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SOUTH PACIFIC COMMISSION

FOURTEENTH REGIONAL TECHNICAL MEETING ON FISHERIES

(Noumea, New Caledonia, 2-6 August 1982)

PROJECT DOCUMENT -
DESIGN STUDY OF FISH AGGREGATION DEVICES IN THE SOUTH PACIFIC

Following requests for assistance from a number of member governments, SPC has initiated a design study of fish aggregation devices in the South Pacific, with a view of developing a cost effective design appropriate for use in differing depths and sea conditions, and which will have a serviceable life of 3 to 5 years. Full details of the study are given in the attached project document.

2

PROJECT DOCUMENT

1. Title : Design Study - Fish Aggregation
Devices in the South Pacific
2. Participating Countries : All member countries of the South
Pacific Commission
3. Executing Agency : South Pacific Commission
4. Duration : Eight weeks

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PROJECT DOCUMENT

DESIGN STUDY - FISH AGGREGATION DEVICES IN THE SOUTH PACIFIC

I. BACKGROUND

Introduced from the Philippines, following the success and rapid growth of the payao raft purse seine fishery in that country, the use of anchored fish aggregation devices (FAD), to attract and hold schools of surface and deep swimming tunas, is one of the most significant developments in tropical fisheries in recent years. Twenty-two (22) Pacific basin countries and territories have current or projected FAD development programmes, with over 302 units deployed to date, and a further 200 units planned (Table on page 2). At an average value approaching A.\$3,300 per unit, this represents a total investment well in excess of one million dollars.

Anchored rafts have proven very effective in augmenting catches from both commercial and artisanal fisheries, and their use is rapidly changing the pattern of fishing activities in the region. While regionally, the greatest benefits in economic terms will come from their use in commercial fisheries, the greatest impact of fish aggregation devices, particularly in the smaller countries with limited coastal resources, will be in the artisanal sector. Their introduction has made it possible for village fishermen to economically harvest the offshore tuna resources on a more regular basis, thereby relieving pressure on overfished reef and lagoon stocks. Fishing around FADs has been shown to produce increased and more consistent catches, reduce search and travel distance thereby conserving fuel, and to increase the safety factor for small-boat operation.

SUMMARY BY COUNTRY OF FADs DEPLOYED AND REPORTED LOST, 1977-82

<u>COUNTRY</u>	<u>NUMBER DEPLOYED</u>	<u>NUMBER REPORTED LOST</u>
American Samoa	16 (further 3 planned)	14
Australia	7 (further 19 planned)	Unknown
Cook Islands	6 (further 18 planned)	4
Fiji	75 (100 more presently being deployed for '82 season)	70 +
Federated States of Micronesia	20 +	Unknown
French Polynesia	8 (further 3 planned)	4
Guam	4	3
Hawaii	26 +	7 +
Kiribati	5	3 +
Marshall Islands	project planned	
Northern Marianas	5 (further 2 planned)	5
New Caledonia	6 planned	
New Zealand	3	Unknown
Niue	3 planned	
Palau	11	6
Papua New Guinea	76	25 +
Solomon Islands	20 (est).	Unknown
Tokelau	1 planned	
Tonga	1	Reported lost
Vanuatu	5 planned	
Wallis and Futuna	About 40 planned	Unknown
Western Samoa	19	8 +
<u>Totals</u>	302 deployed (further 200 + planned)	149 + reported lost

II. THE PROBLEM

Over 40% of all FADs so far deployed in the region have broken away within 12 months of being set, and the majority lost within eighteen months to two years of deployment. While figures remain incomplete, over 302 FADs have been deployed region-wide since 1977, of which 117 have been reported lost, with the latter figure considered conservative.

For the smaller countries such premature losses have had a disastrous effect on artisanal fishery development projects employing fish aggregation buoys. Replacement costs constitute a major drain on often limited development funds which such countries can ill afford. Several have directly approached SPC seeking advice and assistance to help overcome this problem.

Endorsing this concern, fisheries officers from Forum Fisheries Agency member and observer states identified the need to improve current FAD technology as one of the priority areas of the Regional Research and Development Programme (FFA Doc. RRDP 81/1), and for which it was agreed that SPC would act as a principal implementing agency. Discussions during the 1981 SPC Regional Technical Meeting on Fisheries again highlighted the shortcomings of present designs, and stressed the need for marine engineering expertise in the design and construction of FADs appropriate for use in differing depths and sea conditions.

III. THE PROPOSED STUDY

There is an urgent need to draw together all relevant experience from throughout the region to help identify the most effective FAD designs, setting techniques, deployment and maintenance strategies. At present, improvements in the basic design are being achieved by trial and error in each and every country, as individual fisheries officers attempt to solve design and fabrication problems using their own experience and the limited advice available. This results in a repetition of errors from country to country, and an intolerable wastage of scarce resources.

The design of a cost effective FAD, which can withstand expected sea conditions and other defined hazards for a planned serviceable life of 3 to 5 years, is primarily a problem in marine engineering, and its solution will require the services of a competent engineer, with experience of the latest improvements in deep water mooring technology developed for offshore exploration or oceanographic research application.

The proposed study will blend marine engineering expertise with the practical experience and understanding gained by fisheries officers in the field, in an attempt to overcome premature loss problems with current FAD designs. While a limited study of this nature will not solve all the problems associated with the use of FADs, it will document development work already undertaken in the region, thereby eliminating wasteful repetition, and secondly, will prepare cost effective FAD designs which will be superior to current models.

IV. SPECIFIC OBJECTIVES OF THE STUDY

- i) Conduct a thorough study of current FAD designs as well as construction and deployment techniques, which have been developed semi-independently by a number of Pacific countries, with a view to identifying (a) those designs and techniques which have been proven most effective, and (b) problem areas where improvements can be made.
- ii) In the light of recent developments in deep sea mooring technology, and insights gained from the above study, draw up cost effective designs for -
 - (a) Artisanal Fishery FAD - for countries with very limited buoy maintenance capability;
 - (b) Commercial Fishery FAD - where fishing interests have some maintenance capability.
- iii) Prepare guidelines, based on regional and international experience, for the deployment, retrieval (where applicable) and maintenance of FADs.

V. PROJECT PLANNING

(A) ACTIVITIES

<u>Project Activity</u>	<u>Location</u>	<u>Duration</u>
1. Consultant engineer together with SPC Fisheries Officer to visit selected Pacific Island countries with well advanced FAD development programmes.	Western Samoa) American Samoa) Fiji) Solomon Islands) Papua New Guinea)	4 weeks
2. Consultation with SPC fisheries staff. Preparation of final study report with recommended "ideal" FAD design criteria for both artisanal and commercial application.	Noumea.	2 weeks

(B) INPUTS

1. SPC Inputs

1.1 FISHERIES OFFICER

An experienced fisheries officer with extensive knowledge and work experience of fisheries in the Pacific.	Western Samoa) American Samoa) Fiji) Solomon Islands) Papua New Guinea)	4 weeks
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He will co-ordinate field study, collate background information, and travel with consultant engineer to selected countries to evaluate individual FAD projects. He will assist with preparation of final report. (Travel costs to be met by Funding Agency).

1.2 ADMINISTRATIVE SUPPORT	Noumea	As required
Secretarial services.		

	<u>Location</u>	<u>Duration</u>
2. <u>FUNDING AGENCY</u>		
2.1 CONSULTANT MARINE ENGINEER An experienced marine engineer with work experience in the deep water mooring field. He will undertake evaluation of current FAD projects and advise improved designs to overcome present mooring loss problems.	Region/Noumea	6 weeks
2.2 ALL TRAVEL COSTS ASSOCIATED WITH STUDY.		