CLASSIFICATION

PROJECT EVALUATION SUMM- PD-AAT-897

1. PROJECT TITLE
Sub-Project Title
Fisheries Development Project

2. PROJECT NUMBER
272-0101.1

Muscat

4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) 85-1

☒ REGULAR EVALUATION ☐ SPECIAL EVALUATION

5. KEY PROJECT IMPLEMENTATION DATES

A. First PRO-AG or Equivalent	B. Final Obligation Expected	C. Final Input Delivery
FY 82	FY 82	FY 89

6. ESTIMATED PROJECT FUNDING

A. Total $ 17.2

B. U.S. $ 6.6

7. PERIOD COVERED BY EVALUATION

From (month/yr.) April 1982

To (month/yr.) April 1985

Date of Evaluation Review April 1985

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
1. Extend PACD to April 1989	AID/W	1 Jan 86
2. Enter into policy dialogue with GOVOMAN officials and agree to revisions to the elements of sub-project to achieve goals.	G. Towery	15 Jan 86
3. Advise GOVOMAN on changes in Host Country Contract with TA providers to conform to revisions agreed to in 2 above.	G. Towery	15 Jan 86
4. Urge GOVOMAN to accelerate the hiring of fisheries staff.	G. Towery	15 Jan 86

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

- ☐ Project Paper
- ☒ Financial Plan
- ☒ Logical Framework
- ☐ Project Agreement
- ☐ Implementation Plan e.g., CPI Network
- ☐ PIO/T
- ☐ PIO/C
- ☐ PIO/P
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

- A. ☐ Continue Project Without Change
- B. ☐ Change Project Design and/or
- ☒ Change Implementation Plan
- C. ☐ Discontinue Project

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)

Hamood bin Hilal al-Habsi, Managing Director
F. Gary Towery, AID Representative
Rashid bin Amour al-Barwani, Director of Fisheries

12. Mission/AID/W Office Director Approval

Signature

Typed Name
F. Gary Towery

Date
OCT 25 '85

AID 1330-18 (3-78)

13. SUMMARY

The key components of the fisheries program - Statistics, Extension, Research are on track, albiet slightly behind scheduled.

Statistics:

The one year sampling study of fish catch (a base line study for statistics and research) has been completed.

All catch data are entered into the computer, and monthly and yearly reports can now be issued routinely.

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, which risks leaving the program highly dependent on expatriate consultants.

Extension:

The staff of the Extension Program has grown to five agents, two extension centers are now operational (one in the capital region, one in Sohar)

Field research is underway on fish and lobster traps. A tested trap is now being sold to lobster fishermen in Dhofar at less than the cost of imported traps. Research is underway on mechanizing boats, especially using hydraulic winches to pull lines and nets onboard boats, a major labor saver for fishermen. Limited visits are being made to fishing villages to demonstrate this new equipment.

Additional field research is being planned in multi-line trolling, and multi-fishery artisanal vessels, and training courses in boat safety are being planned. Extension efforts are now constrained by the very few number of Omani staff available to work with the expatriate extension consultant.

Research:

The research program staff has grown to 7 laboratory technicians, 2 data 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 Ruwi laboratory, and lobster and abalone research in the Raysuit laboratory in the Dhofar region. This basic research on these three species, which includes weight/length analysis, food and feeding studies reproduction and maturity, ageing and other studies, is expected to continue for about four more years to provide the basic data required to make decisions on the responsible exploitation and regulation of these species.

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

Surveillance: (On-Board Observer Training Program)

The On-Board Observer Program was called a surveillance program in the PP. The program has one expatriate advisor who began work two months ago to conduct training programs for the 12 Omani On-Board observers who go to sea with the foreign and Omani commercial vessels to gather data on their fishing, in part to provide catch data for the statistical program, in part to gather data on the quantities of fish sold on Omani markets, and in part to gather data on the vessels' location while fishing. This data is to be used to determine if new laws or stricter enforcement of existing laws are needed for environmental and resource protection.

Marketing

As part of the project design, a marketing advisor was provided to assess the market situtation and advise on the development of a marketing program. Based on 18 person months of advisory services the Contractor (RDA) is now preparing recommendations for relating fishing and fish handling practices to market demand. This program is expected to include a marketing survey to determine the pattern of marketing fish in domestic markets, economic and financial feasibility studies to guide the placement of government-financed infrastructure such as cold storage plants, consumer education, new product development, and export marketing development. Once the implementation plan for the marketing component is agreed to with the Government, the project will be amended to include a marketing component.

14. EVALUATION METHODOLOGY

The purpose of this evaluation was to review the project after the first year of implementation and to determine what revisions in the project design, level of funding, nature and amount of technical assistance, and other components should be made based on experience to date. This evaluation recognised that initial planning was necessarily somewhat general and that actual implementation has provided valuable experience by which to refine and detail the initial design.

15. EXTENAL FACTORS

The pace of development in Oman is placing a severe strain on Omani human resources. The shortage of Oman manpower has limited the ability of the Directorate of Fisheries to recruit the required numbers of Omani needed to fully develop the extensive and stastical system as planned.

16 - 18 INPUTS - OUTPUTS - PURPOSE - GOAL

As the evaluation suggested, the US Representative has undertaken a dialogue with key Omani officials to refine and detail the project design. Although the "Logical Framework" suggested in Annex A of the evaluation will not be adopted in its entirely, it will serve as a point of departure for these discussions.

19. BENEFICIARIES

An increase labor intensive fisheries activity and of markets will directly impact upon the 8000 traditional fishermen in Oman and their families.

20. UNPLANNED EFFECTS

The prospect of research into the fish resource potential and the possbility of the resources being increased, leading to an incease in harvest both in terms of tonnage and value per ton, has spurred the Government of Oman to devote greater financial resources to the fisheries research activity for capital costs than envisioned. This has caused us to delay the arrival of most of the Technical assistance/researchers but will undoubtedly lead to a stronger project.

Based on the experience gained in assessing the potential for marketing fishery the GovOman has become aware of the need to implement a marketing component for the project. This is a vital element that was missing in the original project design because of the lack of information necessary to design a marketing program.

21. LESSONS LEARNED

The project's accomplishments to date demonstrate that in a country where there is a lack of data on many key elements, it is wise to implement the parts of a project that can be fully designed while gathering information that can be used to further design the missing elements. The PP (see page 10) foresaw the need of a marketing thrust and provided for TA in this area. Now the Joint Commission has the data to amplify its activities in this key area.

ABSTRACT

Fisheries Development Project

Oman

This project is assisting the Directorate General of Fisheries (DGF) (Ministry of Agriculture and Fisheries) to develop key elements of the fisheries sector, specifically, to develop a program of data collection and analysis as the basis for an estimate of the total resource and for policies that guide the use of the resource, a research program to undertake basic biological research, an extension program to assist traditional fishermen, a marketing program to facilitate the marketing of fish, and an observer program to monitor commercial fishing vessels. This mid-term evaluation was conducted in a two week period in Oman by two specialists from the National Marine Fisheries Service and the AID/W desk officer for Oman . The major findings and conclusions are as follows:

-- The project is making progress in all areas except marketing, but progress is slowed by the shortage of Omani staff, due at least in part to GovOman hiring policies and benefits packages for civil servants. The Joint Commission (JC) needs to begin policy dialogue with GovOman on this question.

-- The project needs to define more explicitly the outputs of the project, including the institution building aspects of the project.

-- DGF should review and supplement its budget for the project to include support costs not now available.

-- The technical assistance team should be permitted to hire some of its own support staff under its contract.

-- The marketing program needs to be reviewed and redesigned and should become operational as soon as possible.

EVALUATION REPORT

for

FISHERIES DEVELOPMENT PROJECT

PROJECT NO. 272-0101

by

EDWARD F. KLIMA

STEPHEN H. CLARK

BENJAMIN B. HAWLEY

APRIL 1985

EXECUTIVE SUMMARY

OF THE EVALUATION REPORT

OF THE FISHERIES DEVELOPMENT PROJECT

The purpose of this evaluation was to review the project after the first year of implementation and to determine what revisions in the project design, level of funding, nature and amount of technical assistance, and other components should be made based on experience to-date. This evaluation recognized that initial planning was necessarily somewhat general and that a year of implementation has provided valuable experience by which to refine and detail the initial design.

Drs. Klima and Clark spent two weeks in Oman meeting with officials of the Directorate General of Fisheries (DGF) in Muscat, visiting fisheries sites in Barka and Muttrah as well as the Directorate of Fisheries office and fisheries sites in Salalah. Mr. Hawley also visited the DGF office in Muscat and participated in the visit to Salalah.

This report has concluded the following:

The technical design and direction of the project are sound, if a bit ambitious. Resources Development Associates (RDA) should concentrate its assistance in institution building in DGF to research, extension, data collection and analysis, surveillance and enforcement of GovOman regulations; RDA should also provide direct technical services, without necessarily becoming involved in institution building per se in economic and financial feasibility analyses for private sector activities and policy development and evaluation. This division of work will permit RDA to focus its technical resources more precisely and more efficiently and will allow the GovOman to support the improved welfare of traditional fishermen while also promoting the growth of the commercial fisheries in the private sector, growth which is expected to contribute to the national economy.

The project needs to define more precisely what is meant and desired by the institutional development of DGF. This definition should include technical and non-technical (managerial and administrative) operations of DGF. RDA's institutional building activities should include training (short-term, long-term, in-country, U.S., on-the-job training by RDA consultants, and training in local training institutions) as part of the strengthening of DGF's administrative and managerial staff and operations.

The project needs to identify more precisely the socio-economic circumstances of the fishermen whom the project intends to benefit and to detail how the project's activities will benefit them.

The project needs to overcome major institutional constraints which limit DGF's ability to develop: long hiring procedures, low government salaries, low level of technical, managerial, and administrative skills among current staff.

The staffing and program of the Marine Science and Fisheries Center are being designed, and technical assistance for the center is now being sought by competitive selection.

The statistical program is producing an initial estimate of Oman's fisheries resources which will be a valuable basis for decision making for the Five Year Plan. Future statistics work needs to improve the quality of data now being gathered, broaden the scope of data collection, improve the skills level of data collectors, and broaden the range of analyses of data being collected.

The concept of Fisheries Development needs to be broadened to include stimulating private sector investment and activity in the fisheries sector.

The Directorate of Fisheries Affairs should take on this responsibility. The concept of Fisheries Management needs to be broadened to include surveillance of fisheries resources nation-wide and enforcement of national regulations protecting fisheries resources. A Directorate of Fisheries Management should be created with this responsibility.

Greater work is needed in developing, evaluating, and implementing national policy for the development and management of the nation's fisheries resources and the fisheries sector.

I. INTRODUCTION

The exploitation of oil during the last 20 years has provided Oman the financial base for the rapid development of its physical infrastructure, and the level of development which the nation has achieved during this period is indeed impressive. These oil resources, however, are finite and are expected to provide revenue for only another 25 years. The Government of Oman, therefore, is interested in diversifying the economy in preparation for the eventual decline in oil revenues. The Government has identified fisheries as having great potential as a major sector of the economy, and in 1982 the Omani-American Joint Commission established the Fisheries Development Project funded by $6.6. million in USG funds and $10.6 million in Government of Oman funds. The purpose of this five-year project was to develop the fisheries sector in Oman as a major sector of the economy and to assist artisanal (traditional) fishermen as a primary target group. In October 1983 the Government of Oman signed a jointly funded contract with Resources Development Associates (RDA) of California to provide technical assistance to the Directorate General of Fisheries (DGF) in the Ministry of Agriculture and Fisheries as part of the implementation of this project. This report is an evaluation of this project's first year of implementation with particular reference to RDA's activities to date.

This evaluation was undertaken by Edward Klima and Stephen Clark of the National Marine Fisheries Service (Department of Commerce/USG) and Benjamin Hawley, Officer in Charge/Oman, AID/W (see Annex E).

Drs. Klima and Clark visited Oman from March 14 to April 1, 1985; a list of their contacts and documents reviewed is included in this report as Annexes B and C. Mr. Hawley visited Oman from March 21 to April 11, 1985.

II. THE PROJECT'S DESIGN

A. PROJECT GOALS AND ASSUMPTIONS

The two goals of the project are to develop the fisheries sector as a source of revenue for the national economy and to promote the welfare of traditional (artisanal) fishermen. We believe that the project has correctly defined the growth of this sector in its widest sense: the growth and activity of the private sector in fisheries to the greatest extent possible, the growth of a body of public sector policy which supports this growth and functioning, and the growth of employment opportunities and income for traditional fishermen. We have proposed rewording the logical framework (Annex A) to reflect this understanding.

It is unclear to us, however, what priority the Government of Oman has placed on this sector. The present project is extremely modest in comparison with the magnitude of the task of developing an entire sector. Furthermore, DGF remains obliged to work within a series of government-wide constraints on salaries and hiring, discussed later in this section, which seriously hamper its ability to obtain and retain staff. The shortage of this staff has slowed the implementation of the project and suggests that unless these constraints can be overcome, perhaps by ministerial or higher level action, successful development of the fisheries sector may be permanently hindered. Consequently, we have proposed that the assumption of the Government of Oman action on these constraints be included in the assumptions listed in the logical framework at the goal level, that is, among those assumptions that influence the project's ability to achieve its goal. (See Annex A.)

Also at the goal level of the log frame we have proposed that the project needs to define more precisely who the traditional fishermen to be benefitted by the project are and what the characteristics of their social and economic environment are. It is unclear what sociological or anthropological data and information base are being used to guide the extension program in such matters as extension materials to be used by agents working with fishermen, technologies to be introduced, and market conditions on which fishermen make decisions on time and financial investment in fishing (many are part-time or seasonal fishermen). Without this information extension and other programs cannot be accurately targeted, nor can the project know how, if at all, it is benefitting fishermen.

Another problem here, we believe, is that the project seems to assume the development of traditional fishermen as a natural consequence of the development of DGF. Only the extension program provides for an interaction between the project and the fishermen. This assumed link needs to be made explicit.

B. PROJECT PURPOSE AND ASSUMPTIONS

The means to achieve the project goals, the project purpose, is to increase the capabilities of the Directorate General of Fisheries (DGF) to foster the growth of this sector and promote the welfare of traditional fishermen. The log frame describes this capability as technical capacity, though the text of the Project Paper suggests that this capacity should be understood more broadly to include a skilled support staff, routine office procedures

to meet administrative needs (such as circulating mail, reports, and other information, processing the Omani equivalent of travel authorizations and travel vouchers, and the like), systems for filing, data processing, and other information storage and retrieval, systems for in-service training, short-term, in-country training, and the like. Experience to-date suggests that support staff is still in short supply and is not yet fully trained and that these non-technical functions are neither well established nor fully and consistently performed. This being so, we believe that the project needs to plan a program (short-term training, technical assistance and so on) to address these non-technical institutional shortcomings.

In addition the project needs to identify the characteristics, both technical and non-technical, of the established institution that the project is attempting to develop. The Project Paper does not do so, nor does the RDA work plan which was submitted in March 1985. The latter provides only the various steps involved in implementing the technical subactivities (the research center, the extension program, and so on). The work plan needs to describe the characteristics of each program and office of DGF which RDA expects to be in place at the end of their contract. This definition is essential to focusing the RDA team's and DGF's efforts; without this definition it is difficult to know how the team knows how to focus its work and what common agreement has been reached on the nature of the DGF institution to be built.

As a first step in developing DGF's institutional capabilities the RDA technical assistance team proposed and DGF accepted a restructuring of DGF to cover the functions which DGF needs to perform to foster the growth of

the fisheries sector. These functions are as follows:

A. policy development and implementation

B. statistics gathering and data analysis

C. dissemination of marketing information

D. surveillance and enforcement of regulations on fishing, and

E. research and extension.

Concurrent with implementing this structural change, RDA and DGF have designed and are implementing a series of activities within the above functional categories. These activities are evaluated and discussed in Part III of this report. We fully support this approach, subject only to the qualification that the definition of institution building be more widely defined.

In the development of its own institution DGF is working within certain constraints which hinder the growth of the fisheries sector:

A. The hiring procedures of the Omani Government, which are established outside DGF and apply government-wide, require a long lead time between identifying a need for a staff member and his or her actually beginning work as a government employee. This long lead time slows the pace of institutional development and often results in more qualified candidates' accepting positions with other institutions which can respond more rapidly to their application for employment; this situation is not unique to the Government of Oman.

B. The labor pool of well educated Omani candidates for Government positions is limited, in part because the population of the country is

relatively small, because the nation's educational institutions are relatively young, and because Government wage scales are below those of the private sector and other Government entities such as the Agriculture Development Bank, Petroleum Development Oman, and the Housing Bank.

C. The number of new positions which DGF is able to establish is limited at present by budget constraints and has been limited in the past by the lack of qualified candidates.

These constraints have set a relatively slow pace for the development of an institution whose size and abilities are still at an early stage. Employees with technical education in fisheries or other technical skills are few. Equipment and office space are limited as is a system of field offices. The ability to make policy which will support and encourage private sector activities is still limited. These constraints then are correctly listed in the log frame as assumptions.

III. STATUS OF PROJECT ACTIVITIES

Having identified the functions of the DGF and proposed an organizational structure appropriate to those functions, the RDA team has begun work on activities to be undertaken by each of the directorates within DGF. These activities are designed to embody the most basic functions of these directorates (e.g., research activities in the Directorate of Research) and to lay the foundation for the institutional development of each of these directorates. The activities were identified by the project designers and written into the scope of work for the RDA contract. The following sections describe each of these activities (Statistics, Research, Training, Fishery Development, and Fishery Management) and progress to date. for each. The final section - Salalah - does not correspond to offices within DGF, but relates to the work of DGF and the RDA team. For each activity the terms of reference from the RDA contract are cited to set the context for the evaluation.

A. STATISTICS

Overview: This segment of the Fisheries Development Project lays the foundation for rational development and future exploitation of Oman's fisheries. Problems associated with such an effort appear formidable. Oman has 1,700 kms of coast, much of which lies in remote areas, and the diversity of its harvesting and marketing sectors and the customs and educational background of its people combine to produce problems which cannot be conveniently addressed by intensive data collection systems employed in Western Europe and North America. Landing sites must be sampled to obtain catch and effort estimates. The reliability of these

estimates will depend on sampling intensity and the extent to which the samples are representative. Since no fisheries development program can ultimately succeed without a reliable data base, we support the high priority given to developing and improving Oman's statistical data collection system.

Terms of Reference: "The contractor will be responsible for designing and conducting a one-year statistical field sampling survey of fish catch, as an interim measure, to provide reasonably accurate base line data by key species and species group against which future catch data can be measured."

Activity Goals

1. Train Omani staff in sampling and statistical reporting techniques that will be in keeping with those in use by the world scientific community.

2. Obtain an estimate by species or species group of Oman's total fisheries harvest during this sampling period.

3. Obtain an estimate of the total effort expended to obtain this harvest.

4. Compile an inventory of fishermen, boats and gear presently working in Oman.

5. Obtain basic information necessary for rational design of the long-term statistical program.

6. Establish a computerized data entry and analysis ststem for both the one-year and long-term statistical programs.

7. Begin identification and collection of data which will eventually be needed to develop and manage Oman's fishery resources in a scientifically and socially sound manner.

The following sections discuss each of the goals listed above:

1. Training Omani Staff

Since the program is ultimately to be run by Omanis and since the one-year survey should establish a firm procedural basis for future statistical data collection, this activity is of major importance. We found two areas of concern:

a. In recruiting and training staff. There are two field vacancies at present which have existed for some time, and additional vacancies are anticipated when some of the current staff leave in July for training in the U.S. Obviously, training cannot proceed until replacement staff are available. We also feel that training of Omani regional samplers needs to be upgraded. To the best of our knowledge, the present group received three to four days of training. We feel that a minimum of three weeks of instruction should be provided in such topics as species identification, biological sampling, and fishing techniques and gear. We do not feel that the present staff as a unit is adequately trained in these subjects.

b. To date we are not aware of any data collection by the observers other than for routine verification of catch and total effort reports on foreign trawlers working for the Government or the Oman National Fish Company. Furthermore, reported catches appear to be suspect given the nature of the resource, vessel size and amounts of effort being expended. Such data are

necessary, and the quality of these data needs to be improved. This will require hiring additional observers and training them in species identification and biological sampling principles as well as in navigation and seamanship.

We understand that a request has been made to increase the current observer staff from 9 to 24 members and that RDA is designing an appropriate training course. We support these activities.

2. Estimate of Total Harvest

Definition: This subactivity is preparing an estimate, rather than an inventory of harvest. The latter is impractical under present circumstances. The reliability of this estimate is dependent on design and field procedures employed, sampling intensity, and the degree to which sampling is representative. Total harvest includes both catch, whatever its disposition, and discard of unmarketable fish at sea or on land. In Oman much of the latter is disposed of on shore rather than at sea, thus providing some basis for estimating this discard.

The program: The current sampling program has evolved into a quarterly program in which five geographical regions are sampled by a regional sampler (Omani) and a mobile team (three Omanis and one expatriate). The regional sampler collects data on landings and number of boats fishing at "key" or "non-key" market sites or other landing areas, sampling being done in a six-day cycle to compensate for variations in daily activity. Sampling is scheduled to insure that the most important areas are sampled most intensively. Estimates are based on proration of individual sample

estimates (averaged over sample dates) for key or non-key market sites, or from proration of combined data for other landing areas since sample coverage for these areas is much more limited. More intensive sampling by the mobile team provides a basis for evaluating the regional sampler's results and to adjust those data to obtain final estimates. Discard is estimated from quantities of fish left on the beach.

Regional samplers collect landings information by species group (family) rather than species; at a given site, regional samplers normally collect catch data in numbers and weight from a subsample of the boats landing on the day in question. When the mobile team is available, more intensive sampling is performed, and length-weight information is developed for kingfish (Scomberomorus commersoni).

Discussion: The sampling program as defined by RDA is clearly slanted towards inshore artisanal fisheries using fiberglass or aluminum boats and outboard motors or dhows (in many cases) offloaded by "houris" which can be similarly sampled. For this component of the fisheries sector the approach is valid and is analogous to procedures employed in similar situations in the U.S. We stress, however, that the resulting product is an estimate because it is based on a very limited sample. Such an estimate is a reasonable and appropriate start to developing a national statistical program.

In terms of DGF's planning for the long-term program based on this estimate we note that it is common for a comparable region in the United States to be served by perhaps 15 to 20 full-time government agents, 10 or so part-time staff, and additional state agents. Each agent would be assigned to one

port or, at the very least, a relatively restricted region with a very few ports, where statisical data can be compiled from dealers' records and vessel logbooks, and biological sampling of the catch can also be performed during unloading. By contrast, each Omani regional sampler can visit only one site per day (out of perhaps ten or more) subject to variability in fishing patterns and daily and seasonal activity. We are aware of certain areas which are not being sampled at all and other situations in which very different activity patterns were found from those originally anticipated. Also, fishermen in more remote areas may make at-sea transfers of their catch to other fishermen to bring in for sale, rather than bringing it in themselves. It is reasonable to place less confidence in results of this type of survey than in data collected in intensive sampling programs of the type carried out in the U.S.

Considering the above, the following points should be kept in mind:

a. By any reasonable standard this segment of the program is greatly understaffed. We are aware of two field vacancies at present, and there appears to be little or no backup to cover vacancies which could occur at any time. Two or three samplers per region, supplemented by perhaps two supervisors, will be needed as a minimum if reliable results are to be achieved. This would enable the Directorate to address many current gaps in statistical data collection (for example, the Musandam Peninsula) and to develop more appropriate programs for sampling key species which pose special problems, such as sardines.

b. The above program did not include Oman's trawl fisheries. Data on Korean and Thai trawlers working for the Government or the Oman National

Fish Company are being collected by on-board observers, but the observers appear to be inadequately trained, and resulting data are accordingly suspect. Data on trawl fisheries are a necessary part of the statistical program and should be included in the future as staffing and budget permit.

c. Statistical reporting by species needs to be initiated as well as a higher level of biological sampling. The present system of reporting by family groupings was an appropriate approach since the data collectors had only lmited training but should be regarded as an interim measure only. Biological sampling of the catch is needed for a number of species and should become part of the longer term program.

3. Estimates of Total Effort

Fishing effort in terms of numbers of trips is estimated from counts of numbers of vessels landing at key or non-key markets or cluster areas. Again, a combined average is used for all cluster areas in the region due to more limited sampling intensity.

Many of the comments under Section 2 above (Estimate of Total Harvest) are relevant, since this information is being collected in conjunction with information on total catch. The sampling approach being used is valid and appropriate given the situation and manpower constraints. This approach will provide an estimate on which to base future work. We repeat our caution though that is estimate may deviate considerably from the true value. It is unreasonable to expect five regional samplers, with limited assistance from the mobile team, to provide adequate data given the logistical problems which they face. In the future, more detailed information will also be required (catch per unit time, catch by gear,

etc.). Such information will be critical to building a sound management program.

We note that one possible method of corroboration of sampling results would involve aerial census methods. Use of an aircraft to count boats during hours or on days when they were beached would provide an additional basis for deriving fishing effort estimates by proration on the basis of operating units rather than sample dates. This would be particularly useful in the case of areas (clusters) receiving only limited sampling. A sound, adequately supported licensing program could provide similar information on an annual basis.

4. Inventory of Fishermen and Operating Units

Data on number of boats are being updated during the one-year sampling program. We are aware of no inventory of gear units and are very skeptical about the prospects for achieving reliable estimates of numbers of fishermen although a better basis appears to exist for estimating number of vessels. Such information can be compiled by regional samplers or by the current licensing system backed by adequate enforcement. Ideally, both fishermen and boats should be licensed for nominal fees. Licensing data can readily be computerized and used for generating annual reports.

5. Long-Range Statistical Program

An important objective of the one-year program is to provide the basis for a permanent statistical program for Oman. We believe that the present orientation of the task is most appropriate for providing interim estimates of landings and fishing effort. We emphasize that these are no more than

estimates and that manpower constraints have prevented collecting detailed information on effort, catch by gear, and other data which are the basis for planning for more detailed data collection. Progress in the analysis phase of this subactivity has been limited; some data have been worked up by hand but no statistical analyses have been completed.

In terms of work required in the future, present work does not provide the basis for in-depth analyses on a fishery-by-fishery basis which is needed to develop a reliable program over the long-term; for example, considerable planning will be necessary for collecting data on sardine catch and fishing effort and on lobsters and abalone in the Dhofar region on which little information is now available. Similarly, work is needed on the trawl data base as a means of evaluating the reliability of historical trawl records and to determine future direction in which data gathering for this activity should proceed.

NOTE: We are concerned about the interim period in 1985-86 between completion of the one-year sampling program and implementation of the long-term program. The one-year program ends in July 1985, with interim data collection continuing in some form for the remainder of 1985 and 1986. The long-term program is scheduled to start in 1987. Later this year, Scott McEntire, the RDA consultant working on this program, is being assigned to other activities, and some current samplers are leaving for training in the U.S. We are concerned that this lessening of activities and the absence of an expatriate consultant may weaken an already limited program. There is a great need both for continuing work on sampling, including regional samplers and for expatriate assistance in applied

statistics to increase current sampling intensity during the interim period.

6. Data Base

The data base management program established for the one-year sampling period appears to conform reasonably well to procedures used in other areas. Planning for the long-term program is not scheduled to be initiated before July. Data entry appears to be on schedule, and the editing and storage procedures being used appear to provide a satisfactory basis for data retrieval and basic analysis. Report generation software is being developed.

We feel that this subactivity is being delayed by manpower constraints. Bob McClure, the RDA consultant to the activity, has been assigned other duties which will require a great deal of time (computerization of license files, turtle data and entry and analysis of trawl log data), training new Omani staff members in computer operations and related topics; furthermore, he has only one Omani staff member to assist him.

7. Identification and Data Collection for Development and Management

The project has laid the foundations for this activity but additional work is needed.

B. RESEARCH: THE MARINE SCIENCE AND FISHERIES CENTER (MSFC) OBJECTIVE

Objective: The objective of the Marine Science and Fisheries Center is to acquire basic scientific knowledge of the major fish and shellfish

stocks in Omani water, and to propose practical solutions to the problems facing the rational development and management of the fish and fisheries resources of the Sultanate of Oman.

Overview: DGF and RDA are now working on staffing for the MSFC and developing the programs which the facility will implement. A temporary lab has been established in Ruwi, staffed by two expatriates and one Omani, to conduct sardine research, and another laboratory has been recently constructed in Raysut, which will be primarily concerned with lobster and abalone biology; it is not yet operational. Other research activities include overseeing the construction of three research vessels, one of which is under construction, one is scheduled for construction in the near future, and the design for research programs for the three is still to be done. Comments on staffing and the sardine and shellfish research programs are provided below.

Terms of Reference: "The Contractor will assist the Directorate General of Fisheries in planning all actions necessary to open and make the Marine Science and Fisheries Center (MSFC) operational."

1. Marine Science and Fisheries Center Staffing

A preliminary plan for scientific programs and staffing was completed in August 1984, and a Request for Technical Proposals (RFTP) for expatriate staff is now available for distribution. The activity appears to be basically on schedule with six initial Omani staff scheduled to arrive in April of 1986.

The organizational structure as currently proposed appears basically sound, although certain points need to be addressed:

a. We found no provision for administrative or maintenance support for the technical assistance team.

b. The chain of command specifying the relationship of the Chief Research Officer (CRO) to the director, the deputy director, and to the expatriate staff is not well defined. We also question the wisdom of putting the CRO in charge of a subdivision of the MSFC (small pelagics, large pelagics, or demersal/shellfish) in addition to his other duties which include responsibility for research coordination and planning. We believe that the CRO should devote full time to research and that the position be that of a line manager to whom all subdivision heads report.

c. We question the orientation of the three fisheries positions, as specified in the RFTP, towards stock assessment in the case of large and small pelagics and towards life history and biology of demersals and shellfish. Assessment work will probably be particularly important for shellfish species in the near future, and providing technical assistance should be planned now.

d. Additional staffing will be needed. In particular, computer support needs to be clearly identified and appropriate staff provided.

e. The relationship between the MFSC and fisheries-related programs within the Ministry needs to be clearly specified. The long-range statistical program, for example, will provide valuable data for determining vital statistics and population dynamics of finfish and invertebrate species. It is not clear whether and how such data will be made available to the MSFC.

2. Sardine Research Program

The Sardine Research Program appears to be a valid priority area. We were able to obtain only a rough approximation of standing stock biomass and maximum sustainable yield (MSY), and little seems to be known of the biology, migratory behavior and distribution of small pelagic species.

a. We believe that the focus of research at this stage should be directed towards biology and stock identification to provide the necessary data to determine MSY and optimum yield (OY).

b. The scientific work being undertaken appears to be sound but the rationale for it is not evident. We found no plan or statement of purpose prioritizing research activities to address immediate needs; for example, developing appropriate ageing techniques (i.e., techniques for determining age of fish) which is key to calculating mortality and growth estimates.

c. We believe that there is a need for more systematic and extensive data on growth and mortality rates, spawning, fecundity, stock structure and related information. A sampling effort for these data appears to be lacking at present. Design of such a program, which could probably be most effectively implemented by a research vessel, should be given high priority.

3. Shellfish Research Program

The Raysut Laboratory, not operational at present, will be concerned with shellfish research. Staffing for this laboratory will include one Omani biological aide and two Omani divers. This research is critical because of

indications that abalone and lobster are being overexploited in some areas. We recommend the following:

a. An inventory to determine, at least approximately, the extent of Oman's lobster and abalone resources, and a preliminary estimate of current exploitation levels in the form of maps of distribution of resources.

b. Representative length-frequency sampling of the commercial catch by area and time.

c. Research on the biology of the lobster and abalone resources now under exploitation.

d. Research to develop a biological basis for regulations on lobster fishing (size limits, prohibition on taking berried (egg-bearing) lobsters, and seasonal restrictions).

e. A major problem exists in this program similar to that noted in the Sardine Research Program - lack of focus and clear direction of purpose. We feel that a more quantitative approach to this activity will be necessary in the near future.

C. TRAINING

Terms of Reference: "The Contractor shall be responsible for conducting a manpower assessment of the Directorate General of Fisheries' long-term institutional requirements and in collaboration with the Directorate General of Fisheries develop a training plan to further the education or training for members of the current or newly recruited Directorate General of Fisheries staff."

"The Contractor shall be responsible for selecting institutions offering appropriate degree and non-degree programs and also admission of selected Omanis to these programs."

"The Contractor will develop with appropriate U.S. educational institutions special programs responsive to the training needs of the Directorate General of Fisheries personnel."

"The Contractor will assist the Directorate General of Fisheries to select candidates for both long and short-term training in the U.S."

Overview: The above terms of reference have been addressed by the June 1984 report which proposes a revised organizational structure for the Directorate, assesses manpower requirements and proposes training, identifies appropriate U.S. and Omani institutions and programs for non-degree training, and includes an outline of a one-year general fisheries certificate training course for technical staff.

Seven individuals are now pursuing Bachelor of Science (B.S.) degrees in the U.S. Six began work in September 1984. The seventh will start work for a Master of Science (M.S.) degree in September of 1985. Areas of study include Marine Biology (with emphasis on Fisheries), Oceanography, and Mechanical Engineering. A second group of up to six persons will begin degree level training in September of this year. Also, 29 Directorate staff have been offered the opportunity for non-degree training in the U.S., to include an intensive six-month course in English followed by a two-year certificate program in fisheries. It is anticipated that up to ten of these individuals will accept training in the U.S. This group is scheduled to leave Oman in June 1985.

We believe that the conclusions and recommendations of the training report are basically sound. The proposed organizational structure for DGF has been approved and implemented with some changes. The following is a discussion of Directorates within DGF:

1. Office of the Director General

The report calls for a Fisheries Planning Committee (FPC) and an administrative unit headed by a person holding a B.S. in Business Administration. Staff in this unit dealing with administration, finance, communication and public relations would require at least a two-year certificate.

2. Directorate of Fishery Affairs

The report gives relatively low priority to degree-level training here. We feel that its importance merits higher priority. This Directorate is the logical base for an active management program, and the Domestic and Foreign Fishery Affairs Divisions should accordingly be headed by individuals with sufficient training to devise and implement effective management measures. We feel that higher priority should be given to degree-level training in fisheries for the Director and the above two division leaders. Eventually the Director should hold a master's degree.

3. Directorate of Fishery Development

This Directorate would eventually be headed by a person with a master's degree. Division heads would require different levels of training depending on their specialties. The Marketing Division would be filled at the B.S. level with additional experience in export marketing and

international trade. The Economics Division should be headed by an individual with a Ph.D., or at the very least, a master's degree.

4. Directorate of Research (Marine Science and Fisheries Center)

The staffing pattern appears appropriate. We belive that all Division heads should hold a Master's Degree or higher, and the head of the Oceanography department should hold a Ph.D. Provision needs to be made for staffing and training the captain and crew of the research vessel.

5. Directorate of Statistics and Data Processing

Staffing for this Directorate includes an applied statistician at the Master's level, a junior statistician at the Bachelor's level with emphasis on data processing and management, and one or two technicians trained at the two-year certificate level in computer-based data processing. We also suggest at least 10 to 12 additional statistical agents and supervisory staff, the former to be trained under in-house programs.

6. Directorate of Technical Services and Extension

This unit has been elevated from its original status of Division within the Directorate of Fishery Development. The head of this Directorate should eventually hold a Master's Degree in an appropriate technical field. The heads of the Technical Services and Encouragement Fund Divisions should hold at least a two-year certificate from an appropriate technical school. The head of the Fisheries Extension and Training Division should hold at least a B.S. degree in fisheries. Extension agents might initially be trained at the secondary level supplemented by fishery experience and in-house training.

D. FISHERY DEVELOPMENT

The concept of Fishery Development in its broadest sense refers to the development of the fisheries sector as an economic activity and includes marketing, extension, all fishery resources, gear development and product quality. We believe the Directorate of Fisheries Affairs should be reconstituted as the Directorate of Fisheries Development and its mandate broadened to encompass this definition of Fisheries Development. The purpose of a Directorate of Fishery Development within DGF and its program of Fishery Development is to provide basic information necessary to private investors to enable them to make financial decisions concerning possible investment in a given fishery. Most investors and financial institutions will require the following information as a minimum:

- Resource
  - a. estimated potential yield (amount that can be taken)
  - b. availability (when and where the resource is available in commercial concentrations)

- Harvesting
  - a. fishing gear and vessel requirements
  - b. catch rates and cost of fishing

- Processing
  - a. quantity, quality and type of product required by the market
  - b. cost of producing product

- Market

  quantity and retail price

- Government Requirements
  a. domestic
  b. foreign

The present project addresses a part of these requirements for information. Questions related to the resource area have been in a very limited sense been provided by previous surveys and the on-going statistical activity. We believe the DGF may need to consider establishing a gear research activity to develop new fishing gear. The present project utilizes only existing state-of-the-art technology. Information on processing should be addressed by the marketing activity. Information on administration and Oman Government regulations can be obtained from the Directorate General of Fisheries.

Two major components of Fisheries Development - extension and marketing - are major activities of this project. Each is discussed below:

1. Extension

a. Goal of the Activity: to develop a functioning extension program responsive to the needs of traditional fishermen.

The means of achieving this goal is by training Omani extension agents who can be trained and placed in strategic locations in the country. This rationale is sound, but is contingent on the DGF's being able to recruit qualified Omani staff.

b. Performance Plan Schedule: The socio-economic study completed in June 1984 provides the basis for the design of the extension program and

training an Omani extension staff. Hiring the extension staff has been slow and has resulted in a slowdown of extension subactivities.

c. Major Extension Projects: The extension program will be staffed by regionally based agents to work on a day to day basis with fishermen on fishing operations and equipment, fishing craft, engines and repair, fish handling and processing, and business management.

The following subactivities are in developmental stages (see chart of activities in Annex D):

a. Hydraulic Usage

Artisanal fishery is now limited to small boats with outboard engines or dhows with diesel engines, and none have hydraulic power for hauling nets and other tasks. With hydraulic systems, the dhow crews could use larger gear and increase their catch and their incomes. The small-vessel outboard fleet could use hydraulic power in hauling pots, nets and longliner gear to increase their catch. Furthermore, the use of hydraulic power will permit diversification into other kinds of gear within the fleet.

We feel this project is the cornerstone for the improvement of the Oman artisanal fleet. This development will lead to other developments in the fishing sector such as improved holding and storage of catch, larger and more fishing gear, larger vessels, use of navigational equipment, radio communication, echo sounders and many other techniques.

This project has been delayed because of the delay in obtaining a piek-up truck so that the portable hydraulic gear could be demonstrated to fishermen on land and then at sea with interested fishermen.

b. Trolling Poles

Kingfish and tuna are high value fish in Oman and now are caught by two-man boats use two trolling lines. Trolling poles will permit each boat to use four lines thus doubling the catch for a two-man boat. One boat is demonstrating the poles on Masirah Island.

c. Lobster Traps

The RDA consultant has designed and tested inexpensive lobster traps but they need to be demonstrated to Omani fishermen.

DGF's general approach to extension is sound and probably the best way to proceed. The specific projects we believe are well selected and important to the development of Oman's artisanal fisheries. The problems encountered by this program are similar to problems in the other programs, specifically, delays in locating qualified Omanis, a lengthy hiring process, the low salary scale for Government employees, and delays in the procurement of cars, trucks and engine parts.

We recommend that the extension project also investigate the feasibility of the following: fish attraction devices (FAD), school for diesel mechanics, sport fishing - charter boats for hire in Muscat, and test fishing operation for specific fishes.

2. Marketing

a. Goal of this Activity: to facilitate growth of the fish marketing sector of the fishing industry by providing advice, information, and demonstrations to potential investors in the sector.

The marketing program was not identified in the Project Paper nor in the RDA contract with DGF. The RDA Performance Plan, however, proposed marketing as one of the project's activities, and DGF agreed to its inclusion. Implementation began in February 1984, and a marketing strategy and work report were completed and submitted for approval to DGF in September 1984. The subactivities are as follows:

(1) Inland marketing evaluation and sector analysis:
Reports due April 1985 and June 1985.

A report on the inland market evaluation has been completed. Almost half the report on sector analysis is completed, and the completed report is expected by the end of April 1985. The analysis of the production, marketing and distribution sector is expected by the end of June 1985.

(2) Fresh fish retail sales unit: Report due in June 1986.

This activity was initially disapproved by DGF on the grounds that this type work should be done by the private sector. DGF has now included this study in the next DGF five year plan.

(3) Study of consumer needs: Report due in August 1985.

A survey of home consumption will be implemented within 90 days. Beginning of the report has been delayed due to lack of DGF staff.

(4) Masirah Island Cold Storage Complex

RDA has provided recommendations on how the plant should be operated for maximum efficiency. DGF is considering turning this facility over to the private sector. This project is on hold pending a decision by DGF.

(5) Liaison with Private Sector: Continuing Project Reports due in December 1985, January and February 1986.

This is an ongoing project involving frequent contacts between both DGF and the RDA consultant and domestic and foreign investors. Several foreign firms have shown interest in investing in Oman fisheries. All decisions on foreign investment are made by DGF.

(6) Participation in International Trade Shows

This project was disapproved by DGF on the grounds that this is the responsibility of the private sector. We believe that the private sector needs information on guidelines, regulations, quality and operational standards for the export market. The need to identify type of fishes and types of packaging required by international markets can best be met by DGF's and/or private Omani firms' participation in international trade shows. We recommend that RDA take the lead in identifying shows for DGF participation.

(7) Quality Control: Report due November 1985.

No action to date due to lack of DGF staff. Implementation is now scheduled to begin in June 1985, with a report on the design of a quality control program due in November 1985.

(8) Trade Missions:

This project was disapproved by DGF on the grounds that this is the private sector's responsibility.

ng Information:

s been taken to date because of lack of DGF staff.

. Production and Distribution Analysis:

tics from the Korean vessels are now being collected by the staff of this project; most, however, are in Arabic and need ated and entered into the computer. This subactivity needs a nd data entry personnel.

Government of Oman policy is silent on participation in . trade shows. We believe that trade shows and trade missions way to increase Oman's export market, and we support RDA's ns.

ve that small scale demonstrations of high quality retail oint of sale demonstrations are practical ways to test the f various marketing strategies.

s are widely used around the world and would open foreign rplus fish resources that cannot be consumed domestically. vate sector may be hesitant to undertake these marketing ough lack of experience, but would probably respond to initiatives in this area.

e that the overall policy of the Omani Government to e investment opportunities to Omani citizens is sound and uraged. We recommend, however, that the Omani Government

avoid allowing any one firm to gain predominant control of any segment of the fishing industry and avoid providing subsidies inequitably within the private sector. Competition is healthy for the economy and can increase overall production and improve quality of edible fish products. An example of this potential inequality is lobster production in Salalah: Sudh Marine in Raysut is a private firm producing high quality lobsters while production at Oman National Fish Company (ONFC) left much to be desired. We understand that the Government is considering subsidies to ONFC. We believe that monopolies and subsidies are not in the best interest of the Government of Oman in the long run.

E. FISHERY MANAGEMENT

1. Goal of the Activity: to insure the maintenance of marine resources at an optimum level of yield. Specifically, the Directorate of Fisheries Affairs needs to determine the management parameters of each fishery resource, develop plans for managing each resource, and insure cost effective enforcement of regulations.

2. Overview: In reviewing the project and the proposed organizational structure for DGF, we were struck by the apparent lack of a clearly defined plan for the design and implementation of management regulations which insure that fisheries resources will be properly managed. These regulations are critical now because of emerging problems which threaten fisheries resources, particularly lobster and abalone. Current regulations are inconsistent between Dhofar and other regions, and in other cases no regulations exist to cover situations which require regulation.

The DGF must have the capability to develop and enforce regulations to protect these resources. We suggest the following responsibilities for the proposed Domestic and Foreign Fisheries Affairs Divisions of DGF:

a. Domestic Fisheries Affairs

Planning: This subdivision would prepare management plans and draft regulations for fishery resources based on input from other divisions. For example, results of biological research and stock assessments by the Marine Science and Fisheries Center (MSFC), together with results of economic analyses and marketing studies, could be combined into estimates of optimum yield upon which management regulations would be based.

Legal/Licensing: This subdivision would be responsible for legal review of proposed regulations and plans as well as for licensing of Omani entrepreneurs. Licensing would provide a basis for monitoring entrepreneurs' use of fisheries resources and for dissemination of management regulations and technical information.

Monitoring and Control: This subdivision would monitor the exploitation of the resources and enforce regulations. This capability will unquestionably need to be developed in the near future.

Liaison: This subdivision would be concerned primarily with soliciting the views of Omani fishermen and industry spokesmen on proposed management regulations. Since managing resources can only be accomplished with public understanding and support, the link between the regulators and the users of the resources is vital.

b. Foreign Fishery Affairs

Enforcement and Surveillance: This subdivision would be responsible for staffing the observer program (see page _____) and for insuring compliance with Omani fishery regulations by foreign firms in Omani waters. For example, Oman should be able to seize foreign vessels fishing illegally.

Liaison: This unit would serve an analogous function to its domestic counterpart. It would also be responsible for coordinating surveillance activity with the enforcement subdivisions.

Legal/Licensing: This unit would be responsible for reviewing Omani regulations and enforcement procedures under the provisions of international law and would also process applications, issue permits, and collect fees.

F. SALALAH

RDA has been conducting statistical surveys in the Salalah region and is setting up a laboratory in Raysut. We have been told that little or no information has been provided to the Director of Fisheries (DF) in Salalah on these activities. RDA should provide reports in Arabic and otherwise maintain frequent communication with the DF.

The recent restructuring of the Ministry of Agriculture and Fisheries in the Dhofar region requires the Director of Fisheries to report administratively to the Minister in Dhofar but on technical matters to the DGF in Muscat. These double lines of authority are confusing to smooth management and need to be reviewed.

III. IMPLEMENTATION OF THE PROJECT

A. Resources Development Associates (RDA): the technical assistance contractor

The RDA contract was signed in October 1983. The first group of RDA consultants arrived in February 1984, and the full team was in Oman by April 1984.

We found the RDA staff to be a group of highly trained professionals. They are experiencing several problems which require early resolution:

1. Contract Administration

a. the contract needs an administrative assistant to provide logistical support: petty cash, paperwork associated with hiring, procurement, and so on.

b. there is less counterpart staff than had originally been scheduled, and those already made available need considerable technical training. RDA lacks adequate staff for key punching, typing and translating, with the result that none of RDA's reports have been translated into Arabic. No funds are available in the contract to hire staff for this work. We recommend that such funding be made available.

c. The downstream requirements for expatriates needs to be considered. Key expatriate staff have been provided through 1987, but the Omanis to be trained under the project will not return to Oman until that time and will have no expatriate assistance unless the present contract is extended.

2. Technical Assistance and Advice to the DGF

One of RDA's primary tasks is advising DGF on technical matters especially

on policy matters for which DGF needs to develop policy; for example, on the development of the offshore trawl fishery, on the possibility of selling government cold storage facilities to the private sector, and on the possibility of implementing regulations on lobster fishery. Another example is the present inability of small domestic trawlers to obtain crews because of a government regulation that domestically owned trawlers use only Omani crews. Foreign trawlers are exempt from the regulation. As a result there are two privately owned and fully equipped trawlers in the capital area that have been unable to fish for almost one year because the owner could not recruit two and three man crews although foreign trawlers continue to fish and use foreign crews.

We found that the DGF is presently making decisions without substantive input from RDA. We believe that the following steps can correct this problem:

a. RDA needs to take the initiative to provide policy guidelines to DGF even without a specific request from DGF.

b. RDA's recommendations are now submitted to the DGF in English and without an executive summary in most cases, although there are few English speakers in DGF.

c. DGF should make a clear response to RDA's recommendations, whether an approval or disapproval, so that RDA understands in what direction DGF want to move and what the policy framework is in which RDA should make its

d. We also believe it would be beneficial for DGF staff and RDA consultants to attend at least one major scientific meeting together each year.

B. Directorate General of Fisheries

We found the following problems which need to be addressed:

1. According to the FDA-DGF contract, DGF will provide RDA with office space and supplies, secretarial and translator support, and vehicles. Neither the contract nor the subgrant agreement between the Government of Oman and the Joint Commission, however, specifies the number of vehicles and the number and background of Omani staff to be provided as counterparts to the contractor. RDA proposed manpower needs and support levels in their specific work plans, though these levels have not been reached. As a result, RDA has not been able to implement its work plan as quickly as it had hoped. Clearly, more rapid implementation works to everyone's benefit. We believe that some solution must be found to these logistical problems, in particular a firm estimate of staff and support which DGF can provide, funding for RDA to complete this staff, and a revised work plan for the project based on these new estimates.

2. Two major problems have been the difficulty in finding Omanis who are interested in working for the Government at relatively low Government salaries and the long process of hiring new Government employees. It has taken over eight months to hire staff for extension and marketing. These are policy problems which go beyond DGF but which limit DGF's ability to

develop the fisheries sector. DGF and the Joint Commission could usefuliy address this question at higher levels of the Government of Oman.

3. The training needs for the fisheries sector have been identified; however, only 17 students out of the 26 identified are now scheduled for training in the U.S. Some Omanis are apparently reluctant to spend one or two years out of the country. We can propose no specific remedy for this problem but note that it is a problem.

IV. RECOMMENDATIONS

I. Project Design

1. The end of project status at the goal and purpose levels needs to be defined in detail for each component of the project. The present general description of each has too little detail to guide implementation and be the basis for project evaluation in the future.

2. The JC, DGF, and RDA should define institutional development of DGF in detail, in other words, the characteristics of the developed DGF institution which the project is attempting to establish. That definition should include both technical skills and operations related to fisheries as well as managerial and administrative skills and operations.

3. RDA needs to define the end of contract status for each component of the project under their responsibility. The work plan which was approved by the JC and DGF in March 1985 shows only the stages of implementation; it should also show outputs at the termination of the contract.

4. The JC should consider entering into policy dialogue with the Government of Oman on topics of broad importance to this project: for example, the level of funding and development priority given to fisheries and the budget levels needed to realize that commitment; the salary structure and hiring processes of the government.

5. The JC and RDA should consider redefining the scope of their technical assistance to institution building in the technical areas of statistics, management, surveillance, and enforcement, and in the

non-technical areas of management and administration; RDA should provide direct service rather than institution building to the Government of Oman for economic and financial studies, policy development and review, data and computer systems.

6. The JC and DGF need to make explicit how the link between the development of the DGF institution and the development of the fisheries sector will be achieved, that is, the link between the purpose and the goal of the project. The link between the extension service and the fishermen seems to be the only direct and explicit link. All others are assumed and undefined.

II. DGF Structure and Operations

7. We recommend that DGF establish a Directorate of Fishery Management which adopts as its scope of work a broad definition of managing and maintaining Oman's fishery resources.

8. We recommend that additional secretaries, translators, counterparts and project staff be supplied to RDA as soon as possible from the Government of Oman contribution.

9. We recommend that the DGF make more extensive use of RDA staff for policy development and evaluation.

10. We recommend that the Government of Oman attempt to eliminate institutional constraints to hiring staff, including long hiring procedures and low salary levels.

11. We recommend that DGF not permit any kind of monopolistic control by private firms over any part of the fisheries sector nor provide any subsidies inequitably to firms working in the sector.

12. We recommend that DGF and RDA consider local training for selected DGF staff in areas of statistics, extension, marketing and computers among other areas as an attempt to increase staff skills.

III. RDA Operations

13. RDA should work carefully through the budget for the Oman Government contribution to the project, including the MSFC, as proposed recently by the Directorate General of Finance. This action is at the heart of resolving the logistical support problem that has troubled RDA.

14. RDA should prepare the budget for the MSFC for FY 86 as part of the redrafting of the budget for the Oman Government contribution to the project since the director/chief of party of the new technical assistance contract for the MSFC will arrive between October and December 1985 and will consequently miss the budget review for FY 86. The Omani fiscal year is the calendar year, and budget reviews for an upcoming year takes place in October of the prior year.

15. RDA should consider reducing the technical level of its team in favor of more generalist consultants who can handle the non-technical institution building activities within DGF and help the transfer of the technical knowledge of the technical consultants.

16. We recommend that RDA take the initiative to identify policy issues and provide clear discussions of options and recommendations. This advice should be presented both orally and in writing to DGF. Proposed policy statements should be presented in Arabic. Following up on these policy proposals should be the responsibility of RDA.

17. We recommend that RDA improve communication between its consultants and the Directorate of Fisheries in Salalah, both orally and with reports in Arabic and that they provide the same services and information to the Directorate in Salalah that RDA is presenting to DGF.

18. We recommend that RDA continue work in the Salalah region on marine science, extension, marketing and statistics.

IV. Contract Administration

19. We recommend that RDA hire an administrative assistant as part of its Omani staff and that the Joint Commission (JC) make funds available to their contract for logistics support to complement DGF contributions.

V. Project Implementation

20. We recommend an interim sampling program at approximately the same level as the one-year program to fill the gap between the end of the one-year program and the beginning of the long-term program.

21. We recommend that the research program be more closely focused on issues related toward management and development and that the Salalah lab become operational immediately.

22. We recommend additional expatriate and Omani staff to accelerate the implementation of the extension program.

23. We recommend additional subactivities, possibly as experiments, as part of the extension activity: (a) sports fishing (b) Fishery Attraction Devices (FAD) (c) a diesel school or other training opportunities for mechanics, and (d) test fishing as a means of demonstrating the feasibility of harvesting certain species groups.

24. We recommend that the sector analysis report due April 1985 and the analysis of the production, marketing and distribution sector due June 1985 be carefully reviewed to determine how the marketing program should be structured for the remaining life of the project. A determination should also be made as to whether the institutional building component in relation to marketing can be accomplished.

25. We recommend small scale retail demonstration units to expand domestic markets and participation in international trade shows and trade missions to expand foreign markets.

FISHERIES DEVELOPMENT PROJECT

LOGICAL FRAMEWORK

NARRATIVE SUMMARY:

Goal:

a. To develop the fisheries sector as a non-oil source of income for the national economy through increased investment and activity of ~~private~~ sector entrepreneurs and traditional fishermen supported by increased public sector policy.

b. To promote the welfare of traditional fishermen through better marketing opportunities, access to more efficient technology and equipment, higher incomes, and protection of the fisheries resources by public policy.

Purpose:

To strengthen the institutional capability (technical, managerial, administrative, policy making) of the Directorate General of Fisheries to oversee and manage the nation's fisheries resources and to support the growth of the fisheries sector.

Outputs:

An operational Marine Science and Fisheries Center (MSFC) with trained Omani staff in both technical and administrative positions.

A system of data gathering and analysis for inventorying stock, monitoring catch, gear, effort, and related topics in order to monitor the exploitation of fisheries resources to maintain and protect those resources in the long term.

An extension service for fisheries which provides information and guidance to traditional fishermen (new technology and equipment, marketing opportunities, conservation practices) and to the private sector (investment and marketing opportunities).

A trained staff for surveillance of fisheries resources and enforcement of public regulations governing the use of fisheries resources by fishermen and private enterprises, both Omani and non-Omani.

A trained staff of policy makers for DGF to create, evaluate, and implement public policies which support the use and maintenance of fisheries resources, the activity of the private sector, and the place of traditional fishermen in the nation's economy.

Inputs:

As stated, subject to modification based on revised Government of Oman contributions and possible increase in U.S. Government contributions.

OBJECTIVELY VERIFIABLE INDICATORS:

Measures of Goal Achievement:

The fisheries sector is providing an increasing and sustainable contribution to GNP over time.

The fish catch per unit time is increasing but only within the limits of responsible exploitation.

Traditional fishermen have increased incomes, increased employment opportunities in the fisheries sector, either in their own boats or in private enterprises.

Employment and investment opportunities have increased in the sector at large.

End of Project Status:

A more precise definition of DGF's function and a revised structure to reflect its function, including a clarified relationship between the central office of DGF and the Directorate General of Fisheries in Salalah.

DGF is operating programs in research, data gathering and analysis, surveillance and enforcement of fisheries regulations, policy development and evaluation, and extension.

DGF has a trained and functioning core staff of Omanis for technical, administrative, and managerial matters.

DGF is using expatriate assistance for more specialized tasks, rather than basic staff training.

Magnitude of Outputs:

Marine Science and Fisheries Center

____ Omani support staff members hired and trained

Statistical program established with ____management staff and ____ trained data collectors

Extension service established with ____ trained extension agents and a formal program of extension.

A policy division staffed and operational

A division of surveillance and enforcement staffed and operating

Magnitude of Inputs: As stated.

ASSUMPTIONS:

Achievement of Goal:

Continuation of DGF policy formulation and implementation favoring the fisheries sector

Continuing and increasing priority given to the fisheries sector by the Government of Oman at the Ministerial and higher levels

Continuing favorable economic rate of return for Omani enterprises and fishermen, especially relative to non-Omani enterprises fishing in Omani waters

Social attitudes of traditional fishermen will permit them to be responsive to opportunities in the fisheries sector; Government of Oman programs will be sensitive to social attitudes of traditional fishermen

Omani fisheries resources will be protected from overexploiting and improper fishing techniques and will remain in sufficient abundance to support a fisheries sector

Achievement of Purpose:

Government of Oman policy on hiring and salary levels can be modified to attract and keep qualified Omanis, especially those trained by the project

Sufficient numbers of Omanis can be identified and hired to staff DGF adequately

Sufficient numbers of Omanis will undertake university training to begin to meet DGF's staff needs

Omani enterprises and fishermen will be able to compete with foreign enterprises fishing in Oman

Date	Officials Visited
3/16/85	His Excellency Abdullah bin Ali Bakathir Director General of Fisheries
	Mr. Rashid Amor al-Barwani Director of Marketing and Production
	Dr. Robert Abbott RDA Chief of Party
3/17/85	Mr. Tony Rasch RDA
	Mr. Gomaa DGF Sampler
3/18/85	Mr. Keith Cox RDA Senior Scientist
	Ruwi Lab Staff
	Mr. Ali bin Mohamed Aidroos Director of Extension Services
	Mr. Fred Jurick RDA Extension Expert
	Mr. Mohamed
3/20/85	Mr. Joe McAlister RDA Production/Marketing Expert
3/21/85	Mr. Rashid Amor al-Barwani Director of Marketing and Production
	Mr. Ahmed bin Salem bin Said al-Shanfari Director General of Planning Unit
	Dr. Robert Abbott RDA Chief of Party
3/23/85	Mr. Ali Omar Director of Fisheries for Dhofar
	Mr. Hamed
	Mr. Zakaria Osman Director ONFC, Salalah
	Mr. Ali Saied Al-Marhoon Deputy Director of Fisheries, Dhofar

LIST OF PAPERS REVIEWED

1. DGF - Institutional, Manpower and Training Requirements (RDA)
2. Fisheries Extension and One-year Work Plan (RDA)
3. Marketing Strategy, Reorganization and One-Year Work Plan (RDA)
4. Staffing and Organization for the Marine Science and Fisheries Center (RDA)
5. Socio-Economic Aspects of Fisheries of Oman (RDA)
6. One-Year Work Plan for Reorganization of the DGF Research Dept. (RDA)
7. Problems and Recommendations: Fisheries Access, Monitoring and Control (RDA)
8. Work Plan for the One Year Fisheries Sampling Program (RDA)
9. 1st RDA Quarterly Report
10. 2nd RDA Quarterly Report
11. 3rd RDA Quarterly Report
12. RDA Plan of Performance
13. RFTP for the Marine Science and Fisheries Center
14. FAO Report
15. Project Paper - Fisheries Development
16. Contract between RDA and MAF
17. Sub-Grant Agreement for Fisheries Development Project
18. Training Program (RDA)
19. MAF Organizational Chart
20. Subcontract No. 128 - URI
21. RDA Report #15
22. RDA Report #20
23. RDA Report #21
24. Draft Volume IV 1981-1985 Second Five Year Plan

Extension Subactivities being Designed

Plan of Performance Schedule Extension

1. RDA extension expert
   continuous from March 1984 - February 1987

2. Socio Economic Study
   Report due June 1984
   Report completed June 1984

3. Extension Program Design
   Report due November 1984
   Report completed July 1984

4. Recruit Staff
   SR Extension Officer (5) - Off Target
   Have four on staff, lack one March 1985
   Should have seven by end of year.

5. Procurement of Equipment
   On Schedule for some items
   Cars - pickup truck delays

6. Staff Training
   On the job training - slow do not have full staff
   U. S. Training (3) - Off Target

7. Computerization of Fishermen fund
   Report due June 1985
   Doubtful completed on Target

8. Hydraulic Usage
   Performance - Off Target

9. Trolling Poles
   Performance - Off Target

10. Lobster Trap Fishing
    Performance - Off Target

11. Outboard Engine Maintenance
    Performance - Off Target

12. Village Training Safety and New Gear
    Performance - Off Target

BACKGROUND OF AUTHORS

Dr. Edward F. Klima received his M.S. Degree from the University of Miami and Ph.D. from Utah State University. He is now Director of the Galveston Laboratory of the National Marine Fisheries Service (NMFS) and has responsibility for shrimp research in the Gulf of Mexico as well as ecological and turtle investigations. He has over twenty-five years of experience in fisheries biology, gear research and fisheries administration and has published over 40 scientific papers.

Dr. Stephen H. Clark received his M.S. Degree from the University of Maine and Ph.D. from the University of Miami. He is now head of a program of study on the Gulf of Maine and George's Bank fisheries resources and is the senior assessment scientist at the Northeast Fisheries Center of the NMFS at Woods Hole, Massachusetts. He has over twelve years of experience in stock assessment and fisheries statistics and has published 20 scientific papers.

Mr. Benjamin B. Hawley received his Masters of Regional Planning from Cornell University. He is now officer-in-charge for Oman, Jordan, Lebanon, and Syria in AID/Washington. His experience includes that of project manager for an AID-assisted decentralization and local government development project in Indonesia and agricultural exension work with Peace Corps in Upper Volta, now Bourkina Faso.