

ANNUAL REPORT TO COUNCIL
1989

December, 1989

1. AIMS AND OBJECTIVES

The Institute of Marine Resources, established in January 1978, has continued to follow the following broad objectives :

- (a) research into regional marine resources, including fish stocks and stocks of other kinds of marine life, undersea minerals and exploration of the seabed.
- (b) development of consultancy services for regional governments.
- (c) development of educational programmes in marine sciences.
- (d) the dissemination generally of information on tropical marine environment.

In order to fulfill these objectives IMR has been projected as:

- (a) an advisory body of governments in all questions of the exploration of Marine Resources inside and outside of 200 nautical mile economic zone, and in problems of the protection of the environment.
- (b) a scientific Institute carrying out applied scientific study in living and non-living resources of the sea for the island countries of the USP.
- (c) an educational Institute, through direct research and indirect means.

The Institute was set the task to develop expertise and resources in the following areas:

- marine biology
- fisheries biology
- aquaculture
- food technology as applied to marine products
- marine geology and marine geophysics
- physical, chemical and biological oceanography and related marine meteorology
- marine pharmacology
- coastal marine engineering

The Institute has a broad capability in all spheres of marine sciences relating to the exploitation and management of the resources of the 200 mile economic zone of the member countries of USP. However, mindful of the activities of other organisations, such as the South Pacific Commission (SPC), Forum Fisheries Agency (FFA), South Pacific Applied Geoscience Commission (SOPAC) and National Fisheries and other Marine Programmes of the member countries, the Institute has tended to avoid duplication of effort. Whereas IMR continues to develop and provide marine teaching programmes, as resources allow, other programmes have been governed by requests from member governments.

REVIEW OF AIMS AND OBJECTIVES

The overall objectives basically remain the same. However, there is likely to be some modification with regard to the DTF programme which is currently under review.

2. FACILITIES

2.1 BUILDINGS

The main location of the Institute is on the valuable prime land at Laucala Bay foreshore, leased to USP by the Government of Fiji for this specific purpose. The Institute is accommodated in temporary, white-ant infested wooden buildings and a laboratory and a lecture hall formerly occupied by the School of Pure and Applied Sciences (floor area comprised 1700m²; teaching laboratories 20m²; research laboratories (3) 150m²; workshop 100m² and stores 480m²). A covered working area and a garage totalling 190m² was built last year for the use by students and staff during wet weather.

The life of the present wooden buildings is very limited. Money spent on these buildings is regarded as wasteful.

The Institute has a Field Station at Dravuni Island, Kadavu, with a small laboratory and a 14-bed dormitory (floor area: 103m²). The Dravuni station, funded by EEC, was completed in December 1981 and was opened by Fiji's Prime Minister, Ratu Sir Kamisese Mara.

A second, smaller station has been constructed in Tonga, in 1982, at the Fisheries Division Headquarters in Nuku'alofa. The Institute, by arrangement, shares this facility with Fisheries Division, Tonga which gives access to all its facilities in return.

There has been some preliminary discussions about the building requirements of the IMR (Solomons branch) and IMR (Laucala Campus).

There has been no major modification to the buildings except for internal routine maintenance done by IMR staff.

IMR staff have responded to a request from the Director of Buildings and Grounds to outline Institute requirements for the construction of a new building at Lower Campus.

2.2 VEHICLES

The Institute has two motor vehicles: one 4-wheel drive short wheel base Landrover provided under EEC aid and a pick-up utility provided by SOPAC.

2.3 BOATS

Aphareus : 13.7m steel fisheries training and research vessel powered by a GM 471 diesel. Hydraulic capstan, hauler, and reels; radar; echosounder, recirculating aquarium for livebait well and storage hold. This multipurpose vessel is well equipped for tuna baitfish and tuna studies, as well as for training. (Cost \$120,000, built in Suva and funded by EEC):

The vessel is still in reasonable condition.

Hawksbill : 9m fisheries training vessel powered by a 453 Detroit diesel. The boat is equipped with an array of hydraulics and fishing gear. The vessel has been given under

USAID and the United States Navy Project Handclasp with an additional grant of US\$10,000 to assist outfitting and operations. (Cost US\$85,000, launched 28th June 1989).

With some additional navigational facilities and equipment the vessel would be ideal in carrying out fishing operations and for practical training.

Nautilus: 13m G.R.P. (fiberglass) launch powered by a V8 Caterpillar diesel. Hydraulic winch, pot haulers and fishing reels; radar, echosounders and radio. (Construction cost \$60,000 built in Canada and funded by CIDA, launched in 1973).

In February a survey on Nautilus was done by Colin C Dunlop and Associates funded by ICOD.

It is estimated that the cost of upgrading would be around \$90,000 - \$100,000.

However if she has a refit, the vessel would become an excellent training vessel.

The two options therefore would be to either raise a sum of \$100,000 for upgrading the vessel or to sell the vessel as it is.

Outboard Craft: Three 4m rubber inflatable dive dinghies, three 4m alloy dinghies and one fiberglass punt.

3. STAFF

A summary of the staff and their categories is given in Table 1. Present IMR Organisation Chart is shown in Appendix I.

3.1 ESTABLISHED STAFF

The Institute continues to operate with a small core staff but draws upon specialised staff from project funding and affiliated overseas Universities and Institutes. At the end of 1989, core staff consisted of 6 senior academic, and 5 junior intermediate staff.

3.2 AIDED-FUNDED POSTS

One graduate position, 2 junior intermediate posts and 6 hourly paid staff which were funded by EEC, were carried in the interim by USP.

One Fellow post has been funded by ICOD.

Staffing has continued to be a major problem in IMR.

In 1987, we had 24 staff positions filled. This had been reduced to 18 in 1988. 19 positions have been filled by the end of 1989.

The possibility of relocation of IMR to the Solomons Islands has prompted some IMR staff to apply for jobs outside.

Information Officer, Mr G Rao left IMR in March to join PIMRIS. Mr David Russell took up appointment as Information Officer from 29th May until December 12. The

post thereafter has become vacant.
V Vuki joined IMR in May as a Fellow.

The Fisheries Training Officer Mr H Walton resigned in August and Mr J Maiwelagi has consequently been appointed Fisheries Training Officer in October. Mr Maiwelagi's appointment leaves the Skipper Aphareus position vacant.

Mr R Hume joined IMR as Chief Technician in July.

Mr G Hureau, French-aided staff joined IMR in September as a Fellow.

The Professor of Marine Studies, USP and the Director of IMR, Professor Graham Robin South from Canada is due to take up his appointment in April 1990.

TABLE 1 : STAFFING

1. SENIOR ACADEMIC AND COMPARABLE

R South	Professor of Marine Studies (accepted position in 1989)
J SEETO	Acting Director
H WALTON	Fisheries Training Officer (until Sept)
J MAIWELAGI	Fisheries Training Officer (from Oct)
V RAM	Economics/Extension Officer
V VUKI	Fellow (from May)
R HUME	Chief Technician (from July)
G HUREAU	Fellow (from Sept)
S MILDNER	Fellow (Australian Aided post) (Oct-Dec)

2. GRADUATE

* G RAO	Information Officer (Jan - March)
D RUSSELL	" " (June - Dec)

3. JUNIOR INTERMEDIATE STAFF

MRS S NATH	Secretary (till October)
MISS M SINGH	Clerk/Typist
K TOAISI	Fisheries Officer
* J MAIWELAGI	Skipper <u>Aphareus</u> (till Sept)
* D O'CONNOR	Engineer
MISS H BEGUM	Technician
MR I TUWAI	Executive Officer
MISS J KABURE	Clerk/Typist (temporary)

4. HOURLY PAID, UNESTABLISHED

* (VACANT)	Technical Assistant
S CHAND	Labourer
M PRASAD	Cleaner/Handyman
V DAVAINAVESI	Cleaner/Handyman
* F MANUELI	Technical Assistant (and special assistant for Earth Science and Marine Geology Programme)
* M NAUTU	Deckhand
* S NEWTON	Deckhand
* (VACANT)	Deckhand/Boatman
* F LAVELAWA	Caretaker, Field Station

* (AIDED POSTS)

3.3 STAFF VISITS

A. H WALTON'S VISIT

I. New Zealand : January - February

1. Nelson Polytechnic School

Hugh Walton visited the Nelson Polytechnic School of Fishing and held discussions on the possible cooperation between Nelson Polytechnic School and

IMR. The School offered to utilize its most up to date portable fishing/navigation/ radar simulation equipment for workshops and in practical training courses.

A further cooperative agreement was reached whereby the 5 week fishing programme as practical component of the Nelson Polytechnic course could be held in Dravuni in 1990.

2. New Zealand Fishing Companies

Discussions were also held on possible short-term training attachments for IMR staff at various private fishing companies such as Seasmoke Ltd, Talleys Fisheries and Nelson Fisheries. All these companies showed interest in cooperating with IMR and the Nelson Polytechnic School in transfer of appropriate fishing technology to the South Pacific Region.

3. New Zealand Fishing Industry Board

Hugh Walton also held discussions with David Russell and other officials at the NZ Fishing Industry Board on the Board's training and research activities.

Information was gathered on audio-visual aids and manuals for training programmes offered by the Board to assist in DTF teaching. Books and other teaching materials were also collected for the IMR Library.

4. Teaching and Research Center, Victoria University

Hugh Walton met Prof. J Clift, DTF Programme Review Consultant to submit background papers on IMR in order to assist Prof. Clift in preparing the survey.

II. SPC's R.T.M.F. (Regional Technical Meeting on Fisheries) - Noumea, 7 - 11 August

The Workshop provided the Institute with up to date information on all aspects of the region's fisheries and served to strengthen the Institute's training programme with SPC.

Prof J Clift, consultant for the DTF Review broadly outlined the DTF Review to ensure open dialogue in conducting the review in order to meet the training needs of the region.

A survey on Post Harvest was conducted at the meeting by Prof. J Clift, Steve Roberts and H Walton. Results of the survey indicated the need to increase emphasis on post harvest technology but it was felt that a more comprehensive report on the subject was needed.

IMR has been suggested as a regional base for a Fisheries Post Harvest Laboratory and this matter will be considered in a regional consultancy in 1990.

B. V VUKI

Makogai Island - July

Field trip to Fisheries Research Station to supervise 3rd year students learning about giant clam culture methods during vacation.

1. V RAM
Solomon Islands and Western Samoa - July

Field Study in Coastal and Lagoon areas on Resource Use and socio-economic conditions of communities with scientists from Kagoshima University.

3.4 IMR STAFF TRAINING AND ATTACHMENTS

1. Mr Jone Maiwelagi. Attached to SPC for a 5 week Practical Fisheries Training Workshop in Tuvalu as a consultant. The visit was funded by FAO/UNDP Fisheries Office. The task involved training on aspects of navigation, uses of compass, making deviation cards, use of electronic equipment, fishing methods and handling of catch to Nelson Polytechnic trainees and 32 Tuvaluans.
2. Mr Iliavi Tuwai attended a 2 week FNITC course in August on "Finance for Non-Finance Managers".
3. Miss Hur Begum attended a Red Cross course on "Instruction in First Aid" in June held at School of Pure and Applied Sciences.
4. Mr Fiu Manueli attained an advanced Divers Certificate in Scuba Diving. Fiu was sponsored by SOPAC.

3.5 SHORT TERM APPOINTMENTS, COOPERATION WORK WITH OVERSEAS PERSONS, GUEST LECTURERS AND VISITORS

1. Mr Michael Masha, anthropologist from Austria working on Matuku Island in Lau visited to get information on marine resource use in the Pacific Islands.
2. Dr Masumi Yamamuro and Dr H Mukai of Ocean Research Institute visited IMR and Dravuni Field Station to discuss collaborative work on seagrass research.
3. Dr Anraku Masateru from Overseas Fisheries Cooperation Foundation (OFCF) visited IMR to discuss possible cooperative research projects and get more information on paper presented by V Ram at the OFCF Office in December 1988.
4. Frank Kurbjewit from University of Keil visited to discuss about the possibility of doing a PhD in Marine Biology at IMR.
5. Prof John Clift from Victoria University in Wellington visited in March for 2 weeks to design questionnaires for the DTF Programme Review.
6. Mr Bob Jones and Ms Janni Jansen; Consultants from CIDA Office visited IMR to do an evaluation of ICOD Projects in IMR.
7. Mr A Savu, Director of Development worked for two week to assist in writing of project proposals for EEC funding.

8. Alastair Aulston, from Timber Utilisation, Ministry of Forests, Fiji visited to enquire about infestation in wood by boring Sphaeroma.
9. Mr Warren Evans from ADB, Manila visited the Institute to discuss about the possibility of setting up an Environment Unit with the Fiji Government.
10. Dr M Shepherd visited IMR to discuss about the Ocean Resource Management Programme (ORMP) Course content.
11. Gustav Paulay and Bernie Paulay, Biologists from University of Washington, USA visited to get information on freshwater gastropods.
12. Mr Dirk Spennermen, a paleontologist from Australian National University visited to get information on fossils.
13. Mr Ateel K Sudhakar from Jasper Williams High School visited to get information on Japanese and Fijian Fisheries for High School teaching material.
14. Curriculum Development Unit of Ministry of Education, Fiji, requested for identification of algae.
15. Dr D Doulman, Deputy Director of Forum Fisheries Agency and Fisheries Development Officer, Mr Peniasi Kunatuba visited IMR.
16. Mr Ron Archer and Philip Saunders from ICOD Office in Suva visited IMR to discuss various ICOD projects.
17. Dr Hiran Jayawardene, Secretary General, Indian Ocean Marine Affairs Cooperation visited IMR to discuss about USP's Marine Studies training programmes and how they may benefit.
18. Mr Mike Wells from Nelson Polytechnic School of Fisheries visited to submit his observation report prepared on IMR during his visit in 1988.
19. David Green from ICOD came to discuss about ICOD funding for research projects at IMR.
20. Dr Leon Zann from Great Barrier Reef Marine Park Authority, Townsville came to do work on crown of thorns.
21. Mr Alastair Robertson and Paul Mead from SPC visited IMR to discuss practical fishing programmes.
22. Christine Alfsen from ESCAP visited to seek information on seawave energy utilisation in the South Pacific.
23. Mr Kevin Bailey from SPC, Tuna and Billfish Programme visited IMR.
24. Dr Peter C Pollard from CSIRO, Marine Research Laboratory, Cleveland, Queensland visited IMR to join the Japanese Seagrass team for research in Dravuni.

25. Dr Satoshi Najima from Amakusa Marine Biological Laboratory, Kyushu University, Fukuoka visited IMR to study seagrass in Dravuni.
26. Chris Gullic, Peace Corp Volunteer from Fisheries Department came to gather information on aquaculture in the South Pacific.
27. Steve Roberts from SPC was attached to IMR for 3 weeks doing work on post harvest technology and marketing.
28. Prof. Bill Muntz from Monash University visited IMR.
29. Prof. S Iwakiri, Dr C Kataoka and Dr A Shinomiya from Faculty of Fisheries, Kagoshima University visited IMR to discuss the field study on 'Social Ecology and Regional Planning of Lagoon Areas' in the Solomon Islands and Western Samoa.
30. Mr M Izumi and Mr Shinozaki from Overseas Fisheries Cooperation Foundation (OFCF) visited IMR to get information on status of IMR.
31. Dr Ursula Kaly and Geoffrey Jones from Auckland University visited to get information on Ciguatera Poisoning in Tuvalu.
32. Mr Mahboob Hasrat Ali from Ministry of Health, Lautoka Office came to enquire about oil pollution in the Vuda Oil Depot.
33. Dr Ellen Prager from University of Wisconsin visited while doing modelling for the Laucala Bay.
34. P N Vuille, French journalist came to get information on Oysters, Pearls and Pearl farms in the South Pacific.
35. Kevin Potter from the office of the Auditor General, Halifax, Canada visited IMR as an ICOD Consultant to discuss progress of ICOD funded projects, IMR activities and plans and the DTF Programme Review.
36. Penisoni V Usumaki, General Manager, IKA Corporation visited to discuss the possibility of sending 9 new students for the DTF Course in 1990. Discussions were also held with regard to cooperative activities between IKA and IMR and the possibility of running short courses for IKA Crew.
37. Lis Emonuelson and Ron White from University of California, Santa Cruz visited IMR to get information on activities of IMR as a teaching institution.
38. Dr Hajime Hirata and Dr Hiroki Tanaka from Marine Biotechnology Institute Co Ltd, Tokyo visited IMR and Dravuni field station to collect marine specimen for cancer research.
39. Rob Newman, a volunteer student from the USA assisted the Information Officer in setting up the Library Database for 3 months.

40. Dr Sherwood Maynard, Director, University of Hawaii, Marine Option Programme visited IMR to discuss marine training programme at IMR. Dr W Cruickshank accompanied him.
41. Dr Ann Coopersmith, Dr Moffatt and Dr Marani, UNESCO Consultants for training Workshop on Marine Science for Pacific Secondary School Teachers visited IMR and 9 regional participants attended the Workshop for 2 weeks in November-December at the Dravuni field station.
42. Mr David Russell, Information Officer for NZ Fishing Industry Board was attached to Imr for 6 months to assist in cataloguing and updating IMR Library and Information services.
43. Ms Sue Mildner, Research Fellow from James Cook University was attached to IMR for 3 months to teach DTF courses in Ichthyology and Invertebrate Zoology.

Ms Mildner was also involved in research on coral spawning around the Barrier Reef in the Suva Harbour.
44. Dr N Willoughby from BDDP came to discuss consultancy work on the Rural Fisheries Development Programme in Vanuatu.

3.6 FRENCH-AID STAFF

Mr Geoffrey Hureau, a geologist started work as Fellow in August for a 14 month period under French Aid support.

Mr Hureau's basic task involves teaching aspects of geology to degree students, training of IMR technicians in geological techniques and a research project in his field in the region.

An equipment list for funding by the French Government would also be prepared during his stay at IMR. Concurrent with Mr Hureau's appointment, Laboratory equipment worth about \$50,000 was also presented. This equipment was requested during the time of last French Aid Staff (1987-1988).

4. **TEACHING AND TRAINING PROGRAMMES**

The Institute can provide credit courses at all levels of the regular University Programmes (i.e. postgraduate, undergraduate, and certificate) and mounts short specialist courses when need arises.

However due to staffing levels, this had not been really possible in the last few years.

4.1 POSTGRADUATE

MSc Studies

- (a) L K Bolton - "Biology of the Marine Clam, *Anadara maculosa*, in Kiribati".

L K Bolton has completed her field study in Kiribati and now resides in her home country, New Zealand.

We await the handing of her thesis.

(b) Postgraduate Certificate in Applied Science

Lui Bell - W Samoa - We await the handing in of the final draft of his thesis.

4.2 BSc COURSES

IMR Staff in the past taught Marine Biology (BI305) and Fish and Fisheries Biology (BI307) in the BSc Programme. However for the past two years these were primarily taught by the SPAS Staff with assistance in teaching, supplying specimens and field trips facilitated by IMR.

4.3 DIPLOMA IN TROPICAL FISHERIES

The Institute has been providing this programme since 1978.

The Diploma was suspended in 1984 as man-power requirements for the major client, the Fiji Government were satisfied. At the request of Regional Governments, the Diploma was offered again from 1986 with the addition of 5 new preliminary practically-oriented courses replacing the six-month period previously spent at the Fiji Fisheries Division.

In 1989 there were eleven students registered in year III courses, eleven registered in Year II courses and seventeen students registered in Year I courses.

Five out of the eleven Final Year students graduated this year. Of the ten FSM students who entered the DTF Programme in 1987, only one graduated.

The 1990 enrolment figures are not at hand but Regional Island Governments have already indicated their interest to send students. However, following the recommendations from the Clift Report on DTF Review, the Senate in December decided to temporarily suspend DTF I in 1990 so that the course can be fully reviewed.

The courses of the DTF Programme are Described in Appendix II.
A list of students enrolled in DTF in 1989 is Given in Appendix III.

Following recommendations from the Onorio-Shepherd Report, a review of the Diploma in Tropical Fisheries was done by Prof. J Clift from Victoria University. The survey was funded by ICOD.

TABLE 2 : The Number of Graduating Diplomates by Year and Their Countries of Origin

YEAR	1975	1976	1977	1978	1979	1980	1981	1982	1983	1987	1988	1989	TOTAL
COUNTRY													
Fiji	8	11	10	8	6	8	6	4	9	1	0	0	71
Tonga		1	1	0	1	1	0	0	0	0	0	0	4
Kiribati			1	1	1	0	2	1	3	0	0	0	9
Solomon Islands					3	1	0	0	4	2	3	1	14
Tuvalu				1	0	2	0	0	0	0	2	2	7
Vanuatu								2	0	0	1	0	3
Tokelau								1	0	0	2	0	3
Cook Is										1	0	1	2
FSM												1	1
	8	12	12	10	11	12	8	8	16	4	8	5	114

4.4 DTF REVIEW

The IMR Programme Review Committee (working group of Marine Studies Coordinating Committee) consists of members from IMR, SPAS, SPC, FFA, and SOPAC.

A proposal put up by this Committee to review the D.T.F. Programme was accepted by the MSCC and funded by ICOD.

The survey was conducted for the period of three months from May to July by Prof. John Clift from Victoria University.

Information was gathered by conducting a survey using questionnaires. Primary sources of information were employers of DTF graduates, their immediate supervisors, past graduates, current DTF students and DTF teaching staff.

Following the recommendations from the review the Senate has decided to suspend the DTF I for 1990.

This will allow for any modification or restructuring of courses and to up-grade the Diploma to better meet the needs of the Pacific Islands.

4.5 EXTRA-CURRICULAR TRAINING FOR D.T.F. STUDENTS

The DTF II students did a St John Red Cross First Aid Course and a course in Basic Radio Telephone Usage conducted by the Post and Telecommunications Department.

We were unable to find funding for DTF III students to do a course in scuba-diving (UNDP funded this last year).

These extra curricular activities are not part of the regular DTF programme.

4.6 CERTIFICATE OF EARTH SCIENCE AND MARINE GEOLOGY

This programme is one sponsored by SOPAC (South Pacific Applied Geoscience Commission), at the request of Regional Governments, for inservice training. It is the only non-living resources training programme offered through the Institute, in co-operation with Victoria University, Wellington.

This is the only joint award which USP has with another University. It comprises of a 3-months basic course and four six weeks long Advanced Courses. The courses are held in the summer vacation over a 3-year period.

(a) Basic Earth Science and Marine Geology

An introduction to the geological time scale, geometry, plate tectonics and oceanography with discussions on mineral resources and exploration, energy resources in the south west Pacific, the rock and mineral groups, their classification and recognition. Laboratory practicals include rock thin section cutting, use of petrological microscope, sieving sediments, simple statistics, and topographic, bathymetric, and geological map interpretation. Geophysical surveying, marine surveying, and navigation and geological mapping are introduced in field studies.

(b) Advanced Course 1 : Earth Materials

This course includes mineralogy, hand specimen recognition, minerals and economics, optical mineralogy, thin sections and petrographic description. The petrography of igneous rocks (classification, chemical and mineralogical composition, grain size, texture and crystallisation), sedimentary rocks (classification, mineralogy and description of terrigenous sediments, limestones and grain size, metamorphism, textures, structures and mineral assemblages from contact and regional metamorphism) are examined. It reviews concepts of plate tectonics, island environments, Pacific Ocean evolution and the southwest Pacific arc plate boundary. Mapping of stock intruded into low grade regional metamorphic rocks, volcanoclastic and sedimentary sequences is conducted and report writing outlined.

(c) Advanced Course 2 : Marine Geology and Earth History

This course commences with principles of marine stratigraphy, correlation using fossils, paleomagnetism, radio-metric dating. Sedimentary structures, facies concept, seafloor geology and deepsea environments, ocean circulation patterns, sea level and climatic history, coral reef environments, and fluvial, deltaic and inshore beach environments are examined. The identification and morphology of the major fossil groups and evolution and paleocology are outlined. Inshore marine surveys are conducted investigating coastal erosion, delta formation, inshore sedimentation, reclamation and dune formation. Fieldwork includes mapping, project work and report writing.

(d) Advanced Course 3 : Earth Resources and Mapping

Construction materials including those for concrete road aggregate, cement making, dams and other free standing structures and building stones are discussed. Other topics include: a basic description of soils and determination of soil properties, weathering processes and rates, causes, prevention and control of soil erosion, ore genesis, offshore mineral resources, structural geology and advanced geological map interpretation. and mineral geology. Fossil fuels as non-renewable energy (origins of coal, natural gas and petroleum, deposits and traps, exploration and exploitation water (surface and ground water artesian water) an hydroelectricity are discussed.

(e) Advanced Course 4 : Earth Science and Development Projects; Hazards

This course outlines the elements of planning including the role and neglect of earth sciences in planning, air photograph interpretation, the use of geographical surveys (particularly seismic refraction, magnetic and resistivity) and seismic hazards) faulting recognition and mapping active faults, earthquake magnitude scales, effects of earthquakes on rocks and soils, and quake zoning.

The first 13 graduates completed the certificate programme in 1985 and 1986. In 1987, 17 students attended the three month Basic Course, in early 1988 a similar number attended the first two Advanced courses. In 1989 fifteen of these students completed Advanced Course 3 and Advanced Course 4 and graduated with a Certificate in Earth Science and Marine Geology.

The countries represented at the 1989 courses are shown in the following table.

TABLE 3

COUNTRY	NO OF STUDENTS IN 1989
Cook Islands	2
Fiji	7
Papua New Guinea	2
Solomon Islands	2
Western Samoa	2
TOTAL	15

It is expected that 19 students will attend the Basic Earth Science and Marine Geology Course in 1990 at the beginning of the next 3 year Certificate Programme.

5. SHORT SPECIALIST COURSES

The Institute, as the need arises, offers short inservice courses often jointly with other interested organisations.

Discussions are continuing with CIDA/ICOD to fund training in the marine field. Proposals have included short courses, D.T.F. scholarships, bachelors degree scholarships and postgraduate scholarships and the development of a degree programme in Marine Affairs.

Both FFA and SOPAC also view USP as an institution to service their training requirements and discussions are progressing along these lines.

5.1 SPC/FFA COMPUTER COURSE

After discussions between SPC/FFA/USP Computer Centre and IMR, the University agreed to host three courses and one workshop for the regional fisheries personnel. IMR was responsible for the organisation and management of these courses.

- | | | | |
|--------------------|---|---|--|
| January - February | : | - | FFA/SPC : Introduction to Micro-Computing Course. |
| | | - | SPC/FFA : Fisheries Systems Workshop. |
| July | : | - | SPC/FFA : Intermediate Micro-Computing Course. |
| | : | - | SPC/ADB : Statistical Computing. |
| Nov 14 - 17 | : | | IMR was the venue for a Workshop on the seaweed -
Eucheuma on Marketing and Culture. It was funded by
UNDP/South Pacific Aquacultural Development
Programme and run in conjunction with the Fiji Fisheries
Division. |

5.2 UNESCO WORKSHOP

A three week field workshop in 'Marine Science and Resource Management' was conducted for South Pacific Regional Secondary School Marine Science teachers (Nov 27th - Dec 12th 1989). The workshop was sponsored by the United Nations Educational Scientific and Cultural Organization (UNESCO) and organized by the Institute of Marine Resources. It focussed on teaching marine science techniques, resource management, methods of analysis, assessment of marine environment and included use of computers in handling of marine resources data. The field component was conducted at IMRs Dravuni Field Station, with additional lectures at IMR and the computer tuition utilizing the USP Computer Centre facilities. Eight regional Marine Science teachers attended the course.

The IMR hopes to continue to offer its services to SPC/FFA and other regional organisations to assist with operation of short training courses and workshops.

6. RESEARCH CONSULTANCY AND ADVISORY SERVICE

A list of research and advisory reports of IMR in recent years is given in past reports to illustrate the fact that IMR has worked throughout the USP region and that on most occasions work done in one country was equally applicable in all member countries. To

date, the Institute has accommodated all requests for services from member governments.

The major research projects in 1989 were:

6.1 RESEARCH

- A. Population Dynamics of Crown of thorns on Suva Reef.
- B. Assessment of Fishing Pressure on Suva Reef.
- C. Coral Reproduction in Fijian Waters.
- D. Distribution and Abundance of echinoderms/monitoring of Corals on Suva Reef.
- E. Fish Consumption in Fiji, FSM, Vanuatu and Cook Islands.
- F. Study on the Factors affecting the motivation of small-scale commercial fishermen in Vanuatu.
- G. Fisheries Resource Management and Customary Marine Tenure in the Solomon Islands.
- H. Gear Testing and Development.
- I. Seafood toxins.
- J. Marine Resource Management in Western Samoa.

Progress was continued on these projects despite the heavy teaching load of staff.

6.2 CONSULTANCY

- Marine and Fisheries Survey on Vomo and Vomo-lai-lai.
- Venomous Marine Animals near Hyatt Regency Resort.
- Baseline survey of Scleractinian Corals, Silana.
- Marine and Fisheries Survey on Denarau Island.

6.3 ADVISORY SERVICE

The IMR library was heavily used by USP students, staff, Fiji School of Medicine students, teachers, fishermen and members of the public.

IMR Staff members were regularly consulted on subjects such as :

1. fish poisoning
2. balolo
3. marine species and identification
4. fishing methods
5. aquaculture information
6. hydrographic information
7. use of admiralty charts
8. aquarium construction/upkeep
9. fishing Areas
10. Status of the Fishing Industry
11. General Marine Information
12. Sources of Fishing Gear
13. Marine Ecosystems
14. Information for Projects
15. Marketing of Marine products

6.4 LIBRARY AND PUBLICATIONS

1. LIBRARY

IMR Library material was reorganised and updated in order to obtain better access.

A computer based library cataloguing system developed by UNESCO, called CDS ISIS was installed. This comprises two databases: INFO, the main database, comprises all written material, including books, scientific reports, journals and miscellaneous papers. To date over 800 references have been entered. VIDEO, the other database, comprises the IMR video collection of over 60 videos.

The computer database is particularly useful as, using keyboard searches, material on a particular subject can easily be identified. The shelf location of each item is also given, and in many cases, an abstract describing the contents of the item.

PIMRIS (Pacific Islands Marine Resources Information System), used the IMR information collection as a test case to see how smaller fisheries/marine organisations in the Pacific Islands region would perform within the network.

The IMR INFO and VIDEO databases are now housed on the main PIMRIS system. PIMRIS staff have become very familiar with the IMR setup.

Information requests received by IMR from within the South Pacific Region, on being answered, were also passed on to PIMRIS. The reverse occurred as well, PIMRIS relying on IMR for additional material in answering requests.

Information exchange relationships were also established with the Libraries of Fiji Fisheries Division, UNDP Regional Fishery Support Programme, Forum Fisheries Agency and the South Pacific Commission.

A list of all marine reports on Fiji housed in the IMR library was passed onto Fiji Fisheries Division, where a Fiji Fisheries Bibliography is being collated. In the past IMR has developed significant expertise in the area of ciguatera seafood poisoning. A Pacific wide special interest group (SIG) is being formed throughout the South Pacific Commission in New Caledonia. A list of all IMR ciguatera material was despatched.

Key reports and articles from the offices of three IMR staff members were photocopied and placed in the IMR library. Staff, whenever they now receive new material of relevance to others, make it available to the library for copying.

A master file on all reports was collated.

Public relations efforts resulted in enhanced media links with fisheries reporters from the Fiji Times and Trade News of the South Pacific. A number of articles promoting the fisheries training and biological research activities of IMR were published.

Material for colour brochure on the institutes of USP was provided and an article placed in the USP Students Association annual magazine, Standing displays promoting IMR were also put together on two occasions, one a careers show in downtown Suva and the other in the USP Library foyer.

(2) **Publications Resulting from work done in IMR or in association with IMR**

1. VUKI, V C, F MANUELI & R HUME. 1989. A survey of the marine environment and the fisheries o Vomo and Vomo-lai-lai. IMR Technical Report, USP. 47pp.
2. ZANN, L., J BRODIE & V VUKI. 1989. The history and dynamics of *Acanthaster planci* (L.) in the Suva area (in press).
3. VUKI, V.C., & F VIALA 1989. Shrinkage and weight loss of holothurians from Fijian Waters. South Pacific Commission Fisheries Newsletter (in press).
4. SEETO, J. 1989. Preliminary survey of the Marine Ecology Assessment of available living marine resources around Uliveo Island of South Malekula, Vanuatu. In : The Prompt Report on the Study on Social Ecology and Regional Planning for lagoon areas in the South Pacific. Faculty of Fisheries, Kagoshima University and IMR, USP.
5. RAM, V. 1989. A study of the socio-economic structure and activities of the Peskarus Village in the Maskelyne Islands, Vanuatu. In : The Prompt Report on the study on Social Ecology and Regional Planning for Lagoon areas in the South Pacific. Faculty of Fisheries, Kagoshima University and IMR, USP.
6. WILLOUGHBY, N.G. & V RAM. 1989. Study of the factors affecting the motivation of small scale commercial fishermen in Vanuatu. BDDP,Suva, 42pp (Draft).
7. SEETO, J; M. NAQASIMA; V. JAMES & S. VODONAIVALU. 1989. An Environmental Study of Nadi River and Adjoining Mangrove. Report done for KRTA (NZ) Ltd & Harrison & Grierson Consultants Ltd.
8. NAIDU, S.D., W. PETER, J. SEETO & A HAYNES (1989). Water Quality Studies of Qarani-ni-ki River, Tailevu Province. INR Technical Report No 89/2. 17pp.

6.5 PAPERS PRESENTED

1. VUKI, V.C. A review of tuna fisheries in Fiji. Paper presented at the Western Fisheries Consultative Committee. Tuna Research Workshop, Manila, Philippines, 3-6 April, 1989.
2. VUKI, V.C. & F VIALA. Are there alternatives in the survival of sedentary resources? Paper presented at the International Agricultural Science Workshop in Suva. March 1989.
3. VUKI, V.C. & F VIALA. Shrinkage and weight loss of five commercial holothurian species from Fijian Waters. Paper presented at the International Agricultural Science Workshop in Suva. March 1989.

6.6 VESSEL OPERATION

The Aphareus was used during 1989 for trips to Dravuni Field Station (by USP Marine Pollution Group, Japanese Seagrass Group, UNESCO Workshop and Practical Fisheries Training).

No commercial fishing was done in 1989. The Aphareus is equipped for a variety of fishing methods including reeling, demersal longline, pelagic longline, pole and line and trolling.

The Hawksbill has proved to be handy for reel field trips but had also been on its maiden voyage to Dravuni.

Semester Break

During the semester break the IMR offered a number of optional "hands on" programmes for D.T.F. students.

These included fishing trips, gear construction and trial operation (on Aphareus as well as with local commercial operators).

Students also gained practical experience on culture of giant clams in a 2 week visit to the Makogai Island. This trip was sponsored by the Fiji Fisheries Division.

Students were also given access to video equipment to view selections from the IMR library at their leisure.

The Institute hopes to continue these programmes in the coming years.

6.7 RESEARCH PROJECTS

- (i) The joint IMR/Kagoshima University Faculty of Fisheries research project entitled "Study on Social Ecology and Regional Planning for Lagoon Areas in the South Pacific", was done in Solomon Islands and Western Samoa this year. The team of 5 led by Professor S Iwakiri, Dean of Faculty of Fisheries, Kagoshima University, included IMR staff members J. Seeto and Ms V Ram. The study was funded by the International Scientific Research Programme (Joint Field Research), Ministry of Education, Science and Culture, Japan.

This was the 2nd year of the study. As part of the project, J Seeto and V Ram are scheduled to present the reports of their study in early January 1990 at a Symposium at the Research Centre for the South Pacific, Kagoshima University.

7. COOPERATIVE PROJECTS

7.1 JOINT PROGRAMMES WITH FIJI FISHERIES

- (i) Fish Aggregation Device (FAD) Deployment

IMR and Fiji Fisheries Division deployed FAD's in the offshore areas near Suva,

Beqa and Kadavu. Forms were distributed to fishermen to report catches from FADs to the Fiji Fisheries Division.

(ii) Giant Clam Project at Makogai

DTF students spent time at the Makogai Station learning various aspects of clam culture. The students also helped to collect brood stock, set up laboratories and clean tanks.

(iii) Visits to Fisheries Division/Aquaculture Station

DTF students visited Fisheries Division (Lami) and the Aquaculture Station at Naduruloulou for field trips.

(iv) Exchange of Information

IMR library staff and Fiji Fisheries Division library staff collaborate under the PIMRIS Programme on the exchange of publications and videos.

Requests for information from the region is handled by main USP Library coordinating with IMR Library and Fiji Fisheries Library.

7.2 POST HARVEST

Establishing of a Regional Post Harvest Training and Research Facility

As the need for training has been recognised and research in post harvest technology in the region, a survey using questionnaire was conducted at the SPC RTMF (2) in August this year. The participants responded as representatives of their respective Governments. The survey was conducted by IMR Fisheries Training Officer, Prof. J Clift and SPC Fish Handling and Processing Officer.

The Unit being proposed is likely to cost around US\$250,000 and would consist of freezer and ice-making facilities, processing equipment such as smokers and dryers, and one or two laboratories for use in product development.

In light of the results of the questionnaires, the meeting recommended that a comprehensive report on the subject including a detailed project outline to be prepared and presented at the next meeting in 1990. The document is to outline the benefits countries would derive from the project before any approval is given.

SPC Fish Handling and Processing Officer, MR Steve Roberts is coordinating this consultancy.

7.3 POLLUTION MONITORING GROUP

This group was established in 1988 do pollution research and monitor related activities.

Two staff members, Johnson Seeto and Veikila Vuki are members of the group. IMR has also provided boat services, gear and equipment and divers to the group to carry out their research activities.

7.4 ONGOING FUNDING

(i) Lome III Funding

In 1988, EC requested for a new submission in light of the decision on the permanent location of IMR.

As a result a second submission was written according to EC specification by the Director of Development. Unfortunately this document cannot be traced.

EC sent another request in October to do a feasibility study of IMR. The study is aimed at finding out the provision for support from the EDF and to prepare a project dossier conforming the criteria for financing from the Lome III funds by EC consultants. It has been decided that this feasibility study would take place in early 1990.

(ii) ICOD/CIDA Funding

IMR is very grateful to ICOD for providing financial assistance in the major projects undertaken this year.

Firstly, the Institutional Enhancement Project which provides a 3-year support for the post of Fellow to teach Marine Biology.

The second major project is the technical support for training programme whereby IMR has received a grant of \$53,000 to use in fishing programme, workshop/training Aids, purchase of video set and films, books for the library, 4 computers and 2 printers. ICOD has also funded the DTF Programme Review and the survey of the vessel 'Nautilus' this year.

The establishment of the Canadian Cooperation Office in Suva has done much to ensure further cooperation with the Canadian in funding for IMR development.

Discussion has already taken place for possible support for the position of Information Officer.

ICOD has also shown support in funding short term projects such as hosting workshops and short courses. IMR is very grateful to ICOD for visualizing the important role of IMR in the regional fisheries development hence the support given to IMR.

7.5 VIDEO LIBRARY

With the availability of ICOD funds, it was possible to purchase a video set and new titles.

At present the library has over 60 titles available to students, teachers and interested persons.

A catalogue of titles on hand is available from the library. The video database is also available on the main PIMRIS system.

8. DEVELOPMENTS IN MARINE AFFAIRS 1989

8.1 ESTABLISHMENT OF APPLIED RESEARCH UNIT IN SOLOMON ISLANDS

In 1988, the Solomon Islands Fisheries Division had set aside two rooms in their new research laboratory to house IMR activities.

Research projects to be conducted from the Solomon base could not eventuate this year because of budgetary constraints. Most of these project proposals are submitted for EC funds under Lome III.

8.2 MARINE STUDIES COORDINATING COMMITTEE

This MSCC was formed to coordinate all Marine related activities within USP. Organisations represented on the MSCC include SOPAC, FFA, SPC, Forum Secretariat, ICOD and USP.

This Committee met three times this year and it looked at a number of IMR activities such as the EEC funding, IMR Review, filling vacancies, post harvest, vessel operations, computer workshop, ICOD funding, DTF Review and collaborative work with Astrolabe Inc.

It basically acted as an advisory committee to IMR on policy issues in the absence of a Director.

The appointment of Professor of Marine Studies in early 1990 is going to further strengthen the Committee's activities in promoting development in Marine Affairs.

8.3 FFC MEETING AND RELATED ACTIVITIES

The sixteenth Forum Fisheries Committee Meeting was held in Majuro, Republic of the Marshall Islands from 2-5 May 1989.

Mr Peniasi Kunatuba of the ORMP represented the University.

The Committee "requested the FFC Secretariat to clarify for the next meeting the role of FFC in the IMR Programme".

In light of the marine developments at USP and IMR, the role of the Marine Studies Coordinating Committee and the IMR Programme Review Working Committee is represented by members of SPC, FFA, SOPAC, and Forum Secretariat represents a cross section of FFC with the exception of the Fisheries Officers.

The USP would still see the FFC as an Advisory body to which IMR will report to.

9. FUTURE DIRECTIONS

Following the decision of USP Council as to permanent location of IMR, considerable progress has been made after years of stagnation caused by lack of decision.

With the appointment of Fellow and Chief Technician and institutional support from ICOD, a lot of pending activities have been streamlined.

A major task in the immediate future would be the restructuring of the DTF courses according to the current and future needs of the regional Governments. It is hoped that the new upgraded Diploma becomes a continuing course leading into possible degree programmes.

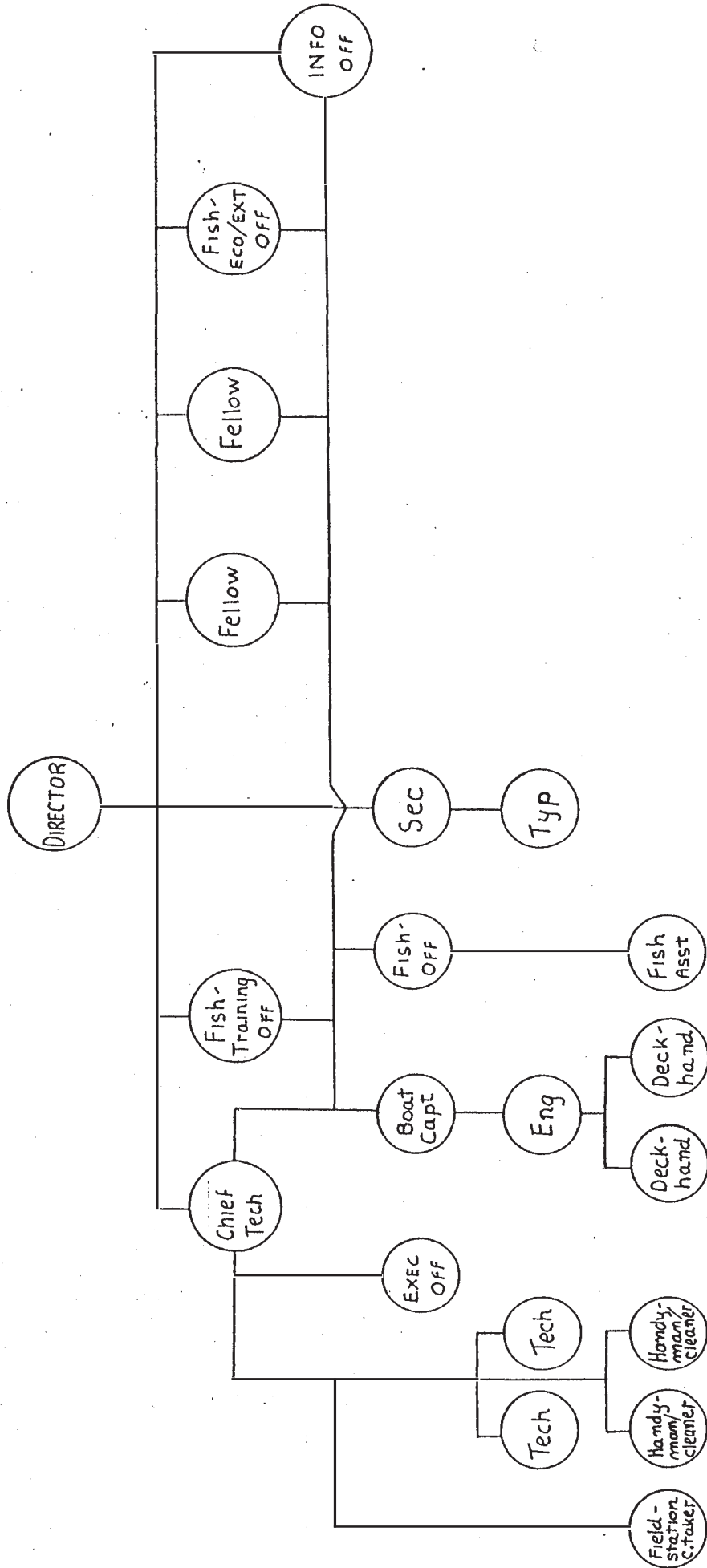
In light of the above, the DTF I course for 1990 has been suspended so that the modified DTF could be offered for any new students specialising in fisheries studies.

This modification to the DTF course is also going to determine the future activities and work responsibilities of IMR.

With increase in academic/comparable staff numbers compared to the previous years, it is hoped that more consultancy and research work would also be possible. IMR eagerly waits the Professor of Marine Studies and the Director of IMR.

APPENDIX I
IMR ORGANISATION CHART

INST MARINE RESOURCES



Nov 89.

APPENDIX II
DTF COURSE PRESCRIPTIONS

COURSE PRESCRIPTIONS

YEAR I

Students entering the University from parts of the region where there are no sixth forms are required to do the Special Preliminary Fisheries Programme. This programme is divided into two parts; the Basic Sciences and English and the Practical Training. The Academic Programme comprises of English, Mathematics, Biology, Chemistry and Physics. These Courses provide basic instruction in each subject oriented towards future courses of study in Fisheries.

A. BASIC SCIENCES AND ENGLISH

LLF14 English for the Diplomas of Tropical Agriculture and Tropical Fisheries

This course has a twofold approach : it aims to provide the student with language skills which he will find useful in his career, and also to increase his awareness and appreciation of English as used in the world around him.

Topics include : grammar, reading comprehension, notetaking, summarizing, the job application, business writing, essay and report writing. Students will also be studying English as used in the media-newspapers, magazines, radio and film.

MADO1 Preliminary Mathematics A

This course is designed to help students understand and apply mathematical principles in different areas. Topics include sets, manipulation of algebraic expressions; relations, functions, formulae and inverses, solution of equations and inequations by algebraic and graphical methods; indices, surds and logarithms; polynomials and Remainder Theorem.

PHPO2 Preliminary Physics A

In this course students are taught the basic concepts of physics and an understanding of experimental procedures; to develop laboratory skills. Topics include units of measurement, vector quantities, force, kinematics, dynamics, density and fluid pressure.

CHPO2 Preliminary Chemistry A

This course aims to provide a basic introduction to Chemistry as a formal science, and to produce an awareness of the place of chemistry in our society. This course is laboratory oriented. The topics included in this course are as follows: Introduction to chemical concepts basic to this science; kinetic picture of matter, phase and phase changes; study of gas behaviour; study of solids and liquids and the chemistry of solutions.

BIPO2 Preliminary Biology (Fisheries Option)

The emphasis of this course is on the chemical and structural basis of life, principles of heredity and diversity of organisms (including the basic principles of classification). It will also include principles of ecology and the relationships between humans and their environment. Where appropriate marine examples will be used.

B. PRACTICAL TRAINING PROGRAMMES

The practical Training is divided into five major topics.

SCDOI Practical Fishing and Fishing Gear

Students learn the construction, use and maintenance of fishing gears, such as nets, traps, longline, pole and line, etc. Welding forms part of the practical skill to be learnt.

SCDO2 Fishing Vessels, Pilotage, Navigation and Seamanship

This course covers the layout, use and maintenance of small to medium-sized (13m long) boats. Students learn basic skills of navigation (rules of the sea, charts, echosounder, radar, position fixing - with and without radar together with rowing, sculling and navigating motorised launches.

SCDO3 Outboard Motors/Small Diesel Engines/Refrigeration

Students are taught the use, maintenance and repair of outboard motors and small diesel engines. A study of other fish preservation methods (salting, drying and smoking) are included in the refrigeration unit.

SCDO4 Basic Laboratory Techniques

This course introduces students to basic laboratory techniques with an emphasis towards fisheries science. Topics include water testing, fish quality testing, construction and maintenance of an aquarium; capture, handling and curation of marine specimen; microscopy and photography of marine specimens.

SCDO5 Management of a Small Fishing Business and Record Keeping

The Course is designed to develop basic accounting skills for management of a small scale business.

Emphasis is also placed on developing an understanding of the structure of fisheries by exposing students to fisheries and fisheries related activities and institutions such as the Fisheries Division, National Marketing Authority (NMA), Pacific Fishing Company (PAFCO), Fiji Development Bank (FDB), Fiji Trade and Investment Board (FTIB), Business Opportunity and Management Advisory Services (BOMAS), Fish Markets and Village Co-operatives.

YEAR II

SCD51 Invertebrate Zoology

An introduction to the fundamentals of zoology, classification and morphology of marine invertebrates. Particular emphasis is placed on organisms important in tropical marine ecosystems, human and marine parasites, commercially important invertebrates of the Pacific and world's seas and those traditionally exploited by the peoples of the Pacific. Practicals include field excursions to nearby mangroves, coral reefs, lagoonal and offshore waters. Students are required to submit written assignments and marine collections.

SCD52 Ichthyology

This course covers fish and their relevance to world fisheries, fish taxonomy and the distribution as well as the biology of fishes. Biological aspects include morphology, senses, physiology, growth, reproduction and survival. Ecological aspects are also covered and field work and projects are part of the course. Emphasis is on tropical marine species.

SCD53* Navigation, Pilotage and Boat Handling, Part A

The first part of this course introduces charts and their abbreviations and symbols. The use of basic navigation is taught. The student is given experience in handling small boats, rope work, the use of blocks and other aspects of basic seamanship. The course covers rules of the road and safety procedures.

SCD54* Navigation, Pilotage and Boat Handling, Part B

The second part of this course continues with advanced work in coastal and deep sea navigation. Ship and seaman management and maritime laws are introduced. The course continues with general seamanship related to the handling of larger vessels and the different fishing gear used.

SCD55* Practical Fisheries and Fisheries Technology, Part A

This course outlines the current world fishing, traditional fishing techniques and technology associated with fisheries. Emphasis is placed on practical aspects of fishing, construction, use and maintenance of gear. Topics include traditional and commercial traps, gill nets, long lines, handling pole and line, purse seine, trolling, etc.

SCD56* Practical Fisheries and Fisheries Technology, Part B

This essentially is a continuation of SCD55. Topics covered include specific types of fishing practiced in the South Pacific.

Emphasis is given to fish operations, vessel technology and fish handling, marketing and processing. Guest lecturers from commercial and government fisheries sector are invited to give lectures on special topics.

ADDITIONAL: Swimming

Instruction in swimming and survival is given to all students with additional instruction in life-saving. Elementary diving techniques (use of snorkel, mask and flippers) may be taught. Instruction in SCUBA is optional but may be offered to interested students.

NOTE : * Courses together given one final grade

YEAR III

SCD61 Oceanography and Marine Ecology

Oceanography: An introduction to physical, chemical and biological oceanography with particular reference to the South Pacific. Topics include : Origin of oceans, zones, sediments, physics and chemistry of sea water, currents and tides, and exploitation of

seas. Emphasis is placed on basic practical techniques, the scientific method and reporting, and relevance to fisheries. Practicals are conducted on board R V Nautilus in nearby lagoonal and offshore waters.

Marine Ecology : A study of the principles of ecology with reference to tropical marine ecosystems and fisheries. Topics include : tropical productivity, plankton, coral reefs, mangroves and protected shores, lagoonal and reef slope benthos, and pollution. The programme is field orientated and students are encouraged to learn skin and scuba diving.

SCD62 Fisheries Biology and Management

The biology and management of exploited marine species (and tropical species in particular) are covered in this course. The size of exploited stocks is related to growth, recruitment and mortality. Other biological aspects such as reproductive strategies and migration are included. Techniques and practical exercises in estimating abundance, growth and mortality are part of this course.

Management objectives and measures relevant to the South Pacific region are discussed.

SCD63 Aquaculture

A study of aquaculture methods relevant to the geography and economy of the South Pacific region. The course covers the selection of suitable species and farming systems from simple open-circuit methods to more sophisticated hatchery techniques. Aspects of obtaining broodstock, control of spawning, larval maintenance, growing methods and nutrition are covered for several species of tropical invertebrates and vertebrates. Problems associated with economic viability, environmental alteration and the introduction of exotic species are discussed.

SCD64 Marine Engineering Knowledge

This course introduces the student to various marine engines (both inboard and outboard) and their operation, installation and maintenance. Marine electrics, electrolysis, fuel supply, pumps, hydraulics, steering gear, stern gear and propellers are covered. Items such as fish storage insulation are also covered. The course includes instruction in the use of tools and safe engineering practices.

SCD65 Boat Designs and Boat Building

This course introduces the various types of boats and methods of construction (including wood, aluminum, GRP, foam sandwich steel and ferrocement). Design aspects include small boat rudders, fittings and stern gear. Boat surveys, alterations and modifications are also included.

SCD66 Fisheries Economics and Management Principles

The course consists of two parts : Part A deals with the theory of demand and supply, market structure, production and cost functions and the determination of economic and technical return to labour, capital and management. Part B deals with record keeping for decision-making purposes. Students will be provided with the basic knowledge of preparation of simple profit and loss statements, balance sheet, budgeting and cash flow

projections and the interpretation of financial records and management controls.

SCD67 Fisheries Extension and Communications

This course introduces students to the role of effective communication and the social and economic techniques of fisheries extension work. The basic tools of socio-economy survey and programme planning for fisheries extension is examined. The application of some of the basic theories and principles of extension and communication is practiced through a field trip to a rural fishing community.

APPENDIX III
A LIST OF STUDENTS FOR Dip T F IN 1989

YEAR I

<u>NAME</u>	<u>COUNTRY</u>
Simpson Abraham	Federated States of Micronesia
Sonia Jose	"
Clyde James	Marshall
Glen Joseph	"
Benjamin Louis	"
Theofanes Isamu	Palau
Beckwin Mechol	"
Audrie Ngiramolau	"
Harvey Skang Renguul	"
Fereti Pue	Tuvalu
Tekata Toaisi	Fiji
Lionel Luda	Solomon Islands
Pascal Oritaimae	"
Patrick Timmy Mesiah	"
Siola'a Malimali	Tonga
Tong Nalu	Tuvalu
Wesley Obed	Vanuatu

YEAR II

John Manusi	Solomon Islands
Bennie Buga	Solomon Islands
Alsen Fred Obed	Vanuatu
Dorothy Munro	Cook Islands
Raumea Koroa	Cook Islands
Samuelu Telii	Tuvalu
Felix Alefaio	Tuvalu
Venantius Meeyog	FSM
Andrew Tafileichig	FSM
Mason Timothy	FSM
Ribanataake Awira	Kiribati

YEAR III

Valentin Martin	Federated States of Micronesia
Dwight Olter	"
Clay Edson	"
Kerat Rikim	"
Samasoni Sauni	Tuvalu
Kelesoma Saloa	"
Samasoni Finikaso	"
Francis Tofuakalo	Solomon Islands
Nooroa Roi	Cook Islands
Etuati Ropeti	Western Samoa
Metusela R Koroa	Cook Islands

APPENDIX IV
SUMMARY OF THE REVIEW OF THE DIPLOMA IN TROPICAL FISHERIES
BY PROFESSOR J CLIFT

SUMMARY

43. As has been stated the DTF was introduced in the early 1970's to prepare Pacific Islanders for positions of middle management in regional fisheries divisions. Today but a few graduates will fill such positions without further education possible at degree level.
44. This 'dead end' nature of the Diploma has resulted in graduates expressing considerable frustration at their inability to gain entry to a degree programme with appropriate cross crediting from the Diploma. This raises the question of the status of the Diploma. From a study of the University Calendar it appears that entry to the majority of USP diplomas require a pass in the Science or Social Science Foundation Programme. At the present time minimum entry to the DTF is at a level considerable below this and many of the courses taught in the DTF would be below 1st year degree level. I would suggest therefore that it is in fact unrealistic to suggest a cross-crediting from the present Diploma to a Science degree. Diploma graduates could enter the Degree Programme under the adult entry regulations and some might be capable of successfully completing a degree.
45. From the survey returns and the discussion I had with those attending the Noumea conference, it is apparent that the Diploma is seen as providing nothing more than a general introduction to the work of a fisheries officer. For the future there will be a need for a better trained graduate to fill the middle management position. That is the current Diploma does not in its current form achieve its aim of preparing graduates for middle management. There was general agreement from employers and the staff of IMR that the Diploma needs to be upgraded if it is to meet the future needs of government fishery's organizations.
46. The minimum educational level required for entry to the DTF should be a pass in the Science Foundation Programme or its equivalent. The Diploma Programme should focus on areas such as fisheries technology including post harvesting technology, marine ecology, oceanography, ichthyology, fisheries management, economic, management principles, fisheries extension and introduction to fisheries research-a programme of 3-4 semesters. Students entering the Diploma program should already have those practical skills of fishing, boathandling, seamanship and navigation.
47. To meet the needs of the less capable students it is suggested that the practical aspects of the current Diploma could be incorporated into a one year Certificate Course. The minimum entry requirement to this course being a pass in the Preliminary Programme.
48. Such a certificate course could include practical fishery, pilotage, navigation, seamanship, maintenance of motors, fish preservation techniques, fisheries technology, record keeping, computer literacy, basic research skills and extension skills.
49. This structure providing a Certificate followed by a Diploma leading to a Degree would provide a strong educational/ training basis for a career (see fig 4)

50. Any move by USP to improve the training offered by IMR would need to be associated with a considerable improvement in staffing and teaching resources including the provision of proper teaching spaces and adequately equipped.

Resources

51. The IMR does have a number of physical resources such as the aquarium which due to lack of maintenance have become rundown and are now not fully utilised. Similarly it appears that much of the scientific equipment is in need of maintenance. Some of this equipment such as the fume cupboards in the laboratory are a safety hazard. As a training establishment I believe that the layout and maintenance of workshops, laboratories and storage areas should set an example for students to follow back in their own work environment. The facilities at the IMR do not set such an example. In fact the overall impression is of a rundown operation.
52. This state of affairs is a result of lack of a senior technician to oversee the work of the technician, the overload placed on the Acting Director and Fisheries Training Officer, the uncertainty as to the future of the IMR and the inadequate funding provided to the IMR.
53. I believe that there is urgent need for independent survey of the IMR physical resources, space utilization and the general state of equipment.
54. Another area of concern is the quality of the print material provided to the students. The English reading level required for standard textbooks and technical papers is beyond the level of comprehension of the majority of the DTF students. It is important that course materials be developed that are within the comprehension range of the students.
55. Without a drastic improvement in IMR resources the University will find it will become increasingly difficult to attract good quality students to enrol in the IMR Programme.