because of the diverse activities that are undertaken.

The development of MSP has meant that USP has a firm place in regional considerations relating to marine issues. In particular, we now participate in high-level activities in the marine sector, and are playing a key role in Council of Regional Organisations of the Pacific (CROP) Marine Sector Working Group. This group is currently charged by the Forum countries to develop an Oceans Policy for the Pacific Islands.

MSP is now seen as the prime training, education and research facility in the South Pacific region, with about 100 FTE undergraduate students and more than 50 post-graduate students enrolled in marine-related programmes. MSP is focusing its efforts at the post-graduate level, as this is one of the priority Human Resources Development needs identified in the region. Of the 140 who graduated with the Diploma in Tropical Fisheries, many are now middle-level or senior staff in Pacific Island fisheries departments.

The founding of the MAP has played an important role in the development of regional policies in government. However there is significant demand in the region for experts in ocean law and policy, fisheries management, protected area management, environmental issues and integrated coastal management and it is hoped that MAP will assist in addressing this need.

MSP has developed important partnerships with sister regional organisations in areas such as the recent completion of a Training Needs Assessment exercise (USP/CROP initiative); the development of a Post-

Harvest Fisheries programme (USP/SPC initiative); Marine Geology training and research (USP/SOPAC initiative) and Aquaculture (USP/SPC/ICLARM initiative).

Three essential factors have been important in MSP's ability to address priorities and needs in USP member countries: human resources, finances and facilities. In addition, the daunting task of developing such a far-reaching programme required the total commitment of the University administration and, in turn, that of the USP Council. It is noteworthy that in the late 1980s and the early 1990s, the ability of USP to meet its enormous responsibilities was in serious doubt. By the beginning of the new millennium, however, there is little doubt that USP has risen to the task and, through MSP, has established a firm reputation to be able to "deliver the goods".

Highly qualified tertiary level teachers, trainers and researchers are still in severe shortage in the Pacific Islands. In some areas (e.g. Marine Geology; Ocean Law and Policy), there is a dearth of trained individuals capable of delivering advanced courses and developing the sophisticated research programmes badly needed in the region. USP will, therefore, continue to rely on the services of non-regional academic staff until these shortfalls are met—probably for the next 10 years or so. However, linkages that MSP has forged have provided welcome opportunities for capacity building in the marine sector.

Surprisingly, finances have not been a serious problem. While USP member countries have generously supported MSP within their capacities, the programme has benefited from long-term and substantial funding through the Canada-South Pacific Ocean Development Program (C-SPODP) Phases I and II. C-SPODP has supported programme development and post-graduate scholarships, as well as a number of specific developments such as PIMRIS, Marine Affairs Programme, Marine Public Education, Post-Harvest Fisheries and, more recently, Aquaculture. Such long-term funding arrangements, programmes of study, and research should augur well in meeting the human resources requirements for the university region.

Facilities were a major hindrance to the development of MSP, which was housed in old aircraft hangars built by the Royal New Zealand Airforce during the Second World War. In 1998, however, the MSP took occupancy of new world-class facilities on the same site, built through the provision of very generous grant aid from the Government of Japan to the Government of Fiji. These facilities are, however, already operating beyond capacity and it is anticipated that additional space will be needed within 10 years.

MSP and USP continue to address the wide range of issues that confront Pacific Islands. They provide the conduit between the cutting edge of scientific research

and the needs of local traditional communities. After all, ocean resources management is about people and how they organise their use of marine resources to ensure their sustainability.

MSP is now built upon a strong foundation, and almost all the elements proposed in the five-year plan of 1991 are now in place. Ultimately, however, the success of the programme is not predicated upon finances or facilities, but rather on the quality of the staff and students. They will determine the success of MSP in the future. The students will become leaders in their own right and, through commitments made during their time at MSP, it is hoped that they will maintain a strong national and regional identity so that the future of the marine sector in the Pacific Islands can be assured.

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