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**Development of new programs in sustainable fisheries at University  
of the South Pacific**

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(Presented by Dr Tim Pickering, USP)

## **SUMMARY**

1. The following paper is for consideration and endorsement by Heads of Fisheries. It summarises proposed new study programs at USP in sustainable fisheries. The programs focus on issues like fisheries sustainability and management in the PICs and integrates fisheries sciences with socio-economic studies and practical or applied studies with theoretical knowledge. The programs would be offered as certificate (1 year, equivalent to the SPC/NMIT Fisheries Officer course), diploma (two years, equivalent to USP's former Diploma of Tropical Fisheries) and degree (3 years) in sustainable management. The first year would replace the existing SPC/NMIT course, and be offered in collaboration with SPC (and NMIT if funds are available). The cross-crediting and incremental learning approach facilitates professional development in fisheries departments in the region. Candidates with the SPC/NMIT Fisheries Officers certificate can progress directly to second year (Diploma). USP's distance and flexible learning programs enables all Certificate and Diploma courses to be undertaken in the major home countries. The wide choice of courses enables generalization, or specialization in areas such as food technology, economics, extension, research and/or policy and management.

## **INTRODUCTION**

2. Inshore (and some offshore) fisheries continue to decline in many of the Pacific Island countries. Reasons include direct influences such as over-fishing of stocks because of increasing demand from increasing island populations, urbanisation and exports, growth of cash economies, wide use of mass capture techniques (gillnets, fences etc), and use of destructive techniques (poisons, dynamite etc).
3. Other, less obvious reasons for stock declines include loss of juvenile nurseries and adult fisheries habitats due to reclamations, terrestrial runoff and pollution, loss of water quality in estuaries and lagoons, decline of coral reefs due to eutrophication (elevated nutrients indicating excessive algal growth), crown-of-thorns starfish and particularly coral bleaching.
4. Fisheries management has generally been ineffective or unsuccessful in its approaches (not only in PICs, but globally). Problems in fisheries management the Pacific Island Countries include lack of strategic planning approaches, lack of capacity (fisheries training has languished in the past decade), lack of good governance (inefficient administrative procedures, increasing corruption), and lack of community-based fisheries management approaches.

### **Need for sustainable fisheries**

5. The “Sustainable fisheries concept” or “Ecosystem approach to fisheries” provides a new, more holistic approach to fisheries management. It integrates fisheries, environmental and socio-economic objectives, and more precautionary approaches in decision-making. It requires the integration of science and social science, economic development and environmental conservation, national (government) and local (community) co-management, and terrestrial catchment and marine environmental management.
6. “Sustainable fisheries” are essential in the PICs where fish is a staple food, and is still essential for the subsistence of a significant proportion of isolated, rural populations (40-60% in some countries).

### **Fisheries training needs**

7. Fisheries training has declined in the PICs over the past decade. USP ceased its generalized two-year Diploma of Tropical Fisheries in the 1990s, and replaced it with more academic, science degrees. The six-month SPC/NMIT Fisheries Officers course has continued, but enrolments have declined and cessation of Commonwealth Secretariat’s funding now prevents its regular annual offering. However, SPC has continued with specific short-term fisheries training courses in priority areas. National needs differ greatly for all levels of staff. Some countries have sufficient trained support staff, while others (e.g. Solomon Islands) require many. Staff development needs also vary greatly. Many SPC/NMIT Fisheries Officer course and USP Diploma of Tropical Fisheries graduates need formal academic qualifications for career progress.
8. There is a need for a more strategic approach to regional fisheries training, to address the critical issues facing the region’s fisheries, take a modern holistic ‘sustainable fisheries’ approach, integrate applied and theoretical subjects, allow greater flexibility and continuing professional development, and reduce duplication by the training providers.

### **New collaborative program in sustainable fisheries**

9. The following paper outlines a proposed new collaborative fisheries training program at the School of Marine Studies, University of the South Pacific. The program would:
  - promote holistic ‘sustainable fisheries’ in the South Pacific region;
  - be collaborative in approach (USP/SPC);
  - reduce duplication in effort;
  - allow tertiary accreditation of a proportion of the SPC/NMIT Fisheries Officer and DTF graduates towards higher studies;
  - permit career progression and promote professional development;
  - allow greater flexibility in courses and study mode, and specific focus areas;

- allow incremental learning and accreditation (one year Certificate > two year Diploma > three year Degree in Sustainable Fisheries);
- permit external studies for much of first year (Certificate) and some of second year (Diploma).

## PROGRAM OUTLINE

10. The following summarises the program structures, shows courses or subjects, and core and elective courses. Note that greater flexibility in cores and electives is possible with special approval.

### CERTIFICATE/DIPLOMA/DEGREE IN SUSTAINABLE FISHERIES

LEVEL	COMPULSORY COURSES*	ELECTIVE COURSES
<b>Certificate in Sustainable Fisheries</b> (8 courses) <b>Assistant Fisheries Officer level</b>	<b>new MS1xx INTRODUCTION TO PACIFIC ISLAND FISHERIES</b> <b>new MS1xx EXTENSION AND COMMUNICATIONS</b> MS111 (I) INTRODUCTION TO MARINE SCIENCE FOR PACIFIC ISLANDS CS100 (I/II) COMPUTING FUNDAMENTALS MS206 (II) MARITIME TECHNIQUES MS204 (I). TROPICAL SEAFOOD	TWO of following: <b>PRACTICAL FISHING TECHNIQUES</b> (SPC COURSE) MA102 (I/II) MATHEMATICS FOR SCIENCE EC100 (I/II) INTRODUCTION TO ECONOMICS <b>MS 2XX. WORK INTERNSHIP ACCREDITED ADVANCED TECHNICAL COURSES</b> (e.g. NMIT) <i>(Other Courses Ge102 (I/Ii) Introduction To Human Geography; Hp101 (I) Government And Public Policy In The South Pacific; Ec101/2. (I/Ii) Macro/ Microeconomics 1</i>
<b>Diploma</b> (above certificate, plus 6 courses) <b>Fisheries Officer level</b>	MS201 (I) INTRODUCTION TO OCEAN RESOURCES MANAGEMENT <b>FIOXX. PROJECT PLANNING, ADMINISTRATION &amp; GOOD GOVERNANCE</b> MS 324. AQUACULTURE <b>new MS2xx MARINE BIODIVERSITY</b>	TWO of following: MS203 (II) FISHERIES ECONOMICS AND MANAGEMENT MS213 (II) PHYSICAL OCEANOGRAPHY MS205 (II) LAW OF THE SEA BI206 (II) QUANTITATIVE BIOLOGY MS 3XX (II) CORAL REEF ECOLOGY AND MANAGEMENT <b>MS 2XX. WORK INTERNSHIP CREDIT OTHER ADVANCED TECHNICAL COURSES</b>

<p><b>Degree in sustainable fisheries</b> (above diploma plus 6 courses) <b>Senior Fisheries officer level (research, extension, policy etc)</b></p>	<p>MS303 (I) COASTAL FISHERIES MANAGEMENT AND DEVELOPMENT <b>MS3XX. OFFSHORE FISHERIES</b> MS301 (II) OCEAN RESOURCES MANAGEMENT IN THE SOUTH PACIFIC MS 311. DIRECTED STUDY</p>	<p>TWO of following: MS313 (II) SEAFOOD SCIENCE MS/BI 307 (II) FISH AND FISHERIES BIOLOGY (<i>note prerequisites</i>) MS311 (I/II) DIRECTED STUDY GE304 (I) RESOURCE CONSERVATION AND MANAGEMENT MS/BI 305 (I) MARINE BIOLOGY (<i>note prerequisites</i>) MS 3XX (II) CORAL REEF ECOLOGY AND MANAGEMENT</p>
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11. \*other course combinations are permitted with approval of the head of School of Marine Studies'

**MODULE APPROACH (ENABLES CORE COMPETENCIES TO BE INCORPORATED INTO EXISTING COURSES WHERE RELEVANT)**

12. Previous reviews of regional needs in fisheries training have stressed the need to mix theory or understanding with basic practical skills. The basic skills or competencies will be incorporated into the above courses where relevant, as self-contained 'learning modules'.
13. Modules include: Small business enterprises; Project planning and management; Professional report writing; Administration, Public Service procedures; Communications, public meetings; Negotiations, conflict resolution; Community-based management; Participatory techniques; Field survey skills.

**YEAR 1. CERTIFICATE IN SUSTAINABLE FISHERIES. EQUIVALENCE WITH SPC/NMIT FISHERIES OFFICER'S COURSE**

14. The first year of studies provides basic understanding and core competencies, and integrates practical and theoretical subjects. It can be offered as the first of three years for the degree for continuing students, or as a stand-alone Certificate suitable for fisheries assistants. It is designed to be generally equivalent to the SPC/NMIT Fisheries Officers certificate, the content of which, reviewed and modified in 2003, is still relevant to the training needs of junior fisheries officers.
15. Two new USP courses will be developed to provide essential material from the SPC/NMIT course (Introduction to Pacific Island Fisheries; Extension and Communications). (Note that additional material is offered in other USP courses and at a higher level in second and third year). Some practical subjects of the SPC/NMIT course (e.g. marine electronics, outboard mechanics, vessel construction) will only be introduced in the USP Certificate as these can be taken in technical and marine training colleges existing in many PICs.

16. SPC will continue to offer a four-week course combining the observer programme and the practical fishing components of the SPC/NMIT Fisheries Officers course. This course will be held on a regular basis (annual or bi-annual), at a national training institution. Attendance to the course will be restricted to staff of fisheries departments (graduates from USP Certificate or Diploma in sustainable fisheries as well as other fisheries officers requiring refresher training in those two areas).

<b>SPC/NMIT SUBJECT</b>	<b>EQUIVALENT USP SUBJECT</b>
Extension & communications	<i>Equivalent new course to be developed by USP (FIOxx EXTENSION AND COMMUNICATIONS)</i>
Fisheries management	<i>Introduced in new MS1xx INTRODUCTION TO PACIFIC ISLAND FISHERIES</i> <i>Advanced training in Diploma courses MS201 (I) INTRODUCTION TO OCEAN RESOURCES MANAGEMENT and MS203 (II) FISHERIES ECONOMICS AND MANAGEMENT and Degree course MS/BI 307 (II) FISH AND FISHERIES BIOLOGY</i>
Report writing	<i>Covered in new MS1xx EXTENSION AND COMMUNICATIONS</i> <i>Part of USP Foundation Studies and USP CELT support</i>
Outboard motor repair	<i>Introduced in MS206 (II) MARITIME TECHNIQUES</i> <i>Specialised courses offered through local marine schools, technical colleges etc</i> *
Practical netting and seamanship	<i>Netting introduced in MS1xx INTRODUCTION TO PACIFIC ISLAND FISHERIES (focus on netting only undesirable)</i> <i>Seamanship covered in MS206 (II) MARITIME TECHNIQUES</i> *
Computer studies	<i>Equivalent CS100 (I/II) COMPUTING FUNDAMENTALS</i>
Navigation and chartwork	<i>Covered in MS206 (II) MARITIME TECHNIQUES</i>
Vessel construction and maintenance	<i>Introduced in MS206 (II) MARITIME TECHNIQUES</i> *
Pacific fisheries overview	<i>Covered in new MS1xx INTRODUCTION TO PACIFIC ISLAND FISHERIES</i>
Marine electronics	<i>Introduced in MS206 (II) MARITIME TECHNIQUES</i> *
Business management	<i>Covered in MS204 (I). TROPICAL SEAFOOD</i>

	<i>Advanced training in</i> Diploma course MS203 (II) FISHERIES ECONOMICS AND MANAGEMENT
Fisheries science	<i>Equivalent in new</i> MS1xx INTRODUCTION TO PACIFIC ISLAND FISHERIES and MS111 (I) INTRODUCTION TO MARINE SCIENCE FOR PACIFIC ISLANDS
Observer program	<i>Introduced in new</i> MS1xx INTRODUCTION TO PACIFIC ISLAND FISHERIES and new MS1xx EXTENSION AND COMMUNICATIONS <u><i>Advanced training provided by SPC</i></u> *
Aquaculture	<i>Introduced in new</i> MS1xx INTRODUCTION TO PACIFIC ISLAND FISHERIES <i>Advanced training in</i> Diploma course MS 324. AQUACULTURE
Seafood safety and quality management	<i>Equivalent</i> MS204 (I). TROPICAL SEAFOOD <i>Advanced training in</i> MS313 (II) SEAFOOD SCIENCE
Safety and survival at sea	<i>Almost fully covered in</i> MS206 (II) MARITIME TECHNIQUES
Learning reviews	<i>Equivalent in all USP courses</i>
SPC component (practical fishing)	<i>practical experience accredited through</i> MS 2XX. <b>WORK INTERNSHIP</b> <u><i>Practical fishing course still provided by SPC</i></u>

17. \*These practical subjects are only introduced in USP courses. Students wishing detailed training and qualifications can undertake these in the national technical colleges, marine training schools or specific SPC courses.

## YEAR 2. DIPLOMA IN SUSTAINABLE FISHERIES

18. The second year builds upon the first by focusing on planning and management, developing better understanding of the marine environment (oceanography, coral reefs etc), and/or ocean resources and governance. Most second year courses may be undertaken through extension at home, but attendance at a summer school may be necessary.
19. Two new courses are planned:

- **Project planning, administration and governance** (which provides practical skills in planning, public sector administration and 'good governance', to explicitly address issues of corruption which are affecting many PICs).
- **Marine biodiversity** (which covers environmental values, and focuses on marine invertebrates, fish and higher vertebrates of fisheries and conservation importance in PICs).

### **YEAR 3. DEGREE (BA/B APPLIED Science?) IN SUSTAINABLE FISHERIES**

20. The third year contains a wide range of choices which enable graduates to further specialise in fisheries management and oceans governance, postharvest fisheries; aquaculture, marine conservation and integrated management, inshore fisheries or offshore fisheries, and more advanced fisheries biology and modeling (which requires science/math subjects in first and second year). A directed study (MS 311) enables independent research or focused studies on the student's area of specialization
21. One new course is planned:
22. **MS 3XX Offshore fisheries** (tuna and migratory species; fisheries biology, life histories, introduction to models etc; fisheries, fishing techniques, economics, management etc)

### **CONCLUSIONS**

23. New programs in fisheries are being developed at USP in response to regional demand for training in applied sustainable fisheries. The new programs are collaborative (with SPC), interdisciplinary (fisheries science, social science), include a mix of theoretical and practical studies, are flexible in learning modes, allow either generalization or specialization, and facilitate professional development in fisheries in the PICs.
24. Feedback is requested from Heads of Fisheries at this meeting, or contact Prof Leon Zann (zann\_1@usp.ac.fj)