



U.S. AGENCY FOR
INTERNATIONAL
DEVELOPMENT

September 29, 1992

Ms. Charlene Miller
Texas A & M Research Foundation
Box 3578
College Station, Texas 77843

Subject: Grant No. HNE-0158-G-00-2062-00

Dear Ms. Miller:

Pursuant to the authority contained in the Foreign Assistance Act of 1961 and the Federal Grant and Cooperative Agreement Act of 1982, as amended, the Agency for International Development (hereinafter referred to as "A.I.D.") hereby provides to the Texas A & M Research Foundation (hereinafter referred to as "the Foundation" or "Grantee") the sum set forth in Section 1C.2. of Attachment 1 of this Grant to provide financial support for the program described in Attachment 2 of this Grant entitled "Program Description."

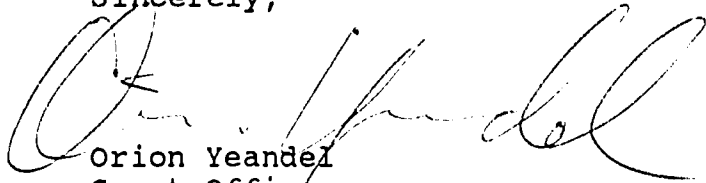
This Grant is effective as of the date of this letter and funds obligated hereunder shall be used to reimburse the Grantee for allowable program expenditures for the period set forth in Section 1B. of Attachment 1 of this Grant.

The total estimated amount of this Grant is the amount set forth in Section 1C.1. of Attachment 1, of which the amount set forth in Section 1C.2. is hereby obligated. A.I.D. shall not be liable for reimbursing the Grantee for any costs in excess of the obligated amount. However, subject to Section 1C.4. of Attachment 1, additional funds may be obligated by A.I.D. until such time as the obligated amount may equal the total estimated amount of this Grant.

This Grant is made to the Grantee on the condition that the funds will be administered in accordance with the terms and conditions as set forth in the attachments listed under my signature below, which together constitute the entire Grant document and have been agreed to by your organization.

Please acknowledge receipt and acceptance of this Grant by signing all copies of this Grant, retaining one copy for your files, and returning the original and remaining copies to the undersigned.

Sincerely,



Orion Yeandel
Grant Officer
Chief, HNE Branch
B Division
Office of Procurement

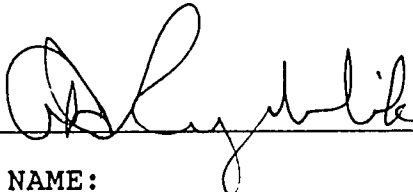
Attachments:

- 1. Schedule
- 2. Program Description
- 3. Standard Provisions
- 4. Special Provision entitled "Restrictions on Lobbying"
- 5. A.I.D. Eligibility Rules

ACKNOWLEDGED:

Texas A & M Research Foundation

BY: _____



cm

TYPED NAME: _____

TITLE: A.D. Rychlik, Executive Vice President
Texas A&M Research Foundation

DATE: _____

OCT 19 1992

FISCAL DATA

A. GENERAL

A.1.	Total Estimated A.I.D. Amount:	\$2,902,000
A.2.	Total Obligated A.I.D. Amount:	\$1,000,000
A.3.	Cost-Sharing Amount (Non-Federal):	\$61,618
A.4.	Other Contributions (Federal):	\$0
A.5.	Project Number:	298-0158.26
A.6.	A.I.D. Project Office:	NE/DR/PIE, H. Blank
A.7.	Funding Source:	A.I.D./W
A.8.	Tax Identification Number:	741-23-8434
A.9.	DUNS Number:	07-859-2789
A.10.	Letter of Credit Number:	72-00-1541

B. SPECIFIC

B.1.(a)	PIO/T Number:	298-0158-3-2632911 & A1 & A2
B.1.(b)	Appropriation Number:	72-112/31037
B.1.(c)	Allotment Number:	270-63-298-01-69-21
B.1.(d)	Budget Plan Code:	NES2-92-33298-IG12
B.1.(e)	Amount:	\$1,000,000

SCHEDULE

1A. PURPOSE OF GRANT

The purpose of this Grant is to provide financial support for the program described in Attachment 2 of this Grant entitled "Program Description."

1B. PERIOD OF GRANT

1B.1. The effective date of this Grant is the date of the Cover Letter and the estimated completion date is September 29, 1995. Funds obligated hereunder (see Section 1C.2. below) shall be used to reimburse the Grantee for allowable program expenditures incurred by the Grantee in pursuit of program objectives at any time during the period beginning on the effective date of this Grant and ending on the estimated completion date.

1B.2. However, because this Grant is incrementally funded (see Section 1C.4. below), funds obligated hereunder are only anticipated to be sufficient for program expenditures through September 29, 1993.

1C. AMOUNT OF GRANT AND PAYMENT

1C.1. The total estimated amount of this Grant for its full period, as set forth in Section 1B.1. above, is \$2,902,000.

1C.2. A.I.D. hereby obligates the amount of \$1,000,000 as partial funding of the total estimated amount set forth in Section 1C.1. above for program expenditures during the indicated period set forth in Section 1B. above. Notwithstanding said total estimated amount, A.I.D. shall not be liable for reimbursing the Grantee for any costs in excess of the obligated amount, except as specified in paragraph (f) of the Standard Provision of this Grant entitled "Revision of Grant Budget" (see also Section 1C.4. below).

1C.3. Payment shall be made to the Grantee in accordance with procedures set forth in the Standard Provision of this Grant entitled "Payment - Letter of Credit," as shown in Attachment 3.

1C.4. As indicated in Section 1C.2. above, this Grant is partially funded. Until such time as the obligated amount (see Section 1C.2. above) shall equal the total estimated amount (see Section 1C.1. above) of this Grant, additional increments of funds may be obligated by A.I.D. under this Grant (by a Grant modification), subject to availability of funds, possible evaluation of the program, program priorities at the time, and the requirements of the Standard Provisions of this Grant entitled "Revision of Grant Budget" and, if applicable (see Section 1K.2. for applicability) "Cost Sharing (Matching)," as set forth in Attachment 3.

1C.5. The total estimated amount of the program described in Attachment 2 of this Grant is \$2,963,618, of which A.I.D. may provide the amount specified in Section 1C.1. above, and the Grantee will provide \$61,618 in accordance with Section 1L. below.

1D. GRANT BUDGET

1D.1. The following is the Budget for the total estimated amount of this Grant (see Section 1C.1. above) for its full period (see Section 1B. above). The Grantee may not exceed the total estimated amount or the obligated amount of this Grant, whichever is less (see Sections 1C.1. and 1C.2., respectively, above). Except as specified in the Standard Provision of this Grant entitled "Revision of Grant Budget," as shown in Attachment 3, the Grantee may adjust line item amounts as may be reasonably necessary for the attainment of program objectives. Revisions to the budget shall be in accordance with Section 1C. above and the Standard Provisions entitled "Revision of Grant Budget" and "Cost Sharing (Matching)."

1D.2. Budget

	<u>A.I.D.</u>	<u>Grantee/Others (Non-Federal)</u>	<u>Total</u>
<u>TEXAS A & M</u>			
<u>Management</u>			
Salaries & Wages	\$ 232,089	\$ 0	\$ 232,089
Fringe Benefits	70,895	0	70,895
Travel & Per Diem	29,279	0	29,279
Equipment	1,000	0	1,000
Other Direct Costs	26,079	0	26,079
Indirect Costs	<u>136,112</u>	<u>10,490</u>	<u>146,602</u>
Total (Mgmt)	\$ 495,454	\$ 10,490	\$ 505,944
<u>Trophodynamics</u>			
Salaries & Wages	\$ 73,780	\$ 0	\$ 73,780
Fringe Benefits	24,754	0	24,754
Travel & Per Diem	17,600	0	17,600
Equipment	12,000	0	12,000
Other Direct Costs	15,700	0	15,700
Indirect Costs	<u>56,688</u>	<u>2,638</u>	<u>59,326</u>
Total (Trophodynamics)	\$ 200,522	\$ 2,638	\$ 203,160

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<u>SUBAGREEMENTS</u>	<u>A.I.D.</u>	<u>Grantee/Others (Non-Federal)</u>	<u>Total</u>
<u>University of Michigan</u>			
Seafood Safety	\$ 230,482	\$ 0	\$ 230,482
<u>Nat'l Inst. of Oceanography & Fisheries/ Egypt</u>			
Management	134,463	451	134,914
Trophodynamics	321,850	0	321,850
Lake Ecosystems	314,075	0	314,075
Seafood Safety	207,100	0	207,100
<u>Kinneret Limnological Laboratory/Israel</u>			
Management	133,854	444	134,298
Trophodynamics	359,825	1,125	360,950
Lake Ecosystems	261,164	0	261,164
<u>Hebrew Univ. of Jerusalem</u>			
(Seafood Safety)	<u>243,211</u>	<u>46,470</u>	<u>289,681</u>
Total Subagreements	\$2,206,024	\$ 48,490	\$2,254,514
TOTAL ESTIMATED AMOUNT	<u><u>\$2,902,000</u></u>	<u><u>\$ 61,618</u></u>	<u><u>\$2,963,618</u></u>

1D.3. Inclusion of any cost in the budget of this Grant does not obviate the requirement for prior approval by the Grant Officer of cost items designated as requiring prior approval by the applicable cost principles (see the Standard Provision of this Grant set forth in Attachment 3 entitled "Allowable Costs") and other terms and conditions of this Grant, unless specifically stated in Section 1I. below.

1D.4. Except as specified in the Standard Provision of this Grant entitled "Revision of Grant Budget," the Grantee may adjust line items (i.e., the total amount for Texas A&M Management, the total amount for Texas A&M Trophodynamics, Trophodynamics [Nat'l Inst. of Oceanography & Fisheries/Egypt], Seafood Safety [Hebrew Univ. of Jerusalem]) within 15% without requesting prior written approval. The Grantee must request prior written approval from the Grant Officer in order to adjust any single line item above 15% for the performance of the program.

1E. REPORTING

1E.1. Financial Reporting

1E.1.(a) Financial reporting requirements shall be in accordance with the Standard Provision of this Grant entitled "Payment - Letter of Credit," as shown in Attachment 3.

1E.1.(b) The financial reports submitted on Standard Form 269, "Financial Status Report" shall have the columns of the section entitled "Programs/Functions/Activities" titled as follows:

Column (a):	"TAMRF Administration"
Column (b):	"U.S. Science Cooperation"
Column (c):	"Egyptian Sub-Grant"
Column (d):	"Israeli Sub-Grant"
Column (e):	"Travel by Egyptians"
Column (f):	"Travel by Israelis"

1E.1.(c) All financial reports shall be submitted to A.I.D., Office of Financial Management, FA/FM/CMPD/DCB, Room 700 SA-2, Washington, D.C. 20523-0209. In addition, one copy of all financial reports shall be submitted to the A.I.D. Project Office specified in the Cover Letter of this Grant, and shall correlate with the Semiannual Technical Reports (See Section 1E.2. below).

1E.1.(d) The frequency of financial reporting and the due dates of reports shall be as specified in the Standard Provision of this Grant referred to in Section 1E.1.(a) above.

1E.1.(e) The Grantee's financial reports shall include expenditures of A.I.D. Grant funds provided hereunder, as well as non-federal matching funds and any other contributions in accordance with Section 1L. below.

1E.2. Program Performance Planning and Reporting

1E.2.(a) Project Implementation Plan

Not later than sixty (60) days from the effective date of this Grant (see Section 1B. above), the Grantee shall prepare and submit to the A.I.D. Project Officer specified in the Cover Letter of this Grant five (5) copies of a project implementation plan, with critical path indicators (as described in Appendix A of A.I.D. Handbook 3), for the full term of this Grant.

1E.2.(b) Annual Workplans

1E.2.(b)(1) The Grantee shall submit annual workplans for this Grant. Each annual workplan shall contain the following:

1E.2.(b)(1)(A) An action-oriented workplan describing planned activities during the next year, delineated by calendar quarter, and linked to the project goals and objectives, which describes the individuals to be involved, the activities to be conducted, and where and when they will be conducted. Planned activities shall be grouped by subject category, and then related to project objectives;

1E.2.(b)(1)(B) A projected budget, utilizing the same budget line items as are set forth in the budget of this Grant, for each calendar quarter, corresponding to the workplan; and

1E.2.(b)(1)(C) Publications, reports, workshops, seminars, and other information dissemination activities planned, by calendar quarter.

1E.2.(b)(2) The Grantee may develop the annual workplans in consultation with the A.I.D. Project Officer for this Grant.

1E.2.(b)(3) Five (5) copies of each annual workplan will be submitted to the designated A.I.D. Project Officer for this Grant and one copy submitted to the Grant Officer. The first annual workplan covering the first year of this Grant shall be submitted by the Grantee not later than sixty (60) days from the effective date of this Grant (see Section 1B. above). Thereafter, the annual workplan for each successive year of this Grant shall be submitted by the Grantee not later than sixty (60) days prior to the beginning of each year.

1E.2.(c) Semi-annual Technical Reports

The Grantee shall submit five (5) copies of brief semi-annual program performance reports, which correlate with the financial reporting periods described in Section 1E.1. above, to the A.I.D. Project Office specified in the Cover Letter of this Grant. In addition, two copies shall be submitted to A.I.D., PPC/CDIE/DI, Washington, DC 20523-1802. These reports shall be submitted within 30 days following the end of the reporting period, and shall briefly present the following information:

1E.2.(c)(1) Progress in comparison with the goals and work plans established for the period and those stated in the proposal on which the project is based and reasons why established goals were not met, if applicable.

1E.2.(c)(2) Changes in Egyptian, Israeli, and U.S. personnel (new and departing), as well as their salary level and the percentage covered through the project.

1E.2.(c)(3) Travel (regional and international) including the purpose of travel, the origin/destination, names of travelers and dates.

1E.2.(c)(4) Meetings and collaborative activities, including the purpose, location, date, and attendance.

1E.2.(c)(5) Procurement of nonexpendable equipment, including the source and origin, and cost of each item.

1E.2.(c)(6) Publications and intellectual property rights including a description, the names and dates.

1E.2.(c)(7) Other pertinent information including the status of finances and expenditures and, when appropriate, analysis and explanation of cost overruns or high unit costs.

1E.2.(d) Special Reports

Between the required program performance reporting dates, events may occur that have significant impact upon the program. In such instances, the Grantee shall inform the A.I.D. Project Officer as soon as the following types of conditions become known:

1E.2.(d)(1) Problems, delays, or adverse conditions that will materially affect the ability to attain program objectives, prevent the meeting of time schedules and goals, or preclude the attainment of work units by established time periods. This disclosure shall be accompanied by a statement of the action taken, or contemplated, and any A.I.D. assistance needed to resolve the situation.

1E.2.(d)(2) Favorable developments or events that enable time schedules to be met sooner than anticipated or more work units to be produced than originally projected.

1E.2.(d)(3) If any performance review conducted by the Grantee discloses the need for change in the budget estimates in accordance with the criteria established in the Standard Provision of this Grant entitled "Revision of Grant Budget," the Grantee shall submit a request for budget revision to the Grant Officer and the A.I.D. Project Officer specified in the Cover Letter of this Grant.

1E.2.(e) Annual Activity Reports

Within thirty (30) days following the annual anniversary date of this Grant, the Grantee shall submit to the A.I.D. Project Office specified in the cover letter of this Grant five (5) copies of an annual technical progress report which will be a description of the past year's activities, including technical, scientific, managerial, and fiscal information. The Grantee shall also submit one copy of the annual activity report to the AGR/Associate Director, USAID/Cairo, Unit 64902, APO AE 09839-4902; one copy to the Political Office, U.S. Embassy/Cairo, UNIT 64900-Box 3, APO AE 09839-4900; and one copy to the Science Attache, U.S. Embassy, Tel Aviv, APO AE 09830. The report shall include, both for each field site or subcontractor/subrecipient individually and for project activities as a whole, a review of program and problems to date, and a discussion of technical and managerial issues significant to the success or failure of this Grant. The report shall also include discussion of the ways in which project research activities may interface with and impact on other regional and bilateral projects, and provide an estimate of the collaboration achieved among the participants. The report will address regulatory issues related to the project. Although principally a technical document, it nevertheless must include pertinent statistics or quantitative information regarding the project and its activities. The Annual Activity Report shall also include an annual expenditure report corresponding to each annual workplan (see Section 1E.2.[b] above) and corresponding to column headings of the quarterly financial report submitted on SF 269 (see Section 1E.1. [b] above). In addition, the annual expenditure report shall contain the following information:

Line (1):	"Accrued Expenditures"
Line (2) & (3)	"Projections for Accruals"
Line (2)	"Next 6 Months"
Line (3)	"Next 18 Months"
Line (4) & (5)	"Projections for Cash Needs"
Line (4)	"Next 6 Months"
Line (5)	"Next 18 Months"
Line (6)	"Pipeline" (the difference funds provided and accrued expenditures)
Line (7)	"Reasons for Variance from Budget"

These expenditure reports will cover A.I.D. and, if applicable, cost-sharing amounts by budget line item (see Section 1D.2. above) and by estimated distribution amongst project components.

1E.2.(f) Environmental Impact

If it appears that outputs of this project will result in an adverse environmental impact, the Grantee shall notify the A.I.D. Project Officer prior to implementation, in order to allow for orderly preparation of an environmental impact statement. The Grantee shall assure that appropriate U.S. Government and/or host country procedures are followed.

1E.2.(g) Care of Laboratory Animals

If the Standard Provision entitled "Care of Laboratory Animals" applies to this Grant (see Section 1K. for applicability), the Grantee shall include the certificate required by paragraph (c) of said Standard Provision in all of its reports which pertain to the use of laboratory animals.

1E.2.(h) Research Involving Recombinant DNA

If any research involving recombinant DNA is being funded hereunder, the Grantee shall comply with the reporting requirements set forth in Section 1I.2.(d) of this Grant.

1E.2.(i) Final Report

Within 90 days following the estimated completion date of this Grant (see Section 1B. above), the Grantee shall submit five (5) copies of a final report to the A.I.D. Project Office specified in the cover letter of this Grant. The Grantee shall also submit one copy of the final report to the AGR/Associate Director, USAID/Cairo, Unit 64902, APO AE 09839-4902; one copy to the Political Office, U.S. Embassy/Cairo, UNIT 64900-Box 3, APO AE 09839-4900; and one copy to the Science Attache, U.S. Embassy, Tel Aviv, APO AE 09830. In addition, two copies shall be submitted to A.I.D., PPC/CDIE/DI, Washington, DC 20523-1802. It will cover the entire period of the Grant and include all information shown in Sections 1E.2.(b) through 1E.2.(e) above.

1F. TITLE TO PROPERTY

Title to property acquired hereunder shall vest in the Grantee, subject to the requirements of the Standard Provision of this Grant entitled "Title To and Use of Property (Grantee Title)" regarding use, accountability, and disposition of such property, except to the extent that disposition of property may be specified in Section 1I. below.

1G. PROCUREMENT AND (SUB) CONTRACTING

1G.1. Applicability

This Section 1G. applies to the procurement of goods and services by the Grantee (i.e., contracts, purchase orders, etc.) from a supplier of goods and services (see the Standard Provisions of this Grant entitled "Procurement of Goods and Services" and "AID Eligibility Rules for Goods and Services"), and not to assistance provided by the Grantee (i.e., a subgrant or [sub]agreement) to a subrecipient (see the Standard Provision of this Grant entitled "Subagreements").

1G.2. Requirements

In addition to other applicable provisions of this Grant, the Grantee shall comply with paragraph (b)(2) of the Standard Provision of this Grant entitled "AID Eligibility Rules for Goods and Services," concerning total procurement value of more than \$250,000 under this Grant. Further thereto, the following is (are) the Authorized Geographic Code(s):

1G.2.(a) Authorized Geographic Codes

1G.2.(a)(1) Source, Origin, and Componentry of Goods and Commodities

1G.2.(a)(1)(A) Source, Origin, and Componentry

Except as specified in Sections 1G.2.(a)(1)(B) and 1G.2.(a)(1)(D) below, all goods/commodities shall have their source and origin in the United States, Israel, or Egypt, and shall meet A.I.D.'s componentry requirements, except as the Grant Officer may otherwise agree in writing (see also Section 1G.2.[a][4] below).

1G.2.(a)(1)(B) Exception for Purchase/Procurement Transactions not Exceeding \$5,000

If the proposed purchase/procurement transaction does not exceed \$5,000 excluding transportation costs, paragraph (b)(1) of the Standard Provision of this Grant entitled "AID Eligibility Rules for Goods and Services" shall apply in lieu of Section 1G.2.(a)(1)(A) above.

1G.2.(a)(1)(C) Local Cost Financing

If, pursuant to Sections 1G.2.(a)(1)(A) or 1G.2.(a)(1)(B) above, the cooperating country is authorized for source and origin purposes, the Standard Provision of this Grant entitled "Local Cost Financing" will apply. Pursuant to said Standard

Provision, indigenous goods and imported shelf items provided by local suppliers are eligible for local cost financing in quantities up to the total estimated cost of this Grant, subject to the restrictions stated in said Standard Provision, and Chapter 18 of Supplement B to A.I.D. Handbook 1, which, as may from time to time be amended, is incorporated herein as a part of this Grant by reference.

1G.2.(a)(1)(D) Restricted Goods

Notwithstanding the foregoing, the restricted goods listed in paragraph (a)(3) of the Standard Provision of this Grant entitled "AID Eligibility Rules for Goods and Services," and, if applicable (see Section 1G.2.[a][1][C] above or Section 1K. below for applicability), paragraph (e) of the Standard Provision entitled "Local Cost Financing," must be specifically approved by the Grant Officer, except to the extent that such approval may be provided in Section 1I. below.

1G.2.(a)(2) Eligibility of Commodity-Related Services

1G.2.(a)(2)(A) Ocean Transportation

The eligibility of ocean transportation services is determined by the flag registry of the vessel. Notwithstanding the Standard Provision of this Grant entitled "Ocean Shipment of Goods," ocean shipping financed hereunder shall, except as the Grant Officer may otherwise agree in writing, be financed only on flag vessels of the United States (A.I.D. Geographic Code 000). If the Grant Officer approves the use of non-U.S. flag vessels, the Standard Provision of this Grant entitled "Ocean Shipment of Goods" will apply. Notwithstanding any of the foregoing, commodities shipped by a transportation medium owned, operated, or under the control of any country not included in A.I.D. Geographic Code 935 (see Section 1G.2.[a][4][B] below) are ineligible for A.I.D. financing hereunder, regardless of whether such transportation costs are financed hereunder. Moreover, commodities are ineligible for A.I.D. financing hereunder if shipped on a vessel which A.I.D. has designated as ineligible, regardless of whether such transportation costs are financed hereunder. Commodities are also ineligible for A.I.D. financing hereunder if shipped under an ocean charter that has not received prior approval of the Grant Officer, regardless of whether such transportation costs are financed hereunder.

1G.2.(a)(2)(B) Dead Freight

Transportation costs attributable to dead freight are not eligible for A.I.D. financing.

1G.2.(a)(2)(C) Despatch and Demurrage

If the Grantee finances the delivery costs beyond the port of loading, the Grantee must refund to A.I.D. all despatch earned at the port of unloading. Demurrage costs are ineligible for A.I.D. financing.

1G.2.(a)(2)(D) Air Transportation

The eligibility of air travel and transportation services is determined by the flag registry of the aircraft. The Standard Provision of this Grant entitled "Air Travel and Transportation" applies. Commodities are ineligible for A.I.D. financing hereunder if shipped under an air charter that has not received prior approval of the Grant Officer, regardless of whether such transportation costs are financed hereunder.

1G.2.(a)(2)(E) Marine Insurance

The Authorized Geographic Code for marine insurance is the same as is set forth in Section 1G.2.(a)(3)(B) below. Paragraph (c) of the Standard Provision of this Grant entitled "AID Eligibility Rules for Goods and Services" applies. If the Cooperating Country is authorized for the placement of marine insurance but discriminates against any marine insurance company authorized to do business in any state of the United States, failure to insure all A.I.D.-financed commodities with U.S. insurance companies shall render the commodities ineligible for A.I.D. financing hereunder.

1G.2.(a)(2)(F) Other Delivery Services

No special eligibility requirements pertain to other delivery services (such as export packing, loading, commodity inspection services, and services of a freight forwarder) except that citizens or firms of any country not included in Geographic Code 935 (see Section 1G.2.[a][4][B] below) are ineligible as suppliers of delivery services, and non-U.S. citizens lawfully admitted for permanent residence in the U.S. are eligible regardless of their citizenship.

1G.2.(a)(2)(G) Incidental Services

Incidental services are defined as installation or erection of A.I.D.-financed equipment or the training of personnel in the maintenance, operation, and use of such equipment. No special eligibility requirements pertain to incidental services except that citizens or firms of any country not included in Geographic Code 935 (see Section 1G.2.[a][4][B] below) are ineligible as suppliers of incidental services, and non-U.S. citizens lawfully admitted for permanent residence in the U.S. are eligible regardless of their citizenship.

1G.2. (a) (2) (H) Local Cost Financing

If, pursuant to this Section 1G.2.(a)(2), the cooperating country is authorized for commodity-related services, the Standard Provision of this Grant entitled "Local Cost Financing" will apply. Pursuant to said Standard Provision, services provided by local suppliers are eligible for local cost financing in quantities up to the total estimated cost of this Grant, subject to the restrictions stated in said Standard Provision, and Chapter 18 of Supplement B to A.I.D. Handbook 1, which, as may from time to time be amended, is incorporated herein as a part of this Grant by reference.

1G.2. (a) (3) Nationality of Supplier

1G.2. (a) (3) (A) Suppliers of Goods and Commodities

Except as specified in Section 1G.2.(a)(3)(C) below, the suppliers of goods and commodities shall have their nationality in the United States, Israel, or Egypt, except as the Grant Officer may otherwise agree in writing.

1G.2. (a) (3) (B) Suppliers of Services (Other Than Commodity-Related Services)

Except as specified in Section 1G.2.(a)(3)(C) below, the suppliers of services (other than commodity-related services, as described in Section 1G.2.[a][2] above) shall have their nationality in United States, Israel, or Egypt, except as the Grant Officer may otherwise agree in writing.

1G.2. (a) (3) (C) Government Owned Organizations

Notwithstanding the foregoing, a Government Owned Organization, i.e., a firm operated as a commercial company or other organizations (including nonprofit organizations other than public educational institutions) which are wholly or partially owned by governments or agencies thereof, are not eligible as suppliers of goods and commodities, commodity-related services, or services (other than commodity-related services), except as the Grant Officer may otherwise agree in writing.

1G.2. (a) (3) (D) Local Cost Financing

If, pursuant to this Section 1G.2.(a)(3), the cooperating country is authorized for supplier nationality purposes, the Standard Provision of this Grant entitled "Local Cost Financing" will apply. Pursuant to said Standard Provision, local suppliers are eligible for local cost financing of indigenous goods, imported shelf items, and services in quantities up to the total estimated cost of this Grant,

subject to the restrictions stated in said Standard Provision, and Chapter 18 of Supplement B to A.I.D. Handbook 1, which, as may from time to time be amended, is incorporated herein as a part of this Grant by reference.

1G.2.(a)(4) Definitions

1G.2.(a)(4)(A) Source, Origin, Componentry, and Nationality of Supplier

Source, origin, componentry requirements, and supplier nationality are defined in Chapter 5 of A.I.D. Handbook 1, Supplement B, which, as may be amended from time to time, is incorporated herein as a part of this Grant by reference (see also Attachment 5 of this Grant which reflects the substance of Chapter 5 of A.I.D. Handbook 1, Supplement B as of the effective date of this Grant).

1G.2.(a)(4)(B) A.I.D. Geographic Codes

A.I.D. Geographic Codes are defined in Appendix D of A.I.D. Handbook 18, which, as may be amended from time to time, is incorporated herein as a part of this Grant by reference (see also Attachment 5 of this Grant which reflects the substance of Appendix D of A.I.D. Handbook 18 as of the effective date of this Grant).

1G.3. Approvals

Inclusion of costs in the budget of this Grant for the purchase of nonexpendable equipment obviates neither the requirement of Section J.13. of OMB Circular A-21 (for educational institutions) or Section 13 of Attachment B of OMB Circular A-122 (for nonprofit organizations other than educational institutions) for prior approval of such purchases by the Grant Officer, nor any other terms and conditions of this Grant, unless specifically stated in Section 1I. below.

1G.4. Title to Property

See Section 1F. above.

1H. INDIRECT COST RATES

1H.1. Pursuant to the Standard Provision of this Grant entitled "Negotiated Indirect Cost Rates - Provisional" and, if applicable (see Section 1K.2. below), "Negotiated Indirect Cost Rates - Predetermined," an indirect cost rate or rates shall be established for each of the Grantee's accounting periods which apply to this Grant. Payment on account of allowable indirect

costs shall be made on the basis of final or predetermined indirect cost rates for each accounting period which applies to this Grant, but not in excess of the following ceiling rate(s) applied to the base(s) which is (are) set forth below. Any indirect costs above the ceiling rate(s) shall be absorbed by the Grantee and considered cost sharing.

<u>Type</u>	<u>Rate</u>	<u>Base</u>
On-Campus	43.0%	<u>1/</u>
Off-Campus	20.0%	<u>1/</u>

1/ Base of Application: Modified Total Direct Costs

II. SPECIAL PROVISIONS

II.1. Limitations on Reimbursement of Costs of Compensation for Personal Services and Professional Service Costs

II.1.(a) Employee Salaries

Except as the Grant Officer may otherwise agree in writing, A.I.D. shall not be liable for reimbursing the Grantee for any costs allocable to the salary portion of direct compensation paid by the Grantee to its employees for personal services which exceed the highest salary level for a Foreign Service Officer, Class 1 (FS-1), as periodically amended.

II.1.(b) Consultant Fees

Compensation for consultants retained by the Grantee hereunder shall not exceed, without specific approval of the rate by the Grant Officer: either the highest rate of annual compensation received by the consultant during any full year of the immediately preceding three years; or the maximum rate of a Foreign Service Officer, Class 1 (FS-1) (as periodically amended), whichever is less. A daily rate is derived by dividing the annual compensation by 2,087 and multiplying the result by 8.

II.2. Compliance With Federal Guidelines and Regulatory Procedures Pertaining to Recombinant DNA

II.2.(a) The Grantee shall implement any research activities under this Grant which involve recombinant DNA in accordance with:

II.2.(a)(1) The National Institutes of Health Guidelines for Research Involving Recombinant DNA Molecules;

1I.2.(a)(2) Procedures issued by the U.S. Department of Agriculture (USDA), the Environmental Protection Agency (EPA), or other appropriate Federal agency;

1I.2.(a)(3) A.I.D.'s environmental procedures; and

1I.2.(a)(4) Such other Federal guidelines and procedures as may apply during the course of research.

1I.2.(b) The Grantee cannot commence testing in any foreign location until written approval for such testing is obtained from the A.I.D. Project Officer and the government of the country where testing is planned. Testing shall be conducted in accordance with all applicable regulations of that country.

1I.2.(c) In addition, and prior to commencement of any such testing, the Grantee shall make a judgement and communicate same to the A.I.D. Project Officer as to whether the regulations, procedures, or facilities of the country in question are adequate to ensure testing in an environmentally sound manner. In the event such judgement is that they are not, the Grantee and the A.I.D. Project Officer will consult and agree on the conditions to be applied to the testing which will have such environmental effect.

1I.2.(d) Reports submitted to A.I.D. under this Grant will address regulatory issues as noted above related to the activity.

1I.3. Publications

1I.3.(a) The Grantee agrees to provide one copy of the manuscript of any proposed publication to the A.I.D. Project Officer not later than submission to the publisher, and to give serious consideration to any comments received from the A.I.D. Project Officer.

1I.3.(b) In the case of publication of any of the reports described in Section 1E.2. of this Grant, A.I.D. reserves the right to disclaim endorsement of the opinions expressed. For other publications, A.I.D. reserves the right to dissociate itself from sponsorship or publication. In both cases, the Grantee will consult with the A.I.D. Project Officer as to the nature and extent of any A.I.D. disclaimer of endorsement or dissociation from sponsorship or publication.

1I.3.(c) If A.I.D. does not choose to disclaim endorsement or dissociate itself from sponsorship or publication, the Grantee shall, in accordance with the Standard Provision of this Grant

entitled "Publications," acknowledge A.I.D. support as follows:

"This publication was made possible through support provided by the Office of Development Planning, Bureau for Near East, U.S. Agency for International Development, under Grant No. HNE-0158-G-00-2062-00."

11.3.(d) In addition to providing one copy of all published works and lists of other written work produced under this Grant to the A.I.D. Project Officer, as required by paragraph (b) of the Standard Provision of this Grant entitled "Publications," the Grantee shall also provide two copies of such publications and lists to A.I.D., PPC/CDIE/DI, Washington, D.C. 20523-1802.

11.4. Equipment and Other Capital Expenditures

11.4.(a) Requirement for Prior Approval

Pursuant to Sections 1D.3. and 1G.3. above and the Standard Provisions of this Grant entitled "Allowable Costs" and "Revision of Grant Budget," and by extension, Section J.13. of OMB Circular A-21, the Grantee must obtain A.I.D. Grant Officer approval for the following:

11.4.(a)(1) Purchase of General Purpose Equipment, which is defined as an article of nonexpendable tangible personal property, the use of which is not limited only to research, medical, scientific, or other activities [e.g., office equipment and furnishings, air conditioning equipment, reproduction and other equipment, motor vehicles, and automatic data processing equipment, having a useful life of more than two years and an acquisition cost of \$500 or more per unit);

11.4.(a)(2) Purchase of Special Purpose Equipment, which is defined as an article of nonexpendable tangible personal property, which is used only for research, medical, scientific, or other technical activities, and which has a useful life of more than two years and an acquisition cost of \$1,000 or more per unit); and

11.4.(a)(3) Other Capital Expenditures, which is defined as the cost of the asset, including the cost to put it in place).

11.4.(b) Approvals

In furtherance of the foregoing, the Grant Officer does hereby provide approval for the following purchases, which shall not be construed as authorization to exceed the total estimated

amount or the obligated amount of this Grant, whichever is less (see Section 1C. above):

<u>Item</u>	<u>Reference</u>	<u>Estimated Cost</u>
1. One (1) Personal Computer	TAMRF Trophodynamics	\$2,000
2. One (1) Echosounder	Israel Trophodynamics	\$45,000
3. One (1) Subm. Fluorometer	Israel Trophodynamics	\$10,000
4. One (1) Culture System	Egypt Lake Ecosystems	\$12,257
5. One (1) Atomic Absorption	Egypt Lake Ecosystems	\$20,000
6. One (1) Scintilltn Counter	Egypt Lake Ecosystems	\$15,000
7. One (1) Cond. Salinometer	Egypt Lake Ecosystems	\$12,360
8. One (1) Int. Current Meter	Egypt Lake Ecosystems	\$5,000
9. One (1) Coulter Counter	Egypt Lake Ecosystems	\$15,000
10. One (1) Epiflr. Microscope	Egypt Lake Ecosystems	\$8,000
11. One (1) Weather Station	Egypt Lake Ecosystems	\$5,000
12. One (1) 4-Wheel Drive Van	Egypt Lake Ecosystems	\$20,000
13. One (1) Gas Chromatography	Egypt Lake Ecosystems	\$14,014
14. One (1) High Speed Camera	Israel Lake Ecosystems	\$41,000
15. One (1) Hydro Lab	Israel Lake Ecosystems	\$10,000
16. One (1) Computer	Hebrew Univ.-Jerusalem	\$1,000
17. Two (2) Cond/Temp Meters	Egypt Seafood Sfty	\$1,600
18. Two (2) pH Meters	Egypt Seafood Sfty	\$2,200
19. One (1) Trace Metal Anlyz.	Egypt Seafood Sfty	\$14,500
20. One (1) Diss. Oxygen Meter	Egypt Seafood Sfty	\$1,200
21. One (1) Fax Machine	Texas A&M Management	\$2,000

1I.4.(c) Exception for Automation Equipment

Any approval for the purchase of automation equipment which may be provided in Section 1I.4.(b) above or subsequently provided by the Grant Officer is not valid if the total cost of purchases of automation equipment (e.g., computers, word processors, etc.), software, or related services made hereunder will exceed \$100,000. The Grantee must, under such circumstances, obtain the approval of the Grant Officer for the total planned system of any automation equipment, software, or related services.

1I.4.(d) Compliance with A.I.D. Eligibility Rules

Any approvals provided in Section 1I.4.(b) above or subsequently provided by the Grant Officer shall not serve to waive the A.I.D. eligibility rules described in Section 1G. of this Grant, unless specifically stated.

1I.5. Restricted Goods

Pursuant to Section 1G. above, paragraph (a)(3) of the Standard Provisions of this Grant entitled "AID Eligibility Rules for Goods and Services," and, if applicable (see Section 1K. below

for applicability), paragraph (e) of the Standard Provision of this Grant entitled "Local Cost Financing," the Grant Officer's approval is required for purchase of the restricted goods described therein. In furtherance thereof, the Grant Officer does hereby provide such approval to the extent set forth below. The Grant Officer's approval is required for purchases of such restricted goods if all of the conditions set forth below are not met by the Grantee. Any approval provided below or subsequently provided by the Grant Officer shall not serve to waive any terms and conditions of this Grant unless specifically stated.

1I.5.(a) Agricultural Commodities

Agricultural commodities may be purchased provided that they are of U.S. source (generally, the country from which the commodities are shipped) and origin (generally, the country in which the commodities are mined, grown, or produced) and purchased from a U.S. supplier, except that wheat, rice, corn, soybeans, sorghums, flour, meal, beans, peas, tobacco, hides and skins, cotton, vegetable oils, and animal fats and oils cannot be purchased under any circumstances without the prior written approval of the Grant Officer.

1I.5.(b) Motor Vehicles

Motor vehicles, if approved for purchase under Section 1I.4.(b) above or subsequently approved by the Grant Officer, must be of U.S. manufacture and must be of at least 51% U.S. componentry. The source of the motor vehicles, and the nationality of the supplier of the vehicles, must be in accordance with Section 1G.2. above. Motor vehicles are defined as self-propelled vehicles with passenger carriage capacity, such as highway trucks, passenger cars and busses, motorcycles, scooters, motorized bicycles, and utility vehicles. Excluded from this definition are industrial vehicles for materials handling and earthmoving, such as lift trucks, tractors, graders, scrapers, and off-the-highway trucks.

1I.5.(c) Pharmaceuticals

Pharmaceuticals may be purchased provided that all of the following conditions are met: (1) the pharmaceuticals must be safe and efficacious; (2) the pharmaceuticals must be of U.S. source and origin (see Section 1G. above); (3) the pharmaceuticals must be of at least 51% U.S. componentry (see Section 1G. above); (4) the pharmaceuticals must be purchased from a supplier whose nationality is in the U.S. (see Section 1G. above); (5) the pharmaceuticals must be in compliance with U.S. Food and Drug Administration (FDA) (or other controlling

U.S. authority) regulations governing United States interstate shipment of pharmaceuticals; (6) the manufacturer of the pharmaceuticals must not infringe on U.S. patents; and (7) the pharmaceuticals must be competitively procured in accordance with the procurement policies and procedures of the Grantee and the Standard Provision of this Grant entitled "Procurement of Goods and Services."

1I.5.(d) Pesticides

Pesticides may only be purchased if the purchase and/or use of such pesticides is for research or limited field evaluation by or under the supervision of project personnel. Pesticides are defined as substances or mixtures of substances: intended for preventing destroying, repelling, or mitigating any unwanted insects, rodents, nematodes, fungi, weeds, and other forms of plant or animal life or viruses, bacteria, or other micro-organisms (except viruses, bacteria, or other micro-organisms on or living in man or other living animals); or intended for use as a plant regulator, defoliant, or dessicant.

1I.5.(e) Rubber Compounding Chemicals and Plasticizers

Rubber compounding chemicals and plasticizers may only be purchased with the prior written approval of the Grant Officer.

1I.5.(f) Used Equipment

Used equipment may only be purchased with the prior written approval of the Grant Officer.

1I.5.(g) Fertilizer

Fertilizer may be purchased if it is either purchased in the U.S. and used in the U.S., or if it is purchased in the cooperating country with local currency for use in the cooperating country. Any fertilizer purchases which do not comply with these limitations must be approved in advance by the Grant Officer.

1I.6. Limitation on Use of Funds

1I.6.(a) The Grantee shall not utilize funds provided by A.I.D. for any testing or breeding feasibility study, variety improvement or introduction, consultancy, publication, conference or training in connection with the growth or production in countries other than the United States of an agricultural commodity for export which would compete with a similar commodity grown or produced in the United States.

1I.6.(b) The reports described in Section 1E.2. shall contain a statement indicating the projects or activities to which United States funds have been attributed, together with a brief description of the activities adequate to show that United States funds have not been used for the purpose in Section 1I.6.(a) above.

1I.6.(c) The Grantee agrees to refund to A.I.D. upon request an amount equal to any United States funds used for the purposes prohibited by Section 1I.6.(a) above.

1I.6.(d) No funds provided by A.I.D. under this Grant shall be used to provide assistance, either directly or indirectly, to any country ineligible to receive assistance pursuant to the Foreign Assistance Act as amended, related appropriations acts, or other statutes and Executive Orders of the United States (also see the Standard Provision of this Grant entitled "Ineligible Countries").

1J. RESOLUTION OF CONFLICTS

Conflicts between any of the Attachments of this Grant shall be resolved by applying the following descending order of precedence:

- Attachment 1 - Schedule
- Attachment 3 - Standard Provisions
- Attachment 4 - Special Provision entitled "Restrictions on Lobbying"
- Attachment 5 - A.I.D. Eligibility Rules
- Attachment 2 - Program Description

1K. STANDARD PROVISIONS

The Standard Provisions set forth as Attachment 3 of this Grant consist of the following Standard Provisions denoted by an "X" which are attached hereto and made a part of this Grant:

1K.1. Mandatory Standard Provisions For U.S., Nongovernmental Grantees

- (X) Allowable Costs (November 1985)
- (X) Accounting, Audit, and Records (September 1990)
- (X) Refunds (September 1990)
- (X) Revision of Grant Budget (November 1985)
- (X) Termination and Suspension (May 1986)
- (X) Disputes (November 1989)
- (X) Ineligible Countries (May 1986)

- (X) Debarment, Suspension, and Other Responsibility Matters (March 1989)
- (X) Nondiscrimination (May 1986)
- (X) U.S. Officials Not to Benefit (November 1985)
- (X) Nonliability (November 1985)
- (X) Amendment (November 1985)
- (X) Notices (November 1985)

1K.2. Additional Standard Provisions For U.S.,
Nongovernmental Grantees

- (X) Payment - Letter of Credit (November 1985)
- () Payment - Periodic Advance (January 1988)
- () Payment - Cost Reimbursement (November 1985)
- (X) Air Travel and Transportation (November 1985)
- (X) Ocean Shipment of Goods (May 1986)
- (X) Procurement of Goods and Services (November 1985)
- (X) AID Eligibility Rules for Goods and Services (November 1985)
- (X) Subagreements (November 1985)
- (X) Local Cost Financing (November 1988)
- (X) Patent Rights (November 1985)
- (X) Publications (November 1985)
- (X) Negotiated Indirect Cost Rates - Predetermined (May 1986)
- () Negotiated Indirect Cost Rates - Provisional (May 1986)
- (X) Regulations Governing Employees (November 1985)
- () Participant Training (May 1986)
- () Voluntary Population Planning (August 1986)
- (X) Protection of the Individual as a Research Subject (November 1985)
- (X) Care of Laboratory Animals (November 1985)
- () Government Furnished Excess Personal Property (November 1985)
- (X) Title To and Use of Property (Grantee Title) (November 1985)
- () Title To and Care of Property (U.S. Government Title) (November 1985)
- () Title To and Care of Property (Cooperating Country Title) (November 1985)
- (X) Cost Sharing (Matching) (November 1985)
- (X) Use of Pouch Facilities (November 1985)
- (X) Conversion of United States Dollars to Local Currency (November 1985)

1K.3. The following nine-digit zip codes are applicable in lieu of the five-digit zip codes shown in the corresponding standard provisions:

	<u>Mandatory Standard Provisions</u>	
Notices		20523-0051
	<u>Additional Standard Provisions</u>	
Ocean Shipment of Goods		20523-1419
Procurement of Goods and Services		20523-1414
Negotiated Indirect Cost Rates-Predetermined		
First Address		20523-0060
Second Address		20523-1417

1L. COST SHARING AND OTHER CONTRIBUTIONS

1L.1. The Grantee agrees to expend an amount not less than (a) the amount shown in the budget of this Grant for financing by the Recipient and/or others from non-federal funds (see Sections 1D. and/or 1H.), and (b) the amount shown in the budget of this Grant for financing by the Recipient and/or others from other federal funds.

1L.2. The Standard Provision of this Grant entitled "Cost Sharing (Matching)" makes reference to project costs. "Project Costs" are defined in Attachment E of OMB Circular A-110 as all allowable costs (as set forth in the applicable cost principles [see the Standard Provision of this Grant entitled "Allowable Costs"]) incurred by a Grantee and the value of in-kind contributions made by the Grantee or third parties in accomplishing the objectives of this Grant during the program period.

1L.3. The restrictions on the use of A.I.D. funds provided hereunder, as set forth in this Grant, do not apply to cost-sharing (matching) or other contributions unless such restrictions are stated in the applicable federal cost principles and/or imposed by the source of such cost-sharing (matching) funds or other contributions.

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PROGRAM DESCRIPTION

The Grantee's proposal entitled "Cooperative Marine Technology Program for the Middle East - Phase IV" and dated April 28, 1992 (Principal Investigator: Dr. S.Z. El-Sayed) is attached hereto as the Program Description (Attachment 2) and is made a part of this Grant.

Program DescriptionA. Trophodynamics of the Southeastern Mediterranean With Special Reference to Commercially Important Fishes:

1. Background and Rationale: When construction of the Aswan High Dam curtailed downstream flooding of the Nile, there was a catastrophic decline of commercial fish catch in Egyptian waters off the Mediterranean Coast. An A.I.D.-funded study led to a better understanding of the geographic and seasonal variations in the distribution and abundance of primary (phytoplankton) and secondary (zooplankton) producers at the base of the fish food web. But management of the fish stocks requires a more complete understanding of the marine ecosystem. This understanding can best be obtained by studying the trophodynamics of the Eastern Mediterranean coastal shelf ecosystem.

2. Objectives:

- a. Outline the food webs leading to commercially important fish species.
- b. Identify dominant prey of selected species of larvae, juveniles, and adults.
- c. Determine the role of very small algae; i.e., picoplankton and nanoplankton in the food webs.
- d. Answer the following questions regarding the distribution of fish biomass and production:
 - (1) How large are the standing stocks of commercially valuable fish?
 - (2) What are the production rates of these fish stocks?
 - (3) Is there potential for increasing the harvest?
 - (4) Are there unexploited stocks of pelagic species which might support an offshore fishery?

3. Cooperating Institutions:

- a. Academy of Scientific Research and Technology, National Institute of Oceanography and Fisheries, Cairo, Egypt.
- b. Israel Oceanographical and Limnological Research, Kinneret Limnological Laboratory, Tiberias, Israel.
- c. Texas A&M University Department of Oceanography, College Station, Texas, U.S.A.

4. Schedule:

Major Activity	1st Year	2nd Year	3rd Year
Preparatory Workshops	+		
Hydroacoustic Training	++		
Egyptian Cruises	+	+ +	+
Israeli Cruises	+	+ +	+
Sample Processing	++	++++	+++
Data Processing	++	++++	+++
Data Interpret'n Workshop (Egypt)		+	
Data Interpret'n Workshop (Israel)			+
Progress Report Preparation	+	+	
Final Report Preparation			++

B. Investigations on Lake Ecosystems in Egypt and Israel With Implications on Fisheries and Water Quality Management:

1. Background and Rationale: In recent years both Lake Qarun in Egypt and Lake Kinneret in Israel have witnessed changes in water quality and biological species composition which appear to be adversely affecting the lakes' fisheries. More complete information on the lakes' ecosystems is needed as a basis for establishing effective management policies and plans.

2. Objectives:a. Lake Kinneret:

- (1) Quantify the combined effects of zooplankton, fish, and nutrients on the phytoplankton of Lake Kinneret.
- (2) Study the direct effects of fish on nutrient content of lake water.
- (3) Examine the role that the most common fish species play in controlling water quality;

e.g., determining whether these species are a sink or a link for nutrients.

- (4) Analyze fish stocks and management policies to improve the commercial fisheries of Lake Qarun and improve the fisheries and water quality of Lake Kinneret.
- (5) By delineating food web interactions in Lake Qarun, determine the best way to increase fish catch without harming water quality.
- (6) Determine the potential impact of different fish populations on the lake ecosystem.
- (7) Elucidate relationships between fish densities and the distribution of limnological parameters (oxygen, temperature, plankton, etc.).
- (8) Determine the effect of fish on water quality in both lakes, by species and season.

b. Lake Qarun:

- (1) Determine the variability in lake water quality and soil condition, and how such variability affects the biological productivity in Lake Qarun.
- (2) Obtain information on parasites and diseases that may cause fish kills directly or bring down fish productivity by adversely affecting growth rate and reproductive capacity.
- (3) Obtain information on growth rates of the endemic and introduced fish and prawn species and their feeding habits at different growth stages.
- (4) Determine the level of success of planting fish, in terms of growth and survival; and estimate the catch efficiency of different fishing gear.
- (5) Formulate a stocking policy by assessing the stocking potential of the lake and selecting a scheme for adjusting the stocking rate.

3. Cooperating Institutions:

- a. Academy of Scientific Research and Technology,
National Institute of Ocedanography and Fisheries,
Cairo, Egypt.
- b. Israel Oceanographic and Limnological Research,
Kinneret Limnological Laboratory, Tiberias,
Israel.

4. Schedule:a. Lake Qarun:

Major Activity	1st Year	2nd Year	3rd Year
Lake Surveys			+
Study Water Quality of Drains	+ + + +	+ + + +	+ + + +
Study Fish Parasites and Diseases	+ + + +	+ + + +	+ + + +
Monitor Catch & Fishing Effort	+ +	+ +	+ +
Stock Assess. of Fish Populations	+ +	+ +	+ +
Estimate Growth Rates	+ + +	+ +	+ + +
Study Food Web Structure		+ +	+ +
Study Limiting Growth	+ +	+ +	+ +
Data Processing		+ +	+ +
Lake Modeling		+ +	+ +
Data Comparison and Evaluation		+ +	+ +
Develop Management Recommendations		+ +	+ +
Progress Reports		+ +	+ +
Final Report			+ +

b. Lake Kinneret:

Major Activity	1st Year	2nd Year	3rd Year
Estimate Fish Population Size (Acoustic Surveys)	+ + + +	+ + + +	+ + + +
Microbial Loop Studies	+ + + +	+ + + +	+ + + +
Sample Juvenile Bleak, etc.	+ + +	+ + +	+ +
Construct an Index		+	+
Study Impact of Fish Population	+	+	+ +
Data Processing	+ + + +	+ + + +	+ + +
Data Comparison and Evaluation	+	+	+
Develop Mgt. Recommendations			+ + +
Progress Reports	+	+	
Final Report			+

c. Seafood Safety and Fish Decontamination: Technical and Environmental Health Implications:

1. Background and Rationale: There is a growing concern about the safety of seafood in view of the various types of contaminants it is exposed to. Seafood harvested from contaminated waters can transmit infectious and toxic agents to humans. One of the most important infectious agents in seafood, a waterborne pathogen, is hepatitis A virus (HAV). Presently, hepatitis A is hyperendemic in Israel and Egypt. Outbreaks associated with waterborne transmission have been most often attributed to fecal contamination of untreated or inadequately treated water.

Water pollution will exhibit a more harmful effect on aquaculture than natural aquatic systems since cultured species have a limited capacity to adapt, avoid, or escape water pollutants. Recent studies on aquaculture systems in Egypt revealed covert use of organic waste products; including sewage, sewage sludge, and human and animal wastes; as pond fertilizers on private fish farms. Moreover, polluted drains in Egypt discharge directly

into the northern lakes which provide more than 50 percent of the fish catches of the country.

In an attempt to increase the acceptability of wastewater-grown fish and reduce the impact of water pollution, some fish farming practices frequently include procedures for fish decontamination before marketing. This practice, especially promising for aquaculture systems, has to date been undertaken without scientific basis or analysis. This study aims to contribute to a scientific and technological basis for chemical decontamination of fish, and to augment existing information on pathogen decontamination.

2. Objectives:

- a. Complete a comprehensive review of literature to compile existing public health criteria on seafood contamination. Develop a data bank for contaminant bioaccumulation and elimination rates in fishes, as well as factors that influence such rates.
- b. Identify problem contaminants by screening representative samples of fish from different sources for organic and inorganic hazardous chemical residue and pathogen levels.
- c. Assess the rates of elimination of certain viruses and bacteria from contaminated fish.
- d. Determine the survival of HAV in fish culture water and the influence of environmental factors on die-off rate.
- e. Assess the rate of elimination of problem chemical pollutants from contaminated fish.
- f. Develop mathematical models for predicting the rates of elimination of chemical contaminants during depuration in clean water and/or dilution of contaminants by growth in clean water and using clean feed following the wastewater growth phase. Expand these models to include the economic feasibility of these processes.
- g. Develop full scale depuration techniques and, if necessary, post-exposure growth techniques, and determine (1) their effectiveness in reducing the levels of contaminants and (2) their limitations.
- h. Compare levels of contaminants in fish directly produced in treated wastewater with contaminant

levels in fish which were produced from planktons grown in treated wastewater (bioaccumulation from plankton feed). Determine the feasibility of achieving lower contaminant levels in fish by keeping them in clean water and feeding them plankton feed grown in treated domestic wastewater.

- i. Develop public health advisories and safety guidelines for the consumption of contaminated fish.

3. Cooperating Institutions:

- a. National Institute of Oceanography and Fisheries, Cairo, Egypt.
- b. Department of Fisheries, School of Agriculture, Ain Shams University, Egypt.
- c. High Institute of Public Health, Environmental Health, Alexandria University, Egypt.
- d. Environmental Health Laboratory, The Hebrew University, Jerusalem, Israel.
- e. Environmental Health Program, School of Public Health, The University of Michigan, Ann Arbor, Michigan, U.S.A.

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4. Schedule:

Major Activity	1st Year	2nd Year	3rd Year
I. <u>Data Bank:</u>			
Planning Design	+ + +		
Data Collection		+ + + +	+ + + +
Training/Workshop			+
Manual/Reports		+	+
II. <u>Screening Fish Contaminants:</u>			
Establish Measurement Program	+ + +		+ +
Sampling/Measurements		+ + + +	+ + +
Data Analysis/Reports			+ +
III. <u>Fish Decontamination:</u>			
Preparation of Experiments	+ + +		
Laboratory Tests		+ + + +	+ + +
Field Tests		+ + + +	+ +
Data Analysis/Reports			+ +
IV. <u>Risk Ass'ment/Health G'lines:</u>			
Model Development	+ + + +	+ +	
Exposure Assessment		+ + + +	
Health Guidelines			+ +
		+ +	+ + + +

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