

I. PROJECT IDENTIFICATION

1. PROJECT TITLE  
**East African Fisheries Research**  
 618-11-995-649.2

APPENDIX ATTACHED  
 YES  NO

2. PROJECT NO. (M.O. 1025.2)  
**PD-AAK-302-B1**

# 104

3. RECIPIENT (specify)  
 COUNTRY \_\_\_\_\_  
 REGIONAL \_\_\_\_\_  INTER-REGIONAL \_\_\_\_\_

4. LIFE OF PROJECT  
 BEGINS FY 73  
 ENDS FY 77

5. SUBMISSION  
 ORIGINAL  
 REV. NO. 2 5/29/75  
 DATE \_\_\_\_\_  
 CONTR./PASA NO. \_\_\_\_\_

II. FUNDING (\$000) AND MAN MONTHS (MM) REQUIREMENTS

A. FUNDING BY FISCAL YEAR	B. TOTAL \$	C. PERSONNEL		D. PARTICIPANTS		E. COMMODITIES \$	F. OTHER COSTS \$	G. PASA/CONTR.		H. LOCAL EXCHANGE CURRENCY RATE: \$ US (U.S. OWNED)		
		(1) \$	(2) MM	(1) \$	(2) MM			(1) \$	(2) MM	(1) U.S. GRANT LOAN	(2) COOP COUNTRY	(3) BUDGET
1. PRIOR THRU ACTUAL FY	369	240	98	70	84	59		240	98			121
2. OPRI. FY 75	13					13						2034
3. BUDGET FY 76	375	300	98	30	36	20	25	300	98			162
4. BUDGET +1 FY 77	60	20	4	10	12	5	25	20	4			179
5. BUDGET +2 FY												
6. BUDGET +3 FY												
7. ALL SUBQ. FY												
8. GRAND TOTAL	817	560	200	110	132	97	50	560	200			2496

9. OTHER DONOR CONTRIBUTIONS

(A) NAME OF DONOR	(B) KIND OF GOODS/SERVICES	(C) AMOUNT

III. ORIGINATING OFFICE CLEARANCE

1. DRAFTER <b>George W. Ramsay</b>	TITLE <b>Project Manager</b>	DATE <b>4/20/75</b>
2. CLEARANCE OFFICER <b>Charles Husick</b>	TITLE <b>RDOEA</b>	DATE <b>4/21/75</b>

IV. PROJECT AUTHORIZATION

1. CONDITIONS OF APPROVAL  
 Submission within 90 days from date of authorizing cable, appropriate Percy Amendment statement as per the authorizing cable.

2. CLEARANCES

BUR/OFF.	SIGNATURE	DATE	BUR/OFF.	SIGNATURE	DATE
AFR/ESA	JKnoll	5/22/75	GC/AFR	TBork (draft)	5/22/75
AFR/DP	RHuesmann	6/4/75	TA/AGR	JUrano (draft)	5/17/75
AFR/DS	Plyman	5/28/75	PPC/DPRE	IISharlach (draft)	5/28/75

3. APPROVAL AAS OR OFFICE DIRECTORS TITLE <b>Samuel C. Adams, Jr.</b> DATE <b>6/5/75</b>	4. APPROVAL AID (Use M.O. 1025.1 VIC) SIGNATURE _____ DATE _____
TITLE <b>Assistant Administrator for Africa</b>	ADMINISTRATOR, AGENCY FOR INTERNATIONAL DEVELOPMENT

Project Title: East African Regional Veterinary Research Project  
 511-11-110-000 (originally 511-11-110-002)

Original PROP approved for implementation in FY72 (implementation began May 1973 with arrival of the first OPEX technician).

Life of Project: 4 years (May 1973 to September 1977)

Project Revision: 2 years (July 1975 to September 1977)

PAGE I

Summary and Recommendations

1. Project Revision Development

George W. Ramsay, Project Manager (Agriculture), 20501 15th Ave

Consultant Evaluation Team: Dr. W. D. Davies, University of Guelph  
 Dr. G. H. Snelson, University of Rhode Island

This revision was developed under the guidance and supervision of Dr. John G. ...  
 Director, East African Regional Veterinary Research Project (EASPRO).

2. Grants

The grants for this project are from the East African Community (EAC). The implementing agency is the East African Veterinary Research Project Organization, a regional organization of the East African Community.

3. Total Project Funding Requirements

Year	Original PROP		Revision		Total		Total
	1973-74	1974-75	1975-76	1976-77	1973-74	1974-75	
1973-74	369	240	98	70	39	90	21
1974-75	75	13			13		34
1975-76	76	375	300	90	30	20	52
1976-77	77	60	20	4	30	5	75
<b>Total</b>	<b>637</b>	<b>688</b>	<b>418</b>	<b>164</b>	<b>102</b>	<b>115</b>	<b>135</b>

BEST AVAILABLE DOCUMENT

# BEST AVAILABLE DOCUMENT

## 4. Change in Project Name

Beginning with FY76, this project will be shifted from the Education/Human Resource Development Sector to the Food and Nutrition sector. Effective July 1, 1975, this project will be identified by project number G18-11-110-660. The project title remains "East African Freshwater Fisheries Research."

## 5. Description and Justification of Project

### A. Project Description

#### Background

Lake Victoria, the second largest lake in the world, with a surface area of 66,635 square kilometers lies on a plateau between the eastern and western series of rifts in East Africa. The countries of Kenya, Uganda, and Tanzania border the lake with Kenya occupying eight percent, Uganda 42 percent, and Tanzania 50 percent of the lake area. Since the five Partner States of the East African Community control the entire lake, its development and use represent both a challenge and opportunity for increasing regional cooperation.

The importance of the lake to the nutrition and economies of the East African states is shown by the fact that freshwater fish represents the largest single source of animal protein consumed in East Africa. Kenya, one of the Partner States, relies on beef instead of fish as a primary source of animal protein.

Presently, almost all fishing is done by traditional fishermen using canoes and improved synthetic nets. Due to the introduction of the improved nets and an increase in the number of fishermen, the pressure on the traditional fishing grounds has increased and the catch is declining. Approximately 50 to 70 thousand people are dependent upon this industry. They harvest about 110 thousand metric tons of fish valued at 35 million shillings annually.

The major problem in expanding and developing the Victoria fisheries industry is the need to protect the livelihood of the traditional fishermen while expanding the harvest of fish from the deeper areas of the lake. It is assumed that the inshore (traditional) fishing grounds constitute 19 percent of the total surface area of the lake and contain 30 percent of the fish within the lake. During a 110 year period (1937-1979), the FAO carried out a research program and determined that there were approximately 200 thousand metric tons per year of fish available for harvesting in the lake's deeper waters. The East African states, in an attempt to increase their dependence on mechanized fishing by increasing the catch, development of the deep water fisheries on a lake the size of Lake Victoria requires vessels similar to ocean fishing trawlers. Tanzania and Uganda are planning to establish such trawlers on the lake. (Tanzania, which has a long history of trawler fishing, has two

50-foot, 10 ton trawlers that started fishing out of Mwanza in March 1975. Two more trawlers are now being substituted for use on the lake starting around June 1975 and four more boats are now under construction in Denmark.) The effect the trawlers will have on the deep- and inshore-fishing grounds is not known and the future of the traditional canoe fisherman could be very much in doubt. Research is urgently needed to protect the traditional fisherman while the transition from a traditional to a mechanized fishery is underway.

The development of the lake's resources is the responsibility of the individual countries. However, their national fisheries departments are basically management organizations that register and license fishermen and canoes, collect fish catch data, enforce regulations on fishing gear and nets and conduct some extension work on improved methods, gear and equipment. The only research being conducted by the fisheries departments of the Partner States deals with fish processing and marketing. The Partner States have established the Lake Victoria Fisheries Commission to advise on, and coordinate, the lake's development. In addition, the East African Freshwater Fisheries Research Organization, an agency of the East African Community, is charged with carrying out the research required for the proper management of the lake's freshwater fisheries; and East Africa looks to EAFRO as the only organization capable of performing the research needed to develop and expand the fishing industry on the lake.

EAFRO was founded in 1960 and became a part of the AID upon ratification of the Treaty for East African cooperation in 1967. EAFRO's headquarters are located in Jinja, Uganda, and substations have been established in Mwanza, Tanzania, and Kisumu, Kenya. A major building program is now underway to develop permanent offices and housing at the substations.

AID has assisted EAFRO's research efforts for the past two years. During this time, three AID-funded fisheries biologists and one statistician have been assigned to EAFRO's substations in Tanzania and Kenya. As part of this effort, an AID-funded evaluation team reviewed the project in November 1974. This team recommended a shift in emphasis in some of the research now being performed under the original project. This project paper modifies the original project in light of the findings of the evaluation team and two year's experience in working with EAFRO. The individual revisions total a major change in the project direction. The earlier EOP defined the ongoing research in terms of passive and active fishing gear and named a "classical" approach to fisheries research. The proposed revision shifts the focus of the project from fishing gear to fishing zones, i.e., inshore and offshore, and from a classical to a problem solving approach.

The change in EAFRO research philosophy from a classical to an applied approach implied by EAFRO's acceptance of this revised project will promote greater cooperation between the national and regional organizations. EAFRO will be able to respond quickly to the immediate problems faced by the national fisheries departments and thus be of more service to the Partner States.

Project Goals and Objectives

The overall goal is to help the East African Community and its Partner States carry out research programs aimed at the development, harvesting and protection of fish stocks on Lake Victoria to assure a continuous and increased supply of animal protein for the people of East Africa.

The revised project objectives will assist the East African Fisheries Research Organization design and implement initial stages of research aimed at solving urgent problems in the development and management of the fisheries industry, i.e.:

1. evaluate and make recommendations for protecting and extending the range of traditional fishermen,
2. measure the effect of the expanding mechanized fishery on the traditional fishermen by: (a) expanding the fish tagging program to distinguish subpopulations from the inshore and offshore areas, (b) assessing the catch per unit of effort, (c) determining species composition of catch, (d) determining areas to be fished, (e) assessing traveling costs and earnings, and (f) assessing market impact,
3. recommend specific regulations to guide the Partner States in the transitional period from a traditional fishery to a mechanized fishery,
4. train EAFRO staff to continue fisheries research after the departure of U.S. technicians.

The above represents a revision of the objectives set forth in the original FROP. This revision is a result of the consultant's report and recommendations for the future of the project. These objectives have been discussed with and agreed to by Dr. John Okedi, Director, EAFRO. It is felt these objectives more clearly define the urgent problems facing the development and management of the Lake Victoria fisheries.

(B) Project Justification

Freshwater fish represent the largest single source of animal protein consumed by the population of East Africa. More than 250,000 tons of freshwater fish were marketed in East Africa in 1968. Estimated East African production of beef, the next largest animal protein source, during the same year was 185,000 tons. Per capita fish consumption in Uganda is estimated at 2.5 times that of beef. Tanzania currently consumes slightly more freshwater fish than beef. Only Kenya, which has the least per capita fish consumption in East Africa, consumes more beef than fish. According to their 5-year plans, Kenya and Tanzania expect freshwater fish production to grow three times as fast as beef production. These countries estimate a nine percent annual growth in freshwater fish production against a three percent annual growth in beef production. Uganda projects similar annual freshwater fish production increases during the next few years.

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The need for development and expansion of the fisheries industry, thereby increasing the availability of animal protein, becomes very clear when the population growth now irreversibly underway in East Africa is considered. Kenya, with a growth rate estimated at 3.3 to 3.5 percent, has one of the fastest growing populations in the world. Tanzania and Uganda, while not matching Kenya's population increase, have estimated growth rates of 2.7 to 3 percent respectively. In the 10-year period 1965 to 1975 it is estimated that East Africa's population has risen from 38 to 58 million people and the rate of growth has continued throughout the area. A doubling of the region's population by the end of the century is not considered an impossibility.

The need, in the next 25 years, to meet the protein requirements of a population twice as large as today is the basic justification for the Freshwater Fisheries Research Project.

However, while Lake Victoria is reportedly able to support the harvest of 200 thousand metric tons per year of fish in its offshore waters which could double the amount of fish available for the East African population within the next few years, there are potential dangers involved in harvesting of the offshore fish. It is not known whether concentrated fishing in the offshore area will have a detrimental biological, economic or social effect on the traditional canoe fishing industry now extending throughout the shore areas. Rapid development of the offshore fishery could cause severe damage to the traditional fishery.

Thus, before the states of East Africa can safely harvest the additional 200 thousand metric tons of fish a year, considerable research must be undertaken to establish the relationships between the shallow and deep water fisheries, and to minimize the effects development of the deep water fishery may have upon the traditional fishery. The revised Freshwater Fisheries Research Project is designed to furnish the information needed for the development and expansion of the fisheries industry.

#### Specific Project Revisions

To date, AID assistance to IADPFO consists of three fisheries biologists, a fisheries statistician, participant training, and a limited amount of needed commodities. The fisheries biologists have been conducting research on age and growth of important species of Lake Victoria fish, passive gear (gill nets), active gear (trawling and beach seines), basic biological characterization of fished stocks, and a fish tagging program. The fisheries statistician has been preparing test data from commercial landings in Tanzania, Kenya, and Uganda, plus experimental trawling data by the IADPFO for computer summation and analysis. It appears that this important activity will be completed by January 1976.

The following are details of the recommended project revisions:

a. Inshore Fisheries Research--Formerly Age and Growth Studies

The research conducted by the U.S. Fisheries biologist at Kilimanjaro will be modified as follows:

1. development of methodologies for age determination will take a lower priority;
2. the fish tagging program will be expanded to include Tanzanian waters;
3. the fish tagging program will be coordinated with the existing inshore and offshore trawling operation.

Other responsibilities of the fisheries biologist will be:

1. the study and evaluation of the practicality of light inboard trawlers for inshore fishing in the Kivirozo Gulf;
2. making recommendations for the gradual mechanization of the inshore canoe fishing industry in the Kivirozo Gulf.

b. Inshore Fisheries Research--Formerly Passive Gear Research (gill netting)

The research at the Kilimanjaro substation conducted by the U.S. Fisheries biologist will be continued with the following responsibilities and modifications:

1. a fish tagging program for Tanzanian waters;
2. the study and evaluation of the practicality of proposals for light inboard trawlers for inshore fishing in Tanzanian waters;
3. collection of research data and book pointing which will tie into the fish tagging program to be conducted by this technician;
4. making recommendations for the gradual mechanization of the Tanzanian inshore canoe fishing industry.

c. Offshore Fisheries Research--Formerly Active Gear Research (trawling)

Research by the U.S. Fisheries biologist will be continued with increased emphasis on monitoring the expanding mechanized fishery through assessment of catch per unit of effort, catch characteristics of the species, areas fished, trawling costs and earnings, and the market's impact and its effect on the earnings of traditional fishermen.

d. Biological/Statistical Research--formerly Statistical Analysis

The statistical analysis conducted by the U.S. fisheries statistician will be continued as planned. The statistician has been conducting his own research project in statistical analysis, and providing statistical services to other EAFRO research projects.

The research project conducted by the statistician covers the following:

1. assembling 40 years of fisheries catch records from various agencies and government fisheries departments into a single data bank,
2. assessing the extent to which present fishing levels are depressing the fishery and which fishing gear is most harmful,
3. identifying the cycles of weather, fish catches, fish prices, and other economic factors and their associations with each other,
4. identifying fisheries management needs on Lake Victoria.

The statistical service work for other EAFRO research projects includes:

1. analysis of catches from EAFRO's members,
2. summarizing and analyzing of the continuing fisheries surveys in Kenya and Tanzania,
3. summarizing and analyzing of bowtie shooting studies done on other East African lakes.

Forty thousand computer cards containing fish catch data in Lake Victoria have already been punched for the data bank. The card punching is 80 percent complete. The data on the computer cards is being analyzed to reach objectives 2 and 4 above and are expected to reach the final report stage by the end of the U.S. statistician's proposed six-month extension of tour (January 1976).

For the continuation of the project, the U.S. statistician will be replaced by a fisheries biologist/statistician at the Miami substation. A three-month overlap between the statistician and the fisheries biologist is programmed to facilitate the hand over of the statistician's servicing functions to the new man.

The new fisheries biologist/statistician should have a strong background in statistical methods so that he can carry on the statistical services required by other EAFRO research projects. He will also continue updating the data bank from information collected by EAFRO and the Partner States' fisheries departments and conduct an annual statistical analysis of trends in the fishery of Lake Victoria. It is expected that this statistical service work would occupy approximately 40 percent of his time. The other 60 percent would be used to conduct research as follows:



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1. biological studies on the common species of Haplochromis, the fish that make up over 90 percent of the catch in the offshore trading and almost 50 percent of the inshore catch. Little is known of this species;

2. population dynamics of the Haplochromis species;

3. migration, reproduction, species composition, and growth studies of Haplochromis;

4. collection of Haplochromis catch data for both inshore and offshore commercial fishing;

5. make recommendations for the systematic harvesting of Haplochromis on Lake Victoria.

a. Fisheries Economics

A U.S. fisheries economist will be required to interpret the data collected by both the inshore and offshore fisheries research projects. This economic research will cover relationships between prices in species and size of fish, economics of mechanized fishing vs traditional fishing, trawling costs and earnings, and the market impact of mechanized fishing. These economic analyses will be conducted on a consultant basis with the consultant spending one month out of each six-month period during the next two years in East Africa. During his first visit in early FY76, the fisheries economist will prepare the design and plan for his research program and advise the U.S. fisheries biologists of the type and form of data to be collected in his research. This approach to a fisheries economic study was suggested by the education team and EDOEA and IAFPRO concur in its feasibility.

Participant Training

The fisheries biologists have completed training in the U.S. and three new participants are scheduled to begin training in September 1975. A total of 11 man-years of participant training is included in this project. The participants beginning their training in September 1975 include a fisheries biologist, a water quality and pollution specialist, and a bio-statistician. All five participants will obtain masters degrees at U.S. universities. The participant training program is designed to replace the AID technicians in the four positions where they are assisting IAFPRO plus provide a graduate to assume the limnology responsibilities for IAFPRO. All participant training will be completed by the end of the project.

Commodities

AID is assisting IAFPRO in the establishment of the institutions at Kisumu and Mwanza by furnishing a limited amount of commodities for their biology

Laboratories. In FY74 commodities valued at \$20,000 were requested by EAFPRO for AID purchase. In the interim between the time of request and actual purchase, inflation and rising costs of transportation have required an additional obligation in FY75 of \$13,000 to cover increased costs. All commodities purchased under U.S. procurement can be serviced and maintained by EAFPRO through facilities available in Nairobi, Kenya. For FY76 and FY77, \$25,000 have been budgeted to purchase additional commodities required as a result of changes in this revised project paper.

## PART II

### 1. Project Background

The Freshwater Fisheries Research Project (FRP) was developed in May 1970 and approved on July 23, 1971. Implementation of the project was scheduled for FY72, but was delayed until FY73 due to the situation in Uganda. Originally, three of the four U.S. technicians were to be posted to Jinja, Uganda. However, with the withdrawal of all USAID personnel from Uganda this was not possible. EAFPRO then took steps to establish substations in Kisumu and Mwanza and approval was given for two U.S. fisheries biologists to be posted at Mwanza and one fisheries biologist and the fisheries statistician to be posted at Kisumu.

Temporary offices, laboratories and housing were leased in Kisumu and Mwanza to establish the substations as quickly as possible. A limited amount of fishing equipment, laboratory and office supplies and equipment were sent to Mwanza and Kisumu to help start the research activities. Considerable logistical problems existed at first. EAFPRO was a centralized organization with all activities centered in Jinja. Decentralization of EAFPRO involved changing many financial and administrative procedures as well as sharing supplies, equipment, library, boats, etc. These major problems were dealt with during the first year of operation, FY74, and the substations are now running smoothly.

Under these circumstances the research described in the original project paper was started. Progress to date has been uneven due to the problems involved in creating a new organizational structure, as described above, while attempting to begin a new research program. In addition, differences in the ability of both American and East African personnel to cope with an evolving organizational environment while attempting to carry out their research work resulted in a further unevenness of progress.

Soon after the arrival of the U.S. technicians and their EAFPRO counterparts (May-September 1973), a detailed plan of work was developed for each research activity. A commodity list was also developed to supplement the limited laboratory supplies and equipment, and books and periodicals were also ordered from the U.S.

EAFFRO is presently (FY76) investing almost \$2 million in development of the substations in Mwanza and Kisumu. New office and laboratory blocks are under construction at both locations plus senior and junior houses for the staff. A new research vessel has been purchased for Mwanza and another is being refurbished for use at Kisumu. The research fisheries trawler is now scheduled for use one month of each quarter in both Mwanza and Kisumu. With the arrival of the U.S. commodities, the substations at Mwanza and Kisumu will be fully operational in their new quarters at the beginning of 1976.

In keeping with the special provisions of the project authorization, an evaluation consultant team came to East Africa in November 1974 to determine the advisability of continuing the project and/or recommend desirable changes in the research project. This evaluation has lead directly to the revision, in focus and scope, of the original project. The details of the revision were presented in part I and constitute a major change in EAFFRO's and AID's approach to the research problems involved.

#### Prior AID Assistance

The only previous AID assistance to the freshwater fisheries in East Africa was a bilateral fisheries project with the Government of Kenya from 1965-1970. This project was a fisheries extension project with one U.S. fisheries technician posted to Kisumu. The U.S. technician worked with the Kenya Fisheries Department, Extension Section, at Kisumu to demonstrate the new fishing techniques and equipment (mostly synthetic fishing nets) available for their use to the traditional fishermen of the Kenyan coast. The success of this project can be seen everywhere in the Gulf of Aden. Most 100 percent of the fishermen are now using synthetic nets. This, however, has had a serious detrimental effect as well. The Gulf is now overfished and the 13,000 fishermen in the area are suffering from decreasing fish catch. If the effect of the new fishing techniques had been monitored, the overfishing might have been averted.

#### Other Donor Assistance

##### UNDP/FAO Lake Victoria Freshwater Fisheries Project

This project ran from 1967 to 1972 and was cancelled as it was to begin its second phase of research. The first and completed phase of their work involved obtaining rough estimates of the magnitude, location and species composition of the fish stocks, their potential yield, and the evaluation of gear that might be used for harvesting these stocks. The researchers also examined the economic feasibility of trading for the offshore *Trichopteryx* stocks and processing the resultant catch. As a result of this research, it was estimated that 200 thousand metric tons per year could be harvested from the offshore waters on a continuous basis.

During December 1974, the UNDP sent a consultant team to East Africa to determine the feasibility of continuing the research on Lake Victoria. The results of the consultant team have not been released. However, it is believed that there will be only very limited if any assistance given for the Lake Victoria research in the next two years.

### Norwegian Technical Assistance

A Norwegian technical assistance project was conducted from 1970 to 1972 to study the socio-economics of the potential impact of trading on the existing fisheries on the Kenyan waters of Lake Victoria. This study involved two Norwegian sociologists plus the training of one master fisherman for EAFRO. The study predicted that a sophisticated trader and fish meal operation would have a substantial, negative social and economic impact on existing fishing communities. Further research as proposed in this project is required to substantiate these findings and develop a course of action that would minimize the effects of the traders upon the traditional fishermen.

### Swedish Assistance

The government of Sweden contributed one Fisheries Biologist for work at EAFRO during the year 1969-70.

In looking into the future of donor assistance to EAFRO, AID appears to be the only donor that will definitely be assisting EAFRO.

## 2. Project Analysis

### a. Technical Analysis

The technology for conducting research on outdoor insect I in well-known world-wide. East African situations of this technology are presently underway. An example of this application is the applied research studies on Eilania conducted at Kiwira where it was determined that the technology of previous world-wide basic research information on age and growth of Eilania is applicable to Lake Victoria. In most cases, the basic research on the major species of fish conducted outside of East Africa can be used as a base from which to conduct applied research on the same fish species on Lake Victoria. To make this basic research information available for fisheries biologists working on Lake Victoria, AID has included in its commodity program complete sets of research journals, publications and books.

Methodology and techniques to be used in achieving the objectives of the revised project are well-known in East Africa. EAFRO research men and U.S. technicians are capable of preparing the research designs required to achieve these objectives. The laboratory will be adequately equipped and staffed and the availability of research vessels will make the achievement of the research activity targets feasible and possible.

The technical contributions proposed in the "Technical Consultants' report have been reviewed. The technical system has improved and is considered adequate, research vessels are now available on a scheduled basis, and repair and maintenance of laboratory equipment can be accomplished in Kenya. Participant training activities have been established and are being implemented. This ensures that EAFRO will have trained personnel capable of using the technology involved to continue the research when AID-funded personnel are withdrawn.

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b. Social Analysis

The revised Freshwater Fisheries Research Project is designed to help avert a potential social disaster from taking place on the shores of Lake Victoria. It is clear that the expanded fisheries industry will depend upon mechanization. If this mechanization is allowed to move ahead without any knowledge of and concern for the probable consequences, the effect upon the traditional canoe fishermen and the fishmongers around the lake could easily be a disaster. In order to protect the traditional fishermen and maintain the established efficient marketing system, research is needed on the alternate transfer fishing will have on traditional fishing grounds and on ways to extend the range of traditional fishermen and improve the storage and distribution of their catch. This will increase quantity and quality of fish marketed by traditional fishermen and allow them to compete with the mechanized transfer fishermen.

Some areas of Lake Victoria, such as the Kinyondo Gulf near Kisumu, have been badly overfished. The income of traditional fishermen in these areas has been reduced to the level of an unskilled laborer. Either way fishermen whose families have relied on fishing for their livelihood over ten centuries will be forced to find other employment, or they may be assisted in extending their fishing range to less intensively fished areas of the lake using improved techniques and equipment.

It is hoped the research outlined in this revised project paper will allow the Partner States to develop policies that will maintain the livelihood of the traditional fishermen at or at least above the level to which they are subjected during the transition from a traditional to a mechanized fishing industry.

c. Financial

1. Besides its semi-autonomous Corporations, the EAC is divided into several secretariats including the Secretariat for Co-ordination, Research and Social Services under which SARECO operates. These secretariats operate on revenues derived from the customs and excise fees collected on behalf of the Partner States by the EAC. After the payments for the organizations within the EAC are approved, the total amount is deducted from the customs and excise revenues and the balance is distributed among the three Partner States.

2. Budget development in the EAC follows somewhat the same lines as ACP budget development. In February of each year, all departments within the Community are required to submit their budget estimates for the coming financial year. The EAC financial year is the same as ACP's, i.e., July 1 to June 30 of the following year. The budget estimates submitted by all departments in the Community is reviewed by the Finance and Administration Secretariat during the months of March and April. A proposed budget is then prepared by the Finance and Administration people during the month of May. In June of each year, the proposed budget is presented to the East African Legislative Assembly. Upon approval of the budget, the allocation of funds takes place at the beginning of the financial year. Supplementary budget adjustments can be made during the financial year. These adjustments are usually made during the months of October and November.

EAFFRO follows the same budgetary discipline and has been extremely fortunate in receiving the full amount requested by the institutes in their budget estimates over the past several years. In preparation for the coming financial year--1976--EAFFRO has already submitted budgets to the EAC covering the expenses anticipated for establishing the subprojects proposed in this revision of the project paper. It is anticipated, as in the past, that these budget estimates will be approved and ample money will be made available for carrying out the proposed project.

3. EAFFRO has made the greater contribution to the overall project. The total projected contribution by EAFFRO for the life of the project is \$2,613,000 compared to an AID input for the life of the project of \$817,000. This sizeable monetary input by EAFFRO is due primarily to the construction costs of the two EAFFRO substations at Mwanza and Kisumu. Total cost of the construction of the substations is approximately \$3,700,000. In addition, for a total cost of approximately \$300,000, EAFFRO has purchased a pre-erected vessel for the Mwanza substation and is fabricating a reactor vessel for use at the Kisumu substation.

A breakdown of cumulative contributions by fiscal years is as follows:

	USAID	EAFFRO
FY 73	\$270,000	\$112,000
FY 74	90,000	182,000
FY 75	15,000	2,033,000
FY 76	37,000	166,000
FY 77	60,000	178,000

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The budget estimates for EAFFRO projected through FY 77 were arrived at by assuming a continuation of the present level of financial support to EAFFRO by the East African Community.

#### d. Administrative Ability

EAFFRO is considered administratively to be an efficient and capable organization. Proof of its administrative ability is the manner in which it was able to carry out the design, location of the facilities and other administrative responsibilities in respect of the two substations at Mwanza and Kisumu. Another example of its administrative ability is the way EAFFRO was able in only one year to complete all the administrative arrangements and obtain the necessary findings for the construction of a major building program at the EAFFRO substations.

The greatest potential weakness of EAFFRO is its inability to recruit and keep superior scientists due to inferior salary structure relative to some other research establishments in East Africa. Another weakness is the excessive time required to make major changes in research programs because cumbersome EAC policies limit response to changing problems and opportunities. EAFFRO is required by its charter to carry out the research assigned to it by the Partner

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Financial Summary  
(US Dollars)  
\$000

Category		FY 73	FY 74	FY 75	FY 76	FY 77	Sub Total	Total
Personnel	USAID	230 <sup>1/</sup>	10 <sup>2/</sup>		305 <sup>1/</sup>	20 <sup>2/</sup>	560	854
	RAFFRO	48	48	66	66	66	294	
Participant Training	USAID	40	30		30	10	110	140
	RAFFRO	11	8		8	3	30	
Commodities	USAID		59	13	20	5	97	443
	RAFFRO	17	24	230 <sup>3/</sup>	29	46	346	
Land and Structures	USAID							
	RAFFRO	27	33	1,704 <sup>3/</sup>	34	34	1,842	1,842
Travel, Per Diem, and other Costs	USAID				25	25	50	151
	RAFFRO	9	9	25	23	23	101	
TOTAL	USAID	270	99	13	375	60		817
	RAFFRO	112	122	2,035	166	178		2,613
GRAND TOTAL		382	221	2,048	541	238		3,430

1. Funding contract for two years (8 man years) -
2. Contract consultants including fisheries economist
3. RAFFRO construction at Kisumu and Mwanza: complete substation including office/lab building, senior and junior staff quarters and dock
4. Includes new research vessel for Mwanza, refurbishing research vessel for Kisumu, office and lab furniture and household furniture.

States and cannot expand or narrow its scope of activities as it pleases. The problems of recruitment and ability to respond to pressing problems are not uniquely EAFPRO's but reflect the political strains to which all the Community organizations are exposed. EAFPRO's leadership is aware of the difficulties these problems are causing but they do not have the power to change the Community's salary structure or decision making processes.

Even with these problems, EAFPRO is considered fully operational with capable personnel and leadership and generally adequate facilities and budget. It has the capacity and authority to conduct the research proposed in this project efficiently. No changes are needed in EAFPRO's existing administrative systems to support the research set forth in this revised project paper. IDCEA foresees no threat to successful project implementation arising from administrative problems.

### 3. Project Implementation

#### A. Project Implementation Plan

1. Direct management and monitoring responsibilities for the project within AID will rest with a direct-hire project manager located in the Regional Development Office for East Africa (RDEOA), Arusha, Tanzania. It is expected that the same project manager will be responsible for the East African Food Crop Research Project.

#### 2. Technical Services

Technical services under this project will be provided through an OMB contract. Under terms of this contract, the U.S. personnel working on this project will be under the direct supervision of the Director of EAFPRO. All regulations and requirements of personnel working for the East African Community will apply to the OMB personnel. In addition to an employment contract with the contracting office in the United States, the U.S. technicians will also be required to sign a contract with the EAC.

A total of 5 U.S. scientists will be provided throughout the life of this project for a total of 16 man-years of service. During the first two years of the project, AID provided two fisheries biologists in Kenya and a fisheries biologist and a fisheries statistician in Kenya. As mentioned previously, the fisheries statistician will be extended for six months (until January 1973) to complete his statistical research project. He will be replaced by a fisheries biologist/statistician who will carry on the statistical services for the other EAFPRO research activities as well as carry out a biological research project on *Harlequin*. The U.S. fisheries biologist at Kenya during the first two years of the project has been requested to and has agreed to return for a second two-year tour. Of the two research biologists at Kenya, one resigned effective 1 February 1972 and the other was not requested by EAFPRO to return for a second tour.



Immediately following the approval of this revision of the project paper, recruitment should be started for the two U.S. fisheries biologists to be posted at Mwanza. Continuation of ongoing research at Mwanza is extremely important. As mentioned, one position was vacated in February 1975, and the other position will be vacated in April 1975. It is urgent that these positions be filled as soon as possible.

Recruitment of the U.S. biologist/statistician should start immediately to time his arrival for September 1975, thus allowing the 3-month overlap needed for taking over the statistical responsibilities from the U.S. fisheries statistician. Due to the expected research workload and the birth of his first child around the end of his tour, the fisheries biologist at Kisumu has requested a three-month extension of his tour before taking home leave, followed by return to Kisumu for a second tour.

To assist EAFVRO in its need for guidance in economic research, a consultant will be required to come to East Africa for one visit in each six-month period during 1976 and 77 for a total of two years duration of consultant services. The fisheries economic consultant should be given a letter of contract covering his four visits to East Africa.

### 3. Contracting Organization:

RDOEA has been notified by AFD/Management Dept. that the existing contract between AFD and the Transfrontary Corporation has expired and a new contractor, the Near East Foundation, will handle the 1976 and 1977 personnel requirements. RDOEA recommends that the six-month extension of fisheries statistician at Kisumu, Dr. Gerald Martin, be funded under the Transfrontary contract from savings incurred in the resignation and early departure of Mr. Allen Barker from Mwanza.

RDOEA requests that immediately following the approval of this revised project paper, Near East Foundation be contacted and a task order be written for the technical services described above.

### 4. Participant Training:

This project provides a total of \$110,000 to be used for training five participants in the United States to a masters degree level. Two of these participants, fisheries biologists, have completed their training and three are scheduled to begin training in September 1975. All participant training will be completed by the end of this project. Participant training has been designed to replace the U.S. scientists with East African scientists to continue the ongoing research. In addition to these two positions, the project also is training one man in water quality and pollution to allow EAFVRO to respond to requests from the Partner States. For scheduling of the above named participants and further details, please see the schedule on page 18. All participant training will be completed by the end of this project.

USAID Staff Pattern

Position	FY74	FY75	FY76	FY77	FY78
Fisheries Biologist (Mwanza) Inshore Fisheries Research	XXXX	XXXX	XXX	XXXX	X
Fisheries Biologist (Mwanza) Offshore Fisheries Research	XXX	XXX	XXX	XXXX	X
Fisheries Biologist (Kisumu) Inshore Fisheries Research - Dr. J. Rinne	XXX	XXXX	XXXX	XXXX	X
Biostatistician (Kisumu) Statistical Research - Dr. J. Norton	XXXX	XXXX	XX		
Fisheries Biologist/Statistician (Kisumu) Biological (Malochromis) Research and Statistics			XXX	XXXX	X

NOTE: The new fisheries biologist for Kisumu should arrive three months before departure of the bi-statistician to allow for hand over of statistical responsibility.

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Participant Training Schedule

Job Title	Total No.	Degree Required	FY72	FY73	FY74	FY75	FY76	FY77
Fisheries Biologist (David Osonodongo)	30	M.Sc.	XX	XXXX	XXXX			
Fisheries Biologist (John Maranon)	24	M.Sc.		X	XXXX	XXX		
Fisheries Biologist (John Manjala)	30	M.Sc.				XXX	XXXX	XXX
Water Quality and Pollution (Joseph H. M. Chale)	24	M.Sc.				XX	XXXX	XX
Statistician (Dr. Moka)	24	M.Sc.				XX	XXXX	XX
<b>TOTAL</b>	<b>132</b>	<b>5 M.Sc.</b>	<b>6</b>	<b>15</b>	<b>24</b>	<b>30</b>	<b>36</b>	<b>21</b>
<b>NEW STARTS</b>			<b>1</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>
<b>CONTINUING</b>			<b>0</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>3</b>
<b>TOTAL</b>			<b>1</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>3</b>	<b>3</b>

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5. Commodities:

The total of the commodities purchased for the project is \$77,000. The original commodity list prepared by IIRMO and the U.S. technicians made available a limited amount of laboratory equipment and supplies for establishing fisheries laboratories at the new substations. Due to increased costs, resulting from inflation and increased shipping charges, an additional \$13,000 was obligated during FY75. To cover costs of additional commodities required as a result of this project revision, \$25,000 has been budgeted for the final two years of the project.

6. Other Costs:

According to recent information from AID/Washington, new OPEX contracts will be written to include the general provisions now granted to AID-direct hire personnel. As a rough estimate to cover the additional costs of general services support, \$25,000 has been budgeted for each year (FY 76 and FY77).

8. Evaluation Plan

1. Annual Work Plans:

In order to facilitate in-depth and detailed evaluation of this project, EAFPRO will prepare annually individual work plans in collaboration with each technician. Within 30 days after arrival in East Africa of the replacement personnel for this project, a plan will be submitted to EAFPRO and IDOEA outlining in detail the work for the coming year. These work plans from the individual technicians will be combined and presented to the Director of EAFPRO and the IDOEA project manager for their final approval. When intermediate targets and goals for the calendar year are agreed to and approval granted, a detailed implementation schedule will be prepared. This implementation schedule for each area of research activity will include both administrative and technical aspects of the project. The preparation of work plans and subsequent detailed implementation schedules on an annual basis will assist both EAFPRO and IDOEA by establishing measurable targets of achievement by which the project may be evaluated.

2. Annual Project Evaluations:

An annual project evaluation will be held at the end of each financial year. In the absence of an evaluation officer at IDOEA, the agriculture project manager will assume this function. In May of each year, the project manager will notify the Director of EAFPRO and any other interested parties to prepare themselves for the evaluation in the coming month of June. These individuals will be requested to gather pertinent data and information to be used in measuring against the detailed project implementation schedule, work plans, the logical framework, and any other documents and information used in establishing the project's targets. If deemed feasible on outside cooperation may be requested to join the evaluation team for the second evaluation. At the completion of the annual project evaluation, any criticism in the project paper or alterations to the work plans, will be prepared by the agriculture project manager in collaboration with the Director of EAFPRO.

3. End of Project Evaluation Consultant:

Three months prior to the completion of this project, a highly qualified fisheries consultant will be requested to come to West Africa to conduct an end of project evaluation.

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PART III

Logical Framework

A-1 Program or Subsector Goal:

On an ecologically and socially sound basis, increase the production, and thus the availability to the people of East Africa, of the animal protein contained in the freshwater fisheries of the region.

A-2 Measures of Goal Achievement:

1. Increased harvest, at a level that can be continuously sustained, of freshwater fish for human consumption.
2. Economic viability of the fishing sector maintained and opportunities available for the fishermen to move into the modern sector.

A-3 Means of Verification:

1. Records of actual fish catches and sales as compared to recommended levels contained in research results.
2. Economic and nutritional data from international and national statistical services.

A-4 Assumptions for Achieving Goal Targets:

1. Existing political support adequate to insure development of East Africa's freshwater fisheries on an ecological and socially sound basis.
2. Regulatory agencies strengthened to be able to supervise the development of freshwater fisheries.

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B-1 Project Purpose:

To assist the East African Community design and implement the research effort required to develop the fish resources of Lake Victoria on an ecologically and socially sound basis. Priority will be given to the problems involved in the exploitation of the offshore fishing grounds by modern trawlers and the effects offshore fishing may have upon the traditional inshore fishing industry.

B-2 Conditions that Will Indicate Purpose Has Been Achieved:

1. Existence of an ongoing research program capable of providing on a continuing basis the information required for the ecologically sound development of the Lake Victoria fisheries.

2. Adequate research information available to manage the lake resources, both in and offshore, in such a way that the traditional fishing industry is sustained while being encouraged to adopt more modern fishing techniques suitable for both the lake's ecological protection and the economic benefit of the fisherman.

3. Research program continuing under capable East African scientists after the departure of expatriate personnel.

B-3 Means of Verification:

1. Records of distribution of research results to concerned advisory and regulatory agencies.

2. Evaluation of EAFRO research focus and programs.

3. EAFRO staffing patterns.

B-4 Assumptions for Achieving Purpose:

Relations between the Partner States at a level that permits a joint development plan for Lake Victoria to be designed, agreed upon and implemented.

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### C-1 Project Outputs:

1. Recommendations to preserve and improve the economic viability of the traditional fishing industry.

2. An understanding of the effect the introduction of mechanized fishing on the lake is having on the traditional fishermen through results of a) an expanded fish tagging program, b) an assessment of the catch per unit of effort for both traditional and modern sectors, c) a determination of the species composition of the catch of both sectors, d) a determination of fishing grounds suitable for traditional, mechanized or joint exploitation, e) trawling costs and earnings, f) market impact of mechanized fishing upon the traditional fishermen.

### C-2 Magnitude of Outputs:

1. Expand the fish tagging program to Tanzania by Sept 7<sup>1</sup>/<sub>2</sub> and tag a total of 50,000 fish on Lake Victoria by Sept 77.

2. Make recommendations on the practicality of use of light inboard trawlers for inshore-fishing in Kenya and Tanzania waters by Sept 77.

3. Submit recommendations for the gradual rehabilitation of the inshore canoe fishing industry by Sept 77.

4. Establish the data bank on fish catch records by completing 50,000 computer cards and analyze this data to identify fisheries management areas and assess the extent to which present fishing levels are depressing the fishery by Jan 76.

5. Design and initiate a research program to monitor the expanding mechanized fishery on Lake Victoria by Sept 77.

6. Complete an economic study on the trawling costs and earnings, and the market impact and its effect on the traditional fisherman's earnings by Sept 77.

7. Initiate biological studies on the common species of Haplochromis and make recommendations for their systematic harvesting on the lake by Sept 77.

8. Complete the training of 2500 EAFRO scientists to replace U.S. technicians by Dec 77.

### C-3 Means of Verification:

1. EAFRO progress and research reports indicating status of individual research efforts.

2. EAFRO staffing patterns.

3. On site inspection of data bank, etc.

4. Project evaluations.

### C-4 Assumptions for Achieving Outputs:

Program outputs are realistic.

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D-1 Project Inputs:

USAID CONTRIBUTIONS: (3973-77)

Personnel-5 men, 16 months	\$ 560,000
Participants-132 men	110,000
Commodities	97,000
Travel, Per Diem & Other Costs	50,000
	-----
	\$ 817,000

HAFMO CONTRIBUTIONS:

Personnel-32 men	\$ 454,000
Participants	30,000
Commodities	346,000
Land & Structures	1,842,000
Travel, Per Diem & Other Costs	101,000
	-----
	\$2,613,000

D-2 Implementation Targets:

1. Personnel:

- replacement personnel for 3 U.S. Fisheries biologists arrive in Manzha not later than Sept 75,
- biologist/statistician arrives Manzha Sept 75,
- fisheries statistician leaves Manzha Oct 75.

2. Revised work plan and implementation schedule approved by USAID Oct 75 and Oct 76.

3. Complete status report received from Partner State by Dec 75.

4. Complete target outputs list received from Partner State by Dec 75.

5. Complete participant training program by Dec 75.

6. Arrival of all project commodities not later than Dec 76.

7. Completion of construction of buildings by Sept 75.

8. Continuous availability of research vessels for substation use beginning Sept 75.

9. Completion of the project by December 77.

D-3 Means of Verification:

- AID project agreements and FOCs.
- Project implementation plans.
- HAFMO and Partner State records and reports.
- Project Evaluations.
- On-site inspections.

D-4 Assumptions for Evaluating Results:

- Partner State support for HAFMO, as expressed in HAO budgets continues at least at the same level as in the past.
- AID inputs available in a timely effective manner.
- Adequate HAFMO manpower and equipment available.

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