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Evaluation Report
South Pacific Fisheries Development Project
(879-0009)

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EXECUTIVE SUMMARY

Over the period August 15 to September 13, a review team visited the sites of four projects funded under USAID's South Pacific Fisheries Development Project (879 - 0009). The team members were Wycliffe Bakeo, Director of Fisheries, Vanuatu; Felix Panjubo, Project Development Officer, Small Island Countries Program, Forum Fisheries Agency, Solomon Islands; Gerald Russo, Commercial Fisherman resident in Fiji; and Philip Logan, Consultant, University of Rhode Island, Team leader. For much of the trip, the team was accompanied by Elisala Pita, Fisheries Advisor, RDO/SP.

The team was to examine and assess the beneficial impacts of, and lessons learned from the assistance extended to three bilateral projects -- Papua New Guinea's Manus Island canoe development project, Western Samoa's fisheries development program, and Kiribati's Nation Fisheries Corporation, Te Mautari Limited (TML) and to one regional activity, the South Pacific Commission's Tuna and Billfish Assessment Program (TBAP).

SUMMARY OF MAJOR FINDINGS

"0009" Program

1. Overall the 0009 Program can be termed a success. In a very short time, USAID - American aid - was in the fisheries development business in many countries in a meaningful, cooperative way.
2. The process of project planning, review and monitoring was probably as important to generating "goodwill" as the assistance itself.
3. Much of the success of this program of small projects has to be attributed to the personnel who administered it in the field, to their attention to detail, and to the respect they gave and earned themselves.
4. It can't be concluded that this experiment can be widely replicated. Much of the credit for the success of the 0009 approach lies with the regional institutions which were utilized in implementing the program.
5. The success of any particular project was limited by design, and this is one of the tradeoffs of this approach. Given that many of the activities were "gap fillers", little of the greater national program success or failure could be attributed to the component 0009 activity.

Papua New Guinea Canoe Project

1. While the project developed several canoe prototypes, these were not accepted widely enough to encourage the development of any self-sustaining vessel construction enterprise.
2. Boatbuilding skills and the advantages of updated outrigger designs were transferred to sixteen craftsmen considered competent to transfer these skills to village fishing groups. Approximately sixty canoes were constructed and all but a few were sold.
3. Minor modifications to traditional canoes, modifications influenced by the project, will continue to be promoted by enthusiastic staffs of both the Oro Bay and Manus Fisheries Authorities to poorer village fishing groups at appropriate sites.
4. A pre-project assessment of demand would have revealed that the canoe did not fill an outstanding need: commercially available fiberglass vessels were widely adopted over the course of the project, while poorer fishing groups could not afford the canoes.
5. Whatever demand existed was not exploited because funding for extension activities diminished over the life of the project, and because no ready source of loan funds were available.
6. Project management by the NGO FSP was seen as beneficial by DFMR.
7. The existence of geographically extensive, mostly undocumented, possibly unstable claims to marine resources by coastal communities presents a major obstacle to development of commercial marine harvesting activity in other than distant waters.
8. Adequate pre-project research is essential. The assumption that all peoples will willingly take to the sea if income earning opportunities are present is readily challenged in Papua New Guinea. The influence of remission incomes from urban centers to rural areas is also significant, yet local versions of conspicuous and competitive consumption are rife. The rapid, yet possibly, temporary adoption of fiberglass vessels is an example.

Western Samoa Fisheries Development Program

1. With some outside help, the program did what it set out to do. Several ongoing projects were assisted and several others developed which examined various fishing alternatives. A method of fishing which holds the promise of being sustainable was identified and introduced. The potential for another was dismissed based on stock assessment research conducted from the project vessel.
2. The project-designed-and-funded vessel performed well in carrying out assessment activities, and in conducting some experimental fishing. The vessel has proven durable. The crew and Samoan Captain, according to outside experts, were very well trained and performed well. The vessel's future is very uncertain.
3. The provision of desktop computers was a catalyst to data collection and analysis here as elsewhere. It facilitated bottomfish assessments and the regional sharing of analytical software.
4. The UNDP/FAO Mussel project was on the verge of profitability when it was demolished by cyclone Ofa. It represents the only sub-project examined which is (was) directed toward women. Attempts should be made to revive it at another site.
5. Funds for FAD construction and deployment helped maintain increased landings. It is certain that FADS of one form or another will be required indefinitely for supplies of fish for export and, unfortunately, increasingly for domestic consumption. It is likely, but not necessarily imperative, that foreign assistance funds will be sought indefinitely for FADS.
6. It is likely that only one form of fishing -- vertical long-lining for sashimi grade tunas for export, supplemented with trolling for skipjack for local markets -- can be truly self-sustaining, i.e. can operate indefinitely without fuel subsidies, subsidies for (probably price-inflated) alia construction, and even the provision of FADS. Unfortunately, all external start-up assistance to this infant industry will have left by the end of FY91.
7. A project exploring the economics and sociology of various FAD forms and organizational arrangements for ownership, maintenance, policing, etc. is called for. For example, private enterprise supplies effective FADS in the Philippines at about one-tenth of the cost of the Western Samoan aluminum version. Some PIMAR elements could adopt a component similar to this. The knowledge and experience present in personnel of the SPC DSFPD should be wherever feasible.

8. The very well documented findings of the Western Samoa project should be examined for relevance to similar PIMAR components -- of particular relevance are the low estimates of bottom fishing productivity, the experiments with domestic and export markets and the need for a well rewarded, stable fisheries department.

9. Attention should be paid to the forthcoming FAO research on the decline in lagoon and reef food productivity.

**Kiribati's National Fishing Corporation
Te Mautari Limited (TML)**

1. The assistance provided by USAID was well targeted by the 0009 delegates from Kiribati. In effect, the aid was directed at creating some useful company assets, salvaging others and improving the comparative advantage of having trained local crew.

2. The office building was well sited and is well utilized, the training funds were spent on specialized training for potential and existing employees. As planned, the vast majority of graduates of "pre-sea" training was hired by TML.

3. The provision of a new replacement engine added three working years to one of five fishing vessels, the fish aggregating device (FAD) sub-component funds were merged with other FAD funds after the failed deployment of a specialized version.

4. There were minor communication problems among the several government units responsible for accounting, reporting on and executing some of the projects. A very small amount of otherwise well spent funds remained idle as a result.

5. Since 1981 large sums of money have been expended and benefits have been foregone in exchange for different levels of corporate fishing experience, and the subsidy of many more large capital assets. The comparative advantages Kiribati now brings to the array of options under consideration are greater than were available 1981. The evidence clearly suggests, however, that they are not sufficient to make the unassisted state corporation the best option for national involvement in fishing.

6. The losses incurred in that experience should not be factored into decisions concerning what to do now. The decisions at hand concern what to do with existing operations and assets now so as to have them earn a sustainable profit one, ideally, at least as great as the income which could be earned by selling them and investing the proceeds.

**The South Pacific Commission's
Tuna and Billfish Assessment Program (TBAP)**

1. The long term commitment of USAID to stock assessment research and information gathering has been bearing dividends in the last two to three years. The important problems have been identified, the research and outreach are well directed and economical and the advice and information generated by TBAP is well received at all levels.
2. USAID's contribution to TBAP's information services has been put to good use. The professional assessment information provided forms the basis for evaluation of fishing venture options and has encouraged a high level of cooperation from most distant water fishing nations (DWFNs).
3. The information and knowledge gained has enhanced the knowledge base upon which both bilateral and multilateral access negotiations have been based. These have brought over \$120 million in fees to Forum member nations since 1986.
4. The first allegiance of the TBAP in its provision of information has been and must continue to be with SPC member nations and secondarily to private parties because of the inability of member states to police the vast areas of their EEZ's. Some of this information advantage will diminish through time as DWFNs' accrue information rivaling the SPC's.
5. If current financial support arrangements for TBAP were to be terminated soon, it is not obvious that currently benefitting member states or other benefitting states would undertake that obligation. The most likely acceptable distribution of research costs, should they be underwritten by benefitting nations, would be one based on the distribution of benefits.
6. It is recommended that the current arrangement for support continue for a period long enough (up to five years) for member states to augment their fisheries departments' research staffing. This is suggested because there are likely to be changes in institutions governing tuna research. In this period TBAP could be instrumental in encouraging the development of enhanced national research capabilities, helpful in defining the issues for a more sub-regional TBAP, helpful in "selling" the need for continued research, and effective in insuring that member states are adequately represented should the tuna research/management context expand beyond the region.
7. At the conclusion of this period, USAID (and other traditional donors in this area) should expect that the requirements for research by benefitting nations are clear, that the benefits to that research are clear and that the costs of the research are substantially assumed by benefitting nations. There should be no reason for USAID to support the program further.

I. INTRODUCTION

A. Background

The United States Agency for International Development (USAID) implemented its South Pacific Fisheries Development Project (879-0009) in FY1986. The project, with a budget of US\$4.45 million, funded a wide range of fisheries activities (over 100 separate activities) in ten independent South Pacific island countries. The project will end on December 31, 1992. The activities financed under 0009 are categorized into six general subject areas:

- training,
- infrastructure development,
- provision of equipment and supplies,
- research, studies and monitoring,
- export marketing development, and
- technical assistance.

The goals of the project are to maintain a useful and meaningful U.S. presence in the South Pacific and to help revive good relations with the South Pacific island countries. The project purpose is to design and carry out fisheries development activities promoting economic stability and self-sustained growth for these independent countries.

The project was implemented through U.S. private volunteer organizations (PVOs) and contractors as well as through regional organizations such as the Forum Fisheries Agency (FFA) and the South Pacific Commission (SPC).

II. EVALUATION OUTLINE

A. Objectives

The Project Paper (PP) for 0009 requires an in-depth project evaluation to be carried out prior to the end of the project with the objective to examine and assess the beneficial impacts of, and lessons learned from both completed and on-going bilateral and regional sub-project activities financed under the project.

B. Evaluation Criteria

For the required evaluation, it would have been extremely time consuming and expensive to include all bilateral and regional activities supported under 0009. Accordingly, it was appropriate to select a few key activities for the evaluation based on the following criteria:

- the evaluation should include activities in a cross-section of RDO/SP countries;

- the evaluation should include both national and regional activities;
- the evaluation should include a variety of activities which could be replicated elsewhere in RDO/SP countries; and
- selected national activities should relate to private sector fisheries development.

C. Activities Selected for Evaluation

Based on the above criteria, one regional and three bilateral activities supported by 0009 were selected for evaluation:

- Papua New Guinea's canoe development project;
- Western Samoa's fisheries development program;
- Kiribati's national fishing corporation, Te Mautari Limited (TML); and
- South Pacific Commission's Tuna and Billfish Assessment Program (TBAP).

D. Evaluation Team

RDO/SP contracted three consultants as members of the evaluation team, a national fisheries expert to provide island nation perspective, a commercial fishing specialist (U.S. national) to provide the commercial perspective and a fisheries socio-economist (U.S. consultant). Other members of the team were representatives of FFA (for regional perspective) and USAID.

E. Scope of Work

Each member of the team had the same terms of reference and Scope of Work. Each member was to contribute to each of the topics identified in the SOW (see Attachment A).

III. FIELD VISITS

A. Conduct of the Work

As required under the SOW, the evaluation team (ET) carried out a total of 4 weeks of field visits covering four countries, namely Papua New Guinea (PNG), New Caledonia, Western Samoa and Kiribati with one week in Fiji to finalize the evaluation report.

During the visits, the team collected the information on the status of the activities selected for evaluation. It also interviewed government officials and private sector fishery operators (in the countries) and management and program staff (in Noumea) to assess the progress achieved in each project and to identify specific problems experienced by the countries and SPC.

B. Approach Adopted

For each country visited by the team, prior arrangements were made to assure meetings with the relevant officials of governments, officials and management of the National Fishing Corporation, and private entrepreneurs (in PNG and Kiribati). Visits to boat yards, cold storage facilities and fish markets were also arranged. Due to the absence of certain persons, a few of the scheduled meetings had to be canceled. One was postponed and held later in Suva.

IV. EVALUATION REPORTS

IV.A. EVALUATION REPORT: PAPUA NEW GUINEA CANOE DEVELOPMENT

1. INTRODUCTION

Over the period August 15 to September 13, a review team visited the sites of four projects funded under USAID's South Pacific Fisheries Development Project (879 - 0009). The team members were Wycliffe Bakeo, Director of Fisheries, Vanuatu; Felix Panjuboe, Project Development Officer, Small Island Countries Program, Forum Fisheries Agency, Solomon Islands; Gerald Russo, Commercial Fisherman resident in Fiji; and Philip Logan, Consultant to University of Rhode Island, on leave from USDOC, NOAA, National Marine Fisheries Service, Woods Hole, MA, Team leader. For much of the trip, the team was accompanied by Elisala Pita, Fisheries Advisor, USAID, RDO/SP.

The team was required to examine and assess the beneficial impacts of, and lessons learned from the assistance provided under USAID's South Pacific Fisheries Development Project (879-0009) to three bilateral projects: Papua New Guinea's Manus Island canoe development project, Western Samoa's fisheries development program, and Kiribati's National Fishing Corporation, Te Mautari Limited (TML), and to one regional activity, the South Pacific Commission's Tuna and Billfish Assessment Program (TBAP).

The Papua New Guinea Development Project in Manus Island and Oro Bay received US\$165,018 under 0009 over a three year period. Many Pacific island countries have tried to establish boat building programs, with limited success. The team was charged with evaluating and documenting the PNG canoe activity.

The team visited Port Moresby and Manus Island in PNG from August 17-24 where they held meetings with relevant national and provincial government officials and with private individuals involved in the canoe project, in fishing and in fisheries development. (see attached list of meetings).

Summary of Findings

1. While the project developed several canoe prototypes, these were not accepted widely enough to encourage the development of any self-sustaining vessel construction enterprise.
2. Boatbuilding skills and the advantages of updated outrigger designs were very successfully transferred to sixteen craftsmen now considered competent to teach these skills to village fishing groups. Approximately sixty canoes were constructed and all but a few were sold.

3. Minor modifications to traditional canoes, modifications influenced by the project, will continue to be promoted by enthusiastic staffs of both the Oro Bay and Manus Fisheries Authorities to poorer village fishing groups at appropriate sites.
4. A pre-project assessment of demand would have revealed that the canoe did not fill an outstanding need: commercially available fiberglass vessels were widely adopted during the project, while poorer fishing groups could not afford the canoes.
5. Whatever demand did exist was not fully exploited because funding for extension activities diminished over the life of the project, and because no ready source of loan funds was available to make purchases easy.
6. Project management by FSP was viewed as beneficial by DFMR.
7. The existence of geographically extensive, mostly undocumented, possibly unstable claims to marine resources by coastal communities presents a major obstacle to development of commercial marine harvesting activity in other than distant waters.
8. Adequate pre-project research is crucial. The assumption that all peoples will willingly take to the sea if income earning opportunities are present is readily challenged in Papua New Guinea. The influence of remission incomes from urban centers to some rural areas is significant, and local versions of conspicuous and competitive consumption are common. The rapid, yet possibly temporary, adoption of fiberglass vessels is an example.

2. BACKGROUND

Papua New Guinea claims 2.3 million km² of fishing zone. It has some of the richest reefs and lagoons in the South Pacific and several large inhabited islands. The country is rich in extractable and renewable land-based resources.

Medium commercial fishing operations are few because of a dearth of infrastructure and marketing networks. Subsistence fishing, traditionally limited to coastal peoples who represent a minority, is an activity which is supplemental to agriculture. Marine products are significant in coastal diets, however.

The Department of Fisheries and Marine Resources (DFMR) published a sectorial development plan [1] which identified the encouragement of coastal fisheries to increase standards of living as the first priority for allocation of its resources. The document identifies the needs of provincial extension services, citing, among other needs, developments in fishing gear, methods and craft design.

2.1 Problem Addressed

Traditional canoes, long used for subsistence fishing, have been found wanting in more commercial applications. Generally they have low stability in open seas, low load carrying capacity and high fuel consumption when powered by outboard motors.

The DFMR ran trials on inboard craft, but these 7-10m models, though seaworthy and comfortable, were beyond the financial reach of most villagers. Other possibilities included fiberglass and aluminum dinghies. These were thought to be unacceptable because of their cost and the difficulty of repair.

A program to examine cost effective designs which were based on traditional fishing and transportation craft, but which used modern construction techniques and locally produced wood products was launched. Two canoe designs successful in Kiribati were chosen as the initial prototypes upon which to base the start of a craft development and fisheries extension project.

2.2 Oro Bay Fishing Authority Project

The project was initially based at Popondetta in Oro Bay in 1986 under the extension activity of the Oro Fisheries Authority (OFA). The choice reflected the Province's rich marine resources and nearness to an inland oil palm settlement.

¹"The Fisheries Subsector in the Medium Term Strategy 1990 - 1994", Department of Fisheries and Marine Resources, Government of Papua New Guinea, Kanudi, Port Moresby, August, 1989.

The project was managed by a Technical Instructor in Canoe Building (TICB) on secondment to OFA from DFMR and who was assisted by seven staff and trainees. The overall objectives of the project included encouragement of greater self-sufficiency in marine food production; an increase in income earning opportunities; and the promotion of coastal trade, transport and communication through the improvement of small fishing craft.

The immediate objectives included the modification of existing dugout canoes to give greater strength, improve seaworthiness, increase load-carrying capacity, provide greater longevity and to enhance their performance as commercial fishing craft. It was hoped that these adaptations could be provided at affordable prices.

Other goals of interest to the Department and to the Provincial Fishing Authorities included training of fisheries staff and private individuals in the use of the new designs, and provision of continued backup support to the owners of new craft as part of their extension programs. It was hoped that the training and extension activities would encourage the development of private builders of these new designs.

2.3 Manus Fishing Authority Project

The project's major focus shifted in September 1988 to Manus. It, too, was placed under the guidance of a provincial government institution, the Manus Fishing Authority (MFA). The previous TICB was engaged to manage this project. A local counterpart manager was identified and trained. The project employed 5 core staff and 7 trainees and laborers.

The broad objectives of the Manus Project were to develop efficient, rural, coastal transport and fishing craft in order to: 1) allow more rural employment opportunities in the production, distribution and marketing of selected marine resources; 2) provide benefits to the local economy through the introduction of more versatile and efficient coastal transport; 3) encourage greater consumption of fish leading to improved health and import substitution; and 4) to encourage greater exports leading to higher foreign exchange earnings.

The immediate objectives were significantly more modest and were integrated into the goals of the Manus Fishing Authority's extension program. They included the completion of an on going provincial evaluation of village fishing and transport craft, the identification of craft most suited to local conditions, the provision of extension training to village groups to improved fishing techniques, processing methods (e.g of beche-de-mer and other less-perishable products), and the distribution and marketing of their marine products.

In 1989 DFMR recruited an expatriate senior technician who was based initially in Port Moresby at Marine Base to establish a canoe building facility there. He was later shifted to the Fisheries College in Kavieng. Currently the operation in Manus and a scaled down operation in Oro Bay continue under local management.

3. ASSISTANCE TO THE PROJECT

The project received initial technical assistance from the principal UNDP/FAO naval architect as part of the regional fisheries support program. External financial support for the project and the initial in-country management of that support was provided by the International Human Assistance Program. A grant of \$10,000 by IHAP was sufficient to start the project, but the agency soon had to withdraw for reasons external to the project. Through 0009, USAID was able to provide timely support.

The Oro Bay project was initiated in 1987 with the IHAP grant. Later in the year USAID 0009 made its first grant of US\$ 60,000. This contributed to craft construction and training of villagers. It also covered some wages, and bought tools. Foundation of Peoples of the South Pacific (FSP) managed the in-country finances of the project after IHAP withdrew under an agreement with USAID.

The TICB left Oro Bay in October 1987 because of security problems. One of the senior shipwrights was recalled to Moresby due to health reasons and the project reduced operations while a search for a replacement was made.

The project's main activities were shifted to Manus. Again, 0009 funds were rapidly disbursed to assist in the relocation. This assistance to Manus included money to refurbish workshops, and a dormitory, and money for training, equipment and materials. A second amendment to the agreement in 1989 provided an additional USAID assistance of \$46,000 for more materials and training.

The project received a total grant of US\$ 165,018 from USAID. The PNG National Government, and the Oro and Manus Provincial Governments contributed an estimated (in kind) total of \$163,270 of services of senior personnel and infrastructure and logistical support.

4. ACHIEVEMENT OF OBJECTIVES

The evaluation team could not determine to what extent the broad objectives found in project documents were met because of a lack of baseline data, but it is unlikely that there was a detectable change in exports, foreign exchange balances, etc.

There were too few craft involved in commercial fishing to allow for an assessment of the impacts of the project on that count as well. The few part-time fishermen interviewed expressed satisfaction with the craft.

The team did not visit Oro Bay but had an opportunity to interview the director of the Provincial Fishing Authority. He expressed satisfaction with the project while it was there. He understood the need for the change of venue for some of the principals. However, he felt that the Oro Bay project has not ended. It continues principally with provincial assistance. A less expensive mode of canoe modification has been identified and this activity has a life of its own. Core staff and fishermen have been and are being successfully trained.

In Manus, the prototype production and training of staff and individuals was successful. The project performed well in carrying out the evaluation and trials required to confirm the suitability of craft to local conditions.

It has also successfully trained and developed a core of boat builders. Some of the trained staff are employed at the workshop. It is unclear how long this can be supported with such slack demand. The MFA also has a modified version of technology transfer program similar to that of Oro Bay. Canoes which were constructed as prototypes and not sold have been leased out for various uses at nominal cost as part of an automatic extension effort.

It could not be claimed that in either Oro Bay or in Manus that a reasonable attempt to establish the canoe models in the minds of potential consumers had been made. Each fishing authority had plans to couple promotion of the canoe with training in various aspects of fishing. These extension activities were undermined by financial problems within the Department. In addition, there may have been a lack of coordination between the provincial fishing authorities and DFMR in planning the required extension training related to the canoe project. By all accounts extension funds, which were to have come from the central government exclusively, dried up rather unexpectedly.

In quantitative terms, the projects achieved many of their immediate objectives: three workshops were established (two of particular interest) and equipped with tools and materials. Two are currently operated by skilled local builders and run by competent local managers. Approximately 60 craft of various designs were built in total. Approximately 40 individuals have received training of varying length over the funded project life.

Views were expressed that the more appropriate project site was Oro Bay. While the problem of safety for expatriates was apparently real, the people of that area were generally considered to have greater links to the sea, i.e. were poorer and depended more on fishing than did the people of Manus. The move to Manus was expedient. The project was made welcome and it made great progress in designing and testing boats. We are left with the impression that MFA's extension program was as much diverted by the arrival of the project as helped.

Lastly, the canoe project was not coupled with a scheme which would have provided either easy credit for purchases or simplified application procedures or both. There were examples where persons within the DFMR personally tried to assist applicants to obtain loans through the regular development bank channels and had become discouraged with the process.

5. REPORTING AND MANAGEMENT

This activity was managed by the Foundation of Peoples of the South Pacific (FSP) in close liaison with the Department of Fisheries and Natural Resources in accordance with the agreement between the Government of Papua New Guinea, FSP and the United States Agency for International Development. DFNR was satisfied with the USAID level of funding and pleased with the role played by FSP.

FSP was instrumental in helping the project implement activities by minimizing the more standard bureaucratic delays which have traditionally surrounded the disbursement of donor funds to ultimate users. FSP also performed well because of its expertise and past experiences with the small scale development projects in the region. FSP has satisfactorily met the reporting requirement of the project assistance agreement although there were delays in submitting some of the quarterly reports.

Whilst it was acceptable to use (FSP) to manage this activity in order to minimize delays in project implementation and reporting, it should not be considered a long run alternative. The Government of Papua New Guinea should have incentives to develop management cadre as part of its manpower development schemes.

At the same time it should address the question of streamlining its procedures and rules to pave the way for timeliness of project implementation and reporting. This will facilitate the consideration of new project proposals submitted to the funding agencies.

One key constraint now is the need to provide support funds from the DFMR's recurrent budget to sustain the projects' activities. The Provincial Governments will find it difficult to maintain or to increase the level of services that it wishes to provide to the general public in this area and in extension activities in general.

6. PROJECT IMPACTS

The very short term results of the canoe project consist of the approximately 20 canoes built in Oro Bay and 40 in Manus. In addition, sixteen persons were trained in canoe construction to a point where each could teach boatbuilding skills to others. Both the Manus and Oro Bay Provincial Fisheries authorities plan to continue to introduce some of the new technology as part of an expanded extension effort.

The provincial governments view the continuing canoe modification extension efforts as worthwhile -- especially for those who cannot afford or are unlikely to be given one of the new marine plywood canoes or one of the recently popular fiberglass craft. "Walk about" or portable saw mills, supplied by the DFNR, will be employed in villages. Provincial personnel will supply guidance in construction to groups of fishermen who will have provided the logs for sawing.

Aside from these activities, the government feels that having had various craft designs developed which are improved versions of traditional craft, and having the resident skills necessary to put the designs into effect on hand, have been worthwhile. DFNR also felt that the safety aspects of the canoe designs as demonstrated by the existing canoes might influence the designs of other craft -- particularly that of the locally manufactured, popular fiberglass dinghies.

DFMR personnel and others expressed the opinion that the recent, rapid, large-scale adoption of the fiberglass dinghies, particularly on Manus, came about because they were faster and lighter than traditional craft, and because they were modern. Though also expensive, they became a popular form of gift giving from city dwelling relatives. In contrast, the innovative, colorful, stable, marine ply canoes were considered "still canoes."

However, DFMR personnel suggest that demand for the project's canoes may yet develop because of the difficulty of repair to the fiberglass dinghies and because second and third purchase decisions had not yet been made by consumers.

In summary, the longer term impacts of the project -- aside from actual development of the prototypes and establishment of the building facilities -- which would be derived from wide adoption or even extensive local adoption of the canoe designs are far from being realized through these canoes. The niche they might have filled has largely been taken by heavily promoted fiberglass dinghies. The use of even these craft on Manus, at least, was not as platforms for fishing but principally, from what the team observed, transport of persons to market centers and back.

It is possible that some other region of the country may have need for these canoes which cannot appear to be filled better by the fiberglass alternative (canoes have been introduced into five areas of the country). It is also possible that a new niche for the canoes or their derivative will develop as fishing for income becomes more widely adopted. Until then the approach of the Provincial Fishing Authorities to spreading some of the innovations seems realistic and sustainable.

The fiberglass canoes are probably not just a temporary phenomenon as they have been adopted in many, many countries for a large number of different fishing operations. Questions of safety have been addressed by agencies such as FAO which have developed low cost innovations utilizing sails, etc. Some of the advantages of the canoes in this respect, have been matched.

IMPACT ON SUSTAINED PRIVATE SECTOR FISHERIES DEVELOPMENT

The evaluation team did not encounter a fishing or transport or transportation enterprise which was built around any of the canoes. The head of the Oro Bay Fishing Authority said that many such enterprises based on fishing from these canoes or from traditional canoes modified by designs developed in this project exist in his province.

Two vessel owners interviewed in Manus use their canoes casually for occasional fishing, for personal transport and for transporting goods on an occasional basis. Given the lack of roads in much of the rural areas of the country, there is clearly an opportunity for vessel transport to be profitable if the local culture permitted that development. Whether the canoes developed under the project would prove to have significant advantage over other alternatives, is impossible to say. The reintroduced outrigger is novel and may be picked up by other builders.

The prospects for development of small commercial fishing operations are dependent on many more important factors than the appropriate canoe design. The government and all others working in the field are aware of the significant impediments posed to commercial exploitation of fisheries resources posed by the murky state of ownership claims to those resources by coastal peoples.

In general the existence of property rights will protect against over-exploitation of marine resources. That rule assumes, however, that those rights can be clearly identified, articulated, secured, etc., so that transactions between resource extractors and owners are low cost and easy to conduct. This is not yet the case for most of the coastal areas of the country.

In addition to the requirement to compensate resource owners, another frequently cited impediment to commercial fishing was the general lack of infrastructure -- roads, markets, and centers of high population densities.

It had been hoped that one or more self-sustaining businesses centered on boatbuilding would have developed to support other small fishing, transport and transportation business which would have developed around the canoes. The demand for canoes was not sufficient to encourage undertaking of such a project, although there was strong interest in such an enterprise at one point.

The DFMR was approached by local businessmen who sought to takeover the boatbuilding operations at Marine Base near Moresby. The government encouraged the proposal by offering several incentives such as temporarily assigning the best of the trained boatbuilders to the company. Concerned that the new enterprise not fail, the DFMR conducted an analysis of the likely profitability of the enterprise given alternative levels of demand for the vessels, alternative output prices, and variable productivity measures for the labor input.

In return for that information and for the use of its skilled boat builders to get the operation started, the department required that the purchasing company conduct or have someone conduct an analysis of market demand for the craft, construct business plans, plan a construction site and develop a marketing strategy. The break-even figures were on the order of production of 21 vessels per year at a cost of K5,200. The venture never got beyond the talking stage.

The government of Papua New Guinea is seeking to privatize as many services as it can in a drive to reduce government expenditures. The same attitude pervades the Manus Fishing Authority. It has been acting as a principal buyer of fish, as the principal producer and seller of ice blocks and provider of cold storage facility. It too has been attempting to privatize these services with mixed results.

8. OTHER CONSIDERATIONS

There was general agreement among the principals that the vessel design drove the program rather than the demand for the vessel. The canoe and its proponents were a dynamic combination, able to continue the construction, modification and prototype testing without major hitches, while the problems of introducing the canoe, and of identifying the appropriate niche for its adoption were left to existing extension programs whose resources were diminishing through time. Adoption of similar craft by other South Pacific countries was assumed to be sufficient indication that it would be adopted in PNG. This was not the case.

There are many other communities with the potential for benefiting from canoe innovations such as those developed at Oro Bay and Manus. The up-coming fishery development activities which have been surveyed by the Asian Development Bank -- which includes the PNG component of PIMAR -- may be well served by the ready availability of plans, and training skills for canoe development.

The repair and maintenance of outboard motors is thoroughly privatized. New parts may not be widely available, but the many small repair shops encountered specialized in salvaging parts.

There are significant long term problems associated with trying to develop marine resources in much of the country. One aspect of the problem is the projection of ownership of marine resources by coastal villages across inland waters, across reefs and out into the sea. These claims are enforced locally. They are not necessarily recorded nor are they necessarily stable even if recorded. Provincial councils have begun to play a role in acting as intermediaries in the resolution of disputes, in assisting in steps to prosecution of violators (by law enforcement bodies) and, very importantly, in acting as intermediaries between those who would develop marine resources and those who claim those resources.

DFMR feels that almost all of the marine resources, inshore, reef and offshore, are underexploited. The only damage being done is occasional dynamiting of reefs which is coming under control. DFMR concedes that very little production information, catch and effort information is collected on a regular basis.

9. A COMMERCIAL FISHERMAN'S PERSPECTIVE

The ORO Bay/Manus Island Canoe Project objectives included the enhancement of the local fisheries through the proliferation of the proposed canoes. However, the indigenous population has very little history of using the ocean resources for trade. Usage of boats is primarily for transportation of people and freight.

The development objectives outlined the usual benefits of a village scale commercial fishing scheme such as better nutrition, import substitution, and foreign exchange through export. These objectives were to have been accomplished subsequent to the purchase of canoes by individuals and groups and after training in fishing methods, processing, and small business management. These objectives were never met in measurable terms. The canoes were not adopted as hoped and subsequently the "commercial fishing effort" not affected.

Failure of this project to achieve these objectives resulted from many reasons which had little to do with boat design or resources. The vessels were built properly and the design adequate for the types of fishing which would be undertaken for subsistence and local markets. The waters of Papua New Guinea are reportedly well endowed with a variety of marketable marine species.

The lack of response to the canoes for commercial fishing is more of a lack of response to the concept of commercial fishing and may be attributed to specific attitudes of the village people towards the fish resource, fishing, work preferences, priorities of time allocation, lack of a functioning established loan program, inadequate fisheries extension program, fishing gear supply, and fish marketing infrastructure.

However, one observation is that those who can afford a factory-built boat purchase one of the Yamaha design fiberglass dinghies that are being manufactured in PNG. Those who cannot afford to purchase a boat (rural coastal villagers) continue to use the dugout style canoes which are made with no substantial cash outlay. The fiberglass boats are presently the most popular boat for general purpose use. With the current manufacturing and marketing infrastructure supporting them, they will probably take the place of the dugout canoe.

It is my opinion that the new style canoes (the larger models) have a place in fisheries due to their economy, stability and comfort for extended periods at sea. However, there would have to be a concerted attempt to organize commercial fishing within the private sector, utilizing fisheries extension assistance, before there can be any serious increase in the proliferation of the new style canoes.

10. MEETINGS

MONDAY, 19 AUGUST PORT MORESBY
10AM

Mr. Rai Alu, First Assistant Secretary, Division of Resource Development, Extension and Training Division.
Mr. Noel Omeri, Chief Resource Development Officer.
Mr. Len Rodwell, Asst. Secretary, Policy Evaluation and Liaison Division.
Mr. Noan Pakop, Senior Fisheries Extension Officer.
Mr. Pat Woodland, Senior Technical Instructor, CCTU, National Fisheries College, Kavieng.

2PM

Mr. David Vollmer, PNG Director, Foundation for Peoples of the South Pacific

TUESDAY, 20 AUGUST MANUS
10AM

Mr. Gabriel Kudujoham..... Acting Director, AFET, MFA
Manus Fishing Authority.
Mr. Ambrose Guarim, DFMR Chief Boatwright seconded to MFA.

2PM

Mr. Ambrose Guarim

WEDNESDAY, 21 AUGUST
9AM

Mr. F. Benard Borok, Assistant General Manager, Kei Beseu Kampani Pty. Ltd. Box 148 Lorengau, Manus Province:
Chairman, Manus Fishing Authority

1030AM

Mr. Pano Popot, Barracuda Vessel owner living in Lorengau originally from Lou Island

1PM

Mr. Polyop, Barracuda Vessel owner living in Lorengau, originally from Mbuke Is. Former civil servant and former member of the MFA.

FRIDAY, 23 AUGUST . PORT MORESBY

7PM

Mr. Maurice J. Brownjohn, General Manager/ Director, The
Net Shop, PO box 5860 Boroko. Former general
manager of Oro Bay Fishing Authority.

SATURDAY, 24 AUGUST

4PM

Mr. Kema Mailu, Chairman, Oro Bay Fisheries Authority, Oro
Bay Province.

Mr. Fred Embi, Fisheries Officer OBFA, Oro Province.

IV.B. EVALUATION REPORT - WESTERN SAMOA'S FISHERIES DEVELOPMENT PROGRAM.

1. INTRODUCTION

Over the period August 15 to September 13, a review team visited the sites of four projects funded under USAID's South Pacific Fisheries Development Project (879 - 0009). The team members were Wycliffe Bakeo, Director of Fisheries, Vanuatu; Felix Panjuboe, Project Development Officer, Small Island Countries Program, Forum Fisheries Agency, Solomon Islands; Gerald Russo, Commercial Fisherman resident in Fiji; and Philip Logan, Consultant to University of Rhode Island, on leave from USDOC, NOAA, National Marine Fisheries Service, Woods Hole, MA, Team leader. For much of the trip, the team was accompanied by Elisala Pita, Fisheries Advisor, USAID, RDO/SP.

The team was to examine and assess the beneficial impacts of, and lessons learned from the assistance provided under 0009 to three bilateral projects: Papua New Guinea's Manus Island canoe development project, Western Samoa's fisheries development program, and Kiribati's National Fishing Corporation, Te Mautari Limited (TML) - and to one regional activity, the South Pacific Commission's Tuna and Billfish Assessment Program (TBAP).

Western Samoa's fisheries development program included five separate projects which received a total of US\$ 700,000. The projects included technical assistance, resources assessment, test fishing, vessel construction and deployment and training.

The team was specifically asked to evaluate 1) the aid inputs (specifically 0009 support), and 2) the impact on sustained private sector fisheries development in the country. The team visited Apia, Western Samoa from September 2-5, 1991 and held meetings with relevant government officials, entrepreneurs in the fish or support businesses, and individuals from other assistance agencies.

Summary of Findings

1. With some outside help, the program did what it set out to do. Several ongoing projects were assisted and several others developed which examined various fishing alternatives. A method of fishing which holds the promise of being sustainable was identified and introduced. The potential for another was dismissed based on stock assessment research conducted from the project vessel.

2. The project-designed-and-funded vessel performed well in carrying out assessment activities, and in conducting some experimental fishing. The vessel has proven durable. The crew and Samoan Captain, according to outside experts, were very well trained and performed well. The vessels future is very uncertain.
3. The provision of desktop computers was a catalyst to data collection and analysis here as elsewhere. It facilitated bottomfish assessments and the regional sharing of analytical software.
4. The UNDP/FAO Mussel project was on the verge of profitable operation when it was demolished by cyclone Ofa. It represents the only sub-project examined which is (was) directed at women. Attempts should be made to revive it at another site.
5. Funds for FAD construction and deployment helped maintain increased landings. It is certain that FADS of one form or another will be required indefinitely for supplies of fish for export and, unfortunately, increasingly for domestic consumption. It is likely, but not necessarily imperative, that foreign assistance funds will be sought indefinitely for FADS.
6. It is likely that only one form of fishing -- vertical long-lining for sashimi grade tunas for export, supplemented with trolling for skipjack for local markets -- can be truly self-sustaining, i.e. can operate indefinitely without fuel subsidies, subsidies for (probably price-inflated) alia construction, and even the provision of FADS. Unfortunately, all external start-up assistance to this infant industry will have left by the end of FY91.
7. A project exploring the economics and sociology of various FAD forms and organizational arrangements for ownership, maintenance, policing, etc. is called for. For example, private enterprise supplies effective FADS in the Philippines at about one-tenth of the cost of the Western Samoan aluminum version. Some PIMAR elements could adopt a component similar to this. The knowledge and experience present in personnel of the SPC DSFDP should be wherever feasible.
8. The well documented findings of the Western Samoa project should be examined for relevance to similar PIMAR components. Of particular relevance are the low estimates of bottom fishing productivity, the experiments with domestic and export markets, and the need for a well rewarded, stable fisheries department.
9. Attention should be paid to the forthcoming FAO research on the decline in lagoon and reef food productivity.

2. BACKGROUND

2.1 General

Western Samoa consists of two main islands, Upolu and Savaii, and two considerably smaller islands with significant populations, Apolima and Manono. All of the islands have a limited reef area suitable for commercial bottom fish species. The country has one of the smallest EEZs in the Pacific region and is located outside of the major migratory routes of commercial pelagic species.

The present population of 168,000 (est.) inhabitants is highly dependent upon locally caught fish and marine products to meet its protein needs. The traditional main source was fish from lagoons and reefs. In recent years fresh fish from all sources has begun to be slowly replaced by canned fish and mutton flaps; part of this substitution is due to the increase in price of locally caught fish. This reflects significant overfishing of reef and lagoon resources and of outer slope and (now) deep bottom fish.

Shallow water fish species traditionally supplied the vast majority of domestically consumed fish protein. It is unclear whether this is still true. If the fish market is any measure, domestic consumption is heavily dependent on pelagic species now available because of the developments which began in the 1970's.

2.2 Fisheries Development History

2.2.1 Alias

Prior to 1970, fishing outside the lagoons was conducted from dug-out canoes fitted with outboard motors. In the period 1975-1978 an FAO/DANIDA project introduced 120 craft, one hundred of which were "alia" or marine plywood catamarans. These proved very popular.

Another project established the Boatcraft boatyard, in Apia in 1977 which produced fishing craft and provided engines the costs of which were subsidized on the order of 65%. Boatcraft later produced aluminum versions of the alia and fish aggregating devices (FADS). Since the mid-seventies about three hundred of these have been constructed. Just prior to cyclone Ofa in January-February, 1990, about one hundred were in operation. Half survived.

2.2.2 Fish Aggregating Devices (FADS)

FADS were introduced in the late 1970's. They enhanced the profitability of the alia which were at that time trolling for surface tunas (mostly skipjack). Catching tuna without FADS requires fast boats. The FADS reduced fuel costs by providing a focal point for the migratory tuna.

A total of forty-nine FADS were deployed by the end of 1984. Data on deployment and losses are incomplete for the period before 1981. Since then the data reveal a useful life of 9.2 months. This period is less than the life span of around one year experienced elsewhere. There is no doubt that the introduction of FADS greatly increased tuna catches by small-scale fishermen. The most spectacular rise was in 1980, the year following the placement of the first five FADS, when catches increased by nearly 90%.

Due to the fragile nature of the in-shore and outer-slope resources, the commercial alia fleet relies heavily on pelagic resources. It is estimated that currently 550 tons of pelagic fish (mostly skipjack and small yellowfin) are caught per year by the alia fleet of approximately fifty boats. In 1990 it was estimated that this amounted to 70% to all of the commercial fish sold in the country.

2.2.3 Deep Sea Bottomfishing

Bottomfishing using handlines on the outer reef was first introduced in Western Samoa in the early to mid 1970's by the SPC and slightly later by FAO/DANIDA. During the early 1980's heavy fishing pressure off the main Hawaiian Islands reduced the bottom fish catch. This encouraged the harvesting of deep water snappers.

As the number of aluminum alia capable of both bottom fishing and trolling for pelagics grew, so did concern within the Fisheries Division that bottomfish resources in the Apia area were being depleted. Two SPC masterfishermen studied the problem in 1982 and concluded, however, that the decrease in bottomfish catch was due to conservative fishing strategies on the part of the local fishermen.

2.2.4 Other Activity

At the time of the initiation of the 0009 projects, the government was involved in four other projects. These were interwoven to some extent with the activities under 0009. They consisted of a mussel mariculture project which was FAO funded, a FAD construction, deployment and monitoring project partially funded by UNDP/FAO, a test fishing project partially funded by the JOVC, and a Hydrographic Survey project.

2.3 Fisheries Development Assistance

Recognizing the need to manage its fishery resources properly, the Government of Western Samoa requested USAID assistance to recruit a Fisheries Advisor to assess needs and design appropriate programs related to pelagic and deep sea species.

2.3.1 Fisheries Advisor Project (91.1) 9/86 - 12/88. (US\$ 182,000)

The purpose of the project was to provide expert assistance to the Department of Agriculture's Forest and Fisheries Division in designing and implementing programs and projects designed to enhance management and further develop fisheries resources at all levels of the fisheries sector. The expert was to act as advisor to the Chief Fisheries Officer during his three year contract period. The advisor was to exercise full participation in the administration of the Fisheries Division and in the development of all levels of the fisheries sector.

The Advisor was to describe the personnel, infrastructure and finance necessary to accomplish these tasks, and to identify possible external sources of funding. In addition, personnel requirements were to be laid out, positions described, training needs identified and counterparts recommended.

An American fisheries advisor was recruited and served from 1987 through 1989. He assisted the Fisheries Division in the design and implementation of the subsequent four USAID 0009 funded projects (Grant Nos. 91.2, 91.3, 91.4, 91.5 and 91.4 amended) listed below. The initial budget for three advisor's three years was estimated at US\$ 182,000. All but US\$ 15,000 was spent.

2.3.2 Multi-fisheries Project (91.2) 7/87 - 12/90. (US\$ 70,000)

This project provided funds for immediately identifiable equipment needs for research and for extension activities. The US\$ 70,000 purchased 1) two computers and a printer for stock assessment work (US\$ 22,000), 2) three air conditioners for the computer environment and a photocopier (US\$ 9,000), and 3) three 4WD vehicles for extension work (US\$ 39,000). The extension work was associated with the ongoing programs mentioned above and described in more detail below.

2.3.3 Mussel Culture/Small Scale Fisheries Extension Services
(91.3) 9/87-12/89. (US\$ 87,500)

This project supported two activities, the ongoing mussel mariculture project and the ongoing FAD deployment/fisheries extension project. The Fisheries Division started an investigation into the possibility of culturing the Philippine Green Mussel in Western Samoa in 1981. Green mussel was considered a possible "cash crop", rich in protein and suitable for cultivation at the village level. The project was aimed at training village women in the techniques of mussel farming .

In 1982 a pilot culture project was established. In 1983 new pilot projects were also established at remote areas on Savai'i and Upolu islands to determine how mussel cultivation would develop under village conditions. Concurrent with this project was a proposal to open extension service offices at Asau and Salelologa, the two main centers of population.

A three-ton flat-bed truck was purchased with 0009 funds to transport raft materials long distances and to enhance the availability of extension personnel. Two 15-hp outboard motors (one used as a spare) and a dinghy were purchased as well for extension activity.

The small scale fisheries component of 91.3 was designed to assist the fisheries division in its task of encouraging small scale fishermen to fish outside of the reef using FADS and innovative fishing methods. One purpose was to take pressure off the bottom fish and certainly the reef and lagoon fish. The vehicles mentioned above were utilized in connection with this extension work.

On average a FAD, designed for use in Western Samoa, cost US\$ 3,200 because it is constructed of heavy gauge aluminum and requires heavy chain. This is not an optimal design world-wide but was considered necessary here. A total of US\$ 39,000 was spent on FAD construction and maintenance. Another US\$ 37,000 was spent on supplies and equipment for gear design for exploratory fishing in deep water. The final US\$ 11,500 was spent on the flat bed truck and on two outboard engines.

2.3.4 Industrial Fisheries (91.4) 9/87.
(US\$ 80,500)

This project was canceled. It was intended to focus on the feasibility of establishing a purse seine fishery and a tuna cannery. The funds were originally to have purchased 16 months of consultancy (US\$ 52,000) and to cover gear and equipment and vessel charter costs. These funds were folded into 91.5 activities as described below.

2.3.5 Deep Sea Bottomfishing (91.5) 9/87 - 12/90
(\$US 268,000)

By 1987, there was very real concern about the wisdom of the continued high pressure on deep bottom species. Rapid declines in landings-per-effort of the handlining fleet were experienced in American Samoa. At the same time, new technologies which would only increase the pressure, electric and hydraulic reels, were being introduced in Fiji.

The division saw the need for 1) a thorough analysis of the productivity and potential of their bottom resources, 2) an analysis of the potential for new harvesting methodologies including the new reel technology, and 3) an analysis of the feasibility of export marketing.

The project called for acquisition of a vessel which would be designed to carry out an exploratory assessment of bottom fish resources throughout Western Samoa and also be used to provide the basic data for a study of the economic feasibility of an expanded deepwater fishing sector: the fish produced were to be used in marketing trials, with export the ultimate goal. The vessel would then be used as the nucleus of fisheries extension and research for all of the nation's fisheries. In addition to the vessel acquisition, the project was intended to incorporate a training component for research assistant personnel and training in the statistical analysis of the data collected.

A vessel was chartered for one month's preliminary exploratory fishing to help define the requirements for the new vessel, and to make a first estimate of resource productivity for a depletion experiment. The strategy was defined by NMFS Honolulu personnel.

2.3.5.1 Vessel Construction

An existing commercial design (43 ft. salmon gillnet vessel) was chosen by a short-term consultant who made arrangements for construction, proposed significant modifications, and oversaw the initial building. The vessel was launched in August 1988 and arrived in Apia in November. Final costs for vessel acquisition were on the order of US\$ 200,000. Some US\$ 48,000 was contributed toward construction by the Small Island Countries Fisheries Development Project (of USAID). Details of expenditures are given for this project below in the section on organization and management, section 4.0.

2.3.5.2 Masterfisherman/Gear and Equipment (91.4 amended)
(US\$ 80.5)

The funds from Project 91.4 were employed in this project to recruit a masterfisherman to act as vessel captain and take charge of all operational aspects of the program including fitting out the vessel. He was responsible directly to the Chief Fisheries Officer and was assigned a counterpart. He was to train all new vessel crew as required.

3. ACHIEVEMENT OF ASSISTANCE OBJECTIVES.

3.1 Overview and Fishery Advisor (91.4)

The Fisheries Advisor was successful in initiating a variety of activities under 0009. A standard litany of unfortunate circumstances left most of the capital equipment purchased inoperable save for the very fine vessel. At the time of the team's review, however, there was a sense that all planned division activity had come to a standstill. The department was experiencing staffing problems; a number of qualified staff had left and morale was very low.

The team was unable to obtain a copy of the fisheries advisor's final completion-of-duty report which, it is assumed, he produced. It would have been helpful to understand the context in which many activities were planned. For example, though much of the financial resources were directed at bottom fish fishing, the real success of the overall project is what has been revealed about tuna fishing. It is clear that some thought went into the decision to bring in the SPC masterfisherman for tuna gear trials, but there is no documentation of the switch in emphasis. It is particularly unfortunate that information concerning the recommendations he made with regard to training is not available. There are no expenditures for training listed in projects 91.1 - 91.4, although training under 91.5 did occur into late 1991.

The advisor seemed to be held in high regard among those with whom we spoke. And it could be argued that an important task which was successfully executed was the assessment of bottomfishing potential.

However, as things stood in September, 1991, it appeared that the department's primary activity would be to use the research vessel to deploy the remaining four FADS. Without an injection of more capital for FADS, the department would be relegated to standing by and observing the decline of an increasingly important fishery -- one around which this project was not initially planned but one which it influenced none the less.

3.2 Computers, Support Equipment and Vehicles (91.2)

3.2.1 Computers and support equipment

Two computers, peripherals and consumables were ordered with the assistance of the Forum Fisheries Agency technical staff. An administration problem developed when USAID ignored previous instructions and forwarded the entire amount under this grant to the Western Samoan government. Funds for the computer purchases had to be extracted from the local Treasury and sent to FFA in Honiara, thus causing some delay.

Arrangements were made for a local instructor to provide preliminary instruction and support to the staff at the Fisheries Division. This began in late 1987 when all senior staff were provided with instruction for 2 hours per day for one week each. One senior and two junior staff member have attended regional training programs for computers (not USAID funded).

After the arrival of a power line conditioner, the equipment was set up in a separate air conditioned office. Access to this office was restricted to staff users of the equipment. The air conditioning equipment was critical to the functioning of the computers. Newer computers are less sensitive.

The equipment provided has assisted the Fisheries Division in many aspects of its work. Catch and market records are kept on file, as are growth, aquaculture mortality data, and records of the ongoing bottomfish assessment research. The team was impressed with the array of software which had found its way into the air-conditioned computer room. Much of it quality public domain material, much of it packaged or personalized stock assessment programs -- a form of currency among fisheries scientists.

In sum, the microcomputers were well used. They are a catalyst to the collection and analysis of data of all kinds. As such they encourage scientific communication among biologist-users throughout the region.

3.2.2 Extension vehicles

The original grant provided for three 4WD vehicles. It was later agreed between USAID and the Fisheries Division that this project would cover the purchase of two 4WD drive type vehicles and one 4 1/2 ton flatbed truck funded under project 91.3, with the third vehicle to come from the latter project.

These vehicles were heavily utilized for transport for the conduct of extension and advisory services to about 700 fishermen throughout the country. These services were crucial to the promotion of FAD and alia use for harvest of pelagic resources. They were not a good buy, however. Of the total of four vehicles purchased by the project, one 4WD and the flatbed truck were marginally functional at the time of the team's visit. All vehicles except the last purchase had mechanical problems. All of the Mazda engines performed well but other vehicle components gave out.

3.3 Mussel and Small Scale Fisheries Projects (91.3)

3.3.1 Green Mussel Aquaculture

Cyclone Ofa, which spent much of its force on Western Samoa completely destroyed the green mussel aquaculture site. The tragedy of Ofa was that the culture project had just harvested its first crop and had been successful in marketing the product for WS7.00 (seven Tala) a kilo shell on -- a very substantial price we were told. There was not sufficient material at hand to assess whether the site would have definitely been profitable, although the indications are that it may well have been.

We were also told that a UN expert had visited the site after Ofa and declared it essentially dead for the purposes of aquaculture. There was nothing available to read to substantiate this, nor were we aware of plans to seek another site. This was the sole project which the team has examined which intentionally involved women in fisheries production. Although the project was acclaimed a success by those interviewed and interest in aquaculture projects as expressed by the government is high, there has been no attempt to start a new mussel project.

3.3.2 Small Scale Fisheries

The small scale fisheries project was aimed at enhancing village fishing by incorporating government supplied FADS in fishing beyond the reef. Trial fishing methods which paid off were trolling for skipjack tuna and deep water handlining.

Because of the lack of a report on conditions existing in 1987 when this project began, it is impossible to allocate benefits to the deployment of FADS which were paid for by the project (some dozen or so) or to the increased effectiveness of the extension activity. Garnering information from the report of P. Watt on the long lining experiment, the 100 or so alia which existed in 1987 - 1989 before half were destroyed by Ofa, brought in an annual average total of approximately 500 metric tons of skipjack to the major markets. This was worth roughly WS\$ 3.7 million.

If the cost of FADS are ignored and a fuel and vessel subsidy continued, then this form of fishing might prove profitable. The important role of FADS and the financial support for them is discussed further in the section on sustainable development below. Even in the absence of hard numbers, it is clear that with FADS skipjack (and other fish) can be caught efficiently and without them they can't.

The FADS produced in Samoa are very heavy duty versions of an array of devices used around the world. Heavy chain connects large concrete foot pads to heavy gauge aluminum rectangular floats containing large identification fins. Part of the rationale for the heavy gauge materials was that the Samoan fishermen would tie-off on the floats overnight. If a significant number of boats did in significant wind, the float would disconnect from the foot if lesser materials were used, and/or the entire FAD would move and sink.

In the aftermath of cyclone Ofa, with the alia fleet cut in half, funds from this project were made available to assist in supplying the fleet with adaptations of gear for vertical longlining methods developed by the South Pacific Commission.

3.4 Bottomfishing/Masterfisherman (91.5 & 91.4 amended)

3.4.1 The Vessel

This was the largest component of all of the 0009 assistance to Western Samoa. This project's primary objective was to acquire a new fishing vessel suitable for research in the near and offshore banks around Western Samoa, to determine the state of the bottomfish resources and their maximum sustainable yield as a commercial fishery. All of this was accomplished.

The 43 ft. vessel construction contract was awarded to a firm in Tacoma Wa. The USAID Masterfisherman played a crucial early role in the construction. Construction and outfitting compromises had to be made when budget uncertainties developed. Credit is given all around to the USAID office, the Masterfisherman and others who made complicated arrangements to keep the project going. A design was agreed to in January, 1988 and the vessel launched in August of the same year. It arrived in Western Samoa in November and bottomfishing trials began before the month was out.

3.4.2 The Trials

Bottomfishing trials lasted eleven months, from the end of November, 1988 through late October, 1989, and consisted of twenty-one bottom fishing trips. Samoan hand reels were used almost exclusively so that the data could be compared with the effort expended by the artisanal fleet. Steel versions were adopted after problems with the wooden ones were encountered. During the trials, the vessel was used to deploy four large FADS.

Systematic data collection and recording proved problematical, but, by the end of the trials, the appropriate crew were doing the appropriate jobs. There was great reluctance on the part of the crew to utilize the more advanced reels and their potential was never really tested. This continues to pose problems.

The results of the Bottomfish assessment indicated an maximum sustainable yield (MSY) of 118 tons/year for the entire country. The opinions of the Captain/ Masterfisherman was that the fishery was not economical for this type of vessel. There are two issues which should be raised with this analysis. The first is that the conclusions of gross unprofitability are true when the costs component reflects the operations of a vessel like the Tautai Matapalapala, and the revenues reflect the production of Samoan hand reels.

That the Samoan reels were used was appropriate for the objective of assessing CPUE of a given technology. A more appropriate economic analysis would have been to examine the profitability of the new vessel while using the most modern reel technology it could carry. Of course one can easily associate the Samoan reels production to the costs of bottom fishing from and alia.

A second issue concerns the results of the stock assessment(s). A preliminary assessment by Su'a, puts the total MSY at between 18 and 50 mt/yr. An FAO assessment by King estimates it as 118 mt/yr and another methodology used by King has the equilibrium yield at approximately 88 mt. These are fairly close to each other and in the range of other research carried out in other parts of the Pacific. They are surprisingly low and indicate the fragility of the species of interest and their unsuitability for any significant development dependence.

The notion that "Bottomfishing in the South Pacific is dead" an opinion shared by several very experienced advisors encountered by the team, may overstate the truth. A condition needs to be added that limits the fishing to methods likely to be used by fishermen fishing from small boats. In other words, the use of hydraulic gear in fishing substantially deeper than depths fished in the assessment have proven to be profitable in the short term. But this method requires substantially larger vessels which relocate frequently. The stocks can be fished down fairly rapidly.

It is claimed that the trials conducted from the research vessel stopped short of fishing at the appropriate depth. In particular, the failure to use the advanced technology reel on the research vessel to fish deeper, keeps this question open. This question is probably central to some of the PIMAR activity in Tonga and Tuvalu.

3.4.3 Training and Marketing

The training of division personnel in computer use took place in Apia. Training in biological statistics took place in a course/workshop in Hawaii arranged by NMFS. In this project, money was originally put aside for training and for marketing studies. All of the training money had not been spent by the original end of project, December, 1990. The Samoan Captain was finally able to receive training in Fiji in the latter part of 1991.

Marketing studies were to accompany the bottomfish exploratory fishing. The idea was to discover existing and establish new contacts for export of catches such as snapper. In the course of the project, the marketing function of the government was privatized and a firm called SAMPAC became the sole exporter of fish from Samoa.

Given this development, it was felt that there was no need for project funds to be expended for the establishment of external markets, as SAMPAC was in the process of doing that. SAMPAC played an important role in determining the viability of exporting large tunas, a development which is described below.

3.5 STAGE-TWO DEVELOPMENTS

3.5.1 Background

By the end of October, 1989, the bottomfishing trials were completed. A report was written by (we assumed) the USAID Masterfisherman in December. In the report he recommends uses for the vessel beyond the "USAID-funded longline project." Reference is made in this report to a hydraulic longline hauler which would be used at some point beyond the scope of the bottom fishing experiments.

The data used for bottom fishing stock assessment work by both Su'a and King had been collected during the stay of Capt. Weinberg, which ended in the last quarter of 1989. It appears that Capt. Weinberg left Samoa soon after the completion of the bottom fishing report.

At this point the vessel's scientific activities and economic feasibility activities were at a stand-still, though it was presumably intended to be used for FAD deployment. A year remained in the project timetable. We presume also that a search for someone to carry out longlining work was underway. Cyclone Ofa intervened.

Among the devastation Ofa inflicted was destruction of half of the alia fleet. The research vessel survived and was employed by the fisheries division in trying to reestablish the supply of fish to market. The first nine months of the year were spent in these endeavors.

3.5.2 Pelagic Longlining Trials

In September, an SPC Masterfisherman arrived to conduct vertical and horizontal longlining trials from Tautai Matapalapala using the methods developed by the SPC's Deep Sea Fisheries Development Project (DSFDP). It is unclear who funded his year's service. The objective of the program was to attempt to evaluate if commercial fishing for larger tuna species (yellowfin, bigeye, albacore) would be viable, and if methods could be applied to the alia catamaran fleet.

Markets for high quality large tuna for sashimi had been established and the demand for product delivered fresh seemed very strong. And so a major (though later) component of the tuna activity had to do with marketing.

Thirteen trips were taken between October, 1990 and March 1991. Three fishing techniques were tried. The horizontal long lining method was considered not viable from the research vessel as it was laid out because of the low milage of long line it could reasonably expend. More importantly, it was concluded rather rapidly that this method was very inappropriate for alia use. The deployment of vertical longlines appeared to be sufficiently rewarding to recommend adaptation to the alias.

The SPC Masterfisherman recommended that further trials take place from March onward to determine if adaptations to the gear could be made and alia vertical longlining viability tested.

3.5.3 Alia Vertical Longlining

The vertical longline technology used aboard Tautai Matapalapala was modified and adapted to an alia for experimental trials. In addition to the vertical dropline (longline) components themselves, substantial adaptations were required of the alia deck layout.

Twenty trial trips were taken and the methods gradually adapted. The results were very encouraging. The project then trained ten alia fishermen in the methods and equipment and the division assisted the fishermen with outfitting their vessels.

The output of these fishermen increased substantially over their production using trolling methods. In addition, fuel savings were substantial. Fish handling and bleeding techniques were taught and SAMPAC began to successfully export the product.

In order to reduce the amount of tying-off of vessels on the deployed FADS, a method which was initially part of the vertical long lining strategy, the Masterfisherman designed a submerged parachute anchor or para-anchor to slow the drift of the vessel through the aggregated fish. This method was successful. The report on these activities (Watts, 1991) recommended that the para-anchor could be utilized in other deep water fishing.

Although no thorough cost/earnings analysis has been done to date on all of the possible methods of fishing from alias, the vertical longlining method is most likely to be profitable. At the time of the team's visit, some two months after the end of the dropline project, twelve alia fishermen were actively engaged in producing large high quality tuna for export.

Note:

It is not clear from the information at hand whether and at what point USAID funds were used in the pelagic longlining trials or in the subsequent adaptation of the vertical longlining technology to the alias.

4. ORGANIZATION AND MANAGEMENT OF ACTIVITIES

4.1 On FFA Management

Funds for all of the projects (879-0009.91.1 - 91.5) were administered through the Forum Fisheries Agency. FFA monitoring of expenditures and reporting met the highest standards. FFA has played an integral part in trying to insure the success of this and other projects.

4.2 On 91.1 - 91.5.

In the final stages of implementing the activities, considerable delays occurred. The Project Assistance Completion Dates (PACD) for most of the projects subsequently had to be extended by USAID. The support and assistance provided by the SPC Masterfisherman (following the Division's request), greatly assisted the Division in completing the project.

Reporting for the projects was carried out by FFA which administered the funds on behalf of the Government of Western Samoa. Through this arrangement reporting requirements of the grant agreements were adequately met.

In the course of implementing 91.5, a number of modifications were sought because some project components were not considered necessary. Although these modifications were approved by USAID, these may have influenced the achievements of the project.

Budget Item	Original (US\$)	Approved Revised (US\$)
1. Preparatory work	5,000	5,000
2. Vessel Charter	30,000	21,538
3. Information Analysis	5,000	0
4. Vessel Specs and Prep	6,000	6,000
5. Vessel Construction	150,000	96,792
6. Vessel Equip and Spares	30,000	43,407
7. Sea Trials and Delivery	20,000	31,928
8. Marketing Trials	10,000	0
9. Vessel Operations	35,000	27,577
10. Training	10,000	5,000
11. Data Analysis/Report	15,000	28,500
12. Administration Costs	0	9,024
13. Storage and Insurance	0	1,934
	-----	-----
	326,000	276,700
	=====	=====

The reduction from the original approved budget was to create savings for partial funding of Project 879-0009.91.4, the Consultant/Masterfishermen. Two new project items were included in the final approved budget. Unfortunately, the marketing item was eliminated -- ostensibly because SAMPAC had been privatized. This may have been a shortsighted savings in light of the continued dependence of fishermen on one export source and the lack of other marketing information.

6. IMPLICATIONS FOR SUSTAINABLE DEVELOPMENT

6.1 Fishing Methods

The assistance provided under 0009 for Western Samoa's fisheries programs was significantly more than that provided to other participating countries. The basic thrust of the expenditures was to explore possibilities for sustainable resource exploitation.

After the construction of a durable vessel, the pursuit of several avenues of inquiry, the devastating cyclone Ofa, and injection of SPC DSFDP know-how, the project finally succeed in identifying one or possibly two sustainable enterprises. It also succeed in eliminating several other possibilities.

A composite description of the predominant types of fishing activity and their relevance to food production and sustainable employment are given below:

1. Inshore Fishing: Uses traditional canoe when a vessel is used. Most of the production is eaten. When there is some surplus it is sometimes sold. The production represents the bulk of the fish in the Apia and other markets and sixty percent of the total production. Thirty-five to forty percent of the population engage in this type of fishing. FAO (see L. Zahn) is documenting the rapid decline in lagoon and reef fisheries -- on the order of 50% reduction since 1983.

2. Offshore bottomfishing using alia: Approximately seven vessels in the Apia area and fourteen on the western end of Upolu pursue this type of fishing full time. These latter vessels sell to American Samoa, "where there is always a market". Fishing expenses for this type of fishing are low as are maintenance costs when compared to other forms of alia use.

A management plan, probably employing closed areas is being development. Limited resources probably preclude this method from becoming truly profitable. King and others estimated that fourteen alia bottomfishing full time could capture the sustainable yield of all Samoan waters. Most of this catch is destined for export.

3. Trolling for skipjack using alia: This is the principal fishing method for approximately 60 alia year round. Catches average 50 kg/day and receive approximately WS 1.30 per pound. Fuel costs are very high as are repair costs because the vessel is always operating at high speeds. This fleet is playing an increasingly important role in providing fish to domestic markets as the inshore fisheries rapidly decline.

In the absence of the vessel fuel subsidy, the vessel subsidy and the provision of FADs by the government, it is very unlikely that this form of fishing by itself is sustainable. Conversely, the provision of FADs and the fuel subsidy can be counted upon to bring forth skipjack tuna for domestic consumption. Because of this clear relationship between FAD provision and food productivity, it is likely that the government will continue to seek foreign assistance in FAD provision (see below).

4. Vertical longlining for large tunas from alia: There are fifteen full time fishermen in this fishery. The average catch is estimated at 140 kg per trip which nets T 1.60 per pound. The trips are typically day trips. Fuel costs are considerably lower than trolling costs and equipment losses are not significant. Yet another profitable activity is the combination trolling after the vertical longline has been deployed.

There are definite congestion limits around FADs and the upper limit of vessels fishing them depends on what gears are used. Up to five vessels (alia) using both vertical longlines and trolling between sets can use a location effectively.

Current constraints to the smooth operation of an alia based large pelagic export sector include: the low volume of available export product, shortage of suitable tuna bait, shortage of suitable fishing gear, and the need for more FADs. The fisheries division might address some of these shortages.

6.2 Outlook

The principal immediate problem to be addressed by the Government of Western Samoa in the fisheries sector concerns the provision of fish protein in the face of declining subsistence catches. In the short term the government must seek to deploy more FADS and encourage all offshore pelagic fishing activity. In the longer run, ways must be sought to bring down the cost of FADS.

With the exercise or at least the declaration of rights to fish resources being observed, it might be possible to organize the "privatization" of FADS among organized or related groups of fishermen. The costs of fads need not be as high as they are. If FADS and their use are policed by those with an interest in them, FADS of much less expensive construction would survive at least as long as the currently deployed floats. Much has been written and experienced with regard to their construction, ownership, rental, leasing, policing and maintenance.

7. OTHER CONSIDERATIONS

The following comments stand alone and are prompted by the experiences in Western Samoa and by the nature of the 0009 project there.

- Some members of the government expressed the opinion that in many instances the provision of foreign assistance carried with it unstated or understated maintenance and upkeep costs (recurring costs) which the particular receiving agencies failed to communicate to the rest of the government. While the use of intermediate agencies such as the FFA greatly increased the efficiency of project monitoring, procurement and reporting, some vehicle for review of recurring costs by other responsible government departments needs to be worked out.

- The approach taken in the Western Samoan project -- basically one of discovery of feasible activities -- should be valuable to the PIMAR exercise. It should not be necessary to repeat each experiment in every country. The resources which the SPC's Coastal Fisheries Program represent should be utilized.

- With the presumed departure of the local Captain of the Tautai Matapalapala, the value of the vessel to Western Samoa is slight at this point. Some (compensated) use for the vessel in PIMAR activities should be explored.

8. MEETINGS

MONDAY 2 SEPT, 1991
0900

Honorable _____, Minister of Agriculture,
Forests and Fisheries.

1130

Mr. Tupuola Tavita, Director of Agriculture, Forests and
Fisheries.

1400

Ms. Henari Petana, Deputy Secretary for Finance

1700

Mr. Taniela Su'a, Acting Chief Fisheries Officer

TUESDAY 3 SEPTEMBER

8:45

Mr. F. Vitolio Lui, Asst. Secretary for Foreign Affairs.

ALSO PRESENT: Ms ???

1145

Mr. Peter Watt, Canadian SPC Masterfisherman

1300

Ms. Lusia Sefo, Deputy Asst. Secretary to Government

WEDNESDAY 4 SEPTEMBER

0900

Mr. Farani Fosala, Manager and Designer of Vessels Smack Corporation.

Mr. Tu'ufa Savalu, Government Relations, Smack Corp.

Mr. Eugene Hill of Am.Samoa, Business Partner

1100

Mr. Robert Willis, Operations Manager SAMPAC

1300

Mr. Taniela Su'a, Acting Chief Fisheries Officer

THURSDAY 5 SEPTEMBER

0900

Dr. Leon Zann, UNDP/FAO Fisheries Resources Advisor.

IV.C. EVALUATION REPORT: KIRIBATI'S TE MAUTARI LIMITED (TML)

1. INTRODUCTION

Over the period August 15 to September 13, a review team visited the site of four projects which received funds under USAID's South Pacific Fisheries Development Project (879 - 0009). The team members were Wycliffé Bakeo, Director of Fisheries, Vanuatu; Felix Panjuboe, Project Development Officer, Small Island Countries Program, Forum Fisheries Agency, Solomon Islands; Gerald Russo, Commercial Fisherman resident in Fiji; and Philip Logan, Consultant to University of Rhode Island, on leave from USDOC, NOAA, National Marine Fisheries Service, Woods Hole, MA, Team Leader. For much of the trip, the team was accompanied by Elisala Pita, Fisheries Advisor, USAID, RDO/SP.

The team was to examine and assess the beneficial impacts of, and lessons learned from the assistance extended to three bilateral projects -- Papua New Guinea's Manus Island canoe development project, Western Samoa's fisheries development program, and Kiribati's National Fishing Corporation, Te Mautari Limited (TML) -- and to one regional activity, the South Pacific Commission's Tuna and Billfish Assessment Program (TBAP).

TML received US\$ 381,700 under 0009 to support four activities. The team was specifically asked to review the impact of the funding for these projects. In addition, the team was to examine and evaluate the role of national fishing corporations as vehicles for sustained commercial fisheries development.

The team visited Tarawa, Kiribati from September 7-13, 1991 and held meetings with government officials, TML staff and interested private parties (see attached list of meetings).

Summary of Findings

1. The assistance provided by USAID was well targeted by the 0009 delegates from Kiribati. In effect, the aid was directed at creating some useful company assets, salvaging others and improving the comparative advantage of having trained local crew.

2. The office building was well sited and utilized, the training funds were spent on specialized training for potential and existing employees. As planned, the vast majority of graduates of "pre-sea" training was hired by TML. The provision of a new replacement engine added three working years to one of five fishing vessels, the fish aggregating device (FAD) sub-component funds were merged with other FAD funds after the failed deployment of a specialized version.

3. There were minor communication problems among the several government units responsible for accounting, reporting on and executing some of the projects. A very small amount of otherwise well spent funds remained idle as a result.

4. Since 1981 large sums of money have been expended and benefits have been foregone in exchange for different levels of corporate fishing experience, and the subsidy of many more large capital assets. The comparative advantages Kiribati brings to the array of options now under consideration are significantly greater than those it had 1981. The evidence clearly suggests, however, that they are not sufficient to make the unassisted state corporation the best option for national involvement in fishing.

5. The losses incurred in that experience should not be factored into decisions concerning what to do now. The decisions at hand concern what to do with existing operations and assets now so as to have them earn a sustainable profit, ideally a profit at least as great as the income which could be earned by selling them and investing the proceeds.

2. BACKGROUND

Kiribati has one of the region's largest Exclusive Economic Zones (EEZ) surrounding the three main island groups, the Gilbert, Phoenix and Line Islands. The area straddles the equator where the warm sea exhibits little seasonal variation and counter currents produce nutrient rich up-wellings which attract tuna.

The tuna resources in Kiribati were harvested as far back as the early 1960s by Korean and Japanese fishing vessels under bilateral access agreements. These fishing nations have been joined by Taiwan and the USA, with the latter operating under a multi-lateral fishing agreement.

Though these arrangements earned Kiribati economic returns through access or license fees and through limited employment opportunities, the government felt that the nation could do better. Unlike some of other large Pacific island countries with numerous natural resources, marine resources provide Kiribati with the only opportunity for economic development. This led the government to support the establishment of a national fishing company in order to exploit the presence of the resource to the fullest.

2.1 Development Strategy

The Fisheries Division, under the Ministry of Environment and Natural Resource Development is charged encouraging and developing the nation's capability to harvest the marine resources within the nation's EEZ. In 1981, Te Mautari Fishing Company Limited (TML) was incorporated as the national fishing company of Kiribati. The government turned over assets (vessels, infrastructure, fishing equipment and the services of personnel) to the new fishing company, in return for share capital. The government also purchased additional shares for cash to provide the company with working capital. TML also received assistance from foreign donor governments and agencies, including United Kingdom, Japan, Canada, EEC, and the United States.

The company has been pole-and-line fishing for almost 10 years using at most a maximum of five pole-and-line vessels at any one time. The fleet has fished mainly within the Kiribati EEZ. Its carrier ship transports catches from freezer facilities at Betio to regional processing plants in, for example, Fiji and the Solomon Islands. The mothership has been made available for hire by other island countries to transport their fish.

The company also operates the South Tarawa fish market, buying and selling locally caught fish and providing ice. The company also buys and transports tuna and other fish from small-scale fish production which are part of the Outer Island Project.

2.2 Development Assistance.

It has been estimated that assistance to TML from its inception amounts to almost A\$21 million. The United Kingdom has provided technical (management and administration) assistance, an initial research vessel (sunk after it reached the end of its usefulness), and the Betio jetty (A\$3 million).

Japan contributed assistance from the beginning as well. It provided the Betio fish market and one of the original pole and line vessels. It provided technical fishing assistance. It provided two additional pole and line vessels, the large transport vessel and a large cold storage facility.

The European Economic Community provided two Fiji-built pole and line vessels in 1987 valued at A\$2.76 million. Canada has donated computers and other assistance.

The Ministry itself funds the operation of a 80 hectare milkfish bait farm which, while now providing fish for food and some bait, was originally designed to provide sufficient bait at a subsidized price for all of TML's operations.

USAID assistance to TML under the 0009 program was designed to address several contemporary problems in TML operations. The \$381,700 supported four separate activities:

- The replacement of the engine on one of the Japanese supplied pole and line vessels (\$177,500).
- The training of both local fishermen and fisheries personnel from private industry in specialized courses. (\$77,000).
- The provision of an office building to facilitate and improve TML's management and administration output (\$87,200).
- Provision of deep-water FADS to increase vessel catch rates (\$40,000).

Clearly the success of TML did not hinge on the effectiveness of the USAID assistance.

3. ACHIEVEMENT OF OBJECTIVES: USAID ASSISTANCE

In general the niches identified by the I-Kiribati delegation for assistance under 0009 were able to benefit TML directly and carried with them minimal administrative burdens. The special thrust of 0009 allowed for assistance to activities which might not have ranked as highly in terms of critical needs as other longer-to-research needs.

The USA-built engine supplied by USAID was fitted into the Nei Arentetongo in Fiji. It permitted the vessel to operate for three additional years before it too failed while in the Solomon Islands. The reasons given for the second failure had to do with a long developing mismatch between the propeller, gearboxes and the engine. Several people interviewed held the opinion that proper oversight had not been exercised during installation.

In retrospect, it is likely that continued operation of this vessel was not in the long term best interest of the firm. While it could not have been known at the time, the returns to the vessel's operation were not sufficient to cover depreciation (replacement) fixed and variable costs. To compare all of the revenue generated after the engine was replaced with the cost of the engine is misleading. The appropriate comparison would have been between the required expenditures and the profit over and above depreciation that the rehabilitated vessel would have generated. This is the appropriate rule for evaluating the corporations expenditures now.

The deepwater fish aggregating device was constructed and deployed but was soon swept away partly because of the inappropriateness of the site at which it was placed. The remainder of the FAD funds were pooled with other funds dedicated to FADs provided by other donors.

A low maintenance, two story office building was constructed at the jetty which allowed ample space for administration and counterpart training at a more central location than was previously available. The building continues to be in full use and in good condition.

The training component consisted of two different courses of study. Part 1, in two phases, was aimed directly at enhancing skills of current and potential employees of TML. The courses in fire safety and "pre-sea" training were to take place between 1986 and 1992 and train approximately 120 persons. Ninety-five persons were trained and all but a few were employed by TML. The demand for training fell off as TML's expansion slowed.

The training under part two had less relevance to TML operations. It permitted advanced study via correspondence courses for promising graduates of the marine training school. The courses constituted preparatory work for advanced studies overseas for deck ratings. It was expected that 27 persons would receive this training. Approximately 70 persons have begun the courses. Of these approximately 50 are considered still active. It is estimated by the school staff that fifteen are likely to finish.

There is a chance that graduates who have taken these courses or graduates of the marine training school whose overseas careers are ending may eventually play a role in whatever succeeds TML.

4. REPORTING AND MANAGEMENT

As with several other components of the 0009 project, disbursements from USAID to the Government of Kiribati were funneled through the Forum Fisheries Agency's Small Islands Project Office. That intermediary management agency was responsible for generating financial statements, and gathering the required reports. The within-Kiribati management of the funding of the activities was considered cumbersome and time consuming for all concerned because of the requirements of the internal bureaucracy. However, those who were close to the operation of TML felt that the bureaucratic complexity surrounding the handling of foreign assistance funds did not reflect the complexity of operational decision-making within TML.

Before funds from aid donors were received, the responsible ministry (in this case the Ministry of Environment and Natural Resources Development) was required to submit development estimates to the Ministry of Finance to be incorporated into the overall government budget for consideration and approval by Parliament. Only after Parliamentary approval would funds be allowed to be requested from donors for approved activities.

When project funds from the approved projects were received (by the Finance Ministry) from donors, they were deposited in a general or consolidated fund. The Treasury would then issue warrants to the concerned ministry which would issue Local Purpose Orders (LPOs) or Payment Vouchers (PVs) depending on the nature of the service required. The MNR kept copies of the PVs and LPOs to be reconciled later with the Treasury Statement.

The MNR would wait for expenditure reports from other ministries or TML if funds were disbursed to them. The required reports were often delayed because of the number of layers of responsibility involved. These delays held up the implementation of subsequent phases of activities.

The team felt that these procedures could and should be streamlined for the benefit of all concerned. It also recognized the unaccounted for burden on bureaucracies posed by the variety of reporting requirements of many donors. The funding and reporting requirements under PIMAR deserve to be reviewed because the existing system itself has the potential to cause delays even when all the elements for project implementation are at hand.

5. OVERALL PERFORMANCE OF TML.

TML has had two years over the past ten during which revenues were sufficient to cover operating costs. There has not been a period when all fixed costs (including depreciation) were covered and, therefore, none when the opportunity cost of the venture has been met or exceeded.

The Commission of European Communities' report, finished in 1989 estimated that the economic loss, i.e. the difference between benefits and costs (including the opportunity costs), incurred through 1988 was on the order of A\$13 million. Whatever the exact figure, it has grown each year since, even though there was an operating profit in 1989.

In 1990, the company experienced a poor fishing season (total catch of only 600 tons) and it incurred high maintenance and repair costs. With the financial position of the company increasingly unpromising, the government moved to have the company cease operations temporarily in December 1990. TML has recently resumed its operations at a reduced level and is operating two catcher boats plus the carrier vessel.

The litany of problems that have thwarted profitable operation of the company is long:

- the government subsidized baitfish farm produces what has been termed an expensive and inappropriate product;
- the behavior of the pond reared bait has caused the tuna to disperse;
- wild bait, thought to be available year-round, was found to be much more limited in supply and the vessels were not designed to transport large quantities of wild bait.
- cannery prices for frozen product fell dramatically after the start of the venture;
- some of the vessels were considered to be too expensive to operate;
- one engine failed on a principal fishing vessel and the replacement engine failed after three more years;
- the two newest Fiji designed and built vessels were tied up after failure of generators and cooling systems;
- fleet catch rates were considerably below those of all distant water fishing nations;
- fuel prices paid by TML to the government are (appropriately) not subsidized and are high;
- there was reluctance among some elements of management to allow the company to fish opportunistically outside the Kiribati EEZ. It was not recognized for some time that tuna were not available year round
- the management team was characterized as "commercially inexperienced;"
- labor costs were far higher than could be justified by productivity and prices; and, lastly,
- the company operated in a protected government environment where employee incentives were not tied to company success.

Some of these problems were preventable and the responses to them would have been different if the company had been in the private sector and had been taking risks with its own investments.

6. ON EVALUATING ALTERNATIVES

The company, which includes government representation on its board, has been considering a variety of approaches to restructuring operations so as to minimize the drain on the country that TML represents. The team is not in any measure familiar with the profitability of any of the component operations of the company. Still, after having read available materials and discussed a finite set of company problems with a variety of interested persons, it feels that it can at least suggest a set of economic nostrums and express personal opinions which might be employed in the reevaluation process.

6.1 The Economy

It is worth examining a set of rules which should apply in a government's initial decision to enter directly into the fish business or any traditional governmental enterprise, for that matter. The usual set of conditions for government participation in a sector, in basically all forms of governments, is whether or not non-governmental institutions (for example markets) will bring about the desired performance of that sector (to the government's satisfaction), and second, whether the benefits of government involvement equal or exceed the costs (as explained below).

It is a safe assumption that most governments have limited resources. In selecting what problem areas to address or what projects to undertake in order to address basic problems, the government ideally chooses from a portfolio of projects which are ranked according to the net benefits they will generate for the country. Some of these projects lend themselves to easily measurable benefits and costs and others don't. One alternative potentially in every country's portfolio, a kind of minimum standard, is the alternative of investing the project money in interest bearing accounts.

In reality, all national governments are involved in projects whose net benefits are smaller than one or more other available projects. In the US, for example, when projects are, by statute, put to the "Cost-Benefit" test, the usual minimum guideline is simply that the net benefits (as measured by what is called the discounted net present value of producer and consumers' surpluses) be positive. The political process determines the mix of those projects which qualify.

Few governments are willingly, deeply involved in activities for which the benefits to the nation, measured over an appropriate period, are exceeded by the costs. These situations are avoided because they drain the resources which could be put toward more important, more beneficial activities.

The basic procedures and standards for correctly measuring benefits and costs are widely agreed upon. However, a text describing the basics would easily exceed 100 pages (see Mishan [1988], for example). It is not necessary here to go beyond merely stating that total benefits of an activity undertaken by the government are identical to the total value of what is produced while the costs are, ideally, a true measure of all of the resources it took to produce that value.

Net benefits (or net value) then is just the difference between total benefits and total costs. The net benefits result from excess consumer value over what was spent (consumer surplus) and excess revenue over opportunity cost in production (producer surplus). In industries where the product is exported, there is no consumer surplus to measure in the exporting country. Decisions are based upon producer surplus comparisons.

There can be different results (net benefits) when what is essentially the same project is evaluated for two countries with different levels of industrial development. This is not a contradiction. A very beneficial project in one country might not be worth undertaking in another, because of what must be given up to carry out the project. For example, the cost of labor in one country where there is little unemployment is higher than that in a country where the alternative is, for example, casual farm employment. All else equal, a project's net benefits would be higher where potential employees of equal productivity were unemployed.

The development context has other implications as well. For example, a government investment in an industry frequently brings about the establishment of support companies. The magnitude of such so-called indirect effects will vary from industry to industry. Where a country's resources are not fully occupied, the government can add the producer surplus (the net value added) of those support companies to its measurement of net benefits from investing in the primary industry.

It would not be appropriate to do this where resources are already employed because those resources going into the support companies would likely be drawn off some other sector of the economy. There would be, in theory, no significant net gain. When comparing close alternatives in either setting one would expect the indirect effects to "wash out" -- the difference in indirect effects to be small or nil.

Induced effects (expenditures by labor and businesses food, clothing, shelter, entertainment, etc.) are frequently counted in the benefits of investments. However, even within dissimilar project alternatives, these expenditures are like to occur and therefore can be expected, generally, to wash out. The discussion about employment, below, follows the same reasoning.

Another aspect of indirect industries is that government has the option to run a deficit in one company if the payoff in other related support companies is worthwhile, i.e. total net benefits are positive and greater than the alternatives. This is an unlikely but theoretically correct possibility. Of course, if any of the companies is privately owned, it must be financially viable on its own merits.

6.2 The Firm

There are private sector equivalents to the decision rules facing the government at the level of the economy which were described above. Within a given year firms are concerned with what keeps them viable: with profits as measured by revenues less fixed and variable costs. While firms depend on consumers and plan around their wishes, they do not count consumer benefits in their calculations of success, as the government does.

In the longer run a corporation which maximizes profits will remain in a given line of business as long as the profits are equal to or are in excess of the profits available in the next best use of their money and assets. The profits potentially available in other lines of business represent what is referred to as the opportunity cost of being in the business they are in. One opportunity cost always present is the (net) income to be earned by selling the corporation and investing the proceeds in an interest bearing account.

If, however, a firm, for what ever reason, wants to persist in an activity even though the profits are less than the firm could make in other available alternatives, it can do so and do so indefinitely as long as the returns cover variable and fixed costs (including depreciation, maintenance, repairs, etc.), in other words, as long as the true accounting profits are not negative. A company can persist in an activity for a short time when the total of all costs exceed revenues (profits are negative) by covering variable (operating) costs. Eventually the rent is due.

6.3 Employment

The methodology of benefit-cost analysis, if carried out properly, incorporates all of the appropriate considerations of the benefits and costs of different employment impacts of projects. For example, if skilled workers who are unemployed are brought into employment as a result of a project, then, as long as they are not paid inflated wages, the consumer and producer surplus generated by that project (including indirect effects, if appropriate) will completely measure all of the benefits that need to be measured.

If workers are paid much more than what it would take to bring them into employment, say because of some social policy, then the true net benefits of the project are not lessened in an economic sense. The producer surplus is reduced, of course, but the analyst has to be cognizant of this "prepayment" of producer surplus (assuming it will come about) and take it into account. The analyst has to look elsewhere for the true opportunity cost of the labor. If wages exceed the productive contribution of the workers, however, regardless of whether they were formerly employed or not, the net benefits are reduced.

The point of this discussion is that care must be taken in the use of an account of employment numbers in comparing projects. For two projects which, if appropriately evaluated, yield the same benefits but employ different numbers of persons, employment considerations may be validly brought to bear. If one project clearly leads to greater benefits but lower employment than another project, then the former should (ideally) be chosen. Some of the benefits from the former one can be (in theory) used to pay those not employed in the project to work in socially more important endeavors.

6.4 Maximum National Net Benefits from National Resources

All states try to maximize the net benefits they can derive from their natural resources. The process of deriving the maximum net benefits from exploiting fish resources at the artisanal, small commercial and industrial scales calls for a variety of activities all of which generate net benefits. The ideal mix of fishery enterprises might contain some which were entirely driven by private domestic initiative, some which were entirely public in sponsorship and some with mixed support. Some fisheries might have regional and foreign involvement in one or more components of the fish producing system. The reason that the ideal mix would have a variety of participants is that each would bring the best of what it does, the best of what it has, to some fishery situation. No one entity has the comparative advantage in every component, in every aspect of every fishery.

In the industrial fisheries sector, if we assume that sufficient private domestic capital is not available to exploit a particular fish resource on other than an artisanal scale, then the government has a role to play in tapping that source of potential national benefits. The government faces a spectrum of options. At one extreme, it could adopt a risk minimizing role, accepting trade concessions and/or collecting fees in exchange for granting foreign access to the resource. The government might choose not to involve (or risk) any of the nation's financial or human resources directly: none in production, support, processing, transport, marketing, or administration. The risks would be low and the net returns possibly not as high as they might be.

At the other extreme the government might think it worthwhile to develop its own fishing industry. Between these poles may be various combinations of participants each with different levels of investment in one, several or all component parts of a complete marine resource exploitation enterprise. The terms under which non-government entities would participate, of course, would have to be negotiated.

In determining whether to get directly involved -- at what level, in what component(s), and to what extent -- the government would look at how it might fare in comparison to existing successful operations. It would determine the availability of (or the opportunities to manufacture) inputs to each of the component parts of the system: inputs to harvesting (including maintenance and repair), to processing, to storage and transport, etc. It would evaluate its ability to put the inputs together in an efficient and effective manner, to supply the personnel and to carry out the operations profitably given current and projected output prices. Again, available measures of the productivity and profitability of successful operations would be compared.

The government might have some advantages in some components. Clearly one is owning this and other living marine resources and having some advantages of location. It might have a supply of energetic people whose opportunity costs were limited to the returns to some non-industrial activities. I might have extensive knowledge of the resource, its location through time, its behavior, etc. It is worth emphasizing, however, that comparative advantages manifest themselves in contributing to lower costs per unit output. If they merely represent lower costs per unit input, they will not increase producer surplus.

What this comparison also involves is a realistic identification of disadvantages so that honest critiques of purely national enterprises can take place.

Other important issues need to be answered before further costly analysis is undertaken. Two such issues are:

- If some clear advantage to direct government involvement has been identified in some components of what is essentially a food delivery system, are there others who will be willing to complete the system? If not, then the chances the government will be able to undertake the entire operation profitably is open to serious question.
- Are there profitable cooperative arrangements to be made with other existing fisheries within the country such that by increasing the scale or throughput of a component, one or more of the fisheries increases its net benefit contribution to the country without the other decreasing its contribution?

If a component seems worthy of further examination because it appears that it is profitable and sustainable, then serious evaluation of this enterprise is in order. At this point, the best investment to be made is in the best objective advice available.

The analysis would focus on a thorough benefit-cost analysis of alternatives with a strong component of risk analysis. Economic Impact analyses and Input-Output analyses are not appropriate for decision-making in this context. They can supply interesting distributional information, describe a variety of inter-relationships within the fish sector and would, therefore, help in the search for alternatives, and in forming expectations about indirect effects. They can assist in locating feasible scales of operation.

Several more generalizations apply. The initial optimal level of government participation in one or more components of an industry (whether the investment is done alone or jointly) will likely be less than the final equilibrium optimum level because experience with various aspects of the industry will have been gained over time. The more profits that the government earns in the venture, the more it will be able to bring about productive localization of activities through training and education.

However, for any fishery, there is no doubt an upper limit to profitable participation. National endowments differ. Similarly, there is an upper optimal level of overall investment in fisheries by the government (and private citizens) because the best portfolio maximizes returns and minimizes risk through diverse investments.

Meeting social goals through redistribution of income or the purchase of services is only sustainable if the enterprise is sustainable, i.e. covers all costs other than the opportunity cost of other government actions and investments. Pre-distribution of profits is an unnecessary real risk.

6.5 Some Guidelines for the Current Situation

The present mix of fisheries activities in Kiribati includes the Government's receipt of tuna access fees in both bilateral and multilateral arrangements, the operation of small island assistance in artisanal fisheries (with considerable foreign assistance as well), the operation of TML in harvesting, cold storage, transport and other activities, and one or two private fishing ventures.

TML is, in relation to other projects, a grand scheme which initially included bait farming, training, regional agreements, and a very substantial aid component providing much of the capital. It has operated since 1981 and much has been learned by fishermen, captains, the management team, the board of directors and the government.

TML's harvesting operation has incurred probably more than the normal number of debilitating problems in comparison to, for example, a privately operated fishing fleet. Some of these difficulties can be attributed to the fact that much of the capital was donated rather than designed by and paid for by TML. Much of it has been cited as inappropriate. Market conditions changed substantially as well. There is a well documented litany of adverse events and conditions which have hindered TML's development. Some were outlined earlier in this report.

As a result, TML, in trying to make its way -- as structured and with the capital at hand -- has been able to do little more than cover operating expenses in the best of times. After ten years, if it were truly to become a viable enterprise, TML should have been able to evolve to where it could and would have made the adjustments necessary for sustainability: covering variable and fixed costs including depreciation. The alternative to this conclusion is to argue that TML has had the flexibility and incentive system and freedom of operations it has needed, but that it has taken ten years (and will take more) to rationalize operations and identify appropriate vessels, management, markets, etc.

Kiribati has, of course, gone out of its way to give the endeavor more than a fair chance of succeeding. It has essentially subsidized the use of each major contribution it has received in foreign assistance. It is unlikely that more debt underwriting will fundamentally alter the financial landscape.

A corporation having underwritten a subsidiary for ten years would have to expect better prospects than those evaluated by the government in December, 1990. In our estimation, there is very little chance that TML can do other than continue to be a drain on Kiribati's resources, unless non-viable assets are disposed of and costs are substantially reduced.

One view of the enterprise to date is that it represents a learning process, one necessary to industrialization. The reasonable counter-argument asks if any or all parties would repeat the same undertaking for the same results.

Nevertheless, much has been learned about many aspects of commercial fisheries, about the capacities of other fleets, about international business, about resources in and beyond the EEZ etc. Those who might be involved in a rationalization of TML assets and operations know what sets of activities individually and in various combination might constitute feasible and profitable (sustainable) alternatives for the country within and outside of TML.

The following are some obvious suggestions to guide the search for a strategy to rationalize the parts of TML.

- The process should not stop until only sets of alternatives which are sustainable are under consideration.
- The operation of each large capital asset should be evaluated for profitability (covering all fixed and variable costs) under a variety of realistic settings where output is varied. The existing support services should be assumed to continue. Some assets will require that money is expended just to bring them into operating condition. The cost of that rehabilitation should be factored into the calculation of profits unless those costs are to be assumed by some entity beside TML.
- To be retained, an asset's likely operating scenario should be profitable as defined above, i.e. sustainable. Ideally, it should also cover the returns available from investment of income from the sale of the asset.
- Some assets' accounting value may be overstated. Realistic replacement values should be used for depreciation purposes.
- Is there a feasible food production system consisting of (all) sustainably profitable components (assets), i.e. one that gets product to purchasers?
- If not, then is there an additional (currently unprofitable) operation that could be added to make the entire operation feasible (a complete system) and profitable overall?
- If not, can the existing out-of-scale component part(s) be modified so that the entire system is profitable? If not then there does not appear to be a feasible system which is also profitable given the existing array of assets. Operations should cease. Lastly.

- New assets would be required to bring the system into profitability. Otherwise, other uses for the assets should be sought. They might be made available to the private sector, salvaged, sold off, or used in negotiations such as joint ventures.

If a core set of operations survives the examination above, i.e. constitutes a feasible, complete, profitable food production system, then that system's components should be examined to see if they can play a role in making other systems, such as artisanal fishery systems, feasible and also profitable.

A reliance on continued foreign assistance has not been introduced into the discussion above. Having "aid accounts" in this rationalization setting only continues to distort the evaluation and distribution of real costs and returns in this and other sectors.

Likewise, there is no discussion of the option of simply running down existing assets by continuing to operate as long as revenues cover operating costs. In the writer's opinion, more would be gained by selling those assets now and investing the money. However, selling assets simply to subsidize existing unprofitable operations only dissipates benefits further.

The above suggestions only broadly address what might be done with existing assets and operations so as to stop the drain on national benefits. They do not address how to search for the optimal mix of involvement in fisheries. Some very broad ideas were put forward earlier. However, what survives as a rationalized TML may be an element in expanded operations under a joint venture. The returns to that option would have to be greater than those which the rationalized TML would earn. Those assets which cannot profitably play a role in a new TML may play a role in joint venture negotiations as well.

The Government should examine all options for deriving benefits from its marine resources. The TML experiment has some large lessons, the most important, it seems, is that the riskiest component of resource extraction industries is in the actual extraction. It should be left to entities which can adjust aggressively, which can negotiate wages and shares in the most productive manner, which tie bottom-line performance to rewards: basically, entities which will act like successful businesses.

7.0 MEETINGS

MONDAY 9 SEPTEMBER

0900

Mr. Tokiea Creig, Asst. Secretary of Ministry of Environment and Natural Resource Development.
Mr. Teekabu Tikai, Chief Fisheries Officer.
Ms. Tebrengea Teate, Assistant to Secretary, Min. of Environment and Natural Resource Development.

1300

Mr. Herman Taaia, Fleet Manager, Te Mautai Limited.
Mr. Mikaere Manakin, Engineering Manager, TML.

1500

Mr. Simon Diffey, Project Manager, Outer Island Commercial Fishing Trials.

TUESDAY 10 SEPTEMBER

0930

Mr..... N.Z instructor
Mr. Jan..... FRG instructor

1430

Mr. Nair, Planning Office, Ministry of Finance and Member, Board of Directors, TML.

1800

Mr. Teken Tokatake, Secretary for Transport and Communication and former Sec. ENRD.

1930

Mrs. Pam Wilkinson, ODA, Suva. Coord for Tuvalu, Kiribati, Western Samoa, etc

WEDNESDAY 18 SEPTEMBER

1300

Mr. Kietau Tabuebueiti, Manager, TML.

IV.D. SUPPORT FOR NATIONAL FISHING CORPORATIONS

1. Introduction

It is worthwhile to separate the discussion of reasons for and against support for national fishing corporations because of government involvement in what, on the surface, is an area for private enterprise, from reasons for and against support because of the general performance of government fisheries corporations.

2. The Role of Governments in Fisheries

Even in countries where there is a long tradition of minimizing government intervention in markets, government involvement in fisheries is substantial. In the absence of property rights to fish stocks, free markets fail to allocate resources efficiently. The normal profit maximizing activity of firms results in too much capital being invested.

The national profit (called resource rent), which should be generated because a country has such a resource which the market exploits efficiently, is dissipated. By economic definition, the fishery is overfished. It is usually at this late point, unfortunately, that governments are moved to step in and provide for management of the fishery.

The continued investment and reinvestment of excessive capital, coupled with technological advances of that capital usually result in more fishing pressure on the resource than it can respond to positively. Sustainable yields begin to diminish. The resource becomes biologically overfished.

Local and national governments also regularly supply the following goods and services to their fishing industries: provision of jetties, wharves, ports, navigation aids, weather forecasts; provision of safety advice, vessel design assistance, gear research, marketing information, inspection services, etc. In many countries, extension services are also provided.

The common characteristic of these goods and services is that they would not likely be purchased by the usually small units that make up the fishing industries. Individual firms will not pay for population dynamics research or for jetties, for example because of the scale of what needs to be done and because the firm could not benefit from it exclusively. In other words, these goods are, to varying degrees, public goods.

In large economies it may appear that government does not get involved in markets which work well, such as in manufacturing. However, there are a significant number of rules and guidelines laid down by centralized agencies which affect the operation of these sectors even though the industries are not national industries. For example OSHA, other Labor Department offices, the Social Security Administration, etc. affect employer-employee relations.

In smaller economies, it is understandable that the government would want to oversee the operation of an industry which provided, for example, a significant contribution to GNP or to employment. The larger that contribution, the closer the government might want to oversee or monitor that industry's operations.

Likewise, in small and developing economies, it is less likely that private individuals have the capital to risk, should they desire to do so, to establish multiple component, commercial-scale fish industries on their own. The temptation to provide support facilities to spur more enterprise would be as strong in the small economy as it is in the large.

What puts limits on the degree of involvement of government in scenarios such as these, of course, is that the government has limited resources, it has other options for those resources, and, in small economies, it has to be concerned with minimizing the risk it will bear in composing and diversifying the national investment portfolio for its citizens.

3. Performance of Government Fishing Corporations

It is difficult to discern why one or two national fishing corporations appear to be profitable and so many others unprofitable. Some of the difference is in what constitutes a national fishing corporation -- what exactly do the government's civil servants do in and with the corporation and what functions are contracted out. It is a given that private entities in almost all industrial endeavors operate more efficiently, hence more profitably than do nationalized entities.

The answer seems to be that those functions which require operators to act most unlike government, and which require the assumption of much more risk than government can justify, should be left to others to carry out.

It is sometimes argued that other criteria beside profitability may be important: that the funding source may be willing to subsidize sustained losses for the sake of meeting other goals. This notion is used to justify what is essentially the distribution of profits before they are earned. There is very little to justify continued subsidy of a self consuming operation through foreign assistance. Direct contributions of cash to government would be more beneficial than purchasing inefficiently used inputs to the process.

There are sufficient examples of different governments in the region operating various components of the fish industry -- processing plants, boat building and repair, etc -- to provide donor nations with an indication of the viability of these operations. The best donor investment at any point in the process from planning government involvement to examination of options in the face of insolvency is the investment in objective, expert analysis of the viability of different operations: best for the recipient nation and for the donor nation, and best for other nations in the region. It is difficult to carry out sound economic planning when many interdependent regional industries or component parts of industries are being subsidized by government.

The second best investment is in donor coordination of assets so that out-of-scale assets don't trigger the impulse to invest good money after bad, a situation that now plagues TML decision-making. The third best investment is contingent on the profitability of the enterprise, what ever it consists of. Investments in training, education and sundry other opportunities can help enhance the comparative advantage that nations bring to the constant renegotiation of cooperative ventures.

There may be some scale of operation, some distribution of productive services across countries of the region which, taken together, would constitute a profitable undertaking in the fisheries arena. One would assume that this has been examined at some level already. If not, it would be worth exploring.

IV.E. EVALUATION REPORT: SOUTH PACIFIC COMMISSION'S TUNA AND BILLFISH ASSESSMENT PROGRAM.

1. INTRODUCTION

Over the period August 15 to September 13, a review team visited the sites of four projects which received funds under USAID's South Pacific Fisheries Development Project (879 - 0009). The team members were Wycliffe Bakeo, Director of Fisheries, Vanuatu; Felix Panjuboe, Project Development Officer, Small Island Countries Program, Forum Fisheries Agency, Solomon Islands; Gerald Russo, Commercial Fisherman resident in Fiji; and Philip Logan, Consultant to University of Rhode Island, on leave from USDOC, NOAA, National Marine Fisheries Service, Woods Hole, MA, Team Leader. For much of the trip, the team was accompanied by Elisala Pita, Fisheries Advisor, USAID, RDO/SP.

The team was to examine and assess the beneficial impacts of, and lessons learned from the assistance extended to three bilateral projects -- Papua New Guinea's Manus Island canoe development project, Western Samoa's fisheries development program, and Kiribati's National Fishing Corporation, Te Mautari Limited (TML) -- and to one regional activity, the South Pacific Commission's Tuna and Billfish Assessment Program (TBAP).

The TBAP received US\$ 319,000 of direct funds under 0009 and US\$ 40,000 under an earlier AID fisheries grant. TBAP is essential to the assessment of tuna and billfish resources in the region. The evaluation team was asked to examine the impacts of the TBAP and to explore alternatives for its support. The team visited the SPC headquarters at Noumea, New Caledonia from September 27 until September 30, 1991 and held meetings with TBAP staff and SPC management.

Summary of Findings

1. The long term commitment of USAID to stock assessment research and information gathering has been bearing dividends in the last 2-3 years. The important problems have been identified, the research and outreach are well directed and economical and the advice and information generated by TBAP is well received at all levels.
2. USAID's contribution to TBAP's information services has been put to good use. The professional assessment information provided forms the basis for evaluation of fishing venture options and has encouraged a high level of cooperation from most distant water fishing nations (DWFNs).

3. The information and knowledge gained has enhanced the knowledge base upon which both bilateral and multilateral access negotiations have been based. These have brought over \$120 million in fees to Forum member nations since 1986.
4. The first allegiance of the TBAP in its provision of information has been and must continue to be with SPC member nations and secondarily to private parties because of the inability of member states to police the vast areas of their EEZ's. Some of this information advantage will diminish through time as DWFNs' accrue information rivaling that of the SPC member states.
5. If current financial support arrangements for TBAP were to be terminated soon, it is not obvious that currently benefitting member states or other benefitting states would undertake that obligation. The most likely acceptable distribution of research costs, should they be underwritten by benefitting nations, would be one based on the distribution of benefits.
6. It is suggested that the current arrangement for support be continued for a period long enough (up to five years) for the TBAP to redouble its assistance to national fishery management applied research capabilities, and for member states to augment their fisheries departments' research staffing. This is suggested in light of the possible changes in institutions governing tuna research. In this period TBAP could be instrumental in raising awareness among SPC member countries of the regional and national value of current and proposed tuna research, and the requirements for member states to be adequately represented should the tuna management context expand beyond the region.
7. Beyond that period, it does not appear reasonable for USAID to continue to support this program without a substantial show of support by benefitting member nations.

2. BACKGROUND

2.1 History

The South Pacific Commission (SPC) has played an important role in the development of the region's fisheries at subsistence, commercial and industrial levels. Many countries have implemented national fisheries development programs with funding support from the donor community while depending on technical assistance from regional development organizations, including the SPC. The development of national and regional fisheries remains a priority of the SPC and is the Commission's largest single activity.

Tuna resources are the largest fishery resources available to SPC member countries, and, for some countries, are simply the most important resource of all. The yearly catch from the region is estimated at over one million metric tons worth two billion dollars. Most of this is harvested by foreign fleets under bilateral or multilateral license. The Western Pacific's skipjack tuna fishery is considered to be the only major global fishery with significant development potential. The Forum Fisheries Agency (FFA) represents many of the region's nations in the one multilateral treaty which permits a number of U.S. vessels access to regional tuna resources.

The Tuna and Billfish Assessment Program was established by the 1980 South Pacific Conference as a successor to the Skipjack Survey and Assessment Program (SSAP) in recognition of the importance of tuna and billfish resources to the region. The program was implemented in October, 1981, with extra-budgetary contributions from Australia, France, New Zealand, and the United States.

The initial mandate of TBAP was to establish a regional tuna fisheries data base. As tuna catches, fishing fleet diversity, and fleet sizes increased, the TBAP was required to undertake a larger range of research tasks. The program was extended at first by two years and then for a further five. The five year extension was completed in September, 1991.

The TBAP assists member nations in monitoring the catches made under all treaties. It suggests limits to resource exploitation, and provides scientific information that can assist in negotiations between the resource owning nations and the distant water fishing nations (DWFN).

2.2 TBAP Activities

TBAP, through SPC, is involved in a study of environmental effects on tunas. The two projects of interest for this evaluation are the Fisheries Statistics (FSP) and the Tuna and Billfish Research (TBRP) projects within TBAP. The first of these is directed at the collection, processing and dissemination of fisheries statistics pertaining to tuna and billfish stocks in the region. The latter, TBRP, covers a program of research on the status of tuna and billfish stocks, and on the biological and technical interactions which occur in exploitation.

In addition, two other projects of limited duration have been established under TBAP: The Regional Tuna Tagging Programme (RTTP) which commenced in December, 1989, and the Albacore Research Project which commenced in December, 1990, in response to the controversy over drift gillnet fisheries. It too has a small tagging component.

2.2.1 Tuna and Billfish Research Project (TBRP)

TBRP activities include field and biological studies and stock assessment and fishery interaction research. Activities are directed at tropical tunas (skipjack, yellow fin and big eye) and to a lesser extent at albacore which are caught predominately in colder waters.

An extensive Regional Tuna Tagging Program (RTTP) is in progress. It is directly funded by the EC. All other TBAP activities focusing on tunas are scientific and advisory support activities consisting of actual assessments of the target populations, provision of advice to in-country tagging programs, provision of support for the Forum Fishing Agency's observer and port sampling programs, and provision of in-country assessments.

2.2.2 Fisheries Statistic Project (FSP)

The major activities of the Fisheries Statistics Project are 1) processing, on behalf of SPC member countries, daily catch and effort log sheets which have been submitted to member countries by DWFNs under access agreements or have been collected from vessels operating locally, and 2) providing member countries with regular summaries and analyses of their data utilizing a network of data bases.

TBAP staff use the processed data for stock assessment and monitoring, and for the analysis of fishery technical interactions between methods, species, and fleets. The monitoring of fisheries is effected through quarterly reporting of these statistics and through analysis of trends in the catch per effort data.

Confidential reports are produced in the detail necessary for individual nations to be able to formulate access agreements. In addition, the FSP provides computer and database design and management support to member nations to aid in establishing national fishery statistics systems for their own industrial and artisanal fisheries.

The principal data bases developed by TBAP include 1) the Regional Tuna Fisheries data base which is shared with the Forum Fisheries Agency (FFA) and is one of the foundations for the advice provided by the FFA to members; 2) the Standing Committee data base which is geographically broader; and 3) the South Pacific Albacore Research (SPAR) data base, which holds data specific to the Albacore Program.

2.2.3 Information Services

Information supplied by the TBAP provides direct support for the fisheries sector in the region. The "Regional Tuna Bulletin" summarizes tuna catch statistics by fleet, month, method, and species, and provides information on catch by area. About one-third of the 500 subscribers are tuna fishing companies, exporters and processors.

TBAP responds to specific requests from a variety of sources for information on the status of tuna resources. Advice is provided on the available resource base and the potential for development. This information is critical to private sector planning in the fishing industry. TBAP provides data on tuna movements as well. This information, based on the ongoing tuna tagging program, is of great interest to private and government sector vessel operators as they try to locate and harvest tuna resources at minimum cost.

Specific instances of these and other services to private and public interests are contained in the published "Quarterly Performance Indicators" which were provided to USAID.

3. U.S. SUPPORT FOR REGIONAL FISHERIES RESEARCH

3.1 Background

U.S. assistance to research in furtherance of rational exploitation of the region's fish resources has been consistent and enduring. It began in the early 1970's with support of the South Pacific Islands Fisheries Development Agency (SPIFDA).

In 1979 and 1980 USAID contributed US\$ 450,000 and US\$ 100,000 respectively to efforts to assess pelagic resources of the region through the Skipjack Survey and Assessment Program (SSAP). The information gathered in the SSAP efforts has proved critical to the research carried out later under TBAP.

U.S. assistance to broaden pelagic studies under TBAP consisted of US\$ 100,000 per year from 1981 through 1984. For the period 1985 through 1989 inclusive, USAID committed approximately 30% of the US\$ 2.58 million TBAP budget.

Contributions to TBAP under the 0009 funding approach began as part (US\$ 40,000) of a contribution of US\$ 263,000 to the core SPC Coastal Fisheries Program in 1988. The current 0009 project, signed September, 1990, provided for payments of debts incurred in FY89. Its completion date is the end of FY92. It is likely that funds will be exhausted by the end of FY91 or soon after because authority was granted earlier to pay for a shortfall which developed from unexpected currency fluctuations.

3.2 TBAP Budget

The TBAP is funded through non-core contributions from Australia (17%), France (35%), New Zealand (10%) and the U.S. (24%). The current annual budget requirements for the TBAP analytical, statistical and information services is approximately \$ 644,000. This amount specifically excludes funding for the tagging program (RTTP) which is covered by the EEC, and the Albacore research program supported by Canada's ICOD. The headquarters (base) support required for these last two programs draws considerably on TBAP research personnel. Of course, the data derived from the tagging program are major inputs to TBAP analyses and reporting.

3.3 0009 Funding

As mentioned above, an initial contribution of US\$ 40,000 for computers was made to TBAP in 1988. The U.S. contribution to TBAP under 0009 amounted to US\$ 319,000 for the period FY89-FY91. This money was earmarked as follows:

- to collect data, analyze trends and disseminate tuna and billfish statistics to the private sector and Pacific island governments; \$ 200,000
- to provide advice and respond to requests from the private sector on fishing trends and on opportunities for development in regional fisheries; \$ 74,000
- to assess tuna and Billfish stocks in the region and provide advice to Pacific island countries on management of their stocks so as to optimize long-term sustainable harvests; \$ 40,000
- To provide funds for a USAID review in 1991; \$ 5,000.

4. ACHIEVEMENT OF OBJECTIVES: 0009 Funds

Data collection, assessment and information dissemination activities have gone forward at sustained high levels over the period of the funding. The quarterly statistical bulletin, the "Regional Tuna Bulletin", was produced regularly and the other activities associated with both the TBRP and the FSP were carried out and reported on schedule.

Primary indicators of performance under this specific funding are the lists of publications produced from research, from requests for data, and from meetings and courses held and supported. A running total of these citations is contained in the TBAP bibliography which was supplied to the team. Another indicator is the enumeration of responses to private sector requests for information as listed in the quarterly "Performance Indicator Report" which was required by and regularly sent to RDO/SP.

In 1986 TBAP generated six technical reports, five research reports, two internal reports and six working papers in support of two workshops and one regional technical meeting. To date in 1991 its staff of ten professionals were responsible for three Regional Tuna Bulletins, seven activity reports, one conference report, sixteen working papers and three background papers in support of a standing committee meeting, a regional technical meeting and a new Yellowfin research group meeting. Three quarterly performance reports were issued as well.

Quarterly performance reports list inquiries received, among other information. The range of information requested encompasses all that is collected. For example, in the quarter covering January 1 to March 31, 1991, the TBAP received four requests for resource assessments and development prospectuses (including two from Van Camp headquarters and a subsidiary), a trade inquiry from Quantas regarding exports, requests for analyses from private consulting/analytical groups, and requests from a variety of sources regarding the "dolphin-free" issue. TBAP issued strong supporting statements about the lack of incidental dolphin catches in the regional tuna fisheries.

In general, data made available to the public are not as specific with regard to area as data provided to the island nations. Enforcement systems are not in place which would make island nations indifferent to the wide distribution of high resolution area data. By the same policy, the information provided by fleets operating in a given country's EEZ is also protected by the aggregating represented in the Bulletin. The information that is available is sufficient to provide both demanders and suppliers of access privileges the information they need to enter into negotiations.

The technical capabilities of the distant water fishing nations, and their gradual accumulation of data by their own fishing fleets for analysis will tend, over the longer run, to reduce any large advantage in data and information held by any one party. And so the establishment of cooperative data sharing among member states is also a precautionary measure.

The evaluation team was impressed with the breadth of the activities undertaken with regard to the dissemination of information free of cost to interested parties, and with the quantity and quality of the publications -- an SPC hallmark. The program holds meetings regularly at which a large numbers of working papers are produced, and publishes monthly tagging reports. The program also produces a large number of publications at the professional scientific (peer reviewed) level which give its work, and consequently, its voice, world stature. This will be an important commodity as the context of management of the region's primary species evolves.

An indication of the broad appreciation of the material produced under TBAP is the recent contribution to the data bases of U.S. catch and effort data maintained by the members of the American Tunaboat Association. These data contribute substantially to closing the gap in the regional history of tuna fishing.

5. TBAP IMPACTS

5.1 EEZ Fisheries

At a general level, the existence and output of the TBAP provides significant assistance to SPC member nations in the appropriate design and staging of foreign exploitation of their resources, and in providing the information vital to planning and assessing their own direct involvement in harvest and/or processing-support activities. While certainly not the principal reason for the generation of benefits to island nations, the provision of resource information has facilitated the confidence with which island nations arranged for multilateral and bilateral access which netted US\$ 120 million since the Tuna treaty was signed.

As regards foreign exploitation, nations within the region and beyond which span the principal stock areas have to be concerned with overall catch levels for some species, and with technical interactions and biological interactions in order to, as a group and individually, prevent avoidable losses of extractible rents. With the data coming on line now, the harvest interactions of DWFN fleets will be able to be considered and coupled with island nation harvest strategies.

These same concerns face each member country in planning its direct participation in fishing operations. For example, the data are relied upon to identify seasonal areas of high catches so that regional fleets, which regularly face seasonal downturns, can share in a neighbor nation's seasonal riches at favorable regional terms.

The gear specific information indicates shows the relative profitability given the different capital and manpower costs of the various fishing forms. It was significant that a 1989 evaluation of the national fishing company of Kiribati, Te Mautai Limited (TML) based its strategy for profitable reconfiguration on the realistic opportunities for high returns to pole and line fishing available in the information provided by the TBAP. This kind of information had formerly only been available to foreign fleets which had had long histories of fishing in the region.

5.2 Domestic Research

Of growing importance is the role the TBAP plays in regional fisheries through its Fisheries Statistic Project (FSP). In addition to centralizing data processing, publication, and transmission, this group has been instrumental in establishing and standardizing in-country fishery statistics operations for data concerned with local fisheries as well as for the domestic and DWFN pelagic resource exploitation within the EEZs.

TBAP appears to hold out a very positive example to domestic fisheries personnel and holds the promise of being able to improve the standard of domestic fisheries research operations. Computer support, software and training have been made available to the region's personnel. The recognition of the importance of data collection for coastal fisheries is growing. Computers and software can be brought to bear as soon as domestic data are available.

The presence of computers spurs the collection, analysis and publication of fishery information. The review team noted the positive impacts of several computers purchased with "treaty" funds in several fisheries departments in the region.

One synergism beginning to be realized is the sharing of stock assessment models and software throughout the region. ICLARM (Manila) has been a pioneer in this endeavor. Another is the mutual cooperation and support which mark the relationship between TBAP (FSP) personnel and those of the Coastal Fisheries Program -- the SPC's largest program.

Well developed, in-country fishery departments which include at least one well trained statistician, population biologist and resource economist will be crucial to the success of in-country development projects and to appropriate interface with whatever tuna management regimes emerge. The FSP and TBAP in general can supply an excellent training experience for those who would take on those roles.

6. PROJECT MANAGEMENT

The SPC continued to demonstrate its effective management in the work accomplished not only with 0009 funds but with all of the funds supporting TBAP. The TBAP technical management capability is strengthened by the advice of the Standing Committee on Tuna and Billfish.

The last report submitted by the SPC as required by Attachment 1 of the Grant Agreement covered the periods up to 30 June, 1991. The report indicated the successful development of the RTTP which was greatly assisted by the cooperation of the private sector in returning tags and supplying catch data.

The data base confirms that annual catches of the three species now exceed one million tons, making this the single largest tuna fishery in the world, supplying 50% of the global market for canned tuna. This stresses the need to keep the Governments and various private sectors informed of developments through mechanisms such as the Quarterly Regional Tuna Bulletin, and timely responses to requests for information and assistance.

The report was timely and was executed very professionally with outputs related to expenditures. Total expenditures reported were US\$274,750.00 representing 86 percent of the total approved project budget of US\$319,000.00.

Future extra-budget funding for TBAP and the determination of who will be made responsible for its management require urgent attention by SPC and FFA member countries in the light of the fact that this activity will need to be sustained for a very long period of time in one form or another. The placing of future management responsibility of TBAP is discussed below. Alternatives include the SPC, FFA or some other independent arrangement.

7. TBAP TOMMORROW

7.1 General

Because of the personal and professional associations of its staff, the TBAP is well positioned to serve as an advisor to the region as the management of the largest tuna fishery in the world sorts itself out. SPC member countries are already benefiting from TBAP involvement in, and exercise of initiative with regard to activities which might have appeared to be on the periphery of its mandate. For example, the analysis of catch data indicated a need to explore albacore dynamics and this is being pursued actively.

Similarly, in recognizing that the range of yellowfin and skipjack resources far exceeds the SPC sphere, TBAP has been influential in fostering cooperative participation (with some notable exceptions) in data collection and applied scientific analysis on the dynamics of these stocks over their full geographic range. The Western Pacific Yellowfin Tuna Research Group is the focus of that cooperation.

It does not yet appear problematical, given current funding arrangements, that all regional SPC member states do not benefit equally from the attention TBAP pays to each species of tuna. That may change. A more immediate tension is represented by differences in perceptions of where TBAP goes from here.

7.2 Institutional Changes

7.2.1 Alternate Futures

Future developments for TBAP as seen from the perspective of the professional staff were outlined in Working Paper 5 of the Fourth Standing Committee on Tuna and Billfish (17-21 June, 1991: Port Vila) entitled "The South Pacific Commission's Tuna and Billfish Assessment Program: Draft Strategic Plan (1992 - 1996)." The next five year program, which lacked an assured USAID contribution at the time it was written, to a great degree continued and extended the scientific program in support of the regions' pelagic fisheries.

The potential loss of USAID funds for this second "phase" of the scientific program generated consideration of alternative sources which are outlined in the draft plan. EC Lome' IV funding was a predominant possibility. In fact, however, some continued funding from USAID was under discussion before the end of this review mission. The team was not privy to the discussions.

The draft plan, written at the behest of the 1990 Standing Committee (SCTB3), was received and extensively revised by the SCTB4. While not present at either meeting, this author interprets the differences in plans to reflect a major and fundamental difference in the perceptions of the future role of the TBAP between the scientific and professional staff of the program on the one hand and the beneficiaries of the program, the SPC member countries, on the other.

The Draft Plan's Stage Two research direction was essentially adopted by the SCTB4, since the suggested emphases were the logical extensions of the research undertaken so far. This work would appear to have even larger marginal payoffs than the investments made so far, especially in terms of within-region and within-EEZ management.

What was pointedly omitted from the revised plan, however, was the blessing by SCTB of the proposed enhancement and development of the organization (TBAP) from a quasi-SPC Program unit into a free standing secretariat around which a (larger) regional tuna organization could and might logically coalesce.

It would appear that the scope and profile of most international fisheries fora are determined to a large extent by the "the science." The science dictates that the fish stocks should be "managed" or, more correctly, studied over their entire range. It also dictates that the ideal membership of the agency is inclusive of all nations for whom the stocks have interest. The TBAP professional staff are, in a sense, asserting that this is the direction toward which TBAP, its personnel, contacts, and data should move. The problem faced by the benefitting member states of SPC is that they still need their "own" TBAP, and might need one even more, were there a broader regional tuna research body. This is an inevitable tension.

Among other reasons, TBAP exists because there are economies of scale in fisheries research. Much of that research produces management advice. Under a different regime, the current benefitting nations would likely require, at least initially, group representation similar to a TBAP and providing the same advice simply because, again, of the economies it represents.

Should a regional agency emerge which, through broad cooperation, could effectively carry out the required research on stocks of concern, then a more narrowly focused TBAP-like group could satisfy the more specific needs of a subset of current SPC member states. This group could comfortably reside in an organization like the FFA. Without a regional fisheries research agency, there is need for independence of scientific activity from business concerns (but not from economic analyses).

7.2.2 Immediate USAID Funding

It has taken ten years for the Program to develop. Some of the bigger breakthroughs have been made possible by work done under the SSAP. The tagging information and catch information is beginning to cover the time scale required to be able to provide reasonable first level advice to member countries. In addition, information on interactions between different methods of harvest within the fishery is becoming available and should prove valuable in discerning harvesting strategies which are most profitable to the host country. If the rate of increase of exploitation continues, adjustments will have to be made to the levels and methods of exploitation in the near future.

The benefits to resource-holding nations of long-term donor investment in data collection and research are beginning to be realized. Information which is vital to appropriate management is developing and being used. The draft plan notes, and the team concurs, that the next several years will be critical to producing directly applicable research of a sub-regional nature.

7.2.3 Other Considerations

There are other dynamics at work which the review team cannot presume to explain, but merely note. US assistance in research on pelagic resources in the 1970's really meant assistance to SPC member states through one of their primary resources. Today, the existence of the tuna treaty, U.S. fleet interests, other international harvesting interests, the existence of an undervalued dolphin-free harvesting premium, and a seeming rush to participate in the formation of the last great resource oversight body, all impinge on the research effort and cloud the funding question.

The political and scientific aspects of the research are no longer congruent with the somewhat disinterested foreign assistance intentions of the past. Funding TBAP efforts under 0009 may have been convenient, but that association may undermine what had been intended for so many years. The 0009 activity is at an end but there is still a short term need for more assistance in pelagics research. While it would be desirable to have benefiting nations assume the costs of this program in the very near future, this is not likely to happen. In the slightly longer term it may.

7.2.4 Recommendations

The review team recommends that USAID continue to participate fully in funding pelagic resource research. This participation will reflect the original intent of assistance to member states through the SPC. In the very short term this means continued funding for the TBAP research agenda as redefined by the SCTB4.

The analyses coming out of this agenda are crucial to clarifying what can be profited from the resources within the SPC region on a sustainable basis. They will also give a clearer indication of what can be expected when control over harvesting is not complete. It is premature to expect that these questions would have been answered by now. It is not premature to expect that benefitting states would have moved toward assuming the costs, however.

It recommends that during this (up to) five year period, USAID encourage member states to prepare for the possible changes in Tuna and Billfish research and research management discussed above, by developing and appropriately rewarding local expertise in pelagics biology and economics.

Should TBAP disappear tomorrow, there does not appear to be a critical mass of local scientific expertise ready to step in to perform those important secretariat functions in an even more narrow, SPC region basis. This should be of concern after so many years of the recognizing the importance of tuna to member countries.

The team recognises that for many states some of this expertise already exists. This local expertise could form the basis for representation of national interests to FFA and to whatever other entity develops around the research question. The national experts could periodically serve at both the FFA and the TBAP. Some have done this already. Lastly, these experts could form the core of a more narrowly focused research agency should the biology and economics of less-than-total stock management indicate that it would be worthwhile. There are critical issues at the sub-stock level about optimal exploitation which will require a research group to address. These particularly concern interactions and that information is just being developed.

Under all circumstances, the development, reward and retention of a professional level capability in pelagic resources management is a good bet. In most of the world, much more financial reward and prestige is accorded experts and managers of important national endeavors and resources. This should hold true for fishery resource managers and scientists in the South Pacific.

It is recommended that during this (up to) five year period USAID encourage a united front of traditional supporters to press for the complete adoption of TBAP costs by benefitting states from closely related revenue sources. Some factors which might affect the success of that endeavor are discussed below.

7.3 Self-sustaining Support

7.3.1 General

The draft report discussed alternate funding possibilities when it appeared that the U.S. would cease contributing beyond the 0009 program. The possibilities included 1) core funding from the SPC member countries, 2) reliance on extra-budgetary funding under SPC with another source found to replace the U.S. contribution, 3) DWFN support if SPC or TBAP membership is extended, 4) reestablished U.S. contributions from secretariat services supplied by TBAP to the Forum/US Treaty arrangements, and 5) funding from nations benefiting from the services provided.

Number five has appeal as the beneficiaries of the research are able to translate this information into income by extracting some percentage of resource rent from DWFNs and/or by exercising the option to fish themselves, should that appear profitable. Number five is the only truly self sustaining arrangement as well (the 4th is really a variant of the 5th).

In discussing the likelihood of self-sustaining support, by which is meant complete support of the TBAP by nations benefiting from the research and information services it provides, it is useful to examine the provision of these same services to the U.S. fishing industry. We bother to go into this in some detail because it was asked of us and because failure to understand the extent of market failure in fisheries can lead to disappointing results.

7.3.2 Role of Government in Fisheries

Governments intervene in the operation of markets when the market economy fails to bring about the production or efficient use (from the point of view of the country's entire economy) of certain goods. Examples are the failure of markets to produce public goods -- for example, lighthouses -- to regulate natural monopolies, and to appropriately use "open access" resources. Most fisheries around the world still suffer from at least two flaws which inhibit their proper exploitation in the absence of government intervention.

The lack of property rights leads to the over-exploitation of "commonly" owned resources. This is true of publicly owned grazing lands, common pools of oil, and may include fresh air in the future. People, through their governments decide that it is worthwhile to step in and either dictate solutions or create property rights. They allocate these rights either through a lottery, or an auction, or simply by granting them to traditional users of the resource.

The property rights go a long way to solving the abuse of open access resources. In the case of fisheries, however, even this is not sufficient. In the Surf Clam fishery of the eastern U.S. the quasi-governmental Fishery Management Council granted property rights to clam resources, i.e. gave ownership to a percentage of the allowable harvest to individuals.

However, the government is still involved in the fishery as it must determine what the appropriate total annual harvest should be. That function still resides with the government because population dynamics research itself is in the nature of a public good. No one entity could or would pay for the research themselves unless they owned a sufficient percentage of it to make it worthwhile. Secondly, such research has aspects of a natural monopoly: the most efficient way to carry out the research is through a single entity. Thirdly, the enforcement of the quota is most efficiently done by a single agency and therefore is a kind of public good not unlike defense. Lastly, the government is, hopefully, perceived as a disinterested party which can make harvest level determinations objectively.

The arrangement in the Surf Clam fishery is still not optimal from an economic point of view because the cost of the research, enforcement and administration could be charged to those who benefit from it. And those charges could be enforced. As it stands, these charges are made to all taxpayers. This may change as the nation becomes more at ease with this form of resource management.

7.3.3 Conditions for Cooperation

In the case at hand, of course, the resource owners are independent nations. Whether they would support mutually shared research would depend on the following: 1) whether harvesting could be effectively policed, 2) whether the linkage between the benefits and costs of the research were clear (the more of the unit stock owned over its entire range, the better), and 3) whether participation in funding the research is in the long run interest of each participant, i.e. each feels better off with the research than without it.

If a decision were made by resource owners to participate in purchasing research, a second cooperative decision would be required: how to pay for it. The obvious answer is to pass on the charge for the research and monitoring to resource users. But a unified front would have to emerge if the funds were to come from an additional levy on users rather than from an identified percent of current receipts. Only one system would predominate, of course.

Lastly, the most likely cost allocation formula to emerge and be supported, would be based on cost bearing in proportion to benefits earned -- though a better formula would be based on total (national + DWFN) removals.

Other aspects of the current situation which might work against SPC member nations assuming the costs of TBAP include:

- that the skipjack and yellowfin resources are exploited in areas far outside the sphere of influence of any existing cooperative body: benefits are diluted;
- that the range of exploitation of colder water tunas is somewhat larger than the sphere of influence of the Forum Fisheries Agency, though congruent with that of the SPC;
- that the perception may exist that the skipjack stocks are so robust as to need no great investment in further research; and
- that the TBAP's functions could be separated and funded under different programs: for example, those which assist national fishery statistics and stock assessment capabilities could be funded under the core program.

7.3.4 Recommendations Reiterated

For these reasons, it is not certain that, if pressed, member states will move to adopt the total costs of the current program in the near future. These reasons also indicate that their motivation for not assuming responsibility for diffuse benefits and certain costs is complex and astute.

Some other self-motivating factors such as appeals to the Pacific Way may be sufficient to stir a critical mass of supporters. This will take time to develop, however. Additional time will also better reveal the benefits to the research more clearly. The differences in rewards will also sharpen through time.

For these reasons also, the continued funding of the traditional TBAP program is recommended for up to five years. Within five years, interests in parts of the TBAP agenda will have jelled, local expertise could have been encouraged, the transitions which are afoot now will be clearer and the resulting needs identified.

Lastly, the continuation of the TBAP represents the most stable scenario for cooperation between the U.S. tuna fleet and the region's resource rich countries. The transition to a regional tuna body including exploiting nations puts the current cooperation into another much larger arena where there are sure to be more nation-to-nation complications.

8. INDUSTRY PERSPECTIVE

On Private Sector Use of TBAP Information: Who Should Pay?

8.1 Benefits to the Private Sector

Although the benefits of the TBAP to the SPC member countries for the rational management of the tuna resource are a foremost consideration, the benefits derived from utilization of this data by the private sector should not be underestimated.

While the method and scale of comparative commercial tuna fishing operations may vary considerably, the basic goal is consistent: maximize profit through cost effective activity and minimal risk. In a fishery where capital expenditure and operating expenses are so high as to make the risks enormous, the benefits derived from the TBAP information can be critical to the success or failure of a specific business within the industry, and to the entire fishery as a commercial activity.

The TBAP provides strategic information directly to the tuna industry and through agencies such as the American Tunaboat Association. Information can be obtained in the region through national fisheries agencies or through direct inquiry to SPC. The information provided not only gives fishermen what is necessary to accurately assess the potential profitability of a given fishing activity, but also gives broader interpretations of the data which are useful to all sectors of the industry (for example see the Quarterly Performance Indicator's Specific Activities in Support of Private Sector).

Specifically, this information helps private sector management answer questions pertaining to area and time of deployment of fishing fleet to maximize CPUE for specific target species and methods. It provides information on site locations of support activities, e.g. canneries, processing plants, ice facilities, wharf facilities, and transshipment and export locations.

Additionally, information is provided with regard to marketing, trade, and various forms of economic analyses. Production data for profitability studies is used by investors and lending institutions for large and small scale private sector fisheries.

Statistical information is derived from data collected and analyzed by TBAP and made available to the private sector through the quarterly Regional Tuna Bulletin and other non-classified program publications. Aggregate catch information is published but detailed catch information can be made available with host country clearance.

Interpretations of data for specific needs can be arranged. A major success of the TBAP has been to improve data collection and management and to reduce the time required to disseminate the information to the commercial sector.

8.2 Who Pays?

Currently the TBAP is funded from donor countries under various "AID" schemes. The question has been posed whether the value of the information justifies the cost of its acquisition and processing. The two direct beneficiaries of the information are: 1) the countries of the SPC region who use this information to manage their resource and to calculate foreign nation access fees and, 2) the industry itself which either uses the information directly, or benefits indirectly as the positive effects of resource management improve their efficiency and therefore their profits.

A major consideration in deciding who the TBAP "works for" is indicated by the TBAP Mission statement which recognizes its responsibility to the SPC member nations as its first priority and its responsibilities to industry and "exploitation of the resource as a second consideration." Although the goals of the nations and those of the industry are in most cases parallel, there runs an underlying conflict of interest.

Because nations in the position of having the "last word" in resource management can effectively use the TBAP information to control the activities of the industry, the TBAP is in fact "working for" them. While the industry, though getting good technical information from the TBAP, may or may not benefit from the resource management depending on how it is applied by the nations to the industry.

If this is in fact a logical view of the situation, the nations should assume the responsibility for the costs of TBAP and pass part or all of them on to the industry on the basis of "what the market will bear." If the industry cannot or will not pay increased tariff, it should be up to the SPC member countries to decide if they are willing to "foot the bill" for TBAP cost. If neither the industry nor the nations feel that the information is worth paying for, the TBAP should be discontinued.

This is no longer an AID issue. The benefits have been shown to both industry and the nations involved and acknowledged by them. There is adequate revenue being generated from the resource at all levels to enable non-aid sustainability. However, if donors continue to pay for a "free ride" for both the nations and the industry the issue most likely will never be addressed or resolved.

9. MEETINGS

During the week of September 26th - 30th, the team visited the South Pacific Commission Headquarters in Noumea, New Caledonia. The team had the opportunity to meet and work with many members of the TBAP, the Coastal Fisheries Program and the SPC Headquarters staff. In particular the team very much appreciates the assistance provided by M. Helen Courte, Director of Programmes, South Pacific Commission and by Dr. Anthony Lewis, Chief Fisheries Scientist TBAP.

V. CONCLUSIONS: GENERAL CONCLUSIONS ON 0009 APPROACH AND IMPACTS

1. INTRODUCTION

The 0009 program to fund fisheries development activities will have expended some US\$ 5.4 million by the end of fiscal 1992. Thirty-seven projects received from \$US 1,500 to 360,000 for a variety of equipment, services, training, research and construction. Some were bilateral projects and others utilized regional institutions. One exceptional project which was funded at US\$ 1.5 million was itself a set of smaller projects brought to fruition by the Forum Fisheries Agency.

The 0009 program was the third step in a series of moves to improve the relations between the U.S and South Pacific nations. Through the 1970's the regional notion was that the U.S. had paid too little attention to the area. This feeling was deepened by the actions of the U.S. Tuna fleet. And so the USAID office was opened in 1978 to carry out an expanded assistance program. Subsequently negotiations over access for the U.S. fleet were begun.

The Secretary of State requested USAID to initiate a program of fisheries development assistance to reinforce the impression that the U.S. was committed to the region's appropriate exploitation of its marine resources.

An approach to try to ensure the success of this endeavor was adopted by the RDO/SP. The 0009 approach consisted of a decentralized planning activity undertaken at a roundtable of representatives of island governments. This approach was meant to facilitate the disbursement of funds over a large number of legitimate development activities while minimizing the background research, planning costs, and risks. The approach was also to utilize PVO's to see if project funds could be made available more rapidly to the agency requesting them, rather than having the funds go through the usual governmental disbursement process.

The funds were to be used to close gaps in other ongoing or planned development activities which had been vetted in the various ministries of the proposing countries. Other guidance was provided having to do with what would be entertained in the way of commodities, services, etc., what the sector priorities of USAID were, and what the expected outcomes and outputs should be.

2. RESULTS

As one might expect, the sum of the projects do not add up to a grand development strategy, they were not intended to. In the course of the travels of the evaluation team, what was most striking was the lack of any major failures -- which might be represented by revelation of a completely useless endeavor or by one which was harmful to other development activity.

The many projects were proposed, reviewed and implemented rapidly. The program designer took good advantage of the myriad regional institutions and of the networking that these institutions had established over the years.

The development conversation had been ongoing. The 0009 program provided a non-threatening currency to be employed in a planning and development exercise. It required conformance to a reasonable set of criteria. It was taken up readily. The proposals originated where they should originate. Each had to run the gauntlet of mildly competing interests.

Once approved, the projects were very well monitored and reported on by third parties. The demands for reports were from sympathetic quarters. The formal disbursement processes were bypassed at the cost of some small agitation on the part of those upon whom recurring costs are a constant reality. That this approach was to be short lived, and that the recurring costs were relatively small is important. This aspect would have to be negotiated if longer term arrangements for directing funds to users were to be entertained.

The impression the writer has of reasons for the success of the program is probably different from those of the other members of the team if only because he was new to the process but not to the region. These impressions are offered:

- in a very short time, USAID - American aid - was in the fisheries development business in many countries in a meaningful, cooperative way:
- the process of project planning, review and monitoring was probably as important to generating "goodwill" as the assistance itself.
- little of the good will developed seemed to be associated with or transferred to the U.S. tuna fleet.
- the treaty is seen by those island fisheries personnel who expressed an opinion about it as a just, positive, path-breaking arrangement. This, combined with the American fleet's cooperation with TBAP, provides a basis for changing opinions.
- a great deal of the success of this program of small projects has to be attributed to the personnel who administered it in the field, to their attention to detail, and to the respect they gave and earned themselves.

3. CONCLUSIONS

It can't be concluded that this experiment can be widely replicated. Much of the credit for the success of the 0009 approach lies with the regional institutions which were utilized in implementing the program. These, in turn, function as well as they do because of the persons involved who, in turn, reflect their own cultures. It is not novel to note that the interaction of Pacific peoples is usually typified by a high degree of cooperation.

The success of any particular project was limited by design, and this is one of the tradeoffs of this approach. Given that many of the activities were "gap fillers" little of the greater national program success or failure could be attributed to the component 0009 activity.

On the other hand, the activity in Western Samoa, which utilized a somewhat more traditional planning approach, could be termed a success or failure in toto. It was a success, after some readjustment, but it may be stillborn.

One could conclude then that a mixture of traditional planning -- a well laid out strategy -- combined with the positive attributes of the 0009 approach would be optimal.

It is difficult to define what those positive elements of 0009 programming are. Whether by design or not, the face of 0009 was an island face, more specifically, a Pacific face. The funds were from USAID but the local representatives were other islanders. The criteria for acceptability in the planning and implementation were USAID criteria but the peer pressure was a Pacific peer pressure.

It is more difficult to imagine many regions of the world where taking advantage of these dynamics could have such low risk.



SCOPE OF WORK

The scope of work provided here is for the evaluation team as a whole. Each team member has specific expertise and a particular perspective. It is intended that the team work as a unit under a selected team leader, and that their evaluations and insights be combined and synthesized into their final report. As such, no separate terms of reference is provided for any individual team member. For certain topics identified below, it might be more appropriate for the team leader to allocate one team members to handle more of specific topics than others, such as the socio-economist and the economic costs and benefits section, or the commercial fisherman and the impact on private sector fisheries development section. However, it is intended that all team members provide input into each topic identified below. This is a team effort.

The evaluation will follow A.I.D. guidelines provided in the following A.I.D. documents:

- . HB3: 3B5f Monitoring and Evaluation Considerations;
- . HB3: Appendix 3K, Elements of an Evaluation Plan;
- . HB3: 12 Project Evaluation; and
- . AID Evaluation Handbook

For consistency and uniformity in evaluating selected activities, the following will be addressed.

1. Background (history, objectives, performance)
2. Assistance (appropriateness, adequacy, and impact) from alternative sources
 - a. 0009
 - b. host government
 - c. other donors
3. Achievement of stated objectives
 - a. activity
 - b. 0009 support for activity
4. Organizational management of the activity and of 0009 inputs
 - a. grantee's capabilities to effectively implement the activity
 - b. adherence to established reporting requirements
5. Tangible and intangible costs and benefits of the activity and social impact

6. Impact on sustained private sector fisheries development
 - a. effectiveness in expanding private sector production and employment
 - b. equitable distribution of benefits by gender
 - c. sustainability of benefits after 0009 support and/or donor/host government support completed
 - d. possibility of applying approach elsewhere
7. recommendations
 - a. lessons learned
 - b. modifications and refinement to better achieve objectives and increase private sector fisheries
 - c. alternative mechanisms for achieving sustainability of activities and of increasing private sector fisheries

The following additional specific considerations for the regional activity (SPC TBAP) will also be addressed.

SPC TBAP

- a. demand for TBAP services and information from private sector, and government
- b. alternative strategies for sustained private sector support of TBAP

TIMETABLE

The evaluation will involve 4 weeks of field work plus one week for report writing in Suva, Fiji. One week will be allocated for each bilateral activity and for the SPC visit.

The draft report documenting the findings of the evaluation team, will be completed September 20, 1991 and submitted to RDO/SP for review. The final report will be completed by October 31, 1991.

EVALUATION TEAM

The evaluation team will consist of 5 members.

1. National fisheries officer - for the island/national government perspective.
2. FFA project development officer - for the regional perspective.
3. RDO/SP Fisheries Advisor - for the A.I.D. perspective.

4. Commercial fisherman (U.S. consultant) - for the commercial sustainability perspective.
5. Socio- economist (U.S. consultant) for the socio-economic perspective and also as team leader.

MANAGEMENT OF EVALUATION TEAM

The evaluation team will be under the direct supervision of RDO/SP's Agricultural Development Officer through its Fisheries Advisor. The Socio-economist will be delegated the responsibility as the evaluation team leader.

PRODUCT

The product will be a report documenting findings of the evaluation team. The report will be formatted to reflect the scope of work above. The evaluation of each of the four selected activities will be represented by a separate section. Appropriate general introduction and conclusion sections will be included. The evaluation team will follow A.I.D. guidance for reporting requirements as set out in AID Handbook 3, Supplement C.

Three copies of the draft report (due on September 20, 1991) will be provided to RDO/SP. The draft report will also be provided to RDO/SP on Word Perfect 5.1 format on a 3.5 inch IBM format disk.

Twenty copies of the final report (due on October 31, 1991) will be provided to RDO/SP. The final report will be distributed to RDO/SP and Pacific island countries.

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