FINAL EVALUATION

OF THE

OMAN FISHERIES DEVELOPMENT PROJECT

(PROJECT NO. 272-0101.1)

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Commission
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LIST OF ACRONYMS AND ABBREVIATIONS

AID	Agency for International Development
COP	Chief of Party
DGF	Directorate General of Fisheries
FAD	Fish Attracting Devices
FDP	Fishery Development Project
FDMP	Fishery Development and Management Program
GovOman	Government of Oman
JC	Joint Commission
MAF	Ministry of Agriculture and Fisheries
MOEY	Ministry of Education and Youth
MSFC	Marine Science and Fisheries Center
OAJC	Omani-American Joint Commission
OSU	Oregon State University
RA	Research Assistant
RDA	RDA International, Inc.
R.O.	Omani Rial
SQU	Sultan Qaboos University
TA	Technical Assistance
UAE	United Arab Emirates
URI	University of Rhode Island
USG	United States Government

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EXECUTIVE SUMMARY

A. Background

The Fishery Development Project (FDP) was the first project assistance provided by the Omani-American Joint Commission (OAJC). The project was prepared in late 1981; it was authorized in early 1982; and project implementation began in 1983. The goals of the project are to promote fisheries as a non-oil source of income and to promote the welfare of traditional fishermen. The purpose of the FDP is to address major constraints to further development of fisheries by providing technical assistance and training to develop the institutional capacity of the Directorate of Fisheries in four areas: extension, research, statistics and training. These were subsequently amended to include marketing.

The total cost of the FDP was $13 million provided by AID, through the OAJC to the GovOman. The project components were designed in such a way that separate contracts were issued through competitive bidding and host-country contracting to RDA International, Inc. and Oregon State University (OSU). RDA provided long-term advisors for general fisheries policy advice, and development of statistical, extension, and marketing programs. OSU provided long-term advisors to establish research programs on small and large pelagic species, demersal and shellfish species, and fish processing in support of the research activities of the Marine Science and Fisheries Center (MSFC).

Project progress evaluations were prepared in 1985 and 1987. Since a decision has been made to undertake a follow-on fisheries project, this evaluation, conducted at the end of the sixth year of project activities, may be considered as a final evaluation of the first phase of a long-term commitment to the fishery sector in Oman.

B. Purpose of this Evaluation

The purpose of this third and last evaluation of the FDP is: (1) to indicate progress in achieving the project purpose of institutional development of the DGF, and (2) to identify lessons learned under FDP which can be applied to Fisheries Management and Development Program (FDMP).

C. Procedures

The Evaluation Team was comprised of a senior fisheries research manager, a fisheries development specialist, an institutional development and public administration specialist, and an AID official from the ANE/DP/E office in Washington (See Annex 1 for biographical summaries). The Team members were provided with FDP background information from AID officials in Washington prior to their trip to Oman. During their visit to Oman (May 20 to June 19, 1989), the Team reviewed all documents pertinent to the FDP and interviewed senior officials of the Directorate General of Fisheries (DGF) and OAJC, and personnel contracting groups. Site visits to assess the effectiveness of field programs were carried out in the Southern region (Dhofar). Assessments undertaken by the Evaluation Team followed a frame provided by the Scope of Work, which consisted of detailed indicators of program accomplishments.

D. Conclusions

1. Achievement of institutional development

a. Management

A lack of leadership, direction and political will at senior levels of the DGF has seriously constrained development of the fisheries industry in Oman. Weak management has prevented adoption of appropriate policies and regulatory decrees and created numerous administrative and logistical problems which effectively obstructed institution building efforts. The problem of weak management at the DGF was compounded by the Project which attempted to expand DGF programs significantly without including institutional management as a specific project component.

b. Structure

The institutional structure of the DGF is inadequate to support effective fisheries development. The current organization of the DGF does not promote efficient operations needed to maximize program accomplishments. Specifically, lines of authority and responsibility for program planning and execution are poorly defined or non-existent. Further, the current structure is ineffective in promoting horizontal coordination and integration. A good case in point is the tenuous relationship between the DGF in Muscat and the Director of Fisheries for the Southern Region which has impeded the logical integration of the national and southern regional programs.

c. Training

Although the design of the project clearly considered human resources development to be very important, training activities were poorly planned and largely ineffective. The Project contractor seemingly devoted a considerable amount of time and effort to staff development; however, much of this training was unstructured and based on informal, daily contact with counterparts. In only a few cases (e.g. in the statistics program) did this type of informal training lead to successful skills acquisition and application. Further, the two-year, non-degree off-shore fisheries training proved to be expensive and generally inappropriate given the skill levels and academic qualifications of the participants.

2. Project contracting

a. Purpose

The purpose of AID Host Country Contracting for this project was to develop some contract management capability within the DGF. While this was a well-intentioned objective, in retrospect, it served only to exacerbate administrative problems at the DGF and impede project activities.

b. Coordination of contractors' efforts

Significant professional differences between the two contractors, in conjunction with weak management and coordination by the DGF, resulted in poor integration of project activities.

c. Timing

Contractor personnel were mobilized often before technical skill requirements were fully defined and certainly before DGF sources were in place and programs sufficiently underway to benefit from technical assistance. As a result, programs (e.g., the research and extension programs) tended to be driven by the contractors rather than by what was achievable and sustainable by the DGF.

3. OAJC role

The OAJC ability to address project implementation problems was constrained by a lack of technical expertise in fisheries on its staff. However, even considering this lack of expertise, project implementation would have benefited from a more rigorous monitoring and oversight by the OAJC.

4. Project focus

a. Sector approach

Project design was largely based on a traditional sector approach to fisheries development which emphasized four major functional components: statistics, research, extension and marketing. While this focus was appropriate, the project's lack of an institutional management component which would have specifically addressed institutional development constraints proved to be a serious deficiency. Weak institutional management, in large part, prevented the effective implementation of project activities and the successful achievement of project objectives.

b. Extension

The extension program did not achieve the expected results. Extension objectives were never adequately defined and, consequently, a realistic extension strategy was never agreed upon. The lack of motivated DGF extension agents who understand traditional fishing systems and are respected by fishermen further impeded extension program development.

c. Marketing

Effective marketing of Oman's fish resources has enormous economic potential as a source of non-oil revenue. However, efforts to expand the direct role of the DGF in this area were misconceived and the substantial investment by the government in marketing infrastructure and by the project in technical assistance to the DGF has resulted in little tangible benefit.

d. Statistics

The statistics program, which focused on generating stock assessment data and activities, rather than on generating information on fisheries as a production system, was improperly defined. The FDP has confused the traditional role of the statistics program as a management information service by considering it as a section within the DGF responsible for monitoring fish stocks and providing management advice.

e. Research

The research program did not adequately focus on problem-oriented research activities that would lead to the stock assessment information required by FDP and consequently will not have an important long-term impact. Further, the lack of trained personnel as well as logistics and administrative support problems effectively limited the scope of research activities and significantly narrowed overall project research focus.

5. Evaluation of data collection

a. Socio-economic data

Socio-economic data were incomplete, poorly interpreted, and did not identify the technological needs of traditional fishermen. Consequently, baseline data needed to develop an effective extension program were not available.

b. Use of data for extension program development

The FDP has not developed a system to carry out feasibility studies on new technology, conduct adaptive research or undertake methodically pilot demonstration programs upon which an effective extension program can be based.

c. Fishery data

The statistics program is collecting fishery data from complex traditional fisheries. However, the requirements of the frame survey to estimate landings of a myriad of species and boats have not been fully met due to DGF administrative and logistic deficiencies. As a result, precision of data collected has been seriously affected and the accuracy of the data is unknown.

d. Collection and processing

The current statistics program is designed to address traditional fisheries. The established data collecting and processing system, however, does not have the design and physical elements to address potential industrial fishery development.

e. Viability of the research program

The scope of the research program was unrealistic given the weak management structure vis-a-vis the magnitude of project inputs. The

program has developed generalized statistical and analytical procedures which serve as a basis for further institutional development, but has established an inappropriate research frame for long-term fisheries research. In addition, research results are based on a weak data base, consequently, they are unreliable and can not be used for resource management purposes.

6. General Conclusions

a. Project impact

Although a number of activities have been successfully completed by both contractors (after an expenditure of $13,000,000), the impact of these activities on either institution building at the DGF or the development of the fisheries sector in Oman has been minimal. While there have been reported increases in fish catch during the project, the Evaluation Team found it difficult to establish any direct linkage between these reported increases and project activities.

b. Appropriateness of project objectives

The project was unrealistically ambitious with a comprehensive program of fisheries development which overwhelmed the technical and management capabilities at all levels of the DGF, even with the technical assistance and training provided by the project. Further, the project was based on two erroneous assumptions: first, that unlimited financial and human resources would be made available by the Government of Oman to support project activities and, second, that motivated (albeit weak) management was in place at the DGF. However, project objectives and related activities were not restructured or priorities established, even after these conceptual deficiencies became repeatedly apparent early in project implementation.

E. Lessons Learned

1. Unless there are significant changes at the DGF--in terms of providing the level of leadership, direction and political will necessary to develop the fisheries industry in Oman--the value of continued investment in this sector at present levels should be re-examined.

2. Project assistance in Oman, given a generally weak administrative base, is staff intensive and, therefore, is not consistent with the OAJC mandate to serve primarily as a financing institution with a small staff. If such assistance is continued, OAJC staff shortages should be supplemented with contract staff.

3. Sector development programs, such as the FDP, can not address equally all problems in all sub-sectors, but should identify a clear set of objectives and concentrate activities on a limited number of priority constraints. Further, project funding should be closely tied to the ability of the sector to absorb technical assistance and training as measured by pre-determined benchmarks.

4. In the absence of strong management skills at the implementing organization, AID direct contracting is the most effective means of providing technical assistance, even though it increases OAJC staff requirements.

I. INTRODUCTION

A. Background

1. Project antecedents

Fisheries have played an important role both in the historic economic development of Oman and as a significant source of food for its inhabitants. These conditions emerge from the vast fishery resources available to coastal communities stretching along the more than 1700 kilometers of Oman's coastline in the eastern part of the Arabian Peninsula. Oman's unique abundance of fishery resources derives from high biological productivity of marine water masses associated with seasonal upswelling generated by complex monsoon-related oceanographic regimes prevailing in the region. Recent statistics (1988) indicate that landings of all fish species in Oman may have reached 166 thousand metric tons out of an estimated potential of about 400,000 metric tons. Although revenues from fishery exports have surpassed $33 million in recent years, they have been overshadowed by the extraordinary increase in oil revenues since the early 1970's. However, Oman oil reserves are modest relative to those of its neighbors and at current production rates, reserves would last 20-25 years. Consequently, the government is undertaking many development projects aimed at diversifying the economy and further improve education in preparation for the eventual decline in oil revenues. The government has recognized that the fishing industry has a firm place in Oman's future, and, as a consequence, in January 1982 a 5-year Fishery Development Project was approved by the Omani-American Joint Commission and the Ministry of Agriculture and Fisheries.

2. Project purpose

The fishery sector goals are to promote fisheries as a non-oil source of income and to promote the welfare of traditional fishermen. The purpose of the FDP as approved by the OAJC and the Ministry of Agriculture and Fisheries (MAF) in January 1982, was to strengthen the technical capabilities of the DGF. During its execution time, the FDP addressed the major constraints to further development of fisheries by providing technical assistance and training.

3. Project description and implementation

On April 28, 1982 the governments of the Sultanate of Oman and the United States signed an agreement whereby the United States, acting through the United States Agency for International Development, would provide aid in addressing major constraints to the further development of fisheries. Under that agreement, the FDP was implemented by the MAF and the OAJC. In 1983, a contract was signed between MAF and RDA International, Inc. to provide long-term advisors to develop programs in statistics, extension, marketing, and policy advising within the DGF. These advisors were to work with Omani counterparts, to provide on-the-job training for DGF employees, to recommend training programs for qualified Omanis to develop fisheries skills, and to establish and operate technical programs until Omani counterparts were capable of assuming their operation. A similar contractual relationship was established between Oregon State University and the DGF in 1985 to provide a

team of scientists to the MAF's Marine Science and Fisheries Center, which is the research department of the DGF.

Over the past years, ongoing programs were established under these two contracts in statistics, extension, marketing and research. The responsibility for fisheries training was assigned to another OAJC project but it was coordinated and monitored by the DGF and the two contractors. In April 1987, the first interim evaluation of the project was undertaken by a team of fisheries and [illegible] evaluation experts. This evaluation looked at the soundness of the project design after approximately one year of implementation and provided recommendations for future project focus. The second interim evaluation was undertaken by another team of experts in November 1987. It examined progress in achieving project objectives and made recommendations for future OAJC involvement in fisheries beyond the life of the project. Many of the recommendations of this evaluation have been incorporated in the design of a follow-on Fisheries Development and Management Project, to begin implementation later in 1989.

B. Evaluation Purpose, Scope, and Procedures

This evaluation is the third and final evaluation of FDP. Its purposes are:

- To indicate progress in achieving the project purpose of institutional development of the DGF; and
- To identify lessons learned under FDP which can be applied to FDMP.

Since a decision has been made to undertake a follow-on fisheries project (FDMP), this evaluation is viewed in part as an interim evaluation of the OAJC's long-term commitment to the sector as well as an opportunity to assess progress achieved to date and to re-examine the effectiveness of contracting methods, counterpart relationships, institutional structure and functions, project focus and levels of effort expended.

The scope of this evaluation was framed by the tasks assigned to the Evaluation Team. These were:

- To assess the institutional development of DGF;
- To assess the effectiveness of approach to institution building;
- To assess effectiveness of project contracting;
- To assess effectiveness of the OAJC in project implementation;
- To analyze appropriateness of project focus;
- To assess the quality and adequacy of the socio-economic data, fishery statistics and research data collected to date for the purpose of fishery development and management;

- o To assess the soundness of approach and formulate conclusions on stock assessment work; and

- c To summarize the lessons to be learned from the weaknesses and strengths of FDG's design and implementation.

To accomplish the evaluation tasks, the Evaluation Team included a senior fisheries research manager, a fisheries development specialist, an institutional development and public administration specialist, and an A.I.D. official from the ANE/DP/E office in Washington, D.C. Biographical summaries are presented in Annex 1. Prior to their departure for Oman, the Team was provided with FDP background information from A.I.D./Washington officials, Richard Neal, S&T/AGR, Brian Wickland, ANE/PD and Peter Deinken, Oman Desk Officer. During their visit to Oman from May 20 to June 19, 1989, the Team reviewed major FDP's documents, such as the FDP project paper, contractor implementation plans and amendments, the first and second interim evaluation reports, contractors quarterly reports, technical papers produced by the contractors, and project implementation reports. The Team also reviewed memoranda and other pertinent communication in files at MAF and OAJC. A list of the main documents reviewed is presented in Annex 2.

The Team carried out extensive interviews and discussions, with senior officials of DGF, OAJC, and with all members of the contractors' technical assistance teams and their Omani counterparts within DGF. The Team also interviewed some officials of the private sector firms who have significant contact with the MAF and contractor officials. A list of the most prominent persons interviewed is presented in Annex 3. In order to assess the effectiveness of field programs such as extension and statistical and biological sampling, the Team visited fish landing places, fish markets and fishing industries in the Southern Region (Dhofar). Assessments undertaken by the Evaluation Team followed a frame provided by the Scope of Work. The Team's findings measured progress relative to the Start- and End-of Project Status contained in the Project Paper and contractor implementation plans.

II. FINDINGS

A. Achievement of Institutional Development of DGF

1. Project objectives

One of the primary purposes of FDP is to strengthen the technical capability of the Directorate General of Fisheries to plan and manage fisheries development programs. Although the project did not contain either a specific institution-building component or clearly defined institutional development objectives, the project paper identified a number of general indicators which, it was believed, would demonstrate institution-building progress at the DGF. Principal among these indicators were: the replacement of technical experts by qualified Omanis; functioning programs for estimating sustainable yields; and an extension service responsive to the needs of traditional fishermen.

These vaguely defined institutional development objectives were to be accomplished largely through technical assistance and training in functional areas. It was assumed that by strengthening the DGF's functional activities, the project would somehow, ipso facto, produce general improvement in the organizational capability to manage these activities. Project design, however, grossly underestimated the weak management base of the DGF. The project's lack of an institutional management component, which would have specifically addressed institutional development constraints, proved to be a serious deficiency. Continuing weak institutional management, in large part, prevented the effective implementation of project objectives.

2. DGF organizational structure

Before project activities began in 1982, a formal organizational structure did not exist at the DGF. Technical functions were loosely divided into two general categories--research, and all other activities not then classified as research. The organizational chart at that time depicted little more than a series of unconnected boxes. Accordingly, in June 1984, as an early project activity, RDA prepared a report on institutional, manpower and training requirements. The RDA report proposed a reorganization of the DGF based on existing technical functions, program priorities and the availability of personnel. The report further recommended, that during the following five years, priority be given to: statistical and related data management services; technical services (including extension); and, national fisheries affairs. The report also recommended that the services of a senior advisor be provided to the Director General of Fisheries for management, scientific and technical matters and that a policy, planning and review committee be established.

The RDA proposal was partially accepted by the DGF in late 1984 and now represents the current organizational structure. This structure basically consists of the Office of the Director General, the Office of Administration and Financial Affairs, a Fisheries Advisor and the Departments of Fisheries Affairs, Fishery Resources, Statistics, Extension, Training and Research (the Marine Science Fisheries Center). A Department of Fisheries for the Southern Region was also created as a quasi-decentralized office under a Director of Fisheries located in Salalah.

Subsequent to the completion and partial acceptance of the RDA report, a number of additional reorganization studies were commissioned by the DGF. Principal among these are the Wake study in 1988, the Arab League study, the Diwan study and, most recently, the Arthur Andersen study completed in 1989. All of these studies raise serious concerns about the effectiveness of the DGF in promoting fisheries development. As with the RDA report, portions of these proposals have been accepted yet none have been formally adopted. The fact that the DGF can not effectively resolve the basic organizational problems consistently raised in these reports is indicative of the significant organizational, management and leadership deficiencies at the DGF which this project has been unable to address.

3. Institutional development characteristics of the DGF

To measure progress in strengthening the management capabilities and institutional development of the DGF, the Evaluation Team examined six institutional characteristics: personnel, financial resources, management systems, organizational outputs, receptivity to change and leadership.

a. Personnel

At present, the DGF staff consists of approximately two hundred employees, fourteen of whom are women. While this staff is assigned to specific departments, job descriptions do not normally exist and personnel may not always carry out responsibilities implied by their titles and departments. Accordingly, in the absence of a full manpower assessment, a valid discussion of staff responsibilities and qualifications is difficult beyond a general review of staff distribution.

At the beginning of the project in 1982, statistics program staff consisted of two data collectors, one in Muscat and the other in Salalah. In 1988, staff increased to forty-three people, including a director, assistant director, head of analysis, supervisors of analysis, data technicians and samplers. Three expatriate counterpart staff advised the program. Qualifications of statistics program staff are described in detail in Part III E of this report.

In 1984 when the extension program was created, nine Omani extension agents were employed. By 1987, the number of agents was the same, but three were working as clerks. As of October 1988, staff consisted of a director, an administrative assistant, thirteen full time extension agents, field specialist support staff, a master fisherman, shop mechanic, an expatriate advisor and Omanis trained from U.S. training programs. There were no women employed as extension agents.

The DGF has fourteen professional positions in marketing, three of which are filled by expatriates. Official titles often are meaningless, since many staff are untrained and/or uneducated at even minimal levels. The program is staffed by heads of industrial affairs, documentation, product development, quality control and consumer production. There is an accountant, port engineer, refrigeration mechanic, marketing officer, and a seafood specialist. The port engineer, refrigeration mechanic and consumer education specialist are expatriates.

With few exceptions, qualifications generally are not at a high level. Civil service requirements that define job positions are imprecise and while personnel may qualify for a position, they do not necessarily have appropriate training for the job they were hired to do. Job titles may be elegant, but often the corresponding positions are clerical in nature. Even heads of sections may not have secondary school degrees. Moreover, those with a limited education are unable to benefit fully from on-the-job training.

b. Financial resources

Money for programs in DGF is provided by MAF from the budget allocated to it annually by the Ministry of Finance. The process for obtaining funds begins in about July when each program determines its needs for the next year. Requests are submitted through the DGF to the Directorate of Administration and Finance, MAF. The DGF has no accounting staff of its own and not much control over the budget. After review of the submission by the Directorate, Deputy and Minister, a proposal is submitted to the Directorate General of Finance, Ministry of Finance (MF). Approval of the budget by the MF occurs at the end of the year.

Consolidated program budgets are prepared by DGF, FDP and MSFC staff. These budgets consist of all program activities conducted by the respective programs, but are submitted as a total amount for FDP and MSFC, respectively. Once a consolidated budget is prepared by project managers, it is submitted to the Director for Administration and Finance, DGF. The Director coordinates all DGF budgets and submits them to the DG for approval. The DG has power to change these budgets as he wishes. DGF budgets are then submitted to the Department of Finance, MAF, for review and approval by the Minister. The Ministry budget then goes to the Ministry of Finance and is reviewed along with other national budgets. MF may determine as national policy to make across-the-board cuts which then require the respective Ministers to determine where cuts should be made. A five per cent reduction imposed by MF meant a 50 per cent slash in operating budgets last year for the FDP, which caused severe strains in the project's program.

Accounting categories, about 50 in number, which comply with standard numbers and descriptions established by MF, are used to specify items proposed to be spent for the next year. These are not identified by program activity such as extension or statistics, but they include items such as salaries, housing allowances, travel, stationery, office furniture and maintenance, etc. It is these account categories which the DG has authority to move from one account to another. The Department of Finance, however, does not monitor expenditures by accounting item and only recently has prepared reports on monthly expenditures. Monthly reports, however, do not identify the program in which expenditures are have been made. Project managers, therefore, do not know if money has been taken from their budgets and hence cannot control and monitor their own budgets. A manager may know the total amounts remaining at the end of a year, but does not know how the money was spent, by item. Money to repair cars, for example, may not exist at some time and anticipated field travel is prevented.

The DGF prepares three operating budgets: one for the DGF itself, one for the FDP and one for the MSFC. Resources available to DGF are identified

in the following table:

Table I: DGF Financial Resources

	DGF		FDP		MSFC		Combined Total	
Year	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual
1988	748	550	348	285	304	223	1401	1058
1987	NA	NA	394	342	294	269	NA	NA
1986	678	604	406	295	291	161	1375	1060
1985	733	644	949	400			1682	1044
1984	229	177	455	242			684	419

Unspent funds are returned to the treasury, and future allocations then based on previous expenditures. Underspending budgets and returning money to the government is commonly explained in Oman as demonstrating frugal management. However, in the case of the DGF it is difficult to reconcile underspending with admitted shortfalls in budgetary support for important programs such as extension. The problems appear to be more the product of a lack of basic accounting skills and program planning capabilities rather than fiscal responsibility.

Each program under this process competes for its own budget, including regional offices. Project budgets seem to be approved without assessment of consequences or requirements for future years. The process is not an institutionalized planning process based on program budgeting and is not discussed in DGF-wide meetings. Program managers cannot be assured that activities underway in the current year will continue into the next. Consequently, data are not collected, contacts with fishermen are terminated, and training or demonstrations activities are delayed. In short, sustainability of the project suffers, personnel become discouraged and program objectives are not achieved.

Procurement in DGF is handled by the Department of Administration and Finance, the DG, which approves all requisitions, and the purchasing department, which follows procedures established by MF. The procurement system leads to delays in obtaining equipment and supplies which adversely influences project scheduling. There is no forward planning for future purchases, thus preventing timely purchases for program activities and overcoming limits set by the drawn out process.

Expenditures under the budget item for the three groupings above are broken down by the Directorate for Administration and Finance into such items as salaries, parts and fuel, stationery, training and electricity and water. Money for programs is not separated out by activity: budget items for extension, statistics or marketing, for example, are not available and trends cannot be shown. Project personnel state that money is transferred, unknown to them, from one account to another and at times, money believed to be available has already been spent. A program thus could be stalled when money is anticipated to be available, but then found to be spent. If a worn-out vehicle needs replacement, but money for it disappears, field activities have to suffer. Most of the budget, 83 per cent, goes to wages and salaries, far

above the average of other governmental agencies, according to an analysis conducted by OAJC. Thus it is not allocated to fishery development. Due to the large proportion of the budget paid to expatriates, and a potential need to hire more or better qualified staff, a potential budgetary dropoff will have a serious consequence for future Omanization of DGF.

Money from the three budgets can be transferred from one account to another by the Director General. Thus, a line item for a given expenditure by FDP may not be available at the time of anticipated purchase. Uncertainty is, therefore, introduced into forward planning because recurrent and development budgets are mixed.

c. Management systems

Management systems in DGF are consistent with those of MAF and of other government agencies. The personnel system is complex, but follows the procedures established by the Civil Service Commission, Ministry of Finance and MAF. The process to establish a new position may require more than eight months, before advertisement and appointment. Hiring for an established position is easier, but still time consuming. A qualified applicant could easily become discouraged and take another job during the waiting period. As to procurement in DGF, the Directorate of Administration and Finance must approve all contracts over a certain amount although purchase requests are prepared by project heads. Requests are sent to the Directorate of Administration and Finance Office and the DG for approval. The procurement process itself is effective, but reporting in various steps along the way is not. Thus, a project manager cannot be sure of programming an activity unless equipment is available; personnel thus may have little to do while awaiting delivery of an important item they need for work.

With a few exceptions, management capabilities are limited. Initiative and innovation are not rewarded nor encouraged by the management system in DGF; personnel promotion schemes are unpublicized. Observations of personnel at their desks in DGF suggest that demands on capabilities are not excessive. The management system in DGF, however, appears to have internal contradictions. For example, decision-making is said to be a top-down process, but interest group representatives lobby the Minister directly; equity is allegedly pervasive, but a top official can issue unchallengeable directives; and while orders are largely verbal, an enormous amount of paper work is required for the most trivial approvals.

There is no formal structure for planning in DGF in any sense of program development beyond budgeting functions. The fact that program planning is not institutionalized as a systematic process at the DGF has serious implications for sustained program development. The absence of a strong and prominent position in planning results in unsystematic operations that cause delays, waste and inefficiencies. Project planning, in the absence of an overall national strategy, is done by program staff who develop their program agendas for specific activities. Recommendations from project staff are normally transmitted to the DG. Instances were reported, however, in which responses, when received, were rejected in whole or in part. An alternative procedure used is to make suggestions directly to the Minister who was said to be more open, receptive and agreeable to innovative ideas. The procedure does not lend itself to a systematic planning process; the

Department of Administration and Finance which would normally be involved in program planning or monitoring is not so engaged. Evaluations of project activity are not conducted in DGF.

The planning department of MAF is not part of DGF. Planning in the Directorate General of Planning in MAF is concerned with tenders and contracts but not program planning which is done at the project level.

d. Organizational outputs

Effectiveness of an institutional arrangement can best be assessed by accomplishments. Programs were established and are operating (with varying degrees of success) under the FDP in extension, marketing, statistics and research. Project activities are discussed in Parts III D & E.

e. Receptivity to change (absorptive capacity)

Absorptive capacity for technical assistance and training depends on the educational level of personnel, cultural characteristics, perception of the value of public service and benefits from training. The Omani culture emphasizes decision-making as a top-down process and a belief that advisers are in fact staff employed to carry out directives; hence, receptivity to technical assistance is inherently limited. Technical assistance through directed staff work and presentation of options is generally not the way decision-making is done in DGF.

Capacity to absorb technical assistance is also limited by the limited technical and academic qualifications of the DGF staff and language barriers between the DGF staff and the technical assistance team. Some DGF personnel are genuinely interested in fisheries, but that interest depends on an award system in the Ministry, a system that is not well-publicized. Performance is reported on during a three month probationary period and then only if extremely unsatisfactory. The procedure is more formalized in Salalah.

Technical capacity to carry out FDP programs varies, but generally is limited. Capacities are discussed below for each program conducted by FDP, giving findings on level of quality, interest in the program by personnel, capacity to absorb technical assistance and training and the relationship of the respective programs to the southern region program activity.

f. Direction and leadership

The lack of motivation, leadership and political will at the DGF has seriously constrained achievement of project objectives and fisheries development in Oman. Further, personnel are insufficiently trained or inappropriately used; financial management is unsystematic and too uncertain for proper scheduling; the administration and management systems are slow and cumbersome; and training to cope with limitations does not have a high priority. The contractor could not be fully effective in developing institutional capability given the limitations imposed by project design and the limitations noted above.

Frequently the Minister or DG may ask project staff for recommendations on given issues. Responses are transmitted in writing, in English.

A feedback may or may not be received. As a result, project staff either wasted their time or are uninformed of decisions. Often project staff submit program and policy recommendations directly to the Minister, especially on issues that may be detrimental to the project. Direct access to the Minister by project staff, normally frowned on in most bureaucracies, is customarily easy. In order to avoid working through the DG, project staff believe that there often is a need to circumvent normal channels of communication.

The fisheries development program at the top of its management structure is led by a Director General of Fisheries. The structure of the organization managing FDP, from a pre-project state to its various modified forms, was described above, including Omani government units and technical assistance support provided by two contractors serving as advisors to the project.

On the basis of information available from interviews of persons responsible for some aspect of the project, from persons in the private sector and from reviews of documentation relevant to the project, the major source of initiative in managing and leading the project currently comes from expatriates or staff of the two contractors. Although directives are issued by the DG to request program planning documents (the indicative plan or lobster management regulatory program for example), documents are prepared by project contractors. Responses to the documents, or decisions on them, have not been made in many instances, according to the RDA project chief and fisheries advisor to the Minister. Proposals to restructure DGF also came from expatriate advisors, but these too have had limited adaptation.

Training programs proposed by expatriates to develop basic skills in administration and management have been rejected in the implementative stage, or were limited by the number of competent people to train or released from their jobs for training. Efforts were made, including institution, manpower and training requirement studies (1984) by RDA, but programs were not fully implemented. Even had RDA been more aggressive in promoting training, the time and set up were apparently inappropriate for significant change.

Initiative is constrained within the ranks of division and section chiefs because of the alleged top-down decision process which lends itself to waiting for orders and avoiding assumption of responsibility that might set one individual above another, a situation that is generally desirable to avoid. An involved and time-consuming system of review and approval inhibits staff from exercising leadership roles. Further, the DG of Fisheries may request a department to prepare regulations and himself go to the Minister for approval, or, on an ad hoc personal basis, and without informing the management staff, he may issue verbal regulations responding to a local request. This means that staff may not be informed of decisions taken which could have some important impact on the fishery program.

4. Southern Regional Office

The regional office of MAF in Salalah is a relatively small, decentralized arm of the Ministry in Muscat. Administratively, it is headed by a Directorate General of Agriculture and Fisheries whose line responsibility is to the Minister in Muscat; the former has a strong

interest in irrigation and livestock -- two development sectors with historical importance in the region. Under the DG is a Director of Fisheries who is responsible for fisheries activities in the Southern Region. The Director of Fisheries reports directly to the DG in Muscat on technical matters. The DG of Fisheries in Salalah has approximately sixty-four employees who, according to the Director (cited in the Anderson report), are not used properly due to overstaffing and a lack of resources to fund projects.

The Fisheries Directorate is divided into the following sections: maintenance and supply; marketing and production; fishery projects; fishery research; statistics; surveys and studies; contracts and tender followup; Fishermen's Encouragement Fund; licensing and marine guard.

Financial resources available to the Southern Region Office for fisheries are provided through a separate budget allocated to the DGAF by MAF in Muscat. However, while the administration of the Salalah Fisheries Directorate is decentralized, funds available to FDP activities are centralized and controlled in Muscat. Availability of funds has been a constant limitation on project activity and expatriates have minimal local resources available to them. Use and availability of vehicles in Salalah illustrates limitations on project activities: long distances and difficult conditions cause vehicles to deteriorate quickly, but no money has been available for purchase of new vehicles, and funds for repairs are extremely limited.

Further limits on project activities are posed by the lack of a budget for overtime. In the statistics program, overtime is a constant variable. Teams normally work on weekends and afternoons, but there is no provision for overtime in the salaries budget. The Andersen report indicated that although some overtime is paid, the system is inadequate; the percentage of monthly salary received for overtime in Salalah has been reduced to 10 per cent of monthly salaries.

Information obtained from interviews in Salalah indicated that perceptions of the importance of institutionalizing management capabilities are not evident in the fisheries program, but that there were signs of changes occurring. Further integration of activities such as marketing, enforcement and extension, were not yet occurring, but a need for coordination was recognized. An illustration was given of a DG who could not see the link between responsibilities of Industry and Commerce, which builds harbors, and the Directorate of Fisheries, whose fishermen use those harbors.

The bureaucratic system itself works against capable management. This was illustrated by the time-consuming process required to obtain a fishing license. It involves application forms, photos, interviews, dossier checks, etc., taking up to a week, which discouraged many fishermen from obtaining a license altogether. A computerized system of recording information from the fishermen's files, developed by RDA's advisor and inputted in Arabic by Omani staff, has been accepted by the licensing section. It can be used as a management tool, for example, in licensing renewals, in distributing information and arranging extension agent visits.

Project contributions to improve technical capacity were discussed for each program related to the Southern Region wherever such contributions could be identified. In general, technical capacities of Southern Region programs are limited by lack of experience and training. The licensing section was ultimately convinced that a computerized system would benefit them; an Omani trained under the project in computer programming at URI, had the technical capacity to provide data needed. The capacity exists, but it is not widespread.

Among the top officials interviewed (DG, Director and Deputy Director of Fisheries), all were interested in the project, but had not been on the job long enough to make an impact. Interest seems greater than the managerial capability to translate that interest into action.

Project management and leadership in the Southern Region is still in something of a disorganized state. The Director of Fisheries, new to the job, felt that Muscat was not giving the project enough attention and/or resources to do what was necessary. The ability of the Director to control the Southern Region program, for example, through the budget and through the indirect line to MAF/DGF in Muscat, makes leadership difficult. The Director said that administratively he was able to control his program, but a greater degree of communication among some of the key parties--the DGF in Muscat, the Directorate General of Agriculture and Fisheries (who is in a separate building and has visited the Department only once), and the Director of Fisheries--would improve opportunities for management and leadership. The Director does seem willing to listen to his advisor and deputy and may provide the leadership required. Still, encouragement, support and direction from the top, according to the Director, were needed.

5. Effectiveness of approach to institutional development

Although an emphasis of the project was institutional development, the original project design did not include a specific institutional management component. It assumed that the variety of training planned under the project, in conjunction with strengthening functional activities of the DGF, would lead to a general improvement in management capabilities. This proved to be a serious deficiency since the focus on technical skills development was not adequate. The DGF also needed a comprehensive approach to strengthen weak institutional systems. The approach used by the project for institution building essentially consisted of the provision of technical assistance by two contractors who filled functional positions and trained counterparts. As a result, the project bridged, rather than resolved, the major institutional weakness at the DGF. Programs for developing the basic abilities required to implement and manage a fisheries management project, in a bureaucracy with no previous experience with such a sizeable undertaking, were not provided for by the project in its initial design or in the subsequent followup by contractors. Attention to establishing programs and providing expatriate experts can only lead to concerns about further sustainability of the project still dominated by expatriates. Counterparts, when they exist, have so far been unable to assume significant responsibility.

Since consultants largely filled functional rather than advisory positions, they had limited institution building impact from the beginning. Accordingly, technical assistance contractors were used to supplement or fill

inadequate staffing capability and to provide direct services to DGF rather than focusing on institution building. The contractor team commonly served as clerical staff as well in the absence of support services. Consequently, contractors related to senior Ministry officials irregularly, on an ad hoc, issue-oriented basis. While there seemed to be no restrictions on access of contractors to officials, contact is not an institutionalized procedure such as regular weekly progress reports or periodic program review sessions. As far as could be learned from visits to contractor offices, rapport between counterpart and support staff was good, with a few exceptions; the language barrier and cultural differences, however, inhibit close relationships.

Approaches used had some desirable results. However, in terms of development of viable and sustainable institutional arrangements, more attention is needed on basic training in organizational and administrative management and short-term, top-to-bottom training programs for developing abilities in these areas. To increase the effectiveness of institution building efforts would require: implementing recommendations on administration and finance (such as those contained in the Andersen report); tightening of the application of Civil Service Laws; more stringent and precise requirements on personnel qualifications; streamlining hiring procedures; implementation of an incentive system of rewards for showing initiative; improvements in the tone and style of management and leadership from the DG and Minister; and closer review of contractor schedules and performance by the Department of Planning and Coordination in DGF and by OAJC.

In summary, an assessment was made of contributions of FDP to development of a viable and sustainable institution by comparing functional parameters with actual operations and results. In general, the institution that was the object for institutional development, DGF, was incapable of coping with many demands put upon it at the beginning of the project. Some improvements in institutional capability have been made, in spite of serious limitations, that still are not resolved, in terms of organization, administration and management.

- Personnel. Staffing in DGF is currently 202 persons of varying levels of capability and competence.

- Financial Resources. Funds for the FDP cannot be relied upon on a consistent basis; funds assumed to be available at one point may disappear at another, without notice to project managers.

- Planning. A concept for processing steps for planning and programming in a budgetary sequence does not exist.

- Organizational Outputs. Outputs made under the FDP in terms of identifiable products are listed in an appendix. Accomplishments of a "soft" nature, i.e., those involving sensitizing officials to fishery development or to transmitting problem-solving capabilities are less easily recorded, but nevertheless some achievements have been made.

- Receptivity to Change. Capability to accept new ideas exists, especially among individuals trained through program support. The institutional environment for utilizing these capabilities is not

sufficiently developed or receptive to take advantage of trained capability.

- o Direction and leadership. Direction and leadership from the highest levels is needed to enable the system to function for project purposes. Direction and leadership for FDP and recognition of the importance of the fishery resource is still not given the attention it deserves as part of national economic development.

B. Project Contracting

1. Contracting scheme

a. Background

Financial support for the FDP is provided through Host Country Contracts (individual contracts) between the GovOman and RDA International Inc., for Extension, Marketing and Statistics, and Oregon State University (OSU), for Research. Although the US Government (USG) provides money for these contracts via USAID and OAJC, none of the US Agencies is a party to the actual contracts.

The contribution to the FDP by OAJC, up to 1988, was $11 million under the two Host Country contracts. RDA provides eight long-term advisers associated with the extension, statistics, marketing and fishery policy programs. OSU provides six scientists to the MSFC to conduct fish resource and food technology assessments and manage the Center's aquarium and library under the Host Country Contract procedures. OAJC monitors amendments to the host-country technical assistance contracts and reviews and discusses annual work plans prepared by the contractors. Administratively, OAJC staff review and approve contractor payment vouchers. Additionally, payment scheduling to the two contractors has frequently exceeded a contract requirement for payment within 45 days. OAJC has therefore taken responsibility for the default and processed vouchers. Although the OAJC finances these two contracts, it is not directly involved in contract management and does not have any clearly defined line responsibility for program coordination.

b. Host Country versus AID direct contracting

The Team examined the alternatives of AID Host Country contracting and Direct AID contracting. In retrospect, the decision to conform to AID Host Country contracting for the FDP was probably the best alternative, given the aims and objectives of the Project formulation. Since the main focus of attention is towards building the institutional framework of the DGF, the AID Host Country contracting alternative would have seemed to be the most desirable, since under this type of contracting more aspects of minor administration would be covered by the DGF and it assures an active participation of the host country government. However, in the light of experience gained within the Omani fisheries sector and the lack of institutional framework within the DGF, it can now be concluded that the contractual choice was inappropriate and succeeded only in presenting the maximum constraints to project implementation.

One merit of AID Host Country Contracting is that it generates institutional development through the creation of administrative capability. Against this, it tends to create a significant braking effect in project implementation before institutional development can take place. This negative effect rebounds on the ability of the FDP to enhance timely institutional development.

On the other hand, Direct AID contracting, giving the contractor authority over various budget line items, would have tended to provide a more efficient and effective administrative framework for the FDP, and would have avoided some braking effect issues by DGF. Hence, project implementation would have been accelerated, albeit marginally by each issue, but substantially as a result of aggregated issues. This would have allowed the project to more readily have impact on the development of technology transfer to the fishing industry associated with the various programs. The negative effect of Direct AID Contracting would have been the tendency towards a further aggravation of the problems associated with the lack of institutional build-up and administrative capability within the DGF.

c. Fundamental problems of the contractors

Regardless of the contracting schemes, whether by Host Country Contracting, or by AID Direct Contracting, the Team believes that there are more fundamental issues which require addressing more strenuously. Primarily, there was no definitive plan in the FDP for a separate institution building component.

In one sense, the Host Country Contracting has tended to increase lines of communication and liaison between expatriate personnel and higher authorities of DGF. Although this effect is osmotic and hardly quantifiable, this interaction should have led to an increase in leadership and understanding of requirements and priorities needed to develop an integrated fishing system. In the Team's view, a somewhat different reaction has taken place; the constant need for problem solving activities has created an apparently subtle, but not entirely visible, abrasive environment between higher DGF Management and the contractors. The Team notes that in interviews with Omani higher officials there is some resentment towards the contractors per se and the contractors' methods. In some cases, the resentment appears to be a personal issue against the contractors' personnel. The Team believes that the majority of this feeling by Omani Officers is subjectively based on differing cultural perspectives and, in some cases, due to differing personal approaches to tasks and programs.

d. One versus two contracts

The Team paid special attention to the effectiveness of the independent contractor scheme established to supply expatriate expertise to the FDP. On face value it would appear that one contract, rather than two, would have been preferable, since it is simpler administratively to deal with one entity. This would presuppose that the contractor was able to readily put into the field the appropriate personnel across the spectrum of interdisciplinary requirements. It was not known when the FDP was first set in place whether there was a risk in setting up one contract only. It was most likely felt that if the one and only contractor's perspective had not

been appropriately interdisciplinary, the FDP and the programs of the project might have suffered.

Based on their analysis of the two options, the Team feels that two contracts, with the differing perspectives of a commercial consulting company (RDA), and of an academic institution (OSU), was the better option, given the needs of the Omani fisheries at the time of Project preparation. This strategy served the project needs and more readily safeguarded against irregular program focus and implementation failures. Furthermore, separate contracts under well integrated operational schemes would be seen as serving to oversee each others activities. Although this is perceived as the better approach for this particular FDP, in practice, the contractors have mainly operated independently, without inter-dependent and inter-related formal linkages that take into consideration the overall fishery system. The Team further feels that there are some subtle institutional differences between the two contractors which do not redound to the benefit of the FDP.

e. Training under two separate contracts

When training is undertaken under two separate contracts, it is necessary to ensure that a homogeneously trained cadre of Omani experts are produced, as originally envisaged in the Project design. Although one expects the type and extent of training to differ according to professional needs, it is necessary for the coordinate contractors' principles in terms of academic post-graduate, academic undergraduate, technological, technical and trade school requirements. While a committee was ultimately set up to coordinate this requirement, the Team found that it has not really been effective in reaching its objectives on a timely basis. It was apparently formed too late within the frame of the FDP. RDA prepared a full assessment of training needs. The program which was consequently developed was subsequently awarded to another (third) contractor, with yet another agenda of priorities that did not ideally fit into the two existing contractors' outlines. As an example, there are differing opinions of the required qualifications of extension agents. In the Teams's view they should be practical men with an orientation towards fishermen, the beach and the sea. By contrast, citations in documents from sources other than the existing contractors, indicate that extension agents should receive a substantial amount of academic training. Indeed, there would be a natural tendency for a contractor who is implementing a training component to lean towards a more academic orientation of training (See Annex 4 for full discussion of training activities).

f. Ability of DGF to manage contracts

Taking into account that only a few years ago there was a primitive fishing industry in Oman and an equally basic institutional structure, with few or no linkages, the progress of the contractors would have been quite remarkable with a little more backing from the DGF. The actual progress (due to institutional constraints) has been somewhat less than remarkable. However, there is no doubt that Omani and expatriate ambitions are both in concordance with the need for institutional development. In the Team's view, the DGF is not able to cope with the differences between their priorities and imperatives and those of the contractors. The Team was not able to find evidence that any compromise was reached on any issues, particularly with RDA, whose imperatives and priorities are less defined than

those of the research program. Examples of constraints towards contractors' progress are the inability of the extension program to gain a desirable impetus due to the inappropriate quality of Omani extension agents and the inability of RDA's marketing experts to make inroads, due to the lack of institutional linkages between the DGF and the private marketing sector. In the Southern Region, the general lack of institutional ability on the part of DGF tends to constrain all the work of the RDA advisor. The general observation is that DGF has difficulty in coping with the contracts as envisaged by the OAJC and the contractors.

g. Contractor linkages

Outside of the relationship of working together towards a mutually favorable training program, linkages involving a closer working liaison, such as by an inter-contractual committee on common technological issues, were largely absent. The Team feels that while the contractors had no obligation toward each other, professional needs should have brought the contractors together in a committee involving each other in common aims and aspirations. This should normally be the responsibility of DGF, but, given the lack of institutional development in DGF and organizational cohesion on the part of the contractors, the contractors and OAJC should have pushed for some sort of "steering committee". As an example of this, the marketing experts of RDA were steered towards the private sector, following DGF's decision to allow privatization to motivate the market. At the same time, the Food Science Department of OSU at MSFC, was actively pursuing inroads to the private sector on parallel issues. From discussions and reports produced, there is some evidence of collaboration (test marketing of smoked fish, taste panels on lobster quality control, bluefish marketing/processing, sardine drying yard, study to estimate landings, a quality control seminar, value of lobster fishery, and provision of an OSU consultant to the extension program) which would have been of considerable advantage to the advancement of programs on behalf of both contractors.

2. Contractor implementation plans

The many difficulties in creating an infrastructural system in fisheries and allied components, have prevented both contractors from making the inroads which they anticipated. The timing of each program has tended to take an ad hoc course, rather than being in accordance with a well defined program. The Team feels that this has been unavoidable in view of the constraints faced. Examples of this are as previously indicated.

Because of the absence of feasibility studies in the original plans, the operational plans of the contractors appear to be generally too wide in perspective and in some cases do not appear to be achievable, given the associated constraints. RDA in particular did not consider, or if considered, did not carry out, a Technical Feasibility study, following the Socio-Economic study, before deciding on the priorities of the Extension program. OSU has tended to work on current "political" resources issues. They did not carry out what the Team feels would have been a fundamental prerequisite, stock assessment programs, which might have more clearly highlighted the further needs of scientific enquiry (See Section III.E.3).

The Team feels that the focus of attention, the technical application and the analysis of results of the statistics program, are providing important data. However, in the absence of stock assessment and population dynamics data, which could have been used with the emergence of an embryonic management program, which would have included a comprehensive, well trained cadre of managers and fishery enforcement officers, the data provided by the statistics department could not be further absorbed by the fisheries system.

3. Contractor expertise

a. General comments

The qualifications, ability and experience of the contractors' personnel appear to be appropriate to the various programs undertaken, although in some cases the personnel are limited by having a breadth of knowledge, without having the depth required. In one particular case, a contractor staff member did not have the required amount of practical experience, but seemed to be qualified in a more academic or administrative capacity. In this particular capacity, the staff member would require a considerable amount of practical experience related to the task assignment.

It appears that some manpower was brought out before the full range of technical skill requirements were defined and certainly before programs were sufficiently underway to benefit from this assistance. Therefore, in some instances, the scale of programs tend to be contractor driven, rather than striving for what is doable and sustainable on the part of the DGF. This was the case with both the research and extension programs.

RDA, and to a lesser extent OSU, were hindered by the ambiguity in terms of the type of staff which they were expected to provide. On one hand, the Project Paper, the contracts and the OAJC expected advisory staff who, with counterpart staff, would implement program activities. On the other hand, DGF expected Teams to perform assigned tasks independent of the project scope.

b. RDA effort and timing

A total of 610 person-months of field technical staff services were provided by RDA. Of this amount, 105 person-months were allocated to marketing/economics; 125 for extension; 193 for statistics; 145 for policy, planning and administration (including Salalah advisor) of which 100 are estimated for policy and planning and 45 for administration; and 42 for research.

The RDA staff have been constrained by many administrative difficulties and the linkages and effects of the extension and marketing programs have apparently not been seen by DGF senior administrators as having the same priorities as some of the research and statistical programs. Thus from an initial inspection, the effort and timing of the extension and marketing programs do not seem to have had the impact of other programs. However when viewed in the light of DGF priorities, cultural constraints and administrative difficulties, at least some progress has been made to date.

Given RDA's lack of success in getting the extension program underway, a full blueprint for technical composition of expatriate staff members has not

yet been formulated. The Team realizes, however, that it would have been clear to RDA that development was within the confines of the artisanal fisheries only. In turn, this would have indicated that experts with considerable expertise in the artisanal sector, capable of carrying such extension "to the beach" and integrating within the fishing communities, would be required. It is not clear from a review of the CV's of the experts employed in the sector that this is the case, although discussions with the experts indicate generally the correct level of expertise and experience.

RDA's management and support staff have continually attempted to pursue new avenues addressing the priority needs of the sector. The fact that many of the attempted items on its program have not yet demonstrated fruitful results, does not, in the Team's view, reflect adversely on the contractor vis a vis technological efforts towards innovation. However, the Team believes that RDA should have made more formal efforts at a high level to sound major warnings of distress to OAJC and the DGF, to address the main issue of how institutional development might have been accelerated, so that programs could be more speedily implemented. Where a political or other issue is placed on a high priority list by the concerned government agency, the implementation task is lubricated by an urgent need (as an example, the lobster management plan). It is only recently that RDA's extension program has received a greater priority and events have indicated a speeding up of the program. The Team believes that the appropriate impetus can generate and motivate the institutional acceleration as indicated above.

c. Review of expertise of RDA

A brief review of the types of expertise provided by RDA is as follows:

- Chief of Party: The Chief of Party is responsible for providing advice on policy matters to the DG in Muscat. There was one Chief of Party from 1983 to 1985. The second Chief of Party took up tenure in 1985 and remains with the project to the present date. The Team believes that the contribution of the present Chief of Party, through his active participation and optimistic attitude toward the project, would have had greater impact had administrative support from DGF been greater. The Chief of Party has a Ph.D. in Marine Biology, with extensive experience in commercial fishing and administration of fisheries matters.

- Marketing: There have been five marketing experts attached to the project since 1984. All the experts have had appropriate expertise. However, their approach to marketing and processing, which encompass a wide range of disciplines, has been different. RDA has recommended that DGF discontinue its activities in marketing and transfer responsibilities to the private sector. This has tended to create difficulties for the marketing expert's work plan, given the discontinuation of DGF direct involvement in marketing. Accordingly, the Team questions whether it continued to make sense to fund marketing services provided by RDA under the position as presently structured. The experts have had to

concentrate their efforts on micro aspects of marketing without any links between the private sector and any operational programs of the DGF.

- Extension: One Extension Advisor was with the project from 1984 to 1988. He was then replaced by a new advisor who is in place as of the present date. The first advisor was in place at the time when many administrative procedures were being determined. The extent of actual extension work was not quantifiably great during this period. Towards the end of his tenure and during the time of the recent advisor, a more definitive approach has been possible. The new Extension Advisor has excellent Arabic language capability in addition to wide experience and a high level of competence. His Arabic language capability is an extremely valuable facility in view of the limited English spoken by counterparts and fishermen.

- Master Fisherman: A Master Fisherman was attached to the project in 1987 and was replaced in 1988. The first expert left by mutual agreement as he and the project were not ideally suited. The present Master Fisherman has been in place since 1988 and is making some progress in his field of activity. Responding to the fishing communities' needs and ensuring the functioning of measures which are implemented in response to identified needs are regarded as priorities of this significant role. The role of the Master Fisherman is potentially very important in the training of Omani counterparts and commercial fishermen. While the Master Fisherman appears to be qualified, the extent of his practical commercial fisheries experience is not reflected in his CV.

- Marine Engineer: A Marine Engineer was employed in 1987. His contribution is seen as being very effective in providing support to the extension program. However, his activities are curtailed by never-ending requests for ad hoc tasks, not related to his primary job responsibilities, from higher DGF officials, as expressed in the section on Project Focus (Section III.D).

- Statistics: Four statisticians have been employed between the project's start-up and the present date. The statistical program is the most outstanding in its development among all the programs, at least as far as comprehensive data generated to date. There are currently two positions, one for data collection and the other for data integration and statistical analyses. These two positions are occupied by fishery biologists with experience in quantitative population dynamics, statistics and computer science. None, however, is by training a statistician or computer specialist. An important attribute is the Arabic language capability of the experts in place.

- Souther Region Advisor: A fishery biologist with broad experience was transferred from the statistics program to the Southern Region to serve as advisor to the DG in the region.

- General: The Team believes that possession of Arabic language skills would be a decided advantage for expatriate specialists working in the fisheries sector in Oman. However, this has to be balanced with technical qualifications, since the combination is unlikely to be commonly available.

d. OSU effort and timing

A total of 223 person-months of field staff technical services have been provided by OSU. Of this amount, 12 person-months have been for administration, the remainder (211) for research.

The level of effort and timing of contractor staff programs have varied according to priority definitions emanating from DGF. The lobster program has received priority attention in view of the lucrative nature of the sub-sector, while the development of small pelagics and food technology (with higher capital investment) programs, having little priority within DGF, have been retarded by lack of impetus. Further comments on OSU's effort and timing are found in Section III.E.3.

e. Review of OSU's expertise

Close evaluation of the researchers is difficult due to the multidisciplinary nature of fishery science. Originally, the Project Plan stated that three scientists should be experienced fisheries scientists, in the context of the program's focus, and one of the advisors was required to be a population dynamics - stock assessment specialist. OSU provided a suitable basic cadre of three scientists, all holding Ph.D.'s from well recognized institutions of higher education in the USA. The scientific personnel had a broad background in fishery biology, although the quantitative population dynamics and stock assessment component was not found in the background of the personnel.

The Team carefully reviewed the activities and assistance of the scientific group and concludes that great efforts, continuous innovation and implementation of research activities were attempted, although not always with success. The scientific group has evolved in their contractual obligations concerning amended plans, although at Project start none of the scientists had experience with the species and fisheries prioritized by GovOman. All three biologists had worked in tropical marine fisheries prior to their assignment in Oman. (See details, Section III.E.3.)

The Librarian was well prepared and keen in developing and implementing a computerized library reference system. The librarian has run all of his activities almost single handedly, due to the sporadic assistance of a counterpart.

The Aquarium Curator is a young, enthusiastic and active professional, who has full command of the demanding responsibilities of keeping a modest, but well mounted, aquarium. He has been successful, not only in collecting representative specimens of Oman's fauna, but also has described new species for this area. The fact that he has exposed marine life to thousands of Omanis is indicative, by itself, that his activity is OSU's most tangible result.

The Seafood Science Head of Section holds an M.Sc. and has a tenured position at OSU where he actively participates in Extension Programs. At MSFC he has been able to make inroads from the area of scientific research to the private sector, which is in keeping with his philosophy of Extension. He is, however, constrained from further development by lack of support and assumed low priority of his section by DGF and by lack of equipment and facilities.

C. OAJC Effectiveness in Project Implementation

Given the limited number of AID personnel (six direct-hire staff) at the OAJC, the FDP was consciously designed to minimize the need for direct OAJC monitoring and implementation of Project activities. As initially discussed in the FDP Project Paper and subsequently confirmed in the Project sub-grant agreement, the DGF and the MAF were expected to take full responsibility for implementing project activities with minimal OAJC oversight. To reinforce the DGF's ability to implement project activities, the DGF was provided with considerable technical assistance (including senior advisors to the Director-General of Fisheries as well as technical staff advisors) under AID Host Country contracting procedure.

The OAJC believed that it could responsibly undertake normal AID oversight and monitoring responsibilities through the review of progress reports, field visits and meetings with DGF staff augmented by periodic assistance from AID/W. To accomplish this, the OAJC assigned a full-time AID direct-hire project officer who served as the principal counterpart to the Director-General of Fisheries and the RDA and OSU Chiefs of Party. In this regard, the project officer established good working relationships with both government officials and technical advisors. The project officer and OAJC also have effectively provided administrative support to the contractor when necessary. The project officer is a generalist. There is otherwise no fisheries expertise at the Joint Commission.

In retrospect, the planned monitoring and implementation plan was unworkable. As elaborated throughout this report, the OAJC had seriously overestimated the ability of the DGF to manage a project of the scale of the FDP (even with technical assistance) and underestimated the implications of the divisive institutional differences between the two principal contractors (which prevented the formation of an effective project management team). Further, given the absence of technical expertise on the OAJC staff, the OAJC was often unaware of the nature of implementation problems or, to the extent that problems were correctly identified, was not in a position to resolve them.

Regardless of the lack of technical capability at the OAJC, there were still apparent deficiencies in project oversight responsibility in two significant areas. As discussed more fully below, first, periodic implementation plans seemingly were not critically reviewed and second, the recommendations of the second interim evaluation were not fully addressed.

Although annual plans were submitted by both contractors and approved by the OAJC, these plans were little more than lists of desirable activities. They did not establish priorities, identify the steps necessary to complete the tasks, assign staff or discuss budgetary requirements. Consequently, it was not clear from the revised RDA implementation plan for 1988-89, e.g. how,

exploratory fishing at Kuria Muria Island directly promoted extension program objectives; when, where and to whom electric and hydraulic winches and echosounders would be demonstrated; or, how much any of these activities would cost.

The second interim evaluation report identified a number of significant problems with project implementation and recommended a series of remedial actions. Principal among these were a series of recommendations to improve project budgeting , e.g., that a system of accounting which segregated project counterpart funds from DGF general funds be reinstated and that the DGF prepare and approve budgets for FDP program activities. These recommendations were not actively pursued even after it became evident that contractor activities were being constrained by a shortage of counterpart funds.

D. Project Focus

The FDP was a five-year effort to strengthen the technical capabilities of the DGF to develop and manage fishery resources in Oman. To accomplish this, the project attempted to overcome a number of major constraints, including a lack of knowledge of the size of the fishery resource, too few trained fisheries professionals in the DGF, and skills of traditional fishermen needed to further development. Accordingly, the FDP focused on four major areas of technical and scientific assistance: Statistics, Research, Extension, and Marketing. For each one of those areas, specific programs we are developed and implemented. The Team was requested to review how appropriate the programs for project focus have been, to review the project implementation framework, and to assess project emphases and effectiveness.

1. Appropriateness of programs

The analyses carried out by the Team indicate that the main constraints encountered by GovOman in initiating a reasonable plan for development and management of the fisheries sector were due to a noticeable absence of institutional framework and fishery policies, insufficient cadres with the required educational capabilities, and absence of private sector entrepreneurial abilities linked to appropriate financial resources and technology. As a consequence of the above, the basic elements permitting development and management of the sector were absent. It was quite apparent, therefore, that the fishery sector required an urgent upgrading of organization and knowledge to accomplish a fast integrated fishery development congruent with the policies set forth by Sultanate Decree.

The scale of the Project designed to accomplish the goals of the fisheries sector does not seem to have precedents in the recent history of fishery development. In the Team's opinion, the development activities were enormous both in terms of scope and in terms of science and technology requirements. Although, in terms of fisheries development elsewhere, the FDP was not over complicated, it overwhelmed the then existing Omani institution and confused the existing organization and host country leadership. Of equal importance, the Team believes that the seventeen elements identified in the original Project Plan to provide Oman with the institutional capability were too idealistic and based on too many unrealistic assumptions of the management capabilities of the DGF or the availability of resources to achieve its purpose within a realistic time frame.

The four programs selected (Statistics, Extension, Marketing and Research) represented the obvious functional prerequisites required to foster innovation and development in any fishery. For these reasons, in the Team's opinion, the selection of programs for Project focus was generally adequate. Fundamental aspects related to institution management (administration, operation and leadership) were initially taken for granted by the system or were assumed to be provided ad hoc by the Project. In fact, the Team identified a great number of impediments directly responsible for project failures which are associated with weak institutional management. Under these circumstances, the Team believes that an Institution Development and Management Program should have been established as the fifth program for Project focus.

2. Program implementation framework

The organizational structure of the DGF was not considered adequate to carry out planned project activities on a sustained basis. While some improvements have been made and the present organizational chart shows more functional differentiation in accordance with the DGF's overall program, there is clearly a need for more structure (organizational chart) and internal processes. The need for more organizational change is substantiated by several recent studies (1987 RDA Report, Wake report, GCC Report and Diwan Study). While there are numerous recommendations for organizational restructuring, the DGF appears resistant to making major changes in either personnel or organizational form.

The Team believes that the advice provided by the Project to DGF on institutional development was well aimed. It was hoped that the initial organizational requirements to support both the Project and programs would be generated. Such institutional development, however, resulted in an organization with very weak functional integration of components necessary for an efficient assimilation of project impact. Under those circumstances program implementation corresponded to the best possible organizational, but not operational, option available to the Project. The Team bases its reasoning on the belief that an initial weakness of the Project design was the absence of clearer identification of institutional development objectives which considered the political, social and cultural conditions of the DGF. The inevitable resultant effect from such an approach was to hinder the expeditious implementation of the various stages of the Project and programs. Undoubtedly, much of the dampening of aspirations of Project personnel resulted from this condition. In spite of these braking effects on Project implementation, the Team believes that the focus of Project and programs were to a certain extent safeguarded by the original Project design and contractor's obligations established in the initial Project Plan and the contractor's Implementation Plans. Amendments to Contractor's Implementation Plans played a fundamental role in accommodating project design, but in several instances project focuses were altered.

Due to the constrained environment in which the project was held, the Team believes that at least initially, some of the programs were unappropriately focused as non-self-sustained tasks within the emerging institutional framework (especially the Extension and Marketing Programs). These did not result in task specific impacting development. The rationale behind this statement is based on the fact that concentration of effort in

specific tasks, rather than wider spectrum programs, could have resulted in immediate multiplicative and long lasting factors of development. (See Lessons Learned for specific details).

In the light of circumstances existing at the time of preparation of the Project Plan, the prevailing conditions and needs of the sector defined the Project's focus. In the opinion of the Team, the Project focus and design (programs) obeyed the original needs of priority definitions to accomplish the goals of the sector. The alternative of providing a function-oriented, interdisciplinary approach requires the existence of strong functional linkages on a well structured fishery management system, neither of which existed then nor exists now in Oman. Therefore, the Team believes, any attempt to establish a function-oriented program would not have allowed developmental assimilation within the system and would have equally failed to provide the Government with technology and science.

3. Project emphases

The Project Paper put great emphasis in development of human resources. The development of human resources by the Project has been achieved through various forms of in-country-training (on the job, direct, etc.). However, the FDP has not had control on either the selection of people to be trained abroad or the content of the training programs, which have been administered under a different contract (STP/URI). As a consequence of this failure in integrating project resources for human development, and despite the training given to DGF counterparts and other DGF personnel, trainees (especially in the areas of Extension and Statistics), have not been able to perform at the levels expected in the initial Plan after completion of the training. This is one of the most important constraints that diluted program effectiveness. Not only was the training in some cases inappropriate, but the expectations of the Project for counterpart staff to interface with expatriate specialists, on both a professional and experience-derived level after training was completed, was excessively optimistic. The Team notes especially that training alone does not qualify personnel for academic and technical positions. A balance of training and subsequent substantive experience is invariably required before a true assimilation of counterpart responsibility can be achieved. The net result of this inadequacy has been that the expatriate specialists have continued to work in an operational rather than advisory capacity in the various programs (e.g., Statistics and Extension). While the Team is convinced that professional transfer of skills continued to be the aim of the contractor's specialists, differences of skill levels, cultural and sociological parameters, and non-homogeneous ideological adhesion to the project objectives, by contractor and DGF, have all contributed to slowing down the transfer of skills.

4. Project effectiveness

The Team found it difficult to assess Project effectiveness since Project and program objectives were never clearly defined beyond the End-of-Project status, little baseline data was collected and linked to objectives and progress indicators were not established even after seven years of Project activities. There was no logical prioritizing of constraints or objectives either on the basis of their importance or their interrelationship (i.e., cause-effect). If Project effectiveness is measured by the degree of

progress in establishing functioning programs in the major project components, then there has been moderate success in Statistics and Research and little or no success in Extension and Marketing as discussed in the following sections. If project effectiveness, however, is measured by the ability of the DGF to manage any of these programs on a sustained basis, then the project has had considerably less progress.

In this regard, it appears that the statistics and research programs benefited from the greatest degree of technical assistance support (193 person-months and 211 person-months respectively), highest quality and quantity of on-the-job training; and, greatest degree of understanding and interest by counterpart staff.

The project advisors have to cope with the complexities of fisheries development and reach the goals of contractual requirements. To DGF staff, these goals may appear secondary and in most cases they represent an advanced environment of technology and science outside the scope of their training schemes and expertise. Since the advanced technological and scientific programs represent most of the project input, the Project, rather than being a set of integrated programs following the institutional framework, has taken on the pattern of many small turnkey projects. The Team notes that although Project output is following this turnkey appearance, it appears to be the most effective action, given the lack of counterpart expertise.

The Team unequivocally states that contractors personnel, besides the major role of the advisors in their respective programs, are seen by the established system (MAF/DGF) as offering consultation, advice, and services on an ad-hoc basis on minor issues not connected directly with the programs. Further, since the DG designated a mid-level manager as Chief of Party counterpart, the TA role in policy formulation was effectively limited. This is particularly true with extension and policy advising, but it is also affecting statistics and research. This inadequate utilization of skilled human resources considerably reduces the contractors' performance vis-a-vis the stated programs. More significantly perhaps, the disruptive nature of ad hoc services adversely affects the focus of individual programs. Despite these constraints, the Team believes that the constant ongoing effort by the contractors to disseminate the appropriate knowledge embodied within the programs, will in the long term, produce impact to a certain extent on technological and scientific transfer. However, this impact will in all probability be less than that envisioned by the Project. The Team believes that such progress can only take place if DGF policy and internal directives vigorously promote and support the Project and programs. As a result of this constant input, the turnkey effect would be expected to revert to the integrated programs approach and support the institutional development initially envisaged by the Project.

While a number of activities have been successfully completed by the contractors, the impact of these on either institution building at the DGF or the development of fisheries in Oman has been minimal. It is difficult to establish any direct link between project activities and reported increases in fish catch.

5. Program focus

Focus and scope of each program within the project has contributed to Project focus. For this reason a separate review of each program focus was undertaken by the Team.

a. Extension program

The extension program generally based its activities on the perceived need to bridge the gap between the production sector and administration, research, training, transfer of technology and marketing. It was also intended to meet the fishermen's need for information and technical assistance. Additionally, the focus of the extension program, in its dual role, was to train Omani extension workers and specialist agents to interface between both the contractors' staff and the fishermen; the Omani counterparts would then take over the role of the contractors' staff at the end of the projected FDP period.

However, the whole focus of the extension program was on the artisanal fisheries of Oman, there being no indigenous commercial or industrial fisheries within the sector. In the Team's opinion the artisanal fisheries of any sector are more restricted than industrial fisheries, in that the artisanal fishermen operate individually or in small groups and normally have low income levels. The diversity of gear used and species caught by the fishery does not permit a clear definition of focus for the extension program, especially where the fisheries investment capabilities in technology for development are very much constrained or non-existent. Small-scale fisheries are survival fisheries. The Team sees that the survival level of the individual fisherman creates an unbounded environment for extension work. Therefore, in the Team's opinion, the focus of the extension program was rather vaguely designed and based its success on the experience and opportunity that the contractor's extension agent had at the time of his contract in Oman.

The duality of the contractor's focus in developing the extension service, especially in terms of reaching out and understanding the artisanal fishermen, depended for its success in both parts, on preparing a Team of ambitious, conscientious and well integrated Omani counterparts. Since this type of worker did not previously exist in Oman, it was necessary to undertake a special training program for the extension agents. The Team observed that the program has totally failed in its primary objective due to lack of interest in recruitment and subsequently by trainees and counterparts; lack of personnel with the correct basic educational qualifications; lack of aptitude of the entrants; and a general lack of interest from higher levels of DGF.

From the above the Team concludes that the program focus on extension has lacked one of its two prime interdependent elements. It could never have succeeded without a strong cadre of Omani extension agents, professionally turned out and acceptable to the artisanal fishermen. Attempted technological progress without this linkage was impossible. The extension program should have refocused on convincing DGF of this vital interdependent linkage as an extremely important issue. The Team learned that the DGF is apprized of this prerequisite, but so far events do not indicate its establishment.

b. Marketing program

The original focus on marketing was to channel potential fishery resources to be obtained by the developing artisanal fisheries, into the Omani domestic and export markets. An important aspect of the program was to open new markets and bring new opportunities for channeling increased landings of higher quality fish at better prices, through the direct efforts of the DGF in marketing and distribution centers. Several centers had been established by GovOman to facilitate the collection, presentation and further distribution of fish caught by traditional fishermen. Project TA was originally intended to support the marketing operations carried out by the DGF. However, this approach did not fit into the traditional fisheries system in Oman.

It was later found that DGF could not compete with the many hundreds of established, but fragmented, units of entrepreneurial marketers and processors. Thus, the DGF justifiably contracted out the operation of these centers first to the parastatal fishing company and later to private operators. Subsequently, many isolated efforts, made in the interests of market development, although valid for the purpose of fisheries development, were not conducive to the emergence of a well focused marketing program.

The efforts of the five marketing advisors differed both in context as well as perspective, as to inputs to the marketing program. Little institutional progress was made as a result of these efforts and the marketing program did not achieve the envisaged End of Project Status. Failures in the early stages significantly effected project focus.

The Team believes that the major negative impact of the change in Program focus, is reflected in the isolated efforts in the fish marketing and processing component. The component did very little to improve the quality and variety of the product, which could have been derived from the FDP.

Indirectly the Team believes that the consequences of these compounded failures did not contribute towards the expansion of fishing technology and incorporation of fishing activities. In general, the Team believes that the marketing program should have and a more important role than that which has evolved, since it is the market linkages that impact very strongly on the fishery, both from a supply and demand viewpoint and in terms of the value, to both processors and fishermen, for higher quality products.

c. Statistics program

See Section III.E.2. Statistics Program, Sub-Section "a" of the Scope of Program for information on this program focus.

d. Research program (MSFC)

See Section III.E.3. Research Program (MSFC), Sub-Section "a" of the Scope of Program for information on this program focus.

E. Evaluation of Data Collection

1. Socio-economic data

The original Project Plan in 1981 indicated that, while the DGF personnel had participated in preparation of the Plan with the OAJC, the traditional fishermen were not considered in the design of the Plan. The Plan went on to state that it recognized the need to assist traditional fishermen as part of the GovOman policy to include them in the development of fisheries. Since the only Omani fisheries at that time were traditional fisheries, the Team finds this statement to be indicative of an ambiguous fisheries policy. It is a self-evident proposition that if the traditional fisheries were removed from their present place, where they have been for hundreds, if not thousands, of years, there would be no call for institutional development or transfer of technology in any other sector of the industry. In short, there would be no fishing industry.

However, to commence the process of recognizing the needs of the traditional fisheries, a social/cultural/economic analysis was included. This was devised as an input to provide the necessary interaction with the fishermen, to ensure their needs would be met by the extension program, which was to be designed by the Project.

A socio-economic report was presented in June 1984, on behalf of RDA. This was substantial in descriptive analysis, but in the Team's view it lacked quantitative analysis, which in simple terms would answer the question "What are the needs of the fishermen in terms of extension and technological development?" Indeed, the socio-economic data collected in 1984 reflects an evaluation through the cataloging of equipment and people participating in the fisheries. The report does not include the essential analyses conducive to an anthropological characterization of coastal fishing communities.

One important element indicated by the socio-economic survey was that fishermen's populations were ageing and that there was a reluctance on the part of the younger generation to engage in fishing, while at the same time indicating that the majority age-grouping of fishermen (20 to 50) represented a productive labor force. A subsequent Fisheries Development Master Plan was prepared by RDA in 1988. The Master Plan hypothesized that fishing appeared to be too arduous for the young men, with attendant inadequate returns and low social status. The Master Plan concluded that a multitude of approaches would have to be developed within the overall long term development program, to recruit the younger people into the profession, to upgrade their skills and income and to upgrade the low social status of fishermen.

The Team concurs with all of these conclusions and recognizes the importance of socio-economic data leading to an assessment of developmental needs in the traditional fisheries sector. Subsequently, and after a technical feasibility study, implementation of a first class active and comprehensive, Omani integrated, extension service should be considered. For this purpose the feasibility study should have full coastwise coverage, in terms of both physical coverage of the whole coast, including the Southern Region and embracing the full extent of all fishing activities. The needs of the fishermen in terms of technological development is an absolute prerequisite,

on the attenuation of which, a building of social prestige, higher wages and increased recruitment of young men may be achieved.

2. Statistics program

The Team reviewed the Statistics Program with the purpose of developing recommendations for program modification and improvement since statistics has been a key project focus and one that should be continued under FDMP. For this purpose, the Team reviewed the scope of the program including its purpose and function within MAF, the adequacy of existing technical assistance being provided by the FDP, and adequacy of Omani inputs. The Team also reviewed the type and quality of the data being collected and its applicability to MAF decision-making requirements.

a. Scope of Program

The frame that defines the scope of the statistics program may be found in Chapter II of the Project Paper which is repeated below:

"The major issue in developing fisheries is whether there are enough fish in Omani waters (within 200 mile off shore limit, as defined by international treaty) to support a large enough sustainable fishery to constitute a significant portion of the national economy. The belief is that there are enough fish and that the fishery can be greatly expanded. The fact is that no one knows, for the data on standing fish stocks and current catch rates are scanty and exhibit such wide variation that little faith can be placed in them. Until some reasonable approximation can be made, fisheries development in Oman is a gamble. While most experts agree that there is a harvestable surplus, that surplus may not be as large as anticipated, and there is always a danger that overfishing may result from even a small increase in fishing pressure. A continuing statistical program is needed to provide this information."

Because no program for collection of fisheries statistics existed before the implementation of the FDP, very limited information on the fishing industry was available for developing or designing a statistical program congruent with the needs of DGF. For these reasons the Project Plan established that a one year stratified field sampling survey was required to provide reasonably accurate baseline data by species or species groups on which a longer term fisheries statistical system could be based. The one-year program also served the purpose of training DGF personnel who later became the permanent field staff responsible for the collection of data in the long-range fisheries statistical program now in place.

The purpose of the Statistics Program, as originally stated, was to create a data base for the analysis of Oman's fish resources, including the preparation of a resource assessment. The long-term goal was to provide DGF with the data on which to base management decisions to maintain the productivity of the fishery resources. Later on, a revised Implementation Plan (1988-1989) for RDA states that the purpose of the Statistics Program is to establish a data base for the analysis of Oman's fisheries resources, leading to the preparation of a resources assessment and resulting in an ongoing continuous program to guide the management and monitor the utilization of the fishery resources. The purposes stated in the original and amended programs

are slightly different. In the second amendment stock assessment is less imperative and contractual obligations to prepare such assessment are explicitly excluded. On the other hand, management guidance functions not normally associated with statistics programs were included in the amendment.

Under any circumstance, the purpose of the Statistics Program should be the generation of a data base that explains fisheries as a production system, and which functions to provide this information to those responsible for developing management advice (biological, economic and social research, and management department) to MAF. With the information gathered from such a program, the GovOman would know which species are exploited, where, when and by whom they are exploited, and how they are processed, distributed and marketed. The GovOman could then determine fisheries' contribution to the national economy. The Team sees stock assessment as a research activity which makes use of some, but not all, of the information gathered by the Statistics Program, using expertise not commonly associated with statistical programs. In this sense, it is not the role of a statistics program be relied on to guide or monitor fishery resources, since those are responsibilities attributable to the research agency (MSFC).

The Team reviewed future Statistics Program considerations contained in an RDA internal review (March 1989) and sees a lack of focus on purpose and functions given to the Statistics Program. It seems obvious that the Department of Statistics and Data Processing Unit is the natural depository of recent catch data, and that the MSFC should be the source of information on the biology of the fish. However, the natural and mutual interdependence between the research arm and the management arm of the fisheries organizations does not necessarily include the Statistics Program which has the unique and extraordinary task of generating part of the information utilized by one or the other arm mentioned above. The Team emphatically states that research and management are two separate but interdependent activities, none of which is the responsibility (in purpose or function) of the Statistics Program. However, the Statistics Program must work closely with the research and management branches so that the information collected matches the needs of the management system.

b. Adequacy of technical assistance

Technical assistance to the Statistics Program is provided by two RDA advisors: a Fisheries Statistician/Analyst and a Fisheries Statistics Advisor. The advisors are well-trained in areas of population dynamics and stock assessment. They use statistics and computers as tools of their trade. One significant attribute is that both experts speak Arabic fluently; hence, their ability to communicate and transfer knowledge is immensely superior to that of previous advisors associated with the Program.

The Fisheries Statistician/Analyst did not have experience in fisheries statistical programs or computerized systems to handle fishery data banks prior to his arrival in Oman. His education, however, (an MSc from a well recognized fishery resources management institution) allowed him to quickly and effectively develop his scope of work. In the Team's opinion, his input has been of fundamental importance to the existing statistics system now in place. Technical assistance provided by the Statistician/Analyst has included design and planning of sampling regimes, implementation and checking of data

collection protocols, implementation and modification of software for data manipulation and analyses, and training of personnel associated with the data processing section. The advisor has also been responsible for the integration of ex-vessel price data and fish receiving ticket data in the existing data base for purposes of evaluating catch statistics.

The Fisheries Statistics Advisor holds a Doctorate in Marine Biology with a major in stock assessment. He has extensive experience and considerable publications on stock assessment and population dynamics of commercial species in the Mediterranean, Red and Arabian Seas. He is especially well suited for assisting field work activities. Technical assistance provided by this advisor includes improving the field data collection system and assisting in design and implementation of sampling schemes. One important contribution of the Statistics Advisor is to assure that spatial-temporal randomness required by the sampling design is always met by the samplers. This is a very important task because catch statistics are estimated from a stratified random frame survey and randomization elements are fundamental to the established estimation procedure. Besides providing training to field samplers, the Statistician is responsible for checking accuracy of data collected by the field samplers as well as data derived from the Fish Ticket Program.

Omani counterparts interviewed by the Team fully appreciated the capabilities and efforts of these two experts. In the Team's opinion, they provide the most tangible technical assistance provided by RDA to date. The positive contribution of their technical assistance is based on the fact that both advisors understand the data needs for providing management advice as well as the requirements of the data to generate scientific knowledge. The advisors, therefore, have been able to modify and improve program design and ongoing activities. More importantly, they have explained to counterparts the reasons why such actions were required. Both advisors play a major role in generating statistical data analyses and are responsible for preparing all statistical bulletins generated by the Program.

c. Adequacy of Omani inputs

The Team measured adequacy of Omani inputs in terms of personnel assigned to the program and logistic support provided for field activities.

Review of Omani personnel inputs to the Statistics Program is analyzed elsewhere in this report (Section III.A.1.). In summary, integration of field samplers into the program was very active at initial stages when the one year sampling survey was implemented in July 1984. Prior to that year, only two field samplers (one in the Capital and one in Salalah) collected some statistics for the DGF. In 1985 two field samplers were assigned for the Batinah, two for the Capital, two for the Northern Sharkia, one for the Southern Sharkia and one for Dhofar. Since 1985 only 4 more field samplers have been added to the initial cadre, plus two supervisors who assist the Statistician in corroborating accuracy of statistics collected. According to the End-of-Project Status, by the end of 1988 eighteen field samplers (three for each region) plus three supervisors should have been in place (Batinah-Capital, Northern-Southern Sharkia, and Dhofar). That is, the Statistics Program has a deficit of six field samplers and one supervisor; none of the supervisors are in the regions. Given the enormous task of collecting

statistics of artisanal fishing activities spread over 1,700 km of coastline, the Team sees the present number of field samplers and supervisors as very limiting. The most likely result of this will be significantly less precise statistics than initially expected at End-of-Project Status.

Personnel for data integration and analysis consisted of one Supervisor/Analyst and one Data Entry Clerk in 1985. This number was increased to three data entry clerks in 1986, two were transferred from another section in 1987 and one was hired that same year. According to the Statistician/ Analyst there is sufficient manpower for the present activities of data entry and analysis; however, a significant increase in the amount of data to be processed is foreseen when the new National Fish Company initiates activities.

Reports provided for the Team's review indicate that field samplers and data entry personnel were recruited without consultation with advisors or careful review of qualifications. Quite understandably one of the most serious constraints prevailing up to date is the lack of well-trained field samplers and the slow technical capability transfer leading to self-sufficiency observed in the data processing section. The Team notes that major efforts to improve levels of training are underway by the advisors. However, this seems to be the least appreciated and the most time consuming activity of the Program.

Based on a review of field sampling activities, the Team sees the most detrimental impact upon Program performance deriving from budgetary and administrative constraints which have slowed down, impeded, and in some regions paralyzed, implementation of field work. Administrative and budgetary constraints are reflected in logistic support problems (cars not repaired or delayed, lack of timely gasoline and travel allowances, etc.), lack of overtime allowances (sampling can only be performed during working hours), or simply no budget being available for field data collections in some regions. In the Team's opinion, administrative tasks not efficiently provided by the GovOman seem to overwhelm the technical work provided by advisors.

The Team perceives that Omani personnel do not have incentives for increasing their performance, although field samplers (some with secondary education) are fairly well paid with a fixed permanent job. In their regions, Government jobs are highly respected by community members and this, by itself, facilitates data collection.

d. Type and quality of data collected

Sampling for catch and fishing effort (two important pieces of information required for management advice) is a particularly difficult task related to small-scale fisheries. This is because there are so many fishermen, most of whom are logistically difficult to contact. Because it is impossible to contact each fishermen, it is necessary to apply sampling theory in order to estimate catch, effort, and some of the biological properties of the stocks. In Oman, about 90% of the estimated total catch landed (104,055 metric tons in 1987) is taken in small-scale or traditional fisheries. In spite of the significance of these fisheries, they are characterized as being comprised of a large number of low-income fishermen who tend to operate individually or in small groups. They carry out their activities throughout the entire coastline of the country, landing small quantities of a myriad of

species (about 160 commercial species) captured from a variety of small fishing craft and with several different types of gear. Fish are an important source of food to coastal communities, and more recently, some species (lobsters and abalone) have become an important source of foreign exchange generated by the sector.

The Team reviewed in detail the type of data collected in the traditional fishery. Arranged by area, day, and hour, surveyed field samplers collect general information as boats or vessels sequentially arrive at the beach or port. The information contained in the vessel/boat landing log includes time of landing, vessel/boat type, license number, number in the crew, and whether or not the vessel/boat was further sampled for catch and effort data. If a vessel was sampled, the following data are recorded: date, vessel arrival sequence number, name of vessel, name of captain, number of crew, number of fishing days, area of fishing, type of gear and number, total number and average weight of fish by species or species groups, and an estimate of the total landing based on the number of fish landed and the average weight of individual fish in a random sample. If a boat is sampled the following data are recorded: date, license number, fishing hours, landing in numbers of fish by species or group of species, average weight of fish in a random sample, estimated total weight from numbers and average weight of the fish in the random sample, gear type, number of pieces of gear used, price paid per unit fish.

The Team considers that the type of data collected in the traditional fishery is very adequate for the purpose of the Sampling Program.

Quality of the data may only be judged by the precision and accuracy in estimating the different outputs from the fishery (e.g. catch, effort, etc.). Precision will greatly depend on the spatial-temporal coverage requirements of sampling design, while accuracy will fundamentally depend on how field samplers are collecting the data. In the Team's opinion the experimental sampling design used by the frame survey was keenly developed and it could provide precise data if the program were fully operational. Unfortunately, field data collection is plagued by bureaucratic red tape and significant budgetary deficiencies which have prevented continuity of activities and have resulted in an unbalanced data gathering system generating apparently "good" quantity data in some regions, to "poor" quantity or no data in other regions (e.g. the important fishery region of Dhofar). The Team notes that budgetary constraints abolished after hour allowances for field samplers to operate off GovOman office hours. This consideration is important because the Team noticed that a significant fraction of landings in the traditional fishery occur earlier and later than regular Government office hours. Otherwise the frame survey is efficient from a statistical point of view.

Accuracy of the data collected has been assumed to range from + 20 to 25% in previous project evaluations. In fact there is no information available to cross check accuracy of the statistics been collected, therefore the Team could not determine accuracy. Because of the importance of statistical accuracy, the Team reviewed the cross check elements incorporated within the frame survey. These consist of cross sampling made by a mobile sampling group (integrated by the program statistician and two field supervisors) which randomly visit the different regions, and make cross checks of landings obtained from the new Fish Ticket Program. The Team notes that cross checks by

the mobile sampling group do not generate independent samples on the same place and day that the field sampler operates. Therefore, accuracy cannot be estimated from that procedure. Cross checking from the Fish Ticket Program is not possible at this time because data reported in the tickets also needs to be cross checked for accuracy, and the response to the Fish Ticket Program has been low with an approximate 30% response. The Team, therefore, believes that the precision and accuracy of the statistics collected in the traditional fisheries are highly questionable.

It is apparent that precision of estimates will reach adequate levels once MAF/DGF fully understand the need of expeditious solutions to logistic and budgetary problems which are effecting the frame survey. The Team believes that a prompt solution to the problems encountered by the Statistics Program will be reached once higher officials in DGF understand and appreciate the importance of information for fishery development and management. Quality of the data can only be improved by developing cross checking activities, which do not overlap in time and space, with the random sampling scheme assigned to the field samplers. The success of such programs is also vested in the ability to overcome logistic and budgetary constraints mentioned above.

In addition to the traditional fisheries statistics, the Statistics Program maintains databases for the Fisherman's Encouragement Fund, Fishermen's Licenses, the Industrial Fleet Catch, and the Fish Ticket Program. The Team sees that the activities associated with the Fish Ticket Program and Industrial Fish Catch are incipient, but as development of the industrial sector takes place, they may become as important and as involved as those in the traditional fishery. Under those conditions, the Statistics Program will need to be vigorously expanded to cover all of its responsibilities. Data from the industrial fleet is basically data on catch, effort and length frequency statistics reported by Koreans on their fishing activities in Oman. Analyses of these data carried out by Project personnel (OSU) indicates that they were fabricated in a systematic way to comply with GovOman requirements on reporting. Therefore, their use for stock assessment has been discarded. Anomalies created by Korean crews also affected an earlier attempt by the Statistics Program to gather unbiased data from Korean trawlers. That program was aborted and new efforts have been recently re-established within the demersal program in MSFC.

The Team reviewed quarterly and annual statistics reports generated by the Program. The reports integrate well all data collected and the format is adequate. Explanations and results of fishery trend analyses are well suited, although the value of the analyses is jeopardized by deficiencies in the quality of the data used. The reports by the Statistics and Data Processing section are produced and published within a very reasonable time frame. (The statistics report for 1988 was in final draft form when reviewed by the Team). However, from the time RDA submits the statistics report to DGF to the time an official approval is obtained may take 6 to 8 months. This clearly indicates the lack of understanding and appreciation of the information contained in the reports.

The Team feels that the annual statistics report should be submitted with the DGF/Oman emblems and not with the RDA logo. This consideration for the Host Country will certainly activate a change in attitude of DGF officials concerning the use and value of the report. At present, circulation of

statistics information is limited. Consequently, not enough use is made of the information. In this sense, RDA tried but failed to initiate a training program on the use of statistics for management guidance specially designed for DGF Directors.

The Statistics Program will increase its impact on policy and decisions made by resource managers when the information is generated with a greater degree of confidence, when the data collected is integrated to the stock assessment stream, and when the institution (DGF) understands the benefits of fishery management.

The Team believes that future Statistics Program activities will be more effective if consideration is given to:

- Creation of two subsections--one in charge of statistics from the traditional fishery and the second section to collect and process statistics derived from the emerging industrial sector. The Team sees this option as necessary because the two fisheries are different in structure and operation and the requirements of the statistical sampling designs are not the same. The Team understands that there are administrative problems associated with making the Statistics Program more complex but believes that this recommendation is important;

- Revision of data requirements for stock assessment with MSFC. Production models (as exemplified for use by the Statistics Program) which use catch per effort as a proxy for stock size and use fishing effort as proxy for fishing mortality are not the appropriate stock assessment modelling approach for most Omani fisheries. This reasoning is supported by the fact that effective fishing effort from traditional fisheries will be very difficult, if not impossible, to estimate due to the diversity of vessels, boats and types of gear used in that fishery. Also, production models are significantly affected by changes in what can be caught, temporal availability and recruitment of the species, and by differences in selectivity of the various gear in use. None of that information will be easily obtainable for the highly dynamic species and fisheries which characterize the Omani traditional fishery system;

- Implementation of a micro computer system which is able to handle the volume of data and data processing which will be required in the near future. The present personal computer set-up is sufficient for present day operations but it will be very limiting or obsolete if statistics from the industrial fisheries are incorporated in the future;

- Retention of the present advisor's scheme and the addition of an advisor in computer systems. The Team believes the Statistics and Data Processing Department will not operate satisfactorily without the help of expatriate assistance;

- o Budgetary arrangements that will integrate sampling activities in the Southern Region will integrate into the National frame survey. The Team believes that budgetary restrictions in the Southern Region are affecting the quality of national statistics; and

- o Contracting field samplers under separate Government contracts such that they are not subjected to regular Government working hours (7:30-14:00). The Team notes that because of budgetary constraints (no funds for overtime allowances), samplers can only operate during established working hours, whereas most landings occur prior to or after Government working hours. This incongruency significantly affects the precision of the sampling program.

3. Research Program (MSFC)

The Team was requested to review the scope of research work under FDP in the MSFC in order to make an evaluation of the type and quality of data generated for stock assessment, and to review the soundness of conclusions on stock assessment work. This is in view of the fact that research on the dynamics of exploited fish populations is of primary importance in understanding the impact of fishing upon biological production of the stocks and to generate a frame for management advice leading to the appropriate utilization of living marine resources.

a. Scope of programs

According to statements found in several of the documents reviewed by the Team, the most commonly mentioned objective of the MSFC is that of providing scientific advice on which to base the careful management of Oman's fisheries and other marine resources. The Government expects that the MSFC will become Oman's primary source of scientific information concerning the use and management of these important resources. In order to accomplish this desirable objective the Project Plan indicates that the FDP will provide experts with the scientific competence to open and run the center while Omanis receive academic training. This requirement was fulfilled by contracting OSU.

The general focus of the Research Program was decided in Oman before the contract for technical services was let to OSU. The Beginning and End of Project Status indicates that the purpose of the Research Program was to create a data and knowledge base for the species found in Omani waters as part of the DGF's system of fishery management and its attempt to open new fisheries to responsible and efficient exploitation by commercial and traditional fishermen. The Team sees this purpose as defining the MSFC's role as problem-oriented which is consistent with the research focus of FDP. The Team notes, however, that knowledge of fishery systems requires the concurrence of pure and applied research on the biology and population dynamics of the species, as well as an understanding of the type, amount and quality of the technology used in the fishery. Misinterpretations of the fishery system's concept and of research priorities and requirements needed to better serve fishery development and management seem to have created differences between the FDP resources research (OSU) and resource management and development (DGF/RDA) as many disagreements on avenues of fishery research exist among contractors.

The initial OSU contract vaguely specified the contract objective as "to provide technical assistance to staff and assist in managing the MSFC". In the original OSU Implementation Plan, however, the objectives of the OSU project are: (1) to establish ongoing research programs in the six sections of the Center covered by the Project (large pelagics, small pelagics, demersals and shellfish, seafood technology, library and aquarium); (2) to provide (to the Government of Oman) initial research results to be used in making fishery management decisions; (3) to provide on-the-job training to counterpart Omani staff; and (4) to assist in the day to day operation of the Center, its research programs and other activities.

The Team believes that in spite of the extreme generality of the terms of reference in the OSU Contract and Implementation Plan, OSU advisors correctly focused their efforts on priority species fisheries by concentrating research activities, first on lobster and kingfish (and later on other large pelagics), followed by oil sardine, and, more recently, by the demersal species complex. A detailed review of OSU's initial Implementation Plan shows 26 projects plus 6 other potential future projects which were to be implemented during the contract period (August 1986-August 1989).

Such a plan was unrealistic given that only three scientists were associated with the project and that one of them was Chief of Party (COP) and advisor on administrative matters to the MSFC Director. Furthermore, no trained Omani personnel were available then or expected to be available during the OSU project tenure. Under those circumstances the OSU Team should have scaled down planned activities within the program design. The Second Project Evaluation Report (November 1987) clearly indicated that "OSU advisors were working to the best of their abilities...but their contribution was much less than it could be..." due to "... excessive work assignment which was made more difficult by lack of staff and logistic support." For these reasons, the Team believes that the Research Program was over-ambitious from its conception (Project Plan and Contractor's Plan). As a consequence, it impacted upon program scope and affected project focus in the sense that it did not provide stock assessments on which to base rational development of Oman's fisheries.

The Team reviewed the objective and research approach of each research program contained in the OSU Implementation Plan. For some programs the research approach was inappropriate in terms of experimental design and/or analytical procedures. The Team attributes this problem to the weak background of OSU's initial advisors in quantitative population dynamics and their lack of familiarity with fishery characteristics of species similar to those defined as high priority in Oman (lobsters, kingfish, sardines, abalone, demersal fish complex). However, generalists were initially required to comply with the terms of the contract.

The Team also notes that the scope of the stock assessment programs appears to be bounded by a common length-based modelling approach to stock assessment (canned ELEFAN programs, length cohort analysis, natural mortality rate estimates indirectly derived from growth data). In the Team's view, adoption of such a simplistic approach (defined as a "quick and dirty" approach to stock assessment in most specialist's jargon) greatly facilitates development of database (length frequency) systems does not require any long time series of fishery data for stock assessment, and it may, under very restrictive assumptions, provide estimates of essential population parameters

to generate management advise within a short time frame. All these aspects are appealing when considering the constraints surrounding the FDP Research Program environment at Project Start. For reasons more fully explained below, the Team believes that the selected approach to stock assessment research is not substantive in scope and may be leading to a very weak long term national fishery research program.

b. Data for stock assessment

Large Pelagics--Sampling activities have mainly centered on data necessary to generate management advice on Kingfish (Scomberomorus commerson) and long tail tuna (Thunnus tonggol), although sampling of eastern bonito (Sarda orientalis) and kawakawa (Euthynnus affinis) has been recently started. A data gathering system was designed and implemented at Muttrah fish market where fish shipments are received from several parts of the country. According to OSU, this represented an opportunity to collect reasonable information from the large pelagics fishery as whole. The experimental design consists of visiting the market place every day during the first ten days of each month; during the visits fork lengths are measured and recorded. On rare occasions biological data are collected on specimen sampled since the fish are generally marketed whole. Several hundred otoliths were collected for age determinations in 1987 and 1988, but they have not been used to determine age and study growth of the species. Only recently, some of these otoliths have been studied (in the US) to determine daily growth. Also, the OSU Team is sampling these species on an ad hoc basis at Masirah, Musandam and Sur.

The Team believes that fish at Muttrah market represent a mixture of sub-stratified samples of large pelagic species which are affected by regional fishing effort levels, seasonal availability due to migratory patterns of the fish, gear selectivity, differential size and beach marketing. Therefore, it is difficult to assume that the core of the sampling program is collecting valid information on stock size compositions. The Team sees a significant problem in using this information in stock assessment when sample length frequencies cannot be raised to total stock landings. This is not possible because it is not known which fish market samples belong to which landings in the national statistics.

Lobsters--A well designed statistical system for collecting length frequencies from 22 landings areas along the North Arabian Sea coast of Oman has been established. The system collected 24,145 length measurements during the 1988-1989 fishing season. Besides this very large number of length measurements, the program collects individual color patterns to differentiate possible stocks along the coast, sex ratios and maturity stages. Biological information is recorded with corresponding catch and effort data.

In the Team's opinion, this program is generating adequate data which is leading towards a better understanding of the life history and fishery patterns of the scalloped spiny lobster in Oman waters. Several other programs (tagging, experimental fishing in deeper waters, puerulus sampling and laboratory investigations on experimental lobster populations) have been designed and materials (tags, puerulus collectors) have been obtained; however, the programs are waiting for administrative decisions to be implemented.

The Team firmly believes that these initiatives should receive the full support of FDP because they are focused, and they coincide with a rational research scope that will finally result in an understanding of the population dynamics of the lobster resources of Oman.

Small Pelagics--Information on length frequencies and associated biological data of oil sardine (Sardinella longiseps) have been collected since 1984. Samples for the period 1984-1986 were obtained by another project. The origin of the samples were the Muttrah fish market. OSU oil sardine sampling did not begin until September 1987 due to lack of counterparts. As of September 1988 three Omanis (one woman Research Assistant (RA), one woman TA, and one man TA) are associated with the program. The original 1984 statistical sampling design has been modified to include sampling of artisanal landings in each month, therefore, reducing significantly the necessity of Muttrah market fish sampling. For this purpose the sampling program includes a randomly selected sampling period within any month for any of four regions: Dhofar, Capital,Batinah and N/S Sharkia. A different number of fixed sampling days are allocated to each region, giving more time to Dhofar (six days) and the least time to Capital (one day), due to traveling time allowances and importance of the fishery in the regions. During each fixed sampling period as many different samples from as many different fishermen as possible are drawn. Information collected consists of length frequencies and associated data on individual weight, sex maturity, presence of food in stomach and presence of visceral fat. The number of individuals sampled has increased noticeable in all areas sampled since January 1988. No information is collected on landings from which samples were drawn.

The Team believes that this program is well designed but it is too ambitious for three Omanis plus the advisor to carry out. They must cover a vast coastal area with a schedule of 14 sampling days per month. Their schedule is further constrained by the fact that socio-cultural circumstances require that special travel arrangements be made for women. Because of this factor, the advisor and the male TA have been responsible for most field sampling, while the women have played an important role in data processing and in biological sample analyses in the laboratory. The Team also notes that the male TA has only recently (six months ago) learned how to drive.

The Team believes that the oil sardine sampling program is lacking two very important pieces of statistical information: biological samples associated with sampled landings and sampled landings associated with the national statistics program (RDA). Without this information biological data cannot be matched to total landings. Therefore the information as presently collected cannot be used for stock assessment purposes.

Important information needed to determine age composition of landings is not being collected in the sardine fishery. It is imperative to establish a strong collection of ageing data and that this vital information to stock assessment is available in the future. In the Team's opinion the small pelagics section is well organized but too exiguous to result in any significant impact within MSFC. For this reason, the Team strongly recommends that OAJC takes the initiative and suggests that DGF immediately improve the personnel and logistic support of this section. Otherwise unsubstantiated advances in knowledge of the population dynamics of the oil sardine will be the outcome of the FDP effort.

Demersal Fish--Information on this important fish complex were generated by Korean fishing boats operating under contract with GovOman since 1976. Thousands of individual fish records and catch and effort data were available to the project. OSU advisors have reviewed these data and have found conclusive evidence that Korean companies falsified data reports. RDA supported, but was never able to implement, data collection in an extensive on-board observers program which DGF was trying to establish to verify compliance of a fishery treaty. Unfortunately, a series of conceptual errors (assigning data gathering and enforcement as the mission of on-board observers) by DGF and a lack of cooperation by Korean fishermen (captains did not allow observers access to catch or bridge) impeded implementation of this important program.

The on-board sampling program was moved to the MSFC. OSU contracted the services of two consultants who arrived in Oman in July 1988. Unfortunately, no Omani counterparts were hired for the observer program. Therefore, three Omani technicians from the MSFC were requested to attend the training. One TA could not tolerate training at sea and terminated his participation after one week. The other two Omanis finished the training and went back to their original posts. One of the trainees was the male TA in the small pelagics section. Regretfully, the statistics program in that section had to be stopped for the duration of the training program (three months) creating significant damage to the data series being collected for sardine stock assessment purposes.

At present, OSU has re-initiated the on board sampling program (after signing of Amendment 3). For this purpose, eight data collectors with high school education have been hired. An advisor was recruited to train these samplers. Starting in January 1989, the data collector's training program covered 11 weeks of classroom instruction, including techniques for on-board sampling, and a four week sea training on board Korean vessels. The latter phase of the program was ongoing at the time of this evaluation.

Data collectors, once trained, are expected to gather biological and fishery statistics for demersal species from the trawler fleet as well as from the traditional fisheries. They are also expected to help with field sampling activities of lobsters and small and large pelagics sections when not assigned to on-board work.

The Team believes that this renewed effort to obtain data from the important demersal fish complex will result in a significant data base for future stock assessment work. The Team warns that data collectors may be easily overwhelmed by requests for the collection of information from all sections of MSFC. They should concentrate all their efforts and activities in implementing the already badly delayed and very much required demersal observers program.

Other Programs--Several other initiatives to collect data as referenced in the original OSU Implementation Plan have failed to generate a data base or to produce an ongoing stock assessment program. Two such initiatives are the abalone and shrimp sampling programs. In the Team's view, the unproductive efforts were predictable given the excessively broad scope of the Research Program from conception, the absence of advisors' time and the lack of Omani personnel and logistic support. The Team notes the surprisingly low priority

given by DGF to the important abalone fishery which seems to be affected by overfishing.

c. Stock Assessment Work

As noted earlier in this section, the scope of all stock assessment programs appears to be bounded by a common length-based modelling approach to stock assessment. This consists of the following:

- Collection of length frequency data from landings;
- Application of length-based canned ELEFAN programs to estimate growth and total mortality rates from length frequency data;
- Use of growth information generated from ELEFAN to indirectly estimate natural mortality rates;
- Use of the same data on length frequencies of some species (e.g lobsters) in length cohort analysis to estimate survival of length groups, their abundances and that of the stock;
- Estimation of yield per recruit values using growth and mortality rates;
- Estimation of the exploitation rate generating maximum sustainable yield per recruit and comparison of that rate with those estimated for the fishery from mortality estimates generated by ELEFAN procedure;
- Conclusion that if exploitation rate is close or above the rate generating maximum yield per recruit, the stock is over-exploited or vice-versa.

The Team believes that the decision to adopt this approach was not appropriate because the methods implicit in the approach, although based on apparently simple data sources, are based on strict assumptions which cannot be sustained by either the biology or the dynamics of the species and fisheries observed in Oman.

The generalized stock assessment approach has been applied to kingfish, long-tail tuna, oil sardine and lobsters. The Team notes that OSU advisors are well trained fishery biologists whose backgrounds are not in quantitative biology. For that reason, an OSU graduate student trained in population dynamics was hired for six weeks as a stock assessment consultant to help with the analyses on the above species.

The Team reviewed the conclusions of the stock assessment work and offers the following opinions:

- Large Pelagics--It is well known that younger age classes of Scomberomorus species form dense schools becoming solitary swimmers at intermediate and older ages. For this reason, only a

few younger ages appear in gillnet fisheries targeting schooling kingfish. This aspect is significantly apparent in all length frequency data for kingfish in Oman, where one or two very discrete young year classes appear in the monthly samples. However, starting in November, when fish reach about 90 cm, the discrete year class becomes abruptly confounded with animals that do not appear to grow. This is clearly the confounding effect of school desegregations which result in a change in availability and catchability of older fish to the fishery. Truncation of length frequencies due to the above species behavioral changes, and also due to possible selectivity of gillnets used in the fishery, results in canned ELEFAN programs (or any other length-based method) interpreting the situation as though mortality was responsible for the absence of older groups in the samples. For this reason, estimates of total mortality for kingfish may have been significantly over estimated.

Length frequency distributions used in the kingfish analyses were not expanded to total landings because samples obtained under the present sampling design cannot be matched with total landings. The Team does not believe that Muttrah market samples can be simply extrapolated to total landings (as required by ELEFAN) without introducing serious biases in the mortality estimates.

The Team believes that ELEFAN growth estimates need to be revised in light of the weakness of the data. Growth estimates for kingfish must be validated from otolith age readings currently being done. It is also important to note that the growth parameter K for seasonal growth equations estimated from ELEFAN, has a different time scale than the growth parameter K from the standard von Bertalanffy growth function required in yield per recruit calculations. Also, yield per recruit estimations assume knife recruitment to the fishery and that all fish once recruited will be subject to the same catchability. That is, yield per recruit estimations obtained for kingfish must be corrected by the differential catchability of older individuals in the fishery and the possible selectivity of gillnets. For this reason exploitation rates obtained from optimum yield per recruit levels should be revised.

- Lobster--Application of ELEFAN programs to lobster length data did not produce satisfactory results although samples were representative of the exploited stock(s) in Oman. The unsatisfactory results may have resulted from the single modal character of the size distributions obtained over a short time period (fishing season). Application of length cohort analysis to this fishery, as suggested in the working plan, is inappropriate since the time scale of length ranges will increase with size (molting periods increase with age and growth per molt diminishes with age); therefore, length class survival estimates from length cohort analysis will have different time scales corresponding to different periods in the life history of the species. For this reason, survival estimates for the stock cannot be correlated with seasonal fishing intensity. Likewise, abundance of length classes cannot be easily interpreted in terms of fishing seasons.

The Team reviewed a lobster management plan developed with substantial input from the shellfish section. The advice provided is rational and well focused from a biological and fishery standpoint. The Team, however, was shocked by the extraordinary waste created by badly handled and processed lobsters tails which have to be disposed every season. Gains by better management appear to be totally dissipated by tons of unmarketable tails stored in cold storage houses. The Team cannot understand RDA's advice to introduce about 30,000 plastic lobster traps to the fishery. The traps do not have either biodegradable escape panels or rust pins which would allow them to self-destruct if lost at sea. The Team indicates that the use of these traps without self-destructive devices is illegal in the United States. Considering that trap losses are about 20 to 25% per season, (since lost traps become "ghost" traps which continue to generate fishing mortality), the various efforts (by DGF and FDP) to manage this fishery seem out of focus.

- o Small Pelagics--Growth, natural mortality rates and total mortality rate were estimated for the oil sardine stock following the general length-based approach adopted by the program. The estimates indicate that the oil sardine is fully exploited with estimated values of fishing mortality rates which are about that of the natural mortality rate (M= 0.60-0.72).

There several problems with the data base which may distort the assessments. Data corresponding to 1985 and 1986 were originated from stratified fish shipments sampled at the Muttrah market by a previous project. Sampling in 1987 was nil. Samples during 1988 were substantial but during three important months (July, August, and September) no sampling took place as the sampler was removed to participate in an OSU on board demersal sampling training program. Length frequencies cannot be matched to total landings and samples are from captures made with commercial beach seines, which are believed to influence the extreme outer boundaries of the stock's spatial distribution. The Team sees continuous efforts of the biological sampling program, coupled with information on age and catch, eventually leading to an on going stock assessment program for this important species.

d. Seafood technology section

The Seafood Section of the MSFC was created "to assess and perform preliminary technological research and testing of selected species of fish and shellfish to determine their nutritional value."

The general direction of the research program has been towards quality control, chemical and nutritional analysis, processing, packaging, development, etc.

The characterization of seafood technology within the biological research environment of MSRC indicates its status as a minor activity, in terms of scope, although not in terms of importance. The results of seafood technology research and development can quickly pass into the private sector for large scale processing, if the correct programs have been initially selected.

The expatriate head of the Seafood Technology Department sees himself as an extensionist and developer, as a linkage with the private sector. The Team

concurs with this approach and, indeed, there is substantial evidence that the work of the section has connected with many commercial seafood organizations within the private sector. Given time and appropriate opportunity, the type of development which has been attempted could impact most favorably on the industry and be responsible for considerable technological development therein.

However, the problem of finding suitably qualified Omani counterparts, remains a problems which, the Team observes, is endemic within the DGF structure. Due to what is considered to have been a lack of priority definition on training, there has been an erosion of semi-trained and trained staff. Additionally, those presently undergoing training will not return before the expatriate specialist leaves. This will, therefore, lack a sense of direction up on their return. There is a clear case, in the Team's view, for retaining this program, providing a clear cut definition of DGF policy could be reached, together with a consistent future work plan.

The final report of the expert clearly indicates the level of cost which has gone into this program and further states that any indicators of a move from the MSFC to Sultan Qaboos University (SQU) would not be in the interests of the DGF. This is mainly for reasons of logistics, framing of inappropriate programs by SQU, security conditions at SQU University, lack of access to SQU by the private sector and equipment already purchased for MSRC. The Team supports this reasoning and disagrees with the recommendation of the 1987 Evaluation Team that the Section should be removed to SQU, merely because it does not represent a true biological research package.

In summary, the Team believes that the national fish stock assessment and research program, as presently designed by OSU in the MSFC, has helped to pave the hard road of the initial years of a Center that must confront unimaginable constraints associated with facing the realities of an elusive science, the administrative deficiencies of a relatively new institutional organization (DGF), and the requirements of resource managers. The Team commends the efforts of OSU advisors and counterparts and notes the need of a stronger quantitative approach capable of generating the next level of scientific advice for GovOman needs in fishery management.

III. CONCLUSIONS

A. Introduction

The framework for the FDP final evaluation should be compared with benchmarks provided by the expected End-of-Project Status contained in the original Project Plan. These are as follows: (1) management of the Directorate of Fisheries without the full-time assistance of a resident non-Omani fisheries experts; (2) functioning programs that take scientific and socio-economic factors into consideration in determining the optimum yield; (3) recruitment programs attracting secondary school and college graduates for employment in fisheries; (4) estimates of sustainable yield being made on reliable statistical and biological data; (5) catch and effort data being provided in a continuing basis; and (6) services being provided to traditional fishermen.

Likewise, the major outputs of the FDP were to be: (1) a Marine Science and Fisheries Center built and made operational with trained staff; (2) a Fisheries Statistical System functioning with trained Omani staff; (3) the Fisheries Extension Service operating with a staff of trained Omani field agents; and (4) the Directorate of Fisheries' staff capabilities upgraded with training appropriate to the development needs of Oman's fisheries.

The above outputs were to be accomplished during the initial five-year period (1983-1988), and later extended by one year. The conclusions of the Evaluation Team should be reviewed in the context of the above expectations.

B. Achievement of Institutional Development

- A lack of leadership, direction and political will at senior levels of the DGF has seriously constrained development of the fisheries industry in Oman. Weak management has prevented adoption of appropriate policies and regulatory decrees and created numerous administrative and logistical problems which effectively obstructed institution building efforts. The problem of weak management at the DGF was compounded by the project which attempted to expand DGF programs significantly without including institutional management as a specific project component.

- The institutional structure of the DGF is inadequate to support effective fisheries development. The current organization of the DGF does not promote efficient operations needed to maximize program accomplishments. Specifically, lines of authority and responsibility for program planning and execution are poorly defined or non-existent. Further, the current structure is ineffective in promoting horizontal coordination and integration. A good case in point is the tenuous relationship between the DGF in Muscat and the Director of Fisheries for the Southern Region which has impeded the logical integration of the national and southern regional programs.

- o Although the design of the project clearly considered human resources development to be very important, training activities were poorly planned and largely ineffective. Project contractors seemingly devoted a considerable amount of time and effort to staff development; however, much of this training was unstructured and based on informal, daily contact with counterparts. In only a few cases (e.g., in the statistics program) did this type of informal training lead to successful skills acquisition and application. Further, the two-year non-degree off-shore fisheries training proved to be expensive and generally inappropriate given the skill levels and academic qualifications of the participants.

C. Project Contracting

- o While the purpose of AID Host Country Contracting was to develop contract management capability within the DGF, in retrospect, it served only to exacerbate administrative problems at the DGF and to impede project activities.

- o Significant professional differences between the two contractors, in conjunction with weak management and coordination by the DGF, resulted in poor integration of project activities.

- o Contractor personnel were mobilized often before technical skill requirements were fully defined and certainly before DGF resources were in place and programs were sufficiently underway to benefit from technical assistance. As a result, programs (e.g., the research and extension programs) research and extension programs) tended to be driven by the contractors rather than by what was achievable and sustainable by the DGF.

D. OAJC Effectiveness on Project Implementation

- o The OAJC's ability to address project implementation problems was constrained by a lack of technical expertise in fisheries on its staff. However, even considering this lack of expertise, project implementation would have benefited from a more rigorous monitoring and oversight by the OAJC.

E. Project Focus

- o Project design was largely based on a traditional sector approach to fisheries development which emphasized four major functional components: statistics, research, extension and marketing. While this focus was appropriate, the project's lack of an institutional management component, which would have specifically addressed institutional development constraints, proved to be a serious deficiency. Weak institutional management, in large part, prevented the effective implementation of project activities and the successful achievement of project objectives.

- o The extension program did not achieve expected results. Extension objectives were never adequately defined and, consequently, a realistic extension strategy was never agreed upon. The lack of

motivated DGF extension agents who understand traditional fishing systems and are respected by fishermen further impeded extension program development.

- o Efforts to expand the direct role of the DGF in the effective marketing of Oman's fish resources (which has enormous economic potential as a source of non-oil revenue) were misconceived and the substantial investment by the Government in marketing infrastructure and by the Project in technical assistance to the DGF has resulted in little tangible benefit.

- o The statistics program, which focused on generating stock assessment data and activities, rather than on generating information on fisheries as a production system, was improperly defined. The FDP has confused the traditional role of the statistics program as a management information service by considering it as a section within the DGF responsible for monitoring fish stocks and providing management advice.

- o The research program did not adequately focus on problem-oriented research activities that would yield the stock assessment information required by FDP. Consequently, the program will not have an important long-term impact. Further, the lack of trained personnel, as well as logistic and administrative support problems, effectively limited the scope of research activities and significantly narrowed overall project research focus.

F. Evaluation of Data Collection

- o Socio-economic data were incomplete, were poorly interpreted and did not identify the technological needs of traditional fishermen. Consequently, baseline data needed to develop an effective extension program were not available.

- o The FDP has not developed a system to carry out feasibility studies on new technology, to conduct adaptive research or to methodically undertake pilot demonstration programs upon which an effective extension program can be based.

- o The requirements of the frame survey of the statistics program, which collects fishery data from complex traditional fisheries, have not been fully met due to DGF administrative and logistic deficiencies. As a result, the precision of data collected has been seriously affected and the accuracy of the data is unknown.

- o The established data collecting and processing system, does not have the design and physical elements to address potential industrial fishery development because it is designed to address traditional fisheries.

- o The scope of the research program was unrealistic given the weak management structure vis-a-vis the magnitude of project inputs. The program has developed generalized statistical and analytical procedure which serve as a basis for further institutional

development, but has established an inappropriate research frame for long-term fisheries research. In addition, research results are based on a weak data base. Consequently, they are unreliable and can not be used for resource management purposes.

G. General Conclusions

- Although a number of activities have been successfully completed by both contractors (after an expenditure of $13,000,000), the impact of these activities on either institution building at the DGF or the development of the fisheries sector in Oman has been minimal. While there have been reported increases in fish catch during the project, the Evaluation Team found it difficult to establish any direct linkage between these reported increases and project activities.

- The project was unrealistically ambitious with a comprehensive program of fisheries development which overwhelmed the technical and management capabilities at all levels of the DGF, even with the technical assistance and training provided by the project. Further, the project was based on two erroneous assumptions: first, that unlimited financial and human resources would be made available by the Government of Oman to support project activities and, second, that motivated (albeit weak) management was in place at the DGF. However, project objectives and related activities were not restructured nor were new priorities established, after these conceptual deficiencies became repeatedly apparent early in project implementation.

IV. LESSONS LEARNED

A number of important lessons can be learned from this project evaluation. The following seem, to the evaluators, to be the most critical in terms of future work in this area.

- Unless there are significant changes at the DGF--in terms of providing the level of leadership, direction and political will necessary to develop the fisheries industry in Oman--the value of continued investment in this sector at present levels should be re-examined.

- Project assistance in Oman, given a generally weak administrative base, is staff intensive and, therefore, is not consistent with the OAJC mandate to serve primarily as a financing institution with a small staff. If such assistance is continued, OAJC staff shortages should be supplemented with contract staff.

- Sector development programs, such as the FDP, can not address equally all problems in all sub-sectors, but should identify a clear set of objectives and concentrate activities on a limited number of priority constraints. Further, project funding should be closely tied to the ability of the sector to absorb technical assistance and training as measured by pre-determined benchmarks.

- In the absence of strong management skills at the implementing organization, AID direct contracting is the most effective means of providing technical assistance, even though it increases OAJC staff requirements.

ANNEX 1

List of Documents Reviewed for Evaluation

Documents Reviewed

Fisheries Development Project Paper	Dec'81
1st Evaluation Report	'85
2nd Evaluation Report	'87
RRAG Report	
Quarterly Report MSFC	4th'88
Quarterly Report MSFC	1st'89
Ministry of Agriculture Fisheries and Food MSFC Annual	'88
Fisheries Development Project. RDA Oct-Dec	'88
Fisheries Development Project. RDA Jul-Sep	'88
RDA Implementation Plan and Amendments	
Fisheries Development Master Plan. RDA.	Nov'88
Hawley Report	Mar'86
Distribution and Marketing of Fresh & Frozen Fish RDA	Nov'88
Internal Project Review RDA	Mar'89
Marketing Strategy & Workplan RDA Vol 1.	Nov'85
Marketing Strategy & Workplan RDA Vol 2.	Nov'85
Cost of Producing Fish in the Artisanal Fishery RDA.	Oct'85
Economic Analysis of Dhow and Skiff Fishing RDA.	Nov'86
Survey of Household Fish Consumption RDA.	Feb'87
Prelim.Analysis of Production & Marketing Sectors RDA	Sep'86
Survey of Fresh Fish Suqs. RDA	Dec'86
Recommendations for Increasing Government Revenues From a Foreign Trawler Concession RDA	Oct'87
Observations on the Fishing Operations of the Korean Trawler Fleet. RDA	Mar'87
Dev.of Fishing Harbours in the Sultanate of Oman. RDA	Mar'88
Survey of Ex-Vessel Fresh Fish Prices. RDA	May'87
Outline Design for a Fisheries Extension Program.RDA	Jul'84
Socio Economic Aspects of the Fisheries RDA.	Jun'84
Proposal for Quality Control Regulations. RDA	Apr'89
Computer Spreadsheet of Smokefish Cost Analysis OSU	May'89
Edible Flesh Yield of Omani Seafood. OSU	May'89
Final Report, Seafood Section (1986-1989) OSU	May'89
Proximate Analysis of Seafood From Oman OSU.	May'89
Fish Smoking Procedures in Oman. OSU	May'89
Characterization of Oman's Seafood. OSU	May'88
MSFC Final Report (Seafood Section) OSU	May'89
Lobster Management and Development OSU	May'89
Annual Report OAJC Commission Activities	'88
OAJC Annual Work Plan	'89
Andersen Report	'89
RDA Internal Project Review	Mar'89

Dudley, R. Updated Degree Program Training Needs for Center Staff by the Year 2000. MSFC	Mar'88
Wake Report on Training Assessment, MAF	Aug'88
Final Report, Small Pelagics Section, OSU	May'89
Final Report, Demersal Finfish Section, OSU	May'89
Draft Report Demersal/Shellfish Section, OSU	May'89
Final Report Library Section, OSU	May'89
Final Report Aquarium, OSU	May'89
Final Report Larger Pelagics Section, OSU	May'89
Report on interviews with traditional fishermen, OSU	'88
Rep. on Gill Raker Counts Long-Tail Tuna, OSU	'88
Growth and Popln. Charac. of Scomberomorus Commerson	Mar'89
Age, Growth & Mortality Longtail Tuna, OSU	Feb'89
OSU Implementation Plan and Amendments	
UNESCO Review of MSFC	Apr'88

ANNEX 2

List of Persons Interviewed for Evaluation

Persons Interviewed by the Team

Brian Wickland	ANE, USAID, Washington, D.C.
Richard Neal	S&T, USAID, Washington, D.C.
Peter Deinken	Oman Desk Officer, USAID, Washington, D.C.
Stan Stalla	Proj. Development Officer, OAJC, Muscat
David Evans	Advisor to the Minister, MAF, Muscat
Douglas Roberston	Legal Regional Advisor, USAID, Muscat
Steve O'Donahue	Private Fish Processor, Salalah
Alistair Reed	Technical Advisor to the Manager, Oman National Fish Company, Muscat
Rowan I. MacTaggert	Advisor to the Director, Planning Council for Development and Environment, Southern Region, Salalah
Mussalim Quatar	DG of Agriculture and Fisheries, Salalah
Khalid Ali Omar	Department of Fisheries, Salalah
Rashid Bawani	DGF/Director Statistics, Muscat
Elie Moussalli	RDA Statistics Advisor, DGF, Muscat
Mahmoud Boulel	RDA Statistics Advisor, DGF, Muscat
Mohammid Jawad	Director of Budget Procedures Sectors and Defense, Ministry of Finance, Muscat
Penny Aspden	Deputy Director, British Council, Muscat
Mohammed Redha Hassan	Director Gen. of Planning Unit, MAF, Muscat
John Simpkins	Arthur Andersen and Co., Muscat
Murl Baker	OAJC Deputy US Representative, Muscat
Richard Dudley	OSU/MSFC Chief of Party, Muscat
Duncan Miller	OAJC US Representative, Muscat
M'Had Bawani	DGF/MSFC Director, Muscat
Stan Swerdloff	RDA Chief of Party, Muscat
Abdullah Baksthir	DG of DGF/MA&F Muscat.
Mensaf Sellami	RDA Extension Advisor, DGF, Muscat
Oliver Custer	RDA Masterfisherman, DGF, Muscat
Robert Tombari	RDA Marine Engineer, DGF, Muscat
Hamed Bin Hamdam-Al Yahya-I	DGF Dir.of Extension and Marketing, Muscat
Palmi Ingvarson	RDA Marketing Specialist, DGF, Muscat
Richard A Tubb	Head Fish&Wldlf. OSU
Don Johnson	Marine Biologist OSU/MSRC, Muscat
John Dorr III	Marine Biologist OSU/MSRC, Muscat
John Hoover	Librarian OSU/MSRC, Muscat
John Mee	Aquarium Curator OSU/MSRC, Muscat
Ken Hilderbrand	Food Scientist OSU/MSRC, Muscat
Steve O'Donahue	Private Sector Processor
Jennifer Sassano	Marine Biologist OSU/MSRC, Muscat
Sharma Zaki	DGF/MSFC, Muscat
Mariam Mohamed Ali Al Rulushi	DGF/MSFC, Muscat
Lubna Hamoud Al Kharusi	DGF/MSFC, Muscat

Majida Abdulamir Allawatiya	DGF/MSFC, Muscat
Mehdia Haje Al Zidjali	DGF Seafood Technology, Muscat
ArundhatiPrabhaka Aghanashinikar	DGF/MSFC, Muscat
Bob McClure	RDA Southern Region Advisor, Salalah
Mussalen Quttan	DG of DGF Southern Region, Salalah
Mohamed Ahmed Shanfari	Dir. of Fisheries Southern Region, Salalah
Saeed Ahmed Shanfari	Dep. Dir. of Fish. Southern Region, Salalah
Salem Bukheet	Hd. Fish. Research, Southern Region, Salalah
Mohamed al-Harthy	Deputy Dir. Stat. Data Proc.,DGF, Muscat

ANNEX 3

Evaluation Report on Training Program

Evaluation of Fisheries Training Program (STP)

A. Background

Fisheries training was not originally considered a priority area under the Scholarship and Training Project (STP) project paper or sub-grant agreement since funds for fisheries training already had been included in the existing Fisheries Development Project (FDP). Although planning activities (discussed more fully below) were largely completed under FDP as expected, the Joint Commission transferred responsibility for implementing the fisheries training to STP once the STP project was approved and the Checchi technical assistance team became fully operational. The STP budget was also increased a corresponding amount at this time. The rationale for this transfer of training responsibility was to take advantage of Checchi's capability to identify appropriate training programs and to place and monitor participants.

1. Sector Assessment

In June 1984, Resource Development Associates (RDA), the principal technical assistance team for the fisheries development project, commissioned a reorganization plan and corollary manpower assessment of the Directorate General of Fisheries (DGF). The purpose of the manpower assessment was first to analyze the manpower requirements for a twenty year period and then to propose the optimal mix of degree and non-degree training to meet those requirements. Accordingly, the report identified a comprehensive list of desirable training for each function of the directorate, corresponding to a recommended management reorganization plan. As with the manpower assessment commissioned under STP, this assessment under FDP was also of limited use as a means of developing practical training objectives and plans. The fundamental fault of the report was an erroneous assumption that unlimited financial and human resources would be available for training. The report, therefore, became uselessly unfocused, without any attempt to establish logical training priorities. Also, by not fully considering existing staff skills more carefully, the report recommended extensive degree training for a directorate which (excluding the Marine Science Center) had only one employee with a university degree.

2. Training Plan

Training requirements were further elaborated and specific programs were identified during the course of two additional consulting jobs by Dr. John Sainsbury, who participated in the original assessment. His two reports on degree and non-degree training were prepared in 1985 and served as the basis for developing the STP fisheries training program. Since these reports eliminated the immediate need for a sector training plan, the preparation of a two year fisheries sector training plan (1987-1989) was not undertaken until November 1987. Although the fisheries sector budget had been fully programmed by the time the sector plan was completed, priority was given to the establishment of a comprehensive plan which, in addition to further specifying FDP training requirements for Sultan Qaboos University and the Oman Bank of Agriculture and Fisheries, could be used to obtain donor support, as

well as for internal purposes. In this sense, the development of a sector plan was useful.

B. Project Training

Only training in the United States was financed under STP.

1. Florida Institute of Technology

Based on the three manpower reports, Dr. Sainsbury went on to develop a two year certificate program at the Florida Institute of Technology (FIT), where he also held a full time faculty appointment. The purpose of this program was to provide eleven students first with English language training and then with specialized study in one of four areas: applied fisheries; fisheries science and research; computer data processing and statistics; and, applied technology. This program (which was uniquely designed for the DGF) was expected to meet the perceived immediate staff skill needs in key functional areas as well as consider the limited academic achievement of DGF staff. Although the FIT program, at the cost of approximately $50,000 per participant, was the most expensive short-term training being supported by the project, the Joint Commission agreed to its cost because of Dr. Sainsbury's extensive knowledge of DGF requirements and FIT's assurances of his personal supervision of the program.

In an effort to launch the training activity as quickly as possible and thereby gain momentum in implementation of the fisheries project, the participants left for Florida in September, 1985. They began their preliminary six month English language training while the Checchi sub-contract with FIT for the technical program was still being negotiated. Unbeknownst to either the Joint Commission or Checci, Dr. Sainsbury also had been negotiating an academic appointment at Sultan Qaboos University during this period and left FIT in March, 1986. FIT advised Checchi that with the departure of Dr. Sainsbury it no longer had an appropriate faculty member to supervise the Omani participants and broke off contract negotiations.

2. University of Rhode Island

Following the collapse of contract negotiations with FIT, a comparable (in both cost and content) substitute program was developed by the International Center for Marine Resource Development at the University of Rhode Island (URI). URI was considered to be an acceptable alternative institution since it had the staff and facilities to implement the program originally planned for FIT. In fact, the FIT program had included several months of training at URI's Kingston campus and its facilities in Puerto Rico. With the agreement of RDA, the DGF and the Joint Commission, the eleven students who had started the FIT program were transferred to URI. To date, ten students have completed and seven are currently enrolled in the two year certificate program at URI.

Although the URI program tried to compensate for the secondary school or lower education level of the participants by incorporating basic math and science into the core program, the participant's inability to reach the academic standards normally expected of U.S. students at a university level was a serious obstacle to the success of the program. As noted in progress

reports submitted by URI (particularly for the first group of eleven), the participants' lack of academic experience and often correspondingly low level of effort and motivation remained cause for concern. As a result, in addition to training in fisheries science, it became equally important to turn participants without academic skills into effective students by encouraging proper study habits and academic discipline necessary to benefit from a two year program in a classroom setting. However, it is not evident that URI staff had either the training or experience necessary to teach adults with limited formal education. It is interesting to note, in this regard, that the URI fisheries training program had the greatest participant termination rate (five out of twenty-two) of all STP-supported non-degree training programs abroad.

To overcome the problem of selecting academically qualified and sufficiently motivated participants, the Joint Commission suggested in 1986 that a training committee be established to review and endorse all nominations for fisheries training and then monitor participant progress. A committee was formed under the co-chairmanship of the Director of Extension at the Directorate General of Fisheries and the Director of Higher Studies and Training at the DGSFR. Members of the committee included the Joint Commission fisheries project officer and representatives from the DGF, MOEY, RDA and Checchi. While the second group of participants was being selected for the URI program, this committee met regularly and approved a group with considerably higher academic qualifications. Recognizing that the pool of qualified Omanis at the DGF is extremely limited, the committee approach has been largely effective. Many of the problems associated with the first group of students were alleviated through more careful screening of the second group of participants. In addition, the committee regularly reviewed the participant progress reports prepared by URI. This approach has been particularly important given the low level of academic qualifications at the DGF.

A review of training questionnaires submitted by participants who have completed the URI program indicated that both participants and supervisors acquired the skills that they were expected to and are now using them. These findings are inconsistent with the views of the RDA chief of party and others who assert that, of the ten returning participants, six are using the skills learned and the remaining four either did not learn appropriate skills or are not applying what was learned.

In general, the training program appears to have been successful, but it did show symptoms of poor planning at the early stage. For example, a DGF maintenance workshop supervisor with the equivalent of a fourth grade education was approved for training in marine mechanics and a special- ized program was developed for him first by FIT and then URI. According to URE reports, he completed his program through consistently hard work and acquired an expertise in various areas of technical fisheries as well as engine maintenance workshops and diesel engine maintenance training in the DGF extension service program. However, the DGF has since sold fifteen of its twenty workshops to the private sector leaving this trainee under-utilized as workshop manager and unable to concentrate on expanding extension service activities due to lack of an adequate budget.

C. Conclusions

1. The imperative is evident for supporting some level of training for an organization which has a relatively weak human resource base yet which is responsible for the development of a high priority sector. However, the long-term non-degree fisheries program in the United States supported by STP at over one million dollars for seventeen participants was neither cost effective nor appropriate given the lack of personnel at the DGF with even basic academic qualifications. It is simply not reasonable to send participants with little formal education to the United States to learn English, the fundamental concepts of math and science, and then technical disciplines in a university environment within a practical period for an effective cost.

2. Although a number of (albeit poor quality) training assessments have been commissioned for the fisheries sector, there still does not appear to be a unanimous view of training needs vis-a-vis DGF staff qualifications and organizational objectives. Consequently, the fisheries sector was not able to take full advantage of the training opportunities provided by STP. In this regard, alternative programs at Arabic language institutions in Morocco and Tunisia were not investigated until February 1988 after training funds had been fully programmed. It also appears that at no time were in-country programs considered even though this was originally suggested by the OAJC in 1986.

D. Lessons Learned

1. Before additional fisheries training takes place, a full training needs assessment (based on a carefully prepared and logical scope of work) should be completed. This assessment, unlike the earlier assessment prepared for this and other sectors, should establish training priorities, balance administrative vs. functional needs, consider staff qualifications and tie training to specific organizational objectives.

2. Until more academically qualified personnel are brought into the DGF, fisheries training should emphasize short-term in-service Arabic language programs in Oman and third countries.

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12 July 1990

Ms. Joann Feldman
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DEVRES, Inc.
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Dear Joann:

This letter is in response to your request to review RDA's response to the evaluation of the Oman Fisheries Development Project. In general, RDA's response is defensive and lacks understanding of the objectives and purpose of the Final Evaluation. Reacting in this way, RDA makes an effort to single out and to criticize phrases and paragraphs on punctual issues in the evaluation report. They create arguments which significantly distort the real context of the evaluation results and the real situation with the Fisheries Development Project (FDP) in Oman.

The purpose of the evaluation as stated in the Scope of Work is clearly spelled out in the evaluation report. The evaluation was 1) to indicate progress made toward achieving the project purpose of institutional development of the Directorate General of Fisheries and 2) to identify lessons learned under FDP which could be applied to Fisheries Management and Development Program (FDMP). Omani-American Joint Commission (OAJC) officials also requested that the team review specific documents and activities of the FDP, such as the statistics and research programs, in view of the new FDMP. The specific tasks outlined for the team in the scope of work included assessment of the institutional development of DGF, assessment of the effectiveness of the project's approach to institution building, assessment of the effectiveness of project contracting and of the OAJC and analysis of the appropriateness of project focus. The team's mission was to assess end of project achievements in terms of institutional development, subsequent to the completion of the project's activities and an investment of $13 million. The intended evaluation focus was not on how activities were implemented, the difficulties encountered or how tenaciously RDA's personnel tried to accomplish the objectives of the project, but on the impact of project activities in terms of institutional development. It is in that context that the Project significantly failed. It is in that context that the findings of the Final Evaluation are written and not to satisfy the format of an evaluation of specific activities. Such format is found in the two interim evaluations of 1985 and 1987. The purpose

of the Final Evaluation (as cited at the beginning of this paragraph) was discussed at length in a meeting with the contractors (RDA and OSU) in which the A.I.D. Representative also participated. The Final Evaluation Report is highly professional and objective, and fully within context of the purpose defined by A.I.D. The results within that context are not as negative as those in the two interim reports. One wonders whether RDA did not understand the magnitude of the technical problems identified by the reviewers in 1985 and 1987, or whether simply not enough was done to correct the course of action which led to an impressive lack of tangibles at the end of the project. The team reviewed RDA's communications regarding policy, institutional development and several other issues relative to project implementation. The team, however, did not find any actions by the contractor to remedy the problems encountered other than communicating them. As a consequence, many of the issues and problems are still pending.

The team could not change the language of the report where it refers to the "... abrasive environment between DGF management and the contractors" because all government officials interviewed both in the Capital and in the Southern Region clearly indicated to the team their major differences (present and past) with RDA. On the other hand, during interviews with RDA personnel, honest and candid statements were expressed to the team about their displeasure with local authorities and with respect to OSU activities. These aspects were discussed with both contractors, first in group and then separately, when a draft copy of the report was distributed in Oman. The team never retracted its position which was based on facts--not hearsay as is stated in RDA's response. The fact that RDA suggested that a single contractor, instead of two, would be a more efficient arrangement for the follow up project (FDMP) was based on RDA's opinion that OSU did not generate stock assessment studies to frame fishery development. Instead (according to RDA staff comments to the team) OSU concentrated on basic science. This discrepancy was very obvious to the team when it interviewed each member of the OSU and RDA parties. For this reason, the Final Report refers to the "... divisive institutional differences between the two principal contractors...". It is unfortunate that the Chiefs of Party of both contractors retracted their opinions of each other when meeting in a group. The team, however, could not ignore a fact which they considered detrimental to the successful integration of the project objectives.

It is regrettable that some of RDA's comments (e.g., RDA's response on page 3 and Response, page B-1) fail to recognize certain of the obligations they had as contractors. Among those obligations are the increase of catch as project objective and an end-of-project status report on marketing. These are two absolutely fundamental aspects of fishery development.

The fact that many of RDA's activities were carried out but that the results could not be substantiated in terms of who participated, how the activities integrated into Omani plans, and what the impact was of the activities on institutional or fishery development were of major concern to the evaluation team. Opinions expressed by RDA's extension and marketing personnel clearly indicated their desire to accomplish the objectives of the contract. At the same time there was an obvious

feeling that Omani counterparts would never be fully interested in participating in such initiatives and, even more critically, that Omani counterparts would never be capable of sustaining future activities based on such initiatives. Given those premises, the team moved to investigate the Omani perception of RDA's attempts. Based on the interviews which followed the team concluded that "... programs tended to be driven by the DGF." The validity of this statement was further supported by the statement of a top RDA official in Oman that objectives of the project would not be achieved until the DGF was removed from his position, implying that RDA's activities were not being fully considered by the DGF. The clear implication was that either there was a significant failure in the purpose of the OAJC project or that there was a lack of ability to cope with an unrealistically ambitious project implemented in an environment that was quickly overwhelmed by the proposed activities.

Annex A of RDA's response refers to the review of the Statistics Program. Again most of the response is misleading because of RDA's lack of understanding of the purpose of the evaluation. In A-1 RDA claims, "Again we have a case of an evaluator using inaccurate or incomplete information to carry out the evaluation." In fact, RDA is making reference to statements in the last paragraph on page 37 of the Final Evaluation which were copied directly from the original Project Paper and from a revised RDA Implementation Plan (1988-1989). RDA's response goes on to argue that the statement, "Under any circumstances, the purpose of the Statistics Program should be...", made by the evaluation team was inappropriate as a model format for the evaluation. Unfortunately, RDA did not realize that under the scope of the evaluation, the team was requested by OAJC officials to review RDA's own Internal Project Review, Fisheries Development Project, Sultanate of Oman, March 1989. RDA had submitted the document to the Minister of Agriculture and Fisheries to be utilized by the Ministry in its discussion with the Joint Commission in planning Phase II of the project (FDMP). In the team's view, RDA's recommendations were erroneous and misleading, as stated in the last paragraph on page 38 of the Final Evaluation Report.

The last statement in the last paragraph in RDA's response A-1 is erroneous. The team spent a significant amount of their time interviewing RDA personnel as well as all Omani personnel in the statistics office in the DGF. According to RDA's personnel if the project were terminated immediately Omani personnel could not continue with the tasks of the Statistics Division. According to Omani counterparts, their training was inadequate to the point that many did not understand the overall goal of the Statistics Division. According to RDA personnel and Omani counterparts, field activities were plagued with all kinds of problems. Several of these problems created major biases in the data collected. The evaluation team considered the above situation to have a negative influence on institutional development. The team, however, recognized that the statistics program was the most tangible RDA effort. The team did not characterize the activities of RDA as the "tremendous strides..." made by RDA because 1) it is expected that the contractors would make significant progress in implementing an over-dimensioned project in a highly undeveloped sector such as the

fishery sector in Oman, and 2) such a statement would have been out of context given the evaluation's purpose of assessing institutional development. In fact, the extent of institutional development in this component of the project fell far short of what was planned. This conclusion does not, however, imply that the team members were unprofessional or had motives other than the purpose of the evaluation as expressed in RDA's response.

The first paragraph in RDA's response A-2 is, once again, based on a misunderstanding of the purpose of the evaluation.

In the second paragraph in A-2, the documents in question were reviewed by the team and information found in the documents were included in the report but the titles were omitted from the report by mistake.

Re: the third paragraph in A-2, it is difficult to understand RDA's ideas or purpose here. The Final Evaluation Report states on p. 27: "These two positions are occupied by fishery biologists with experience in quantitative population dynamics, statistics, and computer science. None, however, is by training a statistician or computer specialist." That is exactly what the two RDA personnel associated with the statistics program are. Mr. Rash is a statistician who is no longer associated with the project. Usually statisticians are assigned to statistical projects. This facilitates problem solving, improvement of the systems established, and training is carried out with authority.

Re: the fourth and remaining paragraphs in A-2. The Final Evaluation report on page 4 is correct both according to the Project Paper and the actual design.

RDA's objections to the evaluation of the Marketing Program are again biased by their misunderstanding of the evaluation purpose. The team framed the evaluation of marketing activities on the 1986 Amendment No. 2 to the Project Sub-Grant Agreement (p. A-1) which states that the project will establish "a marketing program that stimulates more extensive and efficient marketing, both for the growing commercial export industry and the traditional domestic demand." Again the team focused on the end of project status and not on the many documents prepared by RDA. At this point it is disturbing to read that RDA was not "aware of any A.I.D. document with end of project status for marketing" (RDA's Response, p. B-1). Furthermore, the team could not identify any truly significant impact (relative to investment) of the marketing project on fisheries development in Oman.

With respect to the Extension Program, there is an obvious list of documents and activities that were performed by the contractor. Here again, within the purpose of the evaluation, there was no indication of when and how these activities were integrated with Omani efforts, how they fitted together to strengthen institutional development, or what impact these activities had on fisheries development in Oman. The team, through review of reports prepared by RDA and through interviews of RDA's personnel and Omani officials, concluded that most extension activities consisted of efforts at making a list of activities performed but that they had very limited impact on fisheries development. The

final outcome of this program was in part reflected by the great frustration demonstrated by the RDA staff associated with the extension program to the team during interviews.

In their visit to the Southern Region, the team was struck by the vast number of opportunities available for fishery development that could have been integrated within the extension program in that region. The most important region from a fishery stand point appeared to have been totally neglected by the project. This sentiment was corroborated by strong statements and objections against the program made by all Omani officials interviewed in Salalah, including the DG of DGF and the Director and Deputy Director of Fisheries Southern Region. For the team this was another clear indication of failure of the extension program in achieving institutional development.

RDA's response p. C-4 which indicates that comments in the Final Evaluation on introduction of lobster traps are "irresponsible, incorrect, misleading, and should not have been included" is wrong and self serving. The fact is that RDA recommended the use in Oman of a fishing gear which had components which are illegal in the US. Oman adopted those lobster traps based on the advice of RDA. The statement (RDA's Response, p. C-3) that "The Ministry for reasons unknown chose to order pots without the degradable pins" is simply showing that RDA was not even aware of the impact of their own advice. It was the evaluation team, during the visit to the Southern Region, that by chance detected this error. RDA staff in the Southern Region was not aware of the problem and had to be instructed about it. The team brought this problem to the attention of the OAJC and the OAJC took immediate corrective action. It is hard to believe that in RDA's response (p. C-4) they argue that "this issue was discussed... and should not have reappeared in the final report." Why shouldn't it appear in the Final Evaluation Report? The team developed an objective report which reveals the actual situation with the end of project status and as such it cannot disregard critical issues even though they are not appealing to the contractor.

In conclusion, RDA's response does not invalidate the findings and conclusions of the final evaluation but, rather, further ratifies many of the problems encountered by the team. The final evaluation identified that at the end of a significant project, little institutional development at the DGF had been accomplished. It is hoped that the lessons learned in FDP will help A.I.D. to better design and more rigorously monitor FDMP.

Sincerely

Nelson M. Ehrhardt
Team Leader

ANNEX 4

RDA International, Inc. Response to Fisheries Development Project Evaluation Report

RDA INTERNATIONAL, INC.
RESPONSE TO FISHERIES DEVELOPMENT
PROJECT EVALUATION REPORT
PREPARED BY Devres Inc. - 1989

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RDA International, Inc.
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16 March 1990

Dr. Duncan Miller
USAID Representative
Omani American Joint Commission
Muscat, Sultanate of Oman

Subject: Response to Fisheries Development Project Evaluation Report prepared by Devres Inc. in 1989

Dear Dr. Miller:

We appreciate this opportunity to respond to the evaluation as offered by the Fisheries Development Project Officer Stanley Stalla in his letter (JC 787/89) to Dr. Stanley Swerdloff. As suggested in Mr. Stalla's letter, we would like this response placed in the project file as an appendix to the evaluation document. This response is in addition to the response submitted in November, 1989 by Dr. Swerdloff.

In this letter our company expresses an objection to the Oman fisheries development project evaluation. As evaluations are critical to the implementation phase and ultimately to determine project results we take them seriously. All development professionals are interested in lessons learned and constructive criticism in order to do a better design, implementation, etc., in the future.

At a meeting in Oman held at the Joint Commission with the evaluation team, Stan Swerdloff and I made our comments about elements of the draft evaluation. In particular we pointed out areas that were inaccurate. We left the meeting believing that changes would be made to reflect our comments.

The evaluation team did not make the changes discussed, the report has inaccurate and unsubstantiated comments, and we believe it over emphasizes the negative and does not describe the positive results of the project.

RDA has not seen the scope of work for the evaluation, nor do we have access to some of the AID design documents, and we therefore, cannot respond on certain aspects of the evaluation. We also will not respond to comments related to the Research component which is implemented by OSU. Our response to the evaluation

relates to comments directed to RDA and the program components of our contract with the Government of Oman.

Examples of inaccurate, unsubstantiated, and unclear stat"ements as to which contractor is referred to are: "programs tended to be driven by the contractors rather than by what was achievable and sustainable by the DGF". "The Statistics Program...was improperly defined" "...abrasive environment between higher DGF management and the contractors." "Given RDA's lack of success in getting the extension program underway..." "...the divisive institutional differences between the two principal contractors..." "It is difficult to establish any direct link between project activities and reported increases in fish catch." "...the substantial investment...in marketing...to the DGF has resulted in little tangible benefit." "The team cannot understand RDA's advice to introduce about 30,000 plastic lobster traps to the fishery." "...RDA should have made more formal efforts at a high level to sound major warnings of distress to the OAJC and DGF...of how institutional development might have been accelerated..."

No development project in a third world or underdeveloped setting is perfect. There is always room for improvement. Outside evaluations serve the purpose of providing guidance on where a project design or implementation is not meeting expectations or needs redesigning. We are certainly open to any suggestions regarding areas in which we can improve our implementation. Constructive criticism is always welcome. However, some of the comments above are general, unsubstantiated, based on hearsay and generally not the kind of statements to be found in an evaluation. The above comments related to the specific RDA programs of Statistics, Marketing and Extension are discussed in more detail in Annexes A, B, and C. At this time general issues of institutional development and training are addressed.

The evaluation is correct in stating that institutional development is the ultimate goal, and in pointing out that a specific institutional development component was not included. Since project inception, RDA has continually pointed this out to the Joint Commission. In response to the second evaluation in 1985, I wrote to Benjamin Hawley, the Oman desk officer, to give him our response to that evaluation. One of the recommendations I made was that RDA provide an institutional development consultant to Oman for this project. A copy of the letter is attached as Annex D.

RDA staff provided input to the Joint Commission to a letter sent from the Omani Co-chairman of the OAJC, Saif bin Hamed al-Battashi, to the Minister of Agriculture and Fisheries. The letter summarized progress made, as well as areas where the Ministry should hire additional staff to support certain program areas. A copy of this letter is attached as Annex E. Several other memoranda were sent by RDA to the Joint Commission in 1986 and 1987 regarding policy and institutional matters. One was called "Issues and Recommendations for Fisheries Development in Oman" and another was "Fisheries Development Program Policy Issues", and a third "Overview of Problems in Fisheries Development with Recommendations." In 1988 Stanley Swerdloff submitted a memorandum entitled "Review of DGF Programs" with comments on each program and policy and administrative matters. In 1989 a report entitled " Internal Project Review Fisheries Development Project Oman" was submitted with recommendations.

In addition to the above written documents, the RDA team held numerous meetings and discussions with the Ministry and the Joint Commission regarding the various issues and problems. To conclude that "... RDA should have made more formal efforts at a high level to sound major warnings ... to the OAJC and DGF ..." is inaccurate and not substantiated.

The comment that "It is difficult to establish any direct link between project activities and reported increases in catch" has a dual problem. One, there are examples, such as with tuna, where project longline trials have introduced a new method to Omani fishermen and yielded an increase in that fishery. In addition, exploratory test fishing by the extension team led to locating a new fishing ground near Masirah which also increased the catch. The above notwithstanding, the statement is moot as nowhere does it state as a goal that the project should lead to catch increases. The project should lead to establishment of statistics, extension and marketing programs. This may mean that in some fisheries, such as lobster, there should be reduction in the catch in order to sustain the resource. In the case of the artisanal fishery, increased catch may or may not be a goal. Reducing effort by introduction of better methods will help an artisanal fisherman considerably. In any case, RDA has not seen a document that cites increased catch as a goal of the project.

To state that there is an "... abrasive environment between higher DGF management and the contractors," must be clarified as to what contractor and in what context. To state this without some supporting evidence can only be assumed to be based on hearsay. On occasion there are differences of opinion or interests and goals of both parties may not be the same, but the relationship that RDA has with DGF officials is certainly not "abrasive".

The statement that there are "... divisive institutional differences between the two principal contractors ..." must again be based on hearsay, as it is not true. The evaluators should have noted that the RDA marketing personnel worked closely with the OSU Food Technologist, that the RDA Statistics advisor collaborated with the OSU small pelagic scientist, that staff from both groups served together on committees related to Sultan Qaboos University, the FAO research vessel and workplan, etc. To suggest that "divisive differences" somehow affected the outcome of institutional development gives too much influence to contractor personnel involved in a host country contract. The basic issue here is that the Research Department (MSFC), for a variety of local reasons is not well integrated institutionally in terms of decision making and ministry policy. This is exacerbated by the fact that the two are housed in separate buildings thirty miles apart.

To say that "programs tended to be driven by the contractors rather than by what was achievable and sustainable by the DGF " is to put the problem where it doesn't belong. It also implies that contractors are only out for their own interests. This is untrue. This program was designed by the Joint Commission and the Ministry. The contract clearly states which contractor personnel are to be employed in Oman, for what purpose, and for what period of time. We were expected by the Omani American Joint Commission and the Ministry to provide personnel in a timely fashion in accordance with the contract. The OAJC and the Ministry need to concur with all personnel decisions for the technical assistance team. There were instances when we suggested terminating a position because the Ministry was not able to adequately support the program. This was done in the case of the economist, one marketing position and the on board observer trainer. Statements like the above can be misconstrued, they are unsubstantiated and should be retracted.

The training program was a problem from the moment the OAJC and the Ministry separated responsibility for training from the Fisheries Development project. RDA was involved in the early stages and prepared manpower assessments and training plans for degree and non-degree personnel of the DGF. The RDA consultant who prepared the assessment of students recommended by the Ministry was aware that some of the candidates were not appropriate. He prepared assessments and pointed out problems regarding education and English language capability. As this was to be a public document, he chose to keep his negative comments verbal. As a result of this exercise we recommended in a meeting at the OAJC that a committee be established that would be outside the Ministry and include members from the Ministry of Education and Youth, RDA and Checchi. This committee was formed and was able to

reduce the problems of qualifications and sources of candidates. It is irritating to be criticized by evaluators who don't know all the facts yet make broad statements such as "also, by not considering existing staff skills more carefully ...", as though we worked in a political and cross cultural vacuum.

The statement that "even had RDA been more aggressive in promoting training..." is inappropriate and inaccurate. It is inappropriate because responsibility for training was not given to RDA. RDA carried out the initial assessments, placed nine students in U.S. Universities, and then all were placed under the supervision of the Scholarship and Training project implemented by Checchi. It is inaccurate because the team leader and staff did continue to bring up training needs. Eventually the OAJC and Ministry agreed to a team visiting North African countries to identify training programs in fisheries for future Omani students. The RDA team leader was on this team.

The on-the-job counterpart training was also more formalized than appears in the evaluation and it was done in-country. For example, the statistical samplers, both stationary and mobile, were trained by an RDA staff member, in a formal as well as informal manner. The marketing samplers were similarly trained. The data entry personnel of the Ministry had two formal training courses, the staff of the Southern Region Office received hands on training by the RDA advisor in programming and data entry. The same staff have recently been trained further to make entries in Arabic. Demonstration training of Omani extension agents in use of echo sounders, various fishing methods, fish aggregating devices, use of winches, morton traps, lobster traps, safety measures, boat handling, etc., were all conducted by the extension advisor. To imply that little on-the-job training took place is inaccurate.

Another comment of the evaluation that is not accurate is, "It also appears that at no time were in-country programs considered even though this was originally suggested by the OAJC in 1986." The RDA 1984 report, " Institutional, Manpower and Training Requirements", which the evaluation team characterized as "... uselessly unfocused, without any attempt to establish logical training priorities", recommended in-country certificate training. The RDA report states "The most appropriate site for the initial in-country training programme is the Darsait Vocational Training Institute in the capital area .. " and "the on-going adult education programme provides a learning environment conducive to the training of current and new DGF staff." An in-country course for twenty people was recommended to start in 1986 in "Outboard engines, boat repair, diesel power equipment, fish handling and preservation, etc."

Attached in Annexes A, B, and C are comments related specifically to the evaluation on the statistics, marketing and extension programs, as well as additional references in Annexes D, E,F and G.

In summary, we believe that the evaluation was biased toward the negative, did not adequately review all background material or the development context of Oman, did not include a list of all the accomplishments (a reference was made on page 20 of the evaluation to an appendix with outputs but such an appendix was not found) and made unsubstantiated comments or conclusions. We believe that such statements should be clarified, substantiated, or retracted by the evaluator. We welcome the opportunity to discuss this further with you and Devres Inc. Thank you again for the opportunity to respond.

Sincerely,

RDA INTERNATIONAL, INC.

Keith E. Simmons
Executive Vice President

KES:sdr

ANNEX A

STATISTICS

The evaluation on pages 37 and 38 states "The purpose of the Statistics Program, as originally stated, was to create a data base for the analysis of Omani fish resources, including the preparation of a resource assessment."... "Later on, a revised Implementation Plan (1988 - 1989) for RDA states that "the purpose of the Statistics Program is to establish a data base for the analysis of Oman's fisheries resources, leading to the preparation of a resources assessment and resulting in an ongoing continuous program to guide the management and monitor the utilization of the fishery resources."... "In the second amendment, stock assessment is less imperative and contractual obligations to prepare such assessment are explicitly excluded."

RDA has no document describing the Statistics program that requires "...the preparation of a resource assessment." The original scope of work in the contract, which is the same language found in the RFP, is "The contractor shall be responsible for designing and conducting a one-year statistical field sampling survey of fish catch, as an interim measure, to provide reasonable accurate base line data by key species and species groups against which future catch data can be measured," and "The contractor shall be responsible for developing and implementing a long-range fisheries statistical program suitable to conditions in Oman that can be carried out by Omanis with a minimum amount of expatriate assistance." Again we have a case of an evaluator using inaccurate or incomplete information to carry out the evaluation. The evaluator then goes on to say "Under any circumstances, the purpose of the Statistics Program should be ..." To make such a statement is fine as a conclusion or recommendation but to us a "should be" as the model for evaluation is inappropriate. An evaluation is based on what the project design included not what it "should be."

The evaluators chose to dwell only on the negative side, e.g. lack of institutional support and confidence of data, rather than mention the tremendous strides the program has made since inception. Yes, there are problems, that's why a technical assistance oriented development project was designed. Given the conditions at the time of project implementation, a one-year statistical sampling program was instituted; Omani samplers hired and trained; two Omani supervisors were trained at URI in the U.S.; a long-term program was approved and instituted; a computer training program was established in Oman for local employees and reports were produced. Mentioning problems is appropriate because all projects have them and they should be noted in order to improve, but to ignore the tremendous strides is inappropriate, unprofessional, and makes one wonder about motives.

The statement on page 55 appears to be based on a misunderstanding. "The FDP has confused the traditional role of the statistics program as a management information service by considering it as a section within the DGF responsible for monitoring fish stocks and providing management advice." The statistics program is a data gathering system, as is the research program at the MSFC. All the data collected should then go to someone or some unit within the Ministry who will analyze it and make management recommendations and give policy guidance to the Ministry. The comment on page 55 must be based on misinformation, information out of context, or misunderstanding.

The list of Documents reviewed does not include the "Work Plan for the One Year Fisheries Sampling Program" nor the annual fisheries statistics reports nor the various reports entitled "Considerations for the DGF Statistical Program in the Capitol Region: and others for the Dhofar, Southern Sharqiya, Batinah and Northern Sharqiya regions. A review of them would have provided better understanding of the Statistics Program.

One final comment regarding the staff of the statistics unit: Tony Rasch, who designed the program, is a biostatistician with fisheries experience. The evaluators on page 27 implied that no one has a statistics background. One could also argue that a fisheries biologist learns statistics as part of his training and can carry out such a program.

The evaluation on page 4 gives the impression that the statistics program is "...improperly defined," and that it "... does not have the design and physical elements to address potential industrial fishery development."

The first comment is not properly substantiated. In the RDA scope of work and the work plan, it is well defined and properly designed. The use of "improperly defined" comes from a misinterpretation by the evaluator.

The second comment implies that the program should have been designed for an industrial fishery. The scope of work only relates to the artisanal fishery. RDA statistics staff, however, made recommendations to the Ministry for adapting and improving the system (including a micro computer) to include the industrial fishery.

ANNEX B

MARKETING

There is no mention in the RDA-Oman contract scope of work of a marketing program. There was, however, a Fisheries Production, Marketing and Extension expert on the team in addition to the Fisheries Extension Specialist. The only mention in the RFP of marketing and production is in one discussion of Fisheries extension. The RFP states "Problems in marketing and distribution are among the constraints that must also be addressed..."

As there was no guidance beyond the above, the RDA Production, Marketing, Extension advisor prepared a report "Marketing, Strategy, Reorganization and One Year Work Plan" in September 1984. Subsequently the government issued a Fish Marketing policy which caused RDA to revise its previous report and prepare a two volume report on marketing. These reports are "Volume I, Marketing Strategy" and "Volume II, Marketing Work Plan." When these two volumes were approved, the RDA contract was amended to include the provision of two experts, a Market Information Education Specialist and a Fisheries Production/Marketing Advisor. For the first time a scope of work for this component was included in the RDA contract. The scope of work was not related to institutional development but rather to assist the Director General in implementing "...a fisheries marketing program strategy and work plan."

The evaluation team on page 35 mentions "Little institutional progress was made as a result of these efforts and the marketing program did not achieve the envisaged end of project status." Normally an end of project status would refer to a project paper logframe. The RFP for the project did not mention this program nor is RDA aware of any AID document with end of project status for marketing.

The scope of work for the marketing program as it appears in Amendment No. 3 of the RDA-Oman contract is the following:

> "The Contractor shall be responsible for developing and assisting the Directorate General of Fisheries to implement a fisheries marketing pro gram strategy and work plan. Such plan shall lay the foundation for both domestic and export market research, and shall take into consideration such fac tors as distribution pathways, prices at each level, product forms, production volumes, and potential demand. The Contractor shall assist the Directorate General of Fisheries in devising market sector policies and strategies, assessing market opportunities, reviewing private sector proposals, and assessing processing and marketing infrastructure requirements. The Contractor shall also assist the Directorate General of Fisheries in planning and implementing consumer education programs. To the extent requested by the

Directorate General of Fisheries, the Contrac tor will assist government and private industry in the planning and implementation of fish processing innovations."

If one were to review the Volume II Work Plan and the subsequent quarterly reports one would find the following was accomplished:

Government of Oman adopted reorganization recommended by RDA and established a production/marketing unit within the Department of Fisheries Development. A review of government owned cold storage complexes was made with recommendations for improvement. Marketing information program established, staff hired. Design of fiberglass fish transport box completed and prototype developed by local manufacturer. Design and layout developed for Sultan Qaboos University fish processing facility. Consumer education program underway. Consumer survey completed and data analyzed. Assistance to government in privatizing the eleven government built and owned cold store/processing plants. Studies on fish meal and canning plants completed. Reports entitled "Preliminary Analysis of the Production and Marketing Sectors of the Oman Fishing Industry"; "A Survey of Fresh Fish Suqs in the Sultanate of Oman"; "Observations on Fishing Operations of the Korean Trawl Fleet (Oman)"; "A Survey of Household Fish Consumption in the Sultanate of Oman"; "A Survey of Ex-Vessel Fish Prices in the Northern Sharqiya"; "Distribution and Marketing of Fresh and Frozen Fish Products in the Sultanate of Oman"; "Proposal for a Fish Quality Assurance Program - Sultanate of Oman"; and "Recommendations for Increasing Government Revenues from the Foreign Trawl Concession (Oman)" were prepared by the Marketing advisors. Continued advice and analysis was provided to private sector fish companies; reviews and analysis for government of proposals and license requests by private fish companies; demonstrations of smoked fish were given (including sardines and sea cucumber); tuna processing and handling demonstrations were given; the "fish ticket" system for gathering information from the private sector was instituted; a marketing data bank for fish exports was established; fresh and frozen products from shark, sardines, grouper, snapper, and tuna were prepared for testing markets in New York and Japan; and a fish quality seminar was organized and presented to high level government officials.

As a result of the above activities the Muttrah suq (largest in country) was modernized and made more hygienic; private processing plants have improved their operations and upgraded quality of fish; tuna is now being processed for export; and an insulated fish transport box is now produced locally and is used on most of the trucks that transport fish from the beach to market. This has improved the quality of fish.

To simply state (as the evaluator on page 35 does) that "The component did very little to improve the quality and variety of the product..." without some qualification is inaccurate and misleading. One can argue that the advice to processing plants and fishermen on how to handle fish, plus the improvements at the market,

and the transport of fish did have an impact on the quality of fish. The team has also done work on sardine, squid, sea cucumber and tuna to expand the variety of species marketed.

In addition to the above, RDA had an economist assigned to the Department of Fisheries Development. His task was to carry out economic analyses for policy decisions. His role was not part of (as stated in the evaluation) but related to marketing. His program was advisory only and did not have institutional goals per se. He produced reports such as "Cost of Producing Fish in the Artisanal Fishery Capital Area, Sultanate of Oman"; "the Economics of Artisanal Fishing in the Sultanate of Oman"; "An Economic Analysis of Dhow and Skiff Fishery in the North Sharqiya Region of Oman"; and "A Study of the Fishermen's Encouragement Fund Subsidy Program (Oman)". His work related to both the extension and marketing programs. The economist also prepared portions of the third five-year fisheries development plan.

To evaluate the marketing program on something other than the work plan approved by the government or the government's scope of work for the RDA advisors is not appropriate. The inclusion on page 3 and 55 that "...technical assistance to the DGF has resulted in little tangible benefit" is simply not true and is not substantiated. An additional chapter prepared by the extension evaluator was prepared and submitted that did try to balance the report through reporting positive results, but it was not included. This chapter is attached as Annex F.

ANNEX C

EXTENSION

The evaluators executive summary states that "The extension program did not achieve the expected results. Extension objectives were never adequately defined . . ." The same sentence is repeated on page 54 in the conclusion yet the analysis of the extension program on page 34 does not support this statement nor does it define in detail what the "expected results" were.

The majority of the assessment of the extension program is found on one page (page 34) which in summary states that the extension program has a dual role: 1) that it focuses on the artisanal fishery, and 2) requires a capable Omani team. Then an assumption is made about the artisanal fishery and a conclusion drawn without support. "The diversity of gear used and species caught by the fishery does not permit a clear definition of focus for the extension program ..." "Therefore ... the focus of the extension program was rather vaguely designed..."

There is no evidence to support this assumption and conclusion. There is no review of an RDA report entitled "Outline Design for a Fisheries Extension Program for the Sultanate of Oman (July 1984)", nor a review of the RDA report "Fisheries Extension Departmental Organization and One Year Work Plan (October 1984)". No mention is made of the fact that these documents were reviewed and approved by the Ministry. The list of documents reviewed by the team does not include the October 1984 report and only two quarterly reports out of the twenty-two prepared at the time of the evaluation.

The work plan is specific about the nature of an extension program, the need for the extension agent to be trusted by fishermen and not have enforcing or licensing roles, and the plan details specific programs to be established, tested and implemented. These programs were divided between administrative, production and safety areas: "1) relocation of DGF extension offices with DGF fishermen services; 2) the transfer of Fishermen's Encouragement Fund applications onto computer; and 3) a tour of U.S. Fisheries extension programs for selected DGF extension personnel. The fish production projects are 1) a hydraulic unit puller demonstration; 2) the addition of trolling poles to artisanal fishing boats; 3) lobster trap experimental fishing; 4) experimentation with various style fish traps; and 5) experimentation with various fishing methods and gear. The three fishermen safety and affairs projects are 1) a fishing boat power study to advise fishermen on equipment use; 2) the preparation of an outboard engine maintenance manual in Arabic; and 3) fishing village training sessions on boating safety and fishing gear." The production goals were defined further during implementation.

The RDA extension program in accordance with the RDA/Sultanate of Oman contract scope of work is "The contractor shall be responsible for designing and assisting the Directorate General of Fisheries to implement a fisheries extension program to assist Omani traditional fishermen." The advisor therefore developed a design of the extension service and developed a specific series of programs. His task then was to train the Omani extension team and to assist them in extension activities in the field.

A review of the quarterly reports over the past five years will demonstrate that numerous field activities took place in the above programs and beyond to include tuna longlining techniques; introduction of lobster pots, morton traps, fish aggregating devices; exploratory fishing for new grounds, etc.

A comment is made on page 24 of the evaluation report that "RDA in particular did not consider, or if considered did not carry out, a technical feasibility study, following the socioeconomic study, before deciding on the priorities of the extension program". RDA prepared the "Outline Design" mentioned above as a preliminarily report on the extension program in July of 1984. Almost simultaneously in June of 1984 the University of Rhode Island completed the "Socioeconomic Aspects of the Fisheries of Oman." Both of these reports plus interviews of Omani officials were used in preparing the "Fisheries Extension Departmental Organization and One Year Work Plan" which was completed in October 1984. These reports constitute a preliminary design for extension. Throughout the document RDA mentions the need to hire a sufficient number of extension agents, plus it is mentioned how difficult it will be to find such people. They were all reviewed and discussed by the OAJC and the Ministry and approved.

Another RDA report with further information on the subject of organization, training, and personnel requirements related to the project, including extension, can be found in "Directorate General of Fisheries Oman Institutional Manpower and Training Requirements (June 1984)." This report was prepared by the same individuals involved in the "Extension Outline" and the "Socioeconomic Study." There was input from the socioeconomic study in all of the above mentioned reports. The above report is not on the list of reports read by the evaluators. Again conclusions like the one mentioned above on page 24 are not substantiated and appear to be made on incomplete information.

Another similar unsubstantiated conclusion in the report is found on pages 25 -26, "Given RDA's lack of success in getting the extension program underway, a full blueprint for technical composition of expatriate staff members has not yet been formulated. The team realizes, however, that it would have been clear to RDA that development was within the confines of the artisanal fisheries only. In turn, this would have indicated that experts with considerable expertise in the artisanal sector, capable of carry-

ing such extension "to the beach" and integrating within the fishing communities, would be required."

First, there is no evidence that the program has not gotten "underway." Numerous reports demonstrate the opposite of this general unfounded statement. Second, the RDA Extension One Year Work Plan report mentioned above spells out very clearly that the extension program is only for the artisanal fishery and then develops the series of activities mentioned earlier to assist the artisanal fishery.

In addition, the extension advisor was hired to set up an extension program in the Ministry, establish operating programs and systems, and to train the extension advisors. He then assisted the Omani extension advisors to carry out field demonstrations with Omani fishermen. Many field demonstrations were carried out. They are reported in the quarterly reports.

It was RDA that later on in the program argued for and convinced the Ministry that additional personnel should be brought to assist in the field work. As a result we employed a master fisherman (with previous experience with artisanal fishermen in Djibouti for RDA) and a marine engineer (with previous Oman experience). Yes, there were problems from an institutional development view point, but there were successes and activities that are "underway."

Again general conclusions such as the one above are inappropriate and inaccurate.

Another matter related to the lobster pots should be mentioned here as it was part of the extension program. The evaluation report on page 51 states "The team cannot understand RDA's advice to introduce about 30,000 plastic lobster traps to the fishery. The traps do not have biodegradable escape panels or rust pins which would allow them to self destruct if lost at sea." This statement is misleading and not at all put in the context of Oman.

At the time the fisheries development program was implemented in 1984 the local Omani fishermen were catching lobster with tangle nets. The lobster were in effect tangled in the net and were dead by the time the fisherman brought up his net. This method was not able to discriminate between mature lobsters, females with eggs, or juveniles. As a result RDA proposed legislation related to the lobster fishery. These regulations included restrictions on size, prohibition of catching egg bearing females, prohibiting tangle nets, and required the use of lobster traps. The regulations recommended by RDA included paragraphs on escape hatches and self destruct panels. A copy of the regulations are included with this report as Annex G. The Ministry for reasons unknown chose to order pots without the degradable pins. RDA has raised this issue on several occasions with the Ministry.

This past year the Ministry agreed to order degradable pins for all existing and future traps. It should be pointed out that during the time traps were used even without degradable pins, the damage to the resource was much less than it would have been from the tangle nets.

The above comments by the evaluators are irresponsible, incorrect, misleading, and should not have been included. This issue was discussed with them in Oman at a review of the draft evaluation at the Joint Commission and should not have reappeared in the final report. In my opinion the discussion of the overall extension program was incomplete and it appears the evaluators were not given all the pertinent information to review, or they chose not to include it in their report. We have seen, for example, a draft of an additional chapter on the extension program prepared by the extension evaluation expert which was not included in the final evaluation. This chapter included, inter alia, a list of positive results of the program. A copy of this is attached to this report as Annex F.

Resources Development Associates

A California Corporation

RDA International, Inc.

16 August 1985

Mr. Benjamin Hawley
OIC Lebanon/Jordan/Oman Desk
Department of State, Room 4720
Washington, DC 20520

Dear Ben:

The following are comments and recommendations related to the evaluation from various members of the RDA team in Oman as well as the home office. As the evaluation does not follow the project paper evaluation plan and we have not seen the Scope of Work, we can not comment on the evaluation methodology. We can, however, respond to the document itself. First, some general comments.

A mid-project or formative evaluation should challenge the project design and its assumptions, review the implementation efforts and make recommendations for redesign of the project paper and possible amendments to an implementation agent contract.

An evaluation team should first review the project paper goals and objectives, inputs and outputs, and beginning and end of project status and determine whether it is sound conceptually and logically cohesive. Base line data and benchmark data should then be gathered for comparative and measurement purposes. It is not unusual, due to the AID project development process, to find gaps or inconsistencies in the design of a project. One of the purposes of an evaluation is to take a fresh look at the project away from the pressure of meeting obligation deadlines and recommend appropriate changes. It is important that the evaluation team not confuse design issues with implementation activities. One must always separate the two during the evaluation process or the end result will be a confusion of comments related to the design concept and implementation reality. Obviously, there are interrelationships and project officers must continually test the design with reality but conceptually they should be separate.

One of the obvious design flaws of the Fishery Development Project is the failure to show the cause-and-effect relationship between improvement in the capability of the DGF and attainment of the purpose. Although the project assumed a positive effect, there are many examples in the developing world of a negative impact on production by the private sector through inputs to a public bureaucracy. This is an example of how a sector analysis and concept paper for fisheries would have been useful. A total program would include a description of all the fishery sector elements, the respective roles of the public and private sector, relationship of public policy, laws, etc., to promotion of the fisheries sector.

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The evaluators allude to the need for increased emphasis on institutional development and making linkages that show how improvements in the DGF will improve the welfare of the traditional fishermen and promote the fisheries sector in general, but they do not go far enough. A specific recommendation should have been made to the DGF and JC regarding how to "... make explicit the link between the development of the DGF institution and the development of the fisheries sector..." We recommend that RDA send an Institutional Development Consultant to Oman to determine the linkages and prepare a conceptual framework within which we can implement the project.

The team should also have considered other ways to promote the fisheries sector. This could have centered around the "pillars of development" e.s., policy dialogue, private sector initiatives, and technology transfer in addition to institutional development. This project can address each one of the pillars with roles for both AID and RDA.

The evaluation team did do an analysis, albeit somewhat superficial, of the "logframe" but they failed to comment on the implementation plan, the training plan, the financial plan and the evaluation plan. All four have delays, deficiencies and/or revisions that should be addressed. The project officer should include a rewrite of the above as part of an amendment to the project paper.

Regarding the activities of the RDA Team, the evaluators made a straightforward review of what has been done to date in relation to some of the elements of the contract Scope of Work. However, they did not review whether the Scope of Work is relevant to the purpose of the project. No discussion was made of the training issue in terms of who is responsible for what. This has been a problem for some time. In fact, the evaluation recommends increased training in administrative matters by RDA without discussing the issue of the separation of technical assistance for developing a training plan from the implementation of the training.

The evaluators in their review of the contributions by the Government of Oman should have talked about the conditions precedent and covenants in the Project Grant Agreement between the U.S. Government and the Government of Oman and the role the AID staff should play in obtaining compliance. No comparisons were made between what was promised with what has actually happened or not happened as the case may be. If no conditions precedent or covenants exist related to the Oman contribution, then they should be made a condition for any future obligation or amendment to the Project Grant Agreement. If the Oman Government cannot provide sufficient staff and trainees in a timely manner, then institutional development would be difficult to obtain over the five year life of the project.

In our opinion, there is no clear consensus between the Omani staff, the RDA team and the Joint Commission on this project. There is a need for detailed discussions, group meetings, training, etc., in Arabic and English to clarify issues related to goals, objectives and means to achieve them. At present, there are individuals carrying out tasks with no real sense of overall purpose, program, or frame of reference. In this context tasks became ends in themselves rather than a means to a larger goal.

RDA would be very interested and willing to work with the Joint Commission in developing an approach to achieving the above consensus. If the Joint Commission would take a more active role with RDA in the implementation of this project, we believe that the development impact of this project on the fisheries sector would be greatly enhanced.

We would like to suggest that during the meetings in August and early October between RDA and AID, we jointly work out a proposed course of action and present it to the Omanis in the month of October. In the interim, or until any decision can be made regarding any redesign or amendment to the project paper, we would like to suggest that RDA carry out a thorough review of the contract budget to determine line items that are underspent and those that are overspent. We will then make projections for the rest of the contract life. If sufficient funds are available in the contract, we would recommend that we increase the consultancy line item and continue Scott McEntire and Robert McClure for up to an additional year each.

The consultancy line item should be used to support two primary areas: 1) institutional development activities in extension and the statistical program and the advisory role in fisheries economics and production and marketing; and 2) provide expertise related to fisheries policy, legislation, and regulation.

Regarding the extension of Scott McEntire, we believe it is essential that he have more than six months to establish the observer program. It is an important part of the overall management of the fisheries resource and will require at least a full year (ideally two years) of his time to develop the program to a point where the Omanis can operate it without further assistance. We hope that the reconciliation of the budget will allow us to continue him for six additional months.

Robert McClure has done an excellent job with Tony Rasch in setting up and implementing the one year sampling program. We believe that his time will be required for at least an additional year to phase in the long-term statistical program and develop and fine-tune the computer program. We hope that the reconciliation will allow us to continue him for the additional year.

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ANNEX E

No. 827/85 الرقم

Date 29 December 1985 التاريخ

His Excellency
Abdul Hafidh bin Salim Rajab
Minister
Ministry of Agriculture and Fisheries
P. O. Box 467
Muscat

After Compliments,

The Joint Commission staff together with personnel from your Ministry and the fisheries experts from Resources Development Associates (RDA) have been conducting an assessment of the progress made in implementing the Fisheries Project over the past two years. This review started with an evaluation by personnel from AID Washington and U.S. Government fisheries experts who completed their report in April 1985.

This review has continued since then with the combined effort of all those involved in the project.

I would like to share with you the results of our joint review.

As you know the major components of the Project are: a fisheries statistical program, a research program, an extension program and a training program.

We are pleased to report that considerable progress has been made in the first two years of implementing the Project. The following is a summary of the achievements under the Fisheries Development Project.

Fisheries Statistics Program:

The one year sample survey of total fish landings has been completed. All data from this survey have been entered into the computer, and monthly and yearly reports can be issued routinely. This will commence in January 1986.

This program now forms the basis for a long-term program of data collection and analysis that can include other biological data from the research program and economic data to be collected through this statistical program and the marketing program, if instituted. The prospects for future development are good: the data collectors and data entry person are now experienced and can work with less supervision. The major bottleneck is now the limited number of Omani staff.

There are presently 10 Omanis working to implement the system. A total of at least 20 are needed in order to cover most of the 1,750 km long coastline.

Extension:

A socio-economic study, which forms the basis for the extension program, and a development work plan have been completed. The implementation of the extension program is now underway with four agents and one operational extension center.

Field research is completed and demonstrations are underway on fish and lobster traps. A low-cost trap which can be constructed by lobster fishermen has been demonstrated. Field tests on mechanized boats using hydraulic winches to pull lines and nets onboard boats are being conducted. This will be a major labor and time saver for fishermen. Limited visits are being made to fishing villages to demonstrate this new equipment.

Additional field demonstrations in multi-line trolling have been conducted and training courses in boat safety and fiberglass boat repair/ modification are being planned.

Four Omanis are now working in the extension program. However, the program cannot become fully operational unless 11 additional Omanis are recruited.

Research:

Two temporary laboratories have been established with a research staff of seven laboratory technicians, two data and specimen collectors and two divers. Five additional staff are being recruited.

Research in the biology of three species has been going on for more than a year: sardine research in the laboratory in Ruwi and lobster and abalone research in the Raysut laboratory in the Dhofar region. This basic research on these three species is expected to continue for about four more years. The basic data from this research is required to make decisions on quantities that can be safely caught without overfishing these species.

These research programs will be continued by the Marine Science and Fisheries Center under an expatriate team supplied by a consortium headed by Oregon State University which will begin work early next calendar year.

The Marine Science and Fisheries Center element of the project is behind schedule because the construction of the Center is already about 24 months behind schedule.

Training:

Under the training component of the project, a manpower analysis was completed. A revised organizational structure of the Directorate General of Fisheries (DGF) was proposed and new staffing and training requirements were established.

Seven Omanis are now studying for B.S. degrees in marine sciences and 10 Omanis are studying in a special 2-1/2 year fisheries program at the Florida Institute of Technology. Ten more are scheduled for the 2-1/2 year course in 1986. Also, three are scheduled for B.S. degree training in 1986.

If the Fisheries Development Project is to be successful in its institutional developement goals in fisheries research and fisheries management, 14 Omanis must be identified and sent to study for their B.S. degree.

Marketing:

As a result of advisory services provided under the project, programs were designed and recommended for marketing information, consumer education, quality control, economic analysis, marketing and product development and private sector advisory services. Planning for the implementation of these marketing programs needs to be undertaken by the Directorate General of Fisheries.

General Assistance to the Ministry:

Short-term technical assistance under the project has examined the potential for aquaculture and also prepared recommendations for the Third Five Year Plan.

In spite of the progress made under the Fisheries Development Project in the past two years, which is more fully described in Executive Summary A, the assessment reveals that there is a considerable amount of work yet to be done in the remaining years of the project's life. The tasks to be completed are described in Executive Summary B. To complete these tasks there are several problems and issues which must be satisfactorly dealt with in the near future.

His Excellency
Abdul Hafidh bin Salim Rajab

First and foremost is the lack of Omanis in positions within the Directorate General of Fisheries who can be sent for training or be trained by working with the U.S. advisors. Executive Summary C shows the positions which have been filled and those which are still vacant.

The second problem is the RDA team's lack of administrative support. There is one translator and one secretary assisting the seven member team and visiting consultants. The entire Directorate General of Fisheries has only one Arabic typist.

There are many reports already prepared in English by Resources Development Associates which have not been translated into Arabic. These reports will be of much greater value when translated into Arabic. In order to accomplish this an additional translator and an Arabic typist are needed full time to support the Project's activities.

An administrative officer is needed to relieve the burden of administration from the RDA technician who now performs these duties. These matters could be more expeditiously handled by an Arabic speaker who is experienced in administration. This would give the fisheries advisors more time to concentrate on those areas in which they are experts. We suggest that you consider approving the hiring of these necessary administrative support personnel under the RDA contract and not as regular Ministry employees. Their job would end when the Project is completed. To cover the cost for the personnel, the Ministry could add the necessary funds to the RDA contract.

The third problem concerns the availability of vehicles for the expatriate staff to make field trips. To solve this problem, we recommend that the Ministry consider placing the control of field vehicles under the project.

I understand the problems the Ministry is facing in trying to recruit talented Omani personnel for full-time positions. On the other hand, the Government places high priority on the development and management of fisheries with Omani manpower. To accomplish this, it appears that special personnel policies need to be adopted to facilitate the recruitment and training of Omanis. I believe the recruitment problems could be solved with the close cooperation of your Ministry, the Ministry of Finance and Economy and the Diwan of Personnel Affairs. The recruitment problem has become an urgent matter for which we must find a solution. Otherwise, a great deal of the benefit that could be gained from the technical assistance being provided under the Fisheries Development Project will be lost and the project will not be completely successful.

We would like to meet with you and see if there is some way we can work together in solving the problems discussed above. Since I understand

your Ministry is preparing to request an extension of some of the Fisheries Advisors scheduled to depart Oman in December and March it is important for us to address the problems discussed above in the very near future.

With my highest regards,

(Original Arabic Letter Signed)

Saif bin Hamed al-Battashi
Undersecretary
Ministry of Foreign Affairs
Omani Co-Chairman

Attachments

Copy to The Honorable G. Cranwell Montgomery
American Ambassador and
American Co-Chairman

SUMMARY CURRENT STATUS OF FISHERIES DEVELOPMENT PROJECT

I. The Fisheries Statistical Program

PHASE I: Conduct a one-year sample survey to provide an estimate of the quantities and species of fish landed by artisanal fishermen, numbers of artisanal fishermen and fishing vessels in Omani waters.

PHASE II: Implement a long-term program to collect and analyze biological and economic data and perform other analyses on a continuing basis.

The purpose of the program is to create a data base for the analysis of Oman's fisheries resources and to provide the Directorate General of Fisheries with the data on which to base management decisions to maintain the productivity in the fisheries resource.

The following is a summary of the statistical program as it existed when this element of the program began in April 1982.

-- The Staff consisted of 1 data collector in DGF/Muscat and 1 data collector in DGF/Salalah.

-- Daily records of fish landed were kept by a commercial fishing company (Korean Overseas Fishing Company) and were compiled monthly and yearly by DGF. However, accuracy of this information was not checked. Annual data on catch including number of boats and fisheries were reported to FAO.

-- There was little data on number of artisanal or commercial boats and numbers of fishermen and little knowledge of location, relative importance, and even existence of landing sites.

-- There was little information on seasonal availability and distribution of various species of fish. There was little information on fishing practices of Omani fishermen.

-- There was no economic data on costs of fishing by artisanal fishermen.

Current Status (October 1985) of developing the Fisheries Statistical Program

-- The Staff consisted of Director of Statistics, 1 Supervisor/Data Analyst, 1 Data Entry Person, 7 Field Samplers.

-- Accuracy in collecting fisheries statistics is improving, but still restricted; the Statistical Department staff is too small and dependent on expatriate assistance; only initial thinking has been done on the problem of analyzing data.

-- The first estimate of the artisanal catch will be ready in about one month. However calculations of confidence limits or cross checks are not yet available.

-- Only preliminary information on fishering effort by artisanal fishermen is be available.

-- Data are now being entered into the Computer. However, this is progressing very slowly because only one person is available for this work; the Department is not yet ready to respond to special requests.

II. The Extension Program was designed to increase the efficiency of artisanal fishermen's efforts by improving the quality, marketability, and price of their catch, and consequently improve their incomes.

At the beginning of the Fisheries Development Project (October 1982), there was no staff in the Directorate of Fisheries assigned to these activities. (Workshops and Fishermen's Encouragement Fund were under a different department). There were no extension centers; no applied research was being done; no field activities were underway, and no extension materials were available.

Current Status of Fisheries Extension Program October 1985

-- The extension program had been created as part of the Department of Technical Services and Extension.

-- Three extension agents plus two people seconded from another department to work as extension agents are working in this program.

-- Expatriate assistance required to direct research and extension activities is being provided by RDA.

-- Extension centers are operational, although short of staff.

-- Research on mechanization and traps is underway, and some traps are being demonstrated by extension agents.

-- Limited field visits are being made. (The number of these visits can be increased only if staff is increased.)

III. The Research Program has as its purpose the creation of a data and information base for managing the fisheries resources.

At the beginning of Project, the Department of Research included the following sections:

a. Research, which ran only the turtle tagging program;

b. Statistics, which only gathered data on commercial trawlers;

d. Licensing, which licensed artisanal fishermen and commercial fishing boats; and

e. Enforcement, which attempted to oversee commercial fishing.

The Research Section itself consisted of only a Director, a part-time supervisor and three turtle taggers. There were no Research facilities to speak of, and the turtle tagging program only tagged turtles and collected data. No data analysis was being done.

The present status, as of October 1985, is much improved.

-- The non-research sections of the Department of Research have been transferred to other Departments within DGF.

-- The Research sections have a staff consisting of a Director, seven laboratory staff (sardine research project) including six full-time (one M.A., four B.Sc., one fisheries certificate) and one part-time (M.A.), two data collectors and two divers. In addition, one research technician, two lab assistance, and two boat operators are being recruited.

-- Facilities for research have been improved. The Ruwi laboratory (for the sardine program) is equipped with microscopes, scales, microfiche reader, refrigerator, freezer, glassware, chemicals, reference books. The Raysut laboratory (for the abalone and lobster programs) has been built; scientific equipment is on order; field equipment has been acquired; and a survey/research boat has been acquired and preliminary sea trials have been made.

-- Basic biological research programs in sardines (including indentification, weight/length analysis, food and feeding, reproduction and maturity, ageing, and other studies) and comparable programs for lobster and abalone are underway.

FISHERIES DEVELOPMENT PROJECT

SUMMARY

TASKS TO BE COMPLETED BY

END OF PROJECT

STATISTICAL PROGRAM

-- Hire and train sufficient staff to run the statistical program without expatriate assistance.

-- Establish a long-term data collection program on landings. Centralize the data collection for various departments and refine analysis and reporting so it responds to user needs.

-- Refine the analysis of the data available through surveys conducted during the first year of operations.

-- Improve the accuracy of the data collected. This can only be done by improving the skills of the data collectors through training and increasing the nubmer of data collectors to expand the data base and therefore the reliability of the data.

-- Develop the capability to respond to special requests. This can only be done if the data is more reliable and input is analyzed in a more timely fashion.

-- Speed up data entry. This can be done only through an increase in the number of data entry personnel (key punch operators).

-- Increase the number of supervisory personnel. If the number of data collectors is increased, as it should be, there must be a corresponding increase in the number of data entry personnel and in supervisory staff.

-- Publish quarterly and annual reports on fishing statistics (Artisanal and Commercial).

EXTENSION PROGRAM

-- Increase the number of field visits conducted.

-- Improve the quality of extension agents with in-service training and increase their number by seven.

-- Increase the number of regional extension centers from two to five.

-- Expand the demonstrations now being done.

-- Develop training materials.

-- Relate fishing activities to the needs of the market.

-- Decrease the reliance on expatriate staff through education and training.

RESEARCH

-- Complete construction and equipping of the new marine Science and Fisheries Center.

-- Contract with the consortium of universities headed by the Oregon State University for the technical assistance needed to conduct appropriate research and operate the Marine Science and Fisheries Center.

-- Marine Science and Fisheries Center opened and short-term and long-term research programs to support the development and management of Fisheries started.

-- Seven Omanis with under graduate degrees in Fisheries working in the staff of the Center.

-- Five to Seven Omanis studying at the B.C. level to work in center after graduation.

STATUS OF

RECRUITMENT OF OMANIS

The following is a listing by activity of the staffing requirement, the positions presently filled (hired), and the positions which are vacant (additional needed).

STATISTICAL PROGRAM

Required	Hired	Additional Needed
1 Director	1	0
1 Deputy Director	0	1
1 Data Analyst	1	0
2 Data Enterers (Key Punch)	1	1
2 Supervisors of Samplers	0	2

EXTENSION PROGRAM

Required	Hired	Additional Needed
1 Director	1	0
1 Deputy Director	0	1
10 Extension Agents	3	7
3 Extension Agents (Part-Time)	0	3

RESEARCH PROGRAM

Required	Hired	Additonal Needed
1 Director	1	0
10 Professional Researchers	0	10
20 Technical Support Staff	7	13
1 Administrative Officer	0	1
6 Secretaries/Typists/Translators	0	6
2 Divers	2	0
10 Maintenance	0	10
12 Misc. Drivers, Messangers, Guards	0	12
10 Officers and Crew for Research Vessel	0	10

(2 boat operators being recruited)

We offer the above as an interim measure to keep a good team intact while the overall question of U.S. Government support for long-term technical assistance in the fisheries sector is answered.

Additional comments of a more specific and technical nature on the evaluation are attached.

I look forward to discussing the above with you and Gary Towery in Washington, D.C.

Sincerely,

RESOURCES DEVELOPMENT ASSOCIATES, INC.

Keith

Keith E. Simmons
Oman Project Coordinator
KES:pb
Encl:

ANNEX F

MARKETING

The team reviewed the Marketing Program with the purpose of assessing its effectiveness and importance as a program of the FDP relative to:-

a. Scope of the Program

b. Adequacy of Technical Assistance.

c. Adequacy of Omani inputs.

d. Type and Quality of Data Collected.

e. General Comments.

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a. Scope of Program.

The data available at the beginning of the Project on marketing and processing in Oman were not particularly comprehensive. Although the responsibility for generally administering to the marketing of fish was vested with the DGF, its function in the overall market was insignificant and the market structures continued to operate despite, rather than with the assistance of DGF.

The DGF constructed ice plants and cold stores and had a vested interest in the marketing and processing of fish, for both domestic and export consumption. At the same time many small private trucking processors and marketers operated within the structure of the fishery sector. These were entrepreneurial inputs by both Omani and foreign (UAE) operators.

Part of the scope of the FDP was to open new markets and bring new opportunities to channel the increased landings expected from the Project to both domestic and foreign markets.

RDA on analyzing the market structure, recommended to the DGF that it relinquish its commercially oriented market functions to the private sector, where it is firmly vested in most developed and developing countries. The private sector is motivated by profit and this tends to initiate an efficient and effective approach to marketing. The GovOman processing plants were therefore leased to the private sector.

Subsequently the Expatriate marketing advisors of the contractor, due to this altering focus were directed to concentrate efforts towards the private sector and assistance was given to the private sector investors and operators as required.

b. Adequacy of Technical Assistance.

During the period of the FDP there have been [illegible] Expat. marketing advisors, each with good qualifications, although differing slightly in context of activities and perspectives. [illegible] advisors have left, either early, or at the end of their [illegible] usually with some degree of disillusionment. This however, [illegible] be viewed both in the perspective that they were unable to make major inroads into the Omani marketing system and, that they were in any event high achievers. In all probability the hopes of achievement were somewhat high.

The transfer of responsibility from the DGF to the private sector left a major gap of potential for institutional development within the DGF. Although this is discussed in section 3, it should be noted here that the basic intent of the FDP was to create institutional development through the various programs. Thus by passing the responsibility for marketing to the private sector the FDP lost the opportunity to pass on institutional development in marketing to the DGF personnel, who were then no longer interested in marketing.

The above however, does not reflect on the adequacy of the marketing experts and the Team notes that apart from inroads made on an ad hoc basis to the private sector, the marketing advisors, within the DGF were virtually working in a vacuum.

c. Adequacy of Omani Inputs.

The DGF has demonstrated a totally inadequate perception of requirements on the marketing structure, which is reflected in its inactive policy towards the provision of counterpart staff. The counterparts put forward have been unable to perform in the most basic way and the present counterpart of a highly qualified internationally oriented marketing expert, has little English, is inadequately motivated and his attendant skills were some training as a motor mechanic.

It is apparent that the DGF is aware of the organizational and institutional structures which are required from a government agency, even when the function of marketing is focussed where it should be, on the private sector. The DGF has on its books a Head of Industrial Affairs for marketing; a Head of Documentation; an Accountant; a Port Engineer; a Refrigeration Engineer; a Marketing Officer; a Head of product Development; a Head of Quality Control; a Seafood Specialist; a Head of Consumer Education; 3 Market Data Collectors; a Quality Control Officer., all of whom should still be functioning within the system for institutional and organizational control of the private sector's function in the market. In reality these personnel do not have a true function and the team is not aware of any professional duties which they carry out. Thus they are not under the influence of the marketing advisor and this increases the isolating effect of this advisors ability to function in accordance with his needs.

d. Type and Quality of Data Collected.

As previously indicated the market advisors functions within the sector have been seriously restricted. Within the private sector there are three large companies and in general they have their own internal systems which have been found adequate by the marketing advisors. There are however many small companies who technically require assistance but are demonstrating some resistance to change. They tend to accept a modicum of help and then go away, showing no further interest. After failure they sometimes come back, but this is not the rule. There was one example where the conditions in a processors plant were totally unsanitary. The marketing advisor tried to upgrade the sanitary conditions and succeeded only in offending the management.

Some of the inroads towards development made by the various marketing advisors are as follows:-

1. Report on fish Suqs which led to complete rebuilding of Mutrah fish market (the largest in Oman) and restructuring of sanitary regulations by the Ministry of Health. The team notes that this appears to be a major impact.

2. Various inputs by the advisors led to a three-day Fish Quality Seminar, involving six ministries and the private sector. This directly led to a noticeable improvement in country wide suqs and an improvement in export quality.

3. A study of the Korean trawl fishery led to restructuring of government marketing policies.

4. Three of the advisors have worked extensively with virtually every new processing and marketing operation. The three largest companies, with their own expertise generally have not benefitted, but about twelve smaller firms have worked closely with the advisors. These firms are expanding into the international arena.

5. The present advisor's Quality Assurance Report and recommendations, if adopted will more than compensate, according to RDA, for all funds spent for the whole program to date.

6. Two of the previous advisors made recommendations on fish transportation, which resulted in new regulations on fish boxes. Virtually all truckers now use the new insulated boxes and ice. This has resulted in much improved quality of fish.

e. General Comments.

The marketing sector of the fishing industry is a vitally important component for the wellbeing of the industry. It is the nucleus around which the fishermen's livelihood rotates. An improvement in the quality of fish presented to the market by the fishermen and the resultant potential for market and processing retention of high quality, can either make or break the fishing sector.

The DGF should realize the importance of marketing and actively try to set up the linkages ... should exist between the institution and the private sector in a good marketing system. Attention to this vital element would enable the marketing advisors of the contractor to help the FDP to strengthen the institutional capability of the DGF, as initially prescribed by the FDP documentation.

The marketing advisors of the contractor have also not had the proper facilities. In a good marketing system the large processors have telex, fax and both official and private info. on World markets of all fish products, on a day to day basis. This is the type of information that could be handled by the DGF marketing advisor initially and subsequently handed over as appropriate to the private sector. By contrast the present marketing advisor has a telephone which will not enable him to telephone outside Muscat. It is evident that if a system is to be constructed the facilities for constructing the system should be made available.

THIS IS A ROUGH DRAFT ONLY AND WILL BE EDITED IN WASHINGTON.

The following sections (expansion of extension and marketing) will be completed after the departure of the Devres team leader on 15th. June. They should therefore be reviewed by Murl Baker/John Schneider and subsequently by Stan Sverdloff.

It is requested that John Schneider carries the data to Washington for inclusion in the final report by Dr. Nelson Ehrhardt.

The sections will require the following editing in Washington:-

Editorial corrections.

Formatting to required style.

Any observations/inclusions/deletions by Messrs. Baker/Schneider/Sverdloff.

It should be noted that these statements are being produced as a supplemental document to support completion of the final report by Ehrhardt/Schneider in Washington. These activities were not required as single analytical components in the terms of reference of the final evaluation, but rather were confounded within the institutional development analysis, contracting and scope of work.

EXTENSION.

The team reviewed the Extension Program with the purpose of assessing its effectiveness and importance as a program of the FDP, relative to:-

a. Scope of the program.

b. Adequacy of technical assistance

c. Adequacy of Omani inputs.

d. Type and quality of data collected.

e. General comments

---

a. Scope of program

Data available at the beginning of the Project on the activities

of traditional fisheries were rather scarce. However it was widely believed that especially younger fishermen were beginning to turn away from the sea and seek employment elsewhere. Many fishermen indicated that they did not want their sons to go to sea.

The GovOman policies for the first five year plan was to develop the artisanal fisheries by establishing cold stores and ice plants and also to distribute at subsidised cost boats, motors, nets and other fishing gear. However from the scanty information subsequently available there was some indication that fish landings had only increased marginally.

From this the Fisheries Development Project Plan concluded that if traditional fishermen were to be active participants in the development of the fisheries, they must increase their catches and must receive more realistic prices for their catches by increasing the value of the product. Therefore an Extension Program was included as part of the FDP

The team examined the extension program to the extent that it existed at the beginning, middle and end of the FDP. The actual extension program was commenced in 1984 which was two years after the commencement of the FDP, so that it could reasonable be concluded that at the beginning of the FDP the extension program per se did not exist. That is to say no actual extension work was being carried out by the DGF.

In 1984 nine Omani extension agents were employed and by 1989 the same number of agents were employed. Three of the extension agents are totally unsuitable for the work, since they have no aptitude or abilities. Of the remaining six there are two who may have sufficient potential, if they apply themselves more diligently, to ultimately make good extension agents.

A search was made of the RDA's extension file and some 41 attempted tasks were noted on separate issues, technical, developmental, innovative, training, vis a vis fishermen's activities. These appear as Appendix.....(NELSON THIS IS IN MY DISK FILED:- EXTACT) Many of the tasks have been attempted, but a file search alone was not successful in quantifying the extent of development. (see below for accomplishments of extension service).

b. Adequacy of Technical Assistence.

The technical assistence to the extension program is provided by three RDA advisors; an extension specialist, a marine engineer, and a masterfisherman. There is also an extension advisor in the Southern region, who is well qualified as a generalist. All the extension advisors appear to be well qualified for the work that they are required to perform. The team believes that one particular significant advantage is that the extension advisor

communicate and transfer knowledge to both Omani extension agents and the fishermen is obviously superior to that of his colleagues.

Prior to the arrival of the existing advisors an extension officer was in place in Muscat for a period of about four years and the extension advisor presently in the Southern Region was in Muscat, mainly employed on computer work. Although the previous extension advisor was a very good communicator, the extension program had not got under way during the earlier part of his tenure and he was mainly employed in assisting with the setting up of the service.

The present extension advisor appears to be very knowledgeable in his work. He is Tunisian and has a very good understanding of Arab culture as applied to Omani cultural structures. This together with his Arabic language capability makes him a first class advisor for this work.

The marine engineer and the Masterfisherman, although possessing the requisite capabilities, have a very Western culture orientation and the Team became aware of a certain amount of resistance from the Omani higher DGF Officers to the blunter Western approach. The marine engineer in particular is a very innovative person at his profession and he has apparently been able to provide escape routes by the application of technology in a myriad of situations. It does appear however, that the ability to perform technologically is not regarded by the DGF as highly as the ability to integrate into Omani cultural ideology and mores.

c. Adequacy of Omani inputs

Although the contractor has acquainted DGF with Omani extension agent requirements in terms of numbers and worktypes, the Team does not have any evidence to indicate that the contractor has insisted on providing the DGF with a blueprint for the profile of an Omani extension worker,(specifically) even though the extension worker as such is a unique contributor to personnel inputs. As indicated in the general section he must be a person with two completely different sides to his mission; firstly as an anthropological identifier with the fishermen, he must be one of "them" Secondly he must be able to revert to being a bureaucrat and serve the DGF in providing administrative data, reporting and the required contribution to the institutional side of the program on a continuing basis. In short he should be an educated fisherman; a technologist; an innovator; a part psychologist and above all a friends and confidant of the fishermen.

It is doubtful if during the FDP and perhaps for a considerable time to come, whether such a "two hatted" individual exists among the Omani available counterparts. The type of personnel made available to the FDP were not only inadequate in terms of their inability to perform the less desirable physical roles in the extreme heat "on the beach" and in the fishermen's environment,

but they were less than adequately educated to a minimum level and not suitable for training as extension agents.

Added to this they went out into the field with expat. staff and on incurring minor field expenses they were unable to recoup the expenses for weeks and sometimes months, due apparently to DGF lack of budget availability, but more realistically to financial indifference on the part of upper DGF cadres. This naturally caused further depression of interest in field work and settled as a general constraint, with attendant malaise on the part of the expat. staff. The lack of so called funding for Omani field trips put the brakes on expat activities, as it is explicit that they cannot be in the field without Omani counterparts. If there is a coalition between the upper echelon of DGF and the extension counterpart, that in the ultimate transmits itself to a general lack of interest, the braking effect on program implementation is apparent.

As a consequence of this many inputs to the extension program planned by RDA as being of significant assistance to the traditional fishing communities, have either been temporarily postponed, or advanced as time and circumstances permit. As an example there were a number of issues that could only have been demonstrated from a vessel in the Dhow range and size. This was discouraged by DGF and the activities had to be postponed. Now that the extension service have a boat of their own, providing the ancillary services are not constrained by the DGF, such as fuel, boat movements etc., many of the previously postponed issues should now be able to go ahead.

d. Type and Quality of Data Collected.

Data collection for the extension service begins at the time of Project preparation for the FDP, when although the extension service per se did not exist, it was decided to commence the process of recognizing the needs of the traditional fishermen by carrying out a socio-economic survey. Socio-economic activities have been carried out on the traditional sector on more than one occasion and the survey carried out on behalf of RDA was to a certain extent supplementary to that which was carried out earlier.

However the Team notes that the socio-economic data produced, although very comprehensive in terms of being a full catalogue of fishermen's activities along the full length of the coast of Oman, did not further qualify the needs of the fishermen, either in terms of a macro perspective, or the needs of fishermen at various places on the coast.

In the Team's view there is no evidence to point out that the results of the socio-economic survey have been interpreted in terms of feasibility of technical needs at various places on the coast. If the raw data provided by the survey does not lend itself to technical interpretation the Team believes that it

should at least have been possible to use the data as a means of identifying the needs of a further study which would have had a more technical orientation.

It would seem that the extension services are tending to concentrate on issues that come up on a need-to-solve basis, rather than by making a full analysis of the requirements by having discussions with fishermen and fishermen's leaders to determine the requirements of the sector. The Team has some sympathy with this approach as (indicated above) any approach made by RDA to the sector is constrained by DGF negative activities and attitudes. What tends to develop is the solving of priorities considered by the DG to be priorities, rather than the actual sector needs. Examples of this are the somewhat ambivalent DGF views on the lobster management situation and the use of lobster pots without biodegradable devices for destruction. There is obviously some sub-sector political influence being brought to bear on the lobster situation and this prevents global recommendations and management.

The Team believes that the flow of data will only improve when the constraints to present activities, such as counterparts, fuel and vehicles, political interference and priority definitions have been cleared up.

e. General Comments

From the outset the Team believes that it has proved to be very difficult to create institutional development through the extension service. As quoted by one source the extension program "...has been the orphan of the FDP", whereas the Team believes that extension in a developing fisheries environment, such as in Oman is an absolute prerequisite, which should be afforded a major priority place of importance within the emerging fisheries system. It is evident that all development, whether institutional, developmental, or innovative, ultimately redounds to the benefit of the fishermen and the fishing industry. Without the fishermen development of any type becomes academic, whereas it is often the peripheral parts of the system (research, management, regulation, statistics) that receive the urgent priorities, while the fundamental contributors, the fishermen, are often neglected.

The Team believes that this somewhat eccentric characteristic has also taken place in the FDP. Basically the reason for this is that the institution per se (the DGF) is oriented towards the clean hands/mental/high social status condition, whereas the fishermen are oriented towards the dirty hands/physical/low social status condition. It is therefore very difficult for the two entities to merge, although extension is the link which should be very strongly forged and the extension agents require to have high credibility with both the institution and the fishermen.

The extension agent has a very difficult position to maintain. He must be able to remove his shirt and help the fishermen to pull their boats up the beach; he must virtually live with the fishermen in their houses from an anthropological viewpoint; he must enter the fishermen's activities, gain their confidence and virtually become one of them; he must not under any circumstances be involved in enforcement, statistics or any other tasks that identify him as any other agent than the fishermen's friend. At the same time he must be able to provide administrative links in a reverse direction ie, from the fishermen back to the institution.

The team clearly sees that the FDP was not able to provide the DGF with a comprehensive set of design specifications for an Omani fisheries extension agent, since the prototype did not exist in Oman and the visualization of this vital role was not comprehended.

If suitable extension agents are to become part of the system in Omani fisheries the Team believes that the DGF will have to look elsewhere, outside of the ranks of DGF cadres to find the right personnel profile. The right type of agent may well have to come from the fishing industry proper and be otherwise educated in both extension work and how to fit into the complicated structure of the bureaucracy. He might have to come from a group who, although interested in fishing from a hobby viewpoint, is otherwise educated to a basic standard and is presently employed elsewhere. The main issue is that the agent is trained to recognize the absolute need for the dual role and the need for complete integration into the fishermen's lifestyle and confidence.

It would be disproportionate to highlight the failures of the FDP vis a vis extension generally, without also providing a catalogue of inroads and successes gained by the program during the period of the FDP extension activities (1984-1988). Some of these are as follows:-

1. Safety demonstrations to all coastal villages have resulted in a fishermen's awareness of life jackets, distress flares etc.. This has resulted in the adoption of safety requirements by some fishermen. Safety vidios were prepared by the extension team and shown regularly on Oman TV. in efforts to get the fullest possible coverage.

2.The continued testing and demonstration of trolling poles and small winches has started to impact within the sector. These are now used to a limited extent throughout the Country. Demonstration of swivels, proper leaders and tuna circle hooks have led to their adoption in Sur and Capital tuna fisheries.

3. Tuna long line trials have led to the adoption of this method of fishing by two boats in Sur. The biggest impact has been on the market sector; high quality fish made available by the DGF

vessel were used to test the Shashimi export market. This led to the establishment of a fresh tuna export market, which is eventually expected to generate RO. 5-10 million per annum.

4. The first integrated attempt of the extension program was the Masirah Survey and Demonstration Program. The surveys discovered many new fishing grounds to the south of Masirah Island. The immediate results were 5 tons per day of bottomfish.

Demonstration of echosounders and reels are expected to have future impact.

Demonstration of proper fish handling and subsequent higher prices has made an impact on both fishermen and fish buyers.

5. Artificial bottom reefs are being constructed in the Musandam and Batinah Regions. This is a major co-operative program between the extension team and the fishermen.

6. Several internal reports by the extension advisors have led to the adoption of a FAD program. The procurement of materials is underway. Four FADS are to be placed in the Capital Area before the next yellowfin season.

7. Reports by the extension service have led to revisions of subsidy policies (especially by the Ag and Fish Bank), future plans for fishermen's training and fleet development.

8. A report led to the revision of harbor planning concepts, to favor the growth of Omani traditional fishermen, rather than distant water fleets.

ANNEX G

RECOMMENDATIONS FOR REGULATION OF THE FISHING FOR LOBSTERS IN THE SULTANATE OF OMAN

1985

I. It is unlawful to take any lobster between the 1st of May and the ~~last~~ 1st of September.

It is unlawful to possess a female lobster that is bearing eggs. Any egg bearing lobster which is caught must be immediately returned to the sea unharmed.

It is unlawful to take or possess any lobster less than 80 mm carapace length measured from the base of the eyesocket to the posterior margin of the carapace. (Illustration)

Any person in possession of a lobster must have a measuring device in his possession.

Any lobster retained must be in a whole condition when brought ashore.

II. (1) Issue a regulation forbidding the use of nets for taking lobsters. (Effective date)

(2) Issue a regulation forbidding the use of spears or hooks for taking lobsters. (Immediate)

(3) Issue a regulation forbidding all fishermen, transporters, buyers, mongers, processors or consumers to possess female lobsters with eggs.

(4) Issue a regulation prohibiting all fishermen, transporters, buyers, mongers or consumers from possessing any lobster of less than 80mm in carapace length.

(5) All fishermen, mongers, traders and processors who deal in lobsters must have a device in their possession to measure lobsters.

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(6) All traps or cages for catching lobsters must have a minimum of two (2) 55 mm diameter opening escape gaps to allow the release of small lobsters. One gap to be on the top ~~side~~ of the trap, the other to be on a side of the trap.

(7) All lobster traps must have a built-in release device or "self-distruct" panel that will prevent the trap from continuing to fish if it is lost at sea.

(8) Two staff to be hired to monitor lobster regulations. One to be assigned to Salalah one to be assigned to the Sharquiya area.

(9) Ministry of Agriculture and Fisheries veterninary staff at border posts to be given authority to inspect lobsters being exported from Oman, and to take necessary action when violations occur.

(a) Penalties for violations as follows :

(i) for first offence - warning

(ii) for second offence - confiscation of entire lobster load

(iii) for third offence - confiscation of entire load & vehicle

III. Recommendations - Records :

(10) Lobster processors and exporters must keep records that indicate the origin of the lobster catch by town or village (on forms provided by DG) and submit these records to the statistical department of the Department of Fisheries at the end of each month.

(11) Processors must submit a summary of their production of lobsters by size and grade at the end of each month to the statistical department of the Department of Fisheries.

Other Recommendations related to Lobster Fishery :

(12) The Department of Fisheries to investigate ways to assist the fishermen to replace nets used at present for capturing lobsters by:

(a) exchanging nets for traps

(b) subsidize purchase of traps

(c) selling traps at cost to fishermen

(13) Processors and exporters to pay to the Ministry of Agriculture and Fisheries 50 Bzs. per kilo of the amount of lobster produced for exports.

The funds collected should be designated to funding monitoring, management and research activities of the DGF and for the purchase of traps for exchange with the fishermen for tangle nets.

ANNEX 5

Devres' Reply to RDA International's Response to Fisheries Development

Devres, Inc.

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December 20, 1990

Mr. Juan Buttari
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Agency for International Development
Washington, DC 20523-0004

Ref: RDA's response to Devres' Evaluation of the Oman Fisheries Development Project

Dear Mr. Buttari,

The following letter written by Dr. Nelson Ehrhardt, team leader of the above-referenced Devres evaluation team, is in reply to RDA's "Response to Fisheries Development Project Evaluation Report..." Devres stands behind Dr. Ehrhardt's response. As agreed, I have appended RDA's response and Devres' reply to that response as annexes to the original report. Regarding the annex of project outputs which was referred to on page 20 of the original report but which inadvertently was not included among the annexes, Devres has made every effort to locate the document (including a request for it from RDA) but has been unable to obtain a copy to include in the report. If there are any further questions pertaining to our report, we will be pleased to discuss them.

Sincerely,

Joann Feldman
Associate

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12 July 1990

Ms. Joann Feldman
Associate
DEVRES, Inc.
7201 Wisconsin Ave. Suite 500
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Dear Joann:

This letter is in response to your request to review RDA's response to the evaluation of the Oman Fisheries Development Project. In general, RDA's response is defensive and lacks understanding of the objectives and purpose of the Final Evaluation. Reacting in this way, RDA makes an effort to single out and to criticize phrases and paragraphs on punctual issues in the evaluation report. They create arguments which significantly distort the real context of the evaluation results and the real situation with the Fisheries Development Project (FDP) in Oman.

The purpose of the evaluation as stated in the Scope of Work is clearly spelled out in the evaluation report. The evaluation was 1) to indicate progress made toward achieving the project purpose of institutional development of the Directorate General of Fisheries and 2) to identify lessons learned under FDP which could be applied to Fisheries Management and Development Program (FDMP). Omani-American Joint Commission (OAJC) officials also requested that the team review specific documents and activities of the FDP, such as the statistics and research programs, in view of the new FDMP. The specific tasks outlined for the team in the scope of work included assessment of the institutional development of DGF, assessment of the effectiveness of the project's approach to institution building, assessment of the effectiveness of project contracting and of the OAJC and analysis of the appropriateness of project focus. The team's mission was to assess end of project achievements in terms of institutional development, subsequent to the completion of the project's activities and an investment of $13 million. The intended evaluation focus was not on how activities were implemented, the difficulties encountered or how tenaciously RDA's personnel tried to accomplish the objectives of the project, but on the impact of project activities in terms of institutional development. It is in that context that the Project significantly failed. It is in that context that the findings of the Final Evaluation are written and not to satisfy the format of an evaluation of specific activities. Such format is found in the two interim evaluations of 1985 and 1987. The purpose

of the Final Evaluation (as cited at the beginning of this paragraph) was discussed at length in a meeting with the contractors (RDA and OSU) in which the A.I.D. Representative also participated. The Final Evaluation Report is highly professional and objective, and fully within context of the purpose defined by A.I.D. The results within that context are not as negative as those in the two interim reports. One wonders whether RDA did not understand the magnitude of the technical problems identified by the reviewers in 1985 and 1987, or whether simply not enough was done to correct the course of action which led to an impressive lack of tangibles at the end of the project. The team reviewed RDA's communications regarding policy, institutional development and several other issues relative to project implementation. The team, however, did not find any actions by the contractor to remedy the problems encountered other than communicating them. As a consequence, many of the issues and problems are still pending.

The team could not change the language of the report where it refers to the "... abrasive environment between DGF management and the contractors" because all government officials interviewed both in the Capital and in the Southern Region clearly indicated to the team their major differences (present and past) with RDA. On the other hand, during interviews with RDA personnel, honest and candid statements were expressed to the team about their displeasure with local authorities and with respect to OSU activities. These aspects were discussed with both contractors, first in group and then separately, when a draft copy of the report was distributed in Oman. The team never retracted its position which was based on facts--not hearsay as is stated in RDA's response. The fact that RDA suggested that a single contractor, instead of two, would be a more efficient arrangement for the follow up project (FDMP) was based on RDA's opinion that OSU did not generate stock assessment studies to frame fishery development. Instead (according to RDA staff comments to the team) OSU concentrated on basic science. This discrepancy was very obvious to the team when it interviewed each member of the OSU and RDA parties. For this reason, the Final Report refers to the "... divisive institutional differences between the two principal contractors...". It is unfortunate that the Chiefs of Party of both contractors retracted their opinions of each other when meeting in a group. The team, however, could not ignore a fact which they considered detrimental to the successful integration of the project objectives.

It is regrettable that some of RDA's comments (e.g., RDA's response on page 3 and Response, page B-1) fail to recognize certain of the obligations they had as contractors. Among those obligations are the increase of catch as project objective and an end-of-project status report on marketing. These are two absolutely fundamental aspects of fishery development.

The fact that many of RDA's activities were carried out but that the results could not be substantiated in terms of who participated, how the activities integrated into Omani plans, and what the impact was of the activities on institutional or fishery development were of major concern to the evaluation team. Opinions expressed by RDA's extension and marketing personnel clearly indicated their desire to accomplish the objectives of the contract. At the same time there was an obvious

feeling that Omani counterparts would never be fully interested in participating in such initiatives and, even more critically, that Omani counterparts would never be capable of sustaining future activities based on such initiatives. Given those premises, the team moved to investigate the Omani perception of RDA's attempts. Based on the interviews which followed the team concluded that "... programs tended to be driven by the DGF." The validity of this statement was further supported by the statement of a top RDA official in Oman that objectives of the project would not be achieved until the DGF was removed from his position, implying that RDA's activities were not being fully considered by the DGF. The clear implication was that either there was a significant failure in the purpose of the OAJC project or that there was a lack of ability to cope with an unrealistically ambitious project implemented in an environment that was quickly overwhelmed by the proposed activities.

Annex A of RDA's response refers to the review of the Statistics Program. Again most of the response is misleading because of RDA's lack of understanding of the purpose of the evaluation. In A-1 RDA claims, "Again we have a case of an evaluator using inaccurate or incomplete information to carry out the evaluation." In fact, RDA is making reference to statements in the last paragraph on page 37 of the Final Evaluation which were copied directly from the original Project Paper and from a revised RDA Implementation Plan (1988-1989). RDA's response goes on to argue that the statement, "Under any circumstances, the purpose of the Statistics Program should be...", made by the evaluation team was inappropriate as a model format for the evaluation. Unfortunately, RDA did not realize that under the scope of the evaluation, the team was requested by OAJC officials to review RDA's own Internal Project Review, Fisheries Development Project, Sultanate of Oman, March 1989. RDA had submitted the document to the Minister of Agriculture and Fisheries to be utilized by the Ministry in its discussion with the Joint Commission in planning Phase II of the project (FDMP). In the team's view, RDA's recommendations were erroneous and misleading, as stated in the last paragraph on page 38 of the Final Evaluation Report.

The last statement in the last paragraph in RDA's response A-1 is erroneous. The team spent a significant amount of their time interviewing RDA personnel as well as all Omani personnel in the statistics office in the DGF. According to RDA's personnel if the project were terminated immediately Omani personnel could not continue with the tasks of the Statistics Division. According to Omani counterparts, their training was inadequate to the point that many did not understand the overall goal of the Statistics Division. According to RDA personnel and Omani counterparts, field activities were plagued with all kinds of problems. Several of these problems created major biases in the data collected. The evaluation team considered the above situation to have a negative influence on institutional development. The team, however, recognized that the statistics program was the most tangible RDA effort. The team did not characterize the activities of RDA as the "tremendous strides..." made by RDA because 1) it is expected that the contractors would make significant progress in implementing an over-dimensioned project in a highly undeveloped sector such as the

fishery sector in Oman, and 2) such a statement would have been out of context given the evaluation's purpose of assessing institutional development. In fact, the extent of institutional development in this component of the project fell far short of what was planned. This conclusion does not, however, imply that the team members were unprofessional or had motives other than the purpose of the evaluation as expressed in RDA's response.

The first paragraph in RDA's response A-2 is, once again, based on a misunderstanding of the purpose of the evaluation.

In the second paragraph in A-2, the documents in question were reviewed by the team and information found in the documents were included in the report but the titles were omitted from the report by mistake.

Re: the third paragraph in A-2, it is difficult to understand RDA's ideas or purpose here. The Final Evaluation Report states on p. 27: "These two positions are occupied by fishery biologists with experience in quantitative population dynamics, statistics, and computer science. None, however, is by training a statistician or computer specialist." That is exactly what the two RDA personnel associated with the statistics program are. Mr. Rash is a statistician who is no longer associated with the project. Usually statisticians are assigned to statistical projects. This facilitates problem solving, improvement of the systems established, and training is carried out with authority.

Re: the fourth and remaining paragraphs in A-2. The Final Evaluation report on page 4 is correct both according to the Project Paper and the actual design.

RDA's objections to the evaluation of the Marketing Program are again biased by their misunderstanding of the evaluation purpose. The team framed the evaluation of marketing activities on the 1986 Amendment No. 2 to the Project Sub-Grant Agreement (p. A-1) which states that the project will establish "a marketing program that stimulates more extensive and efficient marketing, both for the growing commercial export industry and the traditional domestic demand." Again the team focused on the end of project status and not on the many documents prepared by RDA. At this point it is disturbing to read that RDA was not "aware of any A.I.D. document with end of project status for marketing" (RDA's Response, p. B-1). Furthermore, the team could not identify any truly significant impact (relative to investment) of the marketing project on fisheries development in Oman.

With respect to the Extension Program, there is an obvious list of documents and activities that were performed by the contractor. Here again, within the purpose of the evaluation, there was no indication of when and how these activities were integrated with Omani efforts, how they fitted together to strengthen institutional development, or what impact these activities had on fisheries development in Oman. The team, through review of reports prepared by RDA and through interviews of RDA's personnel and Omani officials, concluded that most extension activities consisted of efforts at making a list of activities performed but that they had very limited impact on fisheries development. The

final outcome of this program was in part reflected by the great frustration demonstrated by the RDA staff associated with the extension program to the team during interviews.

In their visit to the Southern Region, the team was struck by the vast number of opportunities available for fishery development that could have been integrated within the extension program in that region. The most important region from a fishery stand point appeared to have been totally neglected by the project. This sentiment was corroborated by strong statements and objections against the program made by all Omani officials interviewed in Salalah, including the DG of DGF and the Director and Deputy Director of Fisheries Southern Region. For the team this was another clear indication of failure of the extension program in achieving institutional development.

RDA's response p. C-4 which indicates that comments in the Final Evaluation on introduction of lobster traps are "irresponsible, incorrect, misleading, and should not have been included" is wrong and self serving. The fact is that RDA recommended the use in Oman of a fishing gear which had components which are illegal in the US. Oman adopted those lobster traps based on the advice of RDA. The statement (RDA's Response, p. C-3) that "The Ministry for reasons unknown chose to order pots without the degradable pins" is simply showing that RDA was not even aware of the impact of their own advice. It was the evaluation team, during the visit to the Southern Region, that by chance detected this error. RDA staff in the Southern Region was not aware of the problem and had to be instructed about it. The team brought this problem to the attention of the OAJC and the OAJC took immediate corrective action. It is hard to believe that in RDA's response (p. C-4) they argue that "this issue was discussed... and should not have reappeared in the final report." Why shouldn't it appear in the Final Evaluation Report? The team developed an objective report which reveals the actual situation with the end of project status and as such it cannot disregard critical issues even though they are not appealing to the contractor.

In conclusion, RDA's response does not invalidate the findings and conclusions of the final evaluation but, rather, further ratifies many of the problems encountered by the team. The final evaluation identified that at the end of a significant project, little institutional development at the DGF had been accomplished. It is hoped that the lessons learned in FDP will help A.I.D. to better design and more rigorously monitor FDMP.

Sincerely

Nelson M. Ehrhardt
Team Leader