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BUREAU FOR AFRICA  
CAMEROON

SMALL FARMER FISH PRODUCTION

PROJECT NUMBER: 631-0022

Action Memorandum

PAF II

PROJECT PAPER

AGENCY FOR INTERNATIONAL DEVELOPMENT  
**PROJECT IDENTIFICATION DOCUMENT FACESHEET**  
 TO BE COMPLETED BY ORIGINATING OFFICE

1. TRANSACTION CODE

A  
 A = ADD  
 C = CHANGE  
 D = DELETE

PID

2. DOCUMENT CODE

3. COUNTRY/ENTITY

4. DOCUMENT REVISION NUMBER

5. PROJECT NUMBER (7 DIGITS)

631-0022

6. BUREAU/OFFICE

A. SYMBOL AFR B. CODE 06

7. PROJECT TITLE (MAXIMUM 40 CHARACTERS)

SMALL FARMER FISH PRODUCTION

8. PROPOSED NEXT DOCUMENT

A.  3 2 = PRP  
 3 = PP

B. DATE MM YY  
 07 79

10. ESTIMATED COSTS  
 (\$000 OR EQUIVALENT, \$1 =

FUNDING SOURCE		AMOUNT
A. AID APPROPRIATED		45
B. OTHER U.S.	1. PC	87
	2.	
C. HOST COUNTRY		1.15
D. OTHER DONOR(S)		
TOTAL		2.47

9. ESTIMATED FY OF AUTHORIZATION/OBLIGATION

a. INITIAL FY 80 b. FINAL FY 82

11. PROPOSED BUDGET AID APPROPRIATED FUNDS (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. FIRST FY - 1980		LIFE OF PROJECT	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	H. GRANT	I. LOAN
(1) FN	B 143	077		90		450	
(2)							
(3)							
(4)							
TOTAL				90		450	

12. SECONDARY TECHNICAL CODES (maximum six codes of three positions each)

319

13. SPECIAL CONCERNS CODES (MAXIMUM SIX CODES OF FOUR POSITIONS EACH)

BR TR NTR

14. SECONDARY PURPOSE CODE  
 313

15. PROJECT GOAL (MAXIMUM 240 CHARACTERS)

To improve the diet, diversify farm production and augment the income of the rural population of Cameroon.

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16. PROJECT PURPOSE (MAXIMUM 450 CHARACTERS)

- 1. To increase the amount of fish produced and consumed in the rural sector;
- 2. To strengthen and expand the existing GURC infrastructure responsible for the fish culture program.

draft ENVIFON    draft AM    draft CGVT     PRM    draft HLTH    draft NERT     PC    draft Asst. Dir.

17. PLANNING RESOURCE REQUIREMENTS (staff/funds)

3 mm Health/Environmental Consultant Services \$18,000

All other design requirements supplied by USAID and Peace Corps/Cameroon.

ORIGINATING OFFICE CLEARANCE

18. DATE DOCUMENT RECEIVED BY AID/W, OR FOR AID/W DASHION DATE OF DISTRIBUTION

Signature

*James E. Williams*

Title

James E. Williams, Director  
 USAID/Cameroon

Date Signed

MM DD YY  
 5 2 79

MM DD YY

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

1. TRANSACTION CODE

A ADD  
 C CHANGE  
 D DELETE

PP

2. DOCUMENT CODE  
3

3. COUNTRY ENTITY

Cameroon

4. DOCUMENT REVISION NUMBER

5. PROJECT NUMBER (7 digits)

[ 631-0022 ]

6. BUREAU/OFFICE

A. SYMBOL AFR  
 B. CODE [ 06 ]

7. PROJECT TITLE (Maximum 40 characters)

[ Small Farmer Fish Production ]

8. ESTIMATED FY OF PROJECT COMPLETION

fy [ 83 ]

9. ESTIMATED DATE OF OBLIGATION

A. INITIAL FY [ 810 ] B. QUARTER [ 4 ]  
 C. FINAL FY [ 81 ] (Enter 1, 2, 3, or 4)

10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$) -

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. TOTAL	E. FX	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL	260.0	190.0	450.0	529.4	265.6	858.0
( GRANT )	260.0	190.0	450.0	529.4	265.6	858.0
( LOAN )						
OTHER U.S. 1. Peace Corps	30.0	77.8	107.8	258.7	388.1	646.8
2.						
HOST COUNTRY	-	308.3	308.3	--	2212.0	2212.0
OTHER DONOR(S)						
TOTALS	290.0	576.1	866.1	788.1	2865.7	3716.8

11. PROPOSED BUDGET APPROPRIATED FUNCS (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH CODE		E. 1ST FY 80		H. 2ND FY 81		K. 3RD FY	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) ARDN	143	077		450.0		408.0			
(2)									
(3)									
(4)									
TOTALS				450.0		408.0			

A. APPROPRIATION	N. 4TH FY		O. 5TH FY		LIFE OF PROJECT		12. IN-DEPTH EVALUATION SCHEDULED
	GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN	
(1)					858.0		MM YY 1 2 8 2
(2)							
(3)							
(4)							
TOTALS						858.0	

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14 OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? 1 = YES, ATTACH CHANGED PID FACESHEET.

1 = NO  
 2 = YES

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE

*James E. Williams*

TITLE

James E. Williams  
 Director, USAID/Yamoussoukro

DATE SIGNED

MM DD YY  
 07 03 80

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION

MM DD YY  
 1 2 8 2

## SMALL FARMER FISH PRODUCTION PROJECT PAPER

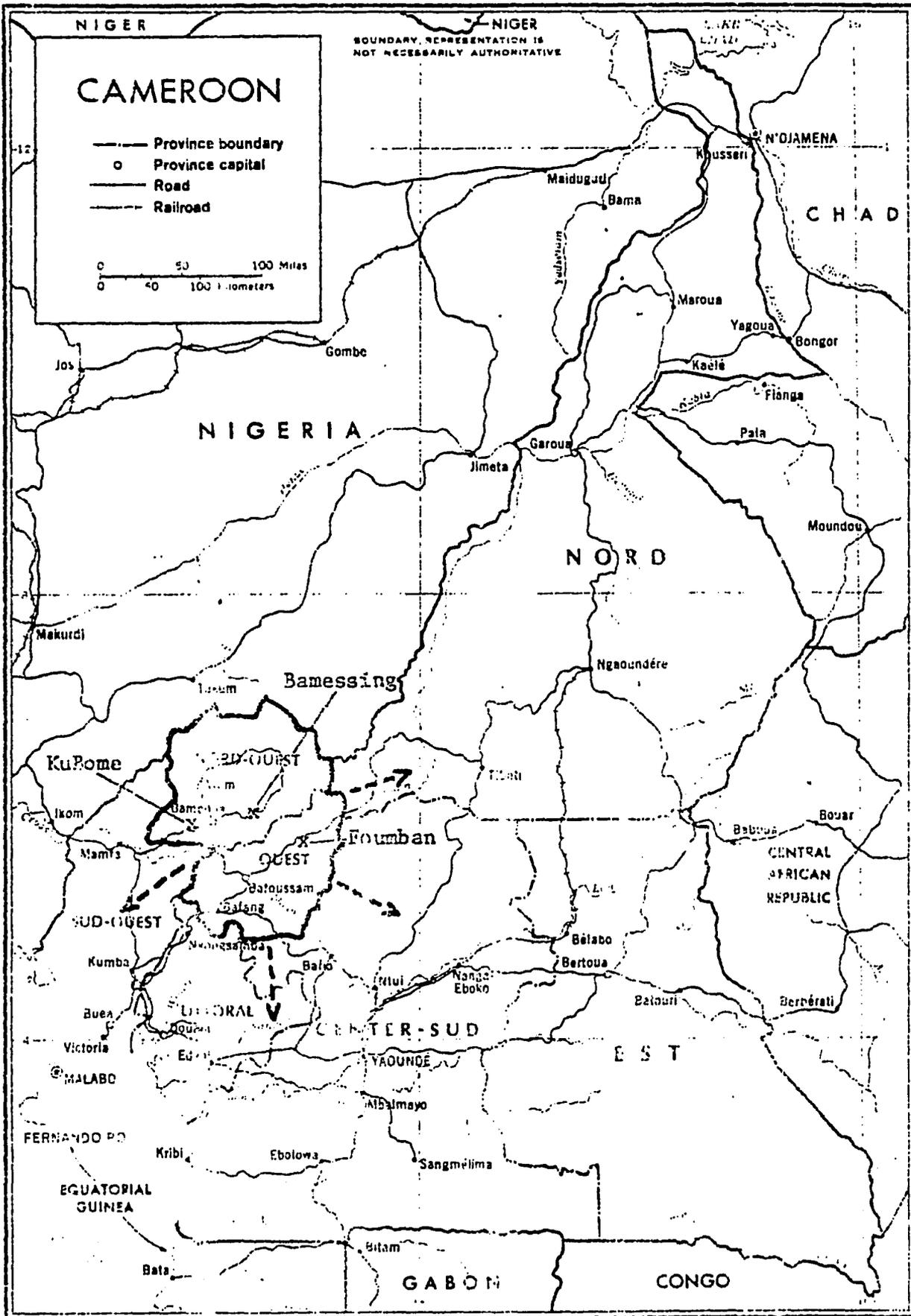
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WESTERN HIGHLANDS  
SPREAD EFFECT

PROJECT DESIGN PERSONNEL

Mr. Keith Cox	Resource Development Associate (RDA) Fisheries Expert
Mr. Alex Cole	RDA Economist
Mrs. Morgan McGowan	RDA Sociologist
Dr. Franz Roza	RDA Health/Nutrition Specialist
Dr. B. Satia	Deputy Director of Fisheries, GURC
Mr. Tim Henry	Peace Corps Volunteer Leader
Mr. Siewe	Engineer, USAID/Y
Mr. Dick Goldman	Agricultural Economist, USAID/Y
Mr. Gary Bittner	Project Manager, USAID/Y
Ms. Kathleen LeBlanc	Financial Analyst, USAID/Y
Mr. Ray Rifenburg	Project Development Officer, USAID/Y

## I. DESCRIPTION OF THE PROJECT

### A. Project Profile

The purpose of the Small Farmer Fish Production project is to increase the productivity of fish ponds, thereby increasing the availability of fish protein, by further increasing Cameroon's capabilities in the field of inland fisheries. In the past, the fisheries program was evaluated by the numbers of ponds without adequate emphasis upon production from the ponds. The activities undertaken through the project will guarantee a regular supply of fingerlings, demonstrate good pond management through efficient extension techniques and provide trained Cameroonian personnel at all levels. These activities will lead to a high degree of quality control throughout selected ponds in the private sector.

The Small Farmer Fish Production project will focus its activities in the Western Highlands - one of the regions identified by the Cameroonian Government and USAID in the Country Development Strategy Statement as a priority zone for U.S. assistance. The participation rate of rural families in the Western Highlands in growing cash crops is very high. Fish pond culture, like coffee cultivation, is considered cash cropping. The project will provide an opportunity for some farmers to raise fish as well as cultivate food crops thus reducing the risks associated with a less diversified farming enterprise. The project will benefit farmers intensively cultivating 6,500 ponds. It is projected that these farm families will improve their level of pond management to an average of 500 - 1,000 square meters under water yielding 1,200 to 1,600 kilograms of fish per hectare annually.

Training will be one of the most important elements of the project. The educational activities will include training programs for farmers, extension agents and fisheries administrative personnel.

Field days will be held periodically at one of the fisheries centers or at selected farmer ponds for farmers from the surrounding area. Farmers undertaking fish cultivation will also be assisted directly at the farm level by fisheries extension agents. It is expected that farmers will be visited at least 2 to 3 times per month.

The existing cadre of fisheries extension agents will attend in-service training courses to upgrade their skills. During the first year of the project agents from the Western Highlands will participate in the in-service course. In subsequent years this in-service training will be conducted nation-wide. Fifteen new fisheries extension agents will be trained each year for three years in a six-month course at Foumban.

Short-term training will be provided for eight persons in fish culture management and fisheries nutrition. These persons will become the managers of fisheries stations and extension coordinators. The training will take place in other African nations and the U.S. Two persons will receive long-term training in the U.S. in fish culture and personnel management and will be appointed to provincial level administrative positions.

The existing fisheries stations at Fouban, Bamessing and Ku Bome will be upgraded to operate at a level capable of meeting farmers' demands for fingerlings and technical assistance. (See map for station locations). At each station a hatchery building, associated livestock (poultry and swine) buildings, and a feed warehouse will be constructed, and Fouban will be supplied with electricity. In the hatchery building spawning will take place, eggs fertilized, and fry raised to be put into ponds. Poultry and swine buildings will be built near fish ponds and the waste material will be used as additional pond fertilization. The poultry and swine associated with fish pond production will show a diversified and balanced ecological farming system to farmers. Fish food (rice, bran, peanut cake, brewery's waste, and maize) will be stored and ground in the feed warehouse. Contracts with commercial organizations will be negotiated to supply fish food to the stations on a regular basis. Balanced rations will be mixed and fed to fry, fingerlings, and brood stock.

Lastly, equipment and technical support will be made available throughout the project life. This equipment and technical support will complement and reinforce the training provided to farmers, extension agents and station personnel.

A fisheries coordinator will be stationed in Bamenda for a period of eighteen months. The coordinator will demonstrate and assist in the following areas: aquaculture extension in the Western Highlands and management of the three fish stations (fish breeding, hatchery management, management of small impoundments, mixing rations for fish, and transporting fingerlings). The coordinator will be responsible for procuring locally purchased materials and equipment and insuring that they reach the project sites on a timely basis. In addition, the coordinator will supervise construction and help facilitate the transportation of materials to the project sites. (See Annex G for the job qualifications and duties for this position).

A fisheries breeding expert will demonstrate breeding techniques after construction has been completed at the three fish stations. He will be stationed in Bamenda for a period of seven months.

Funding for construction materials for a hatchery buildings and a feed warehouse building will be provided by USAID. USAID will co-finance the provision of electricity to the Fouban station.

Technical equipment and vehicles will be provided for the operation of the fish stations and the extension service. Extension agents will receive the following equipment to help them demonstrate and extend fish pond culture: spring balances, measuring tapes, motorcycles, hand levels, plastic bags, hand nets, and hand tools which will be loaned out to farmers for pond construction.

#### B. Project Background

The culture of fresh water fish in small farm ponds was introduced into Cameroon by the French colonial administration in 1947. Several thousand ponds were constructed as well as sixteen fishery stations specifically for fingerling production which was distributed to the fish farmers. With independence and the progressive withdrawal of the French technicians and

advisors, the majority of the ponds were abandoned by the farmers for lack of both fry<sup>1</sup> and management assistance. The French did not establish a program to train Cameroonians in fingerling production or in pond management. Therefore, it was not possible for the majority of fish farmers to continue fish culture after technical support was withdrawn. However, because of the progress of a number of these early ponds, considerable interest and enthusiasm was created among the farming population. Ponds provided farmers with additional revenue and high protein food. The former Government of West Cameroon initiated a fish culture program in 1961 under the Department of Agriculture. That program aimed at increasing private sector production. Because of the growing interest in this program, which was handicapped by limited resources and lack of trained personnel, the Government requested Peace Corps to provide volunteers who had been trained in fish culture techniques and methods to help implement a revitalized program. In 1969 eight volunteers arrived and were assigned to the North West Province.

The Government of Cameroon increased financial support and commitment and the Department of Agriculture, assisted by the Peace Corps, took the initiative to expand and reactivate fish culture activities.

In addition to Peace Corps support, technical assistance from OXFAM and financial assistance from the U.S. Ambassador's Self Help Fund led to the construction of the Ku Bome fish station, and expanded Government extension services. In 1972 the UNDP approved the financing for a fish culture center at Foumban. This center was completed in 1974/1975 but due to financial difficulties within the UN, FAO was forced to withdraw support in 1977. The National Fisheries Center in Foumban has been the site for the training of GURC fisheries extension agents since 1972. Practically all of the working fisheries agents have participated in a training program in Foumban. At present, there is a classroom laboratory for approximately twenty students, a dormitory which can house fourteen students, a cafeteria with a fully equipped kitchen, and a library.

The training course has been run by Peace Corps volunteers since 1976. The duration of the course is six months and one training program is held per year. During the other six months, the 3.3 hectare station devotes all of its energies to fish production.

Encouraged by the success of the fish culture projects in the North West Province, the Government expanded activities to include the West, North and Eastern Provinces. In 1974 the National Fund for Forestry and Fish Culture was raised to the directorate level in the Ministry of Agriculture and assumed responsibilities for the management of fish culture and reforestation throughout the country.

From 1975 until 1977 the government further expanded its program in the East Province and began programs in the Littoral and Central South

1

Fry - recently hatched fish.

Fingerling - small fish that can conveniently be stocked in a production pond; age at stocking depends on species, and management.

Provinces while maintaining the program in the Western Province. However, during this same time fisheries development in the North West reached a plateau. Israeli carp had been introduced in the early 1970s with the advice and help of the Peace Corps. With the construction of Ku-Bome fish station and the subsequent establishment of Bamessing fish station it was felt that a ready supply of carp fingerlings could be guaranteed. Accordingly, the fisheries extension agents began a publicity campaign aimed at convincing farmers raising Tilapia to raise carp. This campaign was successful and demand for carp fingerlings grew rapidly. Unfortunately, the introduced carp did not spawn naturally and pituitary injections were necessary to induce breeding. As the financial assistance provided by OXFAM and self-help began to dwindle, the supply of pituitary also dwindled. As a consequence, there arose an acute shortage of carp fingerlings. Farmers, now convinced that carp were the fish to cultivate, could no longer find fish to stock their ponds. Moreover, the majority refused to return to Tilapia and preferred to leave their pond without fish rather than stock a species other than carp. Many ponds created during the first seven years of the project were abandoned.

In 1976, as the carp began to acclimatize to the new environment, there began to be some natural spawning. Although numbers of fingerling were very small, interest in fish culture was again rekindled and in 1977 the first Peace Corps volunteers were assigned to the North West since 1974. A further increase in PCVs followed in 1978 and 1979 as the carp continued to spawn naturally and as farmers demonstrated a renewed desire to acquire fish cultural skills. However, the number of carp produced each year was still low compared to the potential fecundity of these fish. The major reasons for this low fingerling production were: (1) poor condition of brood stock (high quality feeds lacking, the fish were not in a condition to produce large numbers of viable eggs); (2) poor selection of brood stock (during the past years some of the desired characteristics of the Israeli carp has been lost due to inbreeding); (3) lack of hormones for induced spawning; (4) low number of fertilized eggs from natural spawn and an increasingly high mortality of the young carp fingerlings (a major cause was poor handling and predation by aquatic insects); (5) high losses in transport.

At the same time as carp production began to decline in the North West, the FAO introduced Clarias lazera into the Foumban station from Bangui. Again, it was discovered that this fish did not spawn naturally. However, injections of a less expensive and more readily available hormone (DOCCA) proved successful so that controlled spawns were not limited to the same degree as were those for carp.

Research was conducted by FAO technicians as to the best use of these clarias in polyculture situations. Throughout 1975/1976 efforts were made to spawn clarias and carp at Foumban. However, with the FAO pull-out in late 1976 much of this work stopped. Since 1977 Foumban has continued to be the site for fisheries monitor training. However, with respect to fingerling production, the station produces little more than enough Tilapia fingerlings to supply the 200+ ponds in the nearby area.

Presently a fish culture program is being undertaken in all seven provinces. About 4,550 family ponds averaging 100-300 square meters are

managed by 3,350 rural families. Some larger reservoir ponds (one-half to three hectares) exist in the North West and East Provinces. These ponds produce a total annual production of 84 metric tons with an average annual yield of 600 kilograms per hectare. There are 26 fish stations which function as fingerling distribution centers and support the 126 fish culture extension agents assigned to the program. Of the 126 extension agents, 80 have graduated from the three to six month fish culture annual training program at Foumban.

Early in 1979, the progress of the fisheries program was evaluated by both Peace Corps and GURC officials. They decided that fish culture had completed its first phase and that numbers of ponds were increasing and knowledge of the program was more widely spread. Furthermore, if fish culture were to have its desired impact, it must enter into a "Phase II" where the productivity of individual ponds is to become the key to the success of the program. If this goal is to be met, there will have to be: (1) people in the field at all levels who are able to realize the value of good pond management and how to achieve it; (2) efficient extension services which can convey to the farmer the importance of this good management; and (3) station and logistic support to insure that high quality fingerlings are available to the farmers when needed.

As of December 1979, Peace Corps had three volunteers in administrative and teaching positions and 27 volunteers working as extension agents. These 27 PCVs and their counterparts demonstrate fish pond culture throughout Cameroon. Two Peace Corps volunteers are working as trainers at the Foumban training center, and one as a coordinator for the other 29 volunteers working in the field.

The East Province was the section selected for a five-year rural development project (ZAPI-EST) by the World Bank in 1978. In cooperation with Fisheries Department and Peace Corps the ZAPI project has allocated \$240,000 for further development of fish culture in the East Province.

USAID Yaounde had taken note of the Cameroon Government's and Peace Corps' interest in inland fisheries activities. An inland fisheries project can have direct benefit to a rural population. Because of AID's interest in projects with an impact upon its target group, USAID, GURC, and Peace Corps developed a Project Identification Document for the Small Farmer Fish Production project. The PID was submitted to AID/W in February 1979 and the AID/W approval cable was received in March 1979.

A four-person team from Resources Development Associates came to Cameroon in October 1979 to assist in developing the project. The Director of Fisheries and Peace Corps representatives have participated in the design of the project.

### C. Project Detail

#### 1. Goal

The project goal is to assist the GURC in its efforts to increase the income, improve diet, and diversify farm production of the rural population by improving and expanding the existing inland fisheries program.

## 2. Project Purpose

The project purpose is to increase the overall production of fish from managed inland ponds. This will be accomplished by improving the GURC's ability to deliver extension services (education and technical assistance to farmers) and needed supplies of fingerlings and tools to the small inland fish farmer.

## 3. Project Outputs

In order to arrive at the satisfaction of the project purpose and goal, this project has been designed to accomplish certain tasks which will result in the linkages between outputs, purpose accomplishment and goal achievement.

In order that the project can achieve its purpose, increased fish production, the following problems have been addressed.

Problem: GURC needs an effective extension service capable of demonstrating fish pond culture to the farmers.

Output: At the end of the project there will be an additional 45 extension agents trained to demonstrate fish pond culture to fish farmers. They will be trained for six months at the Foumban training center. They will demonstrate and advise farmers on pond site selection, cooperative methods of constructing a pond, fingerling care, pond management, harvesting on a timely basis, the nutritional benefits of fish and marketing. The existing cadre of fisheries extension agents will attend in-service training courses to upgrade their skills. During the first year of the project, agents from the Western Highlands will participate in this in-service training. In subsequent years this in-service training will be conducted nation-wide. Every two months a field day will be held at three fish stations or at selected farmers' ponds to demonstrate various stages of fish pond culture. It is expected to take eighteen months to effectively demonstrate fish pond culture to a farmer.

Problem: The Inland Fisheries program has a limited number of trained personnel to manage the program and fish stations.

Output: The project will train two people in fish pond culture and personnel management to help manage the Inland Fisheries program. They will be actively involved in the coordination and supervision of fish stations and extension activities in the West and North West Provinces. They will advise and supervise fish station managers and extension activities of the fisheries program. They will be stationed in Bamenda and Bafoussam.

Six Cameroonian technicians trained in fish pond culture will be managing fish stations. Two will be working at the Foumban station and one each at the Ku Bone and Bamessing stations. The remaining two will be placed at stations demanding improved management. They will supervise personnel on the principles and methods of fish breeding. They will manage the operation of hatcheries to produce seed stock of the most important species of fish adapted to their specific project zone.

These project trained technicians will be conversant in fish spawning, hatching, rearing, harvesting and distribution. They will demonstrate and manage the role of aquatic vegetation in fish ponds, its utilization and control. They will demonstrate the mixing of balanced rations for fry, fingerlings and brood fish. In addition, they will determine the species of fish to be used in management of small ponds, species balance, population balances analysis, methods of correcting unbalanced conditions, renovation of old ponds and related problems of water management.

Two people trained in fish nutrition will be working for the three stations. They will be involved in grinding and mixing balanced rations for the various stages of fish (fry, fingerlings and brood stock).

Two people trained in vehicle maintenance will maintain the five project vehicles. They will maintain the vehicles according to the maintenance schedule outlined in Annex L.

Problem: The extension service lacks the mobility and logistic support needed for effectively demonstrating fish pond culture.

Output: At the end of the project the extension service will have the mobility and the logistic support of the fish stations and the Inland Fisheries program for effectively demonstrating fish pond culture. Forty-five motorcycles and five pick-ups will be used for extension support and for delivering fingerlings to farmers. These motorcycles and pick-ups will be used in the West and North West by extension agents and fish station personnel. The extension agents will use the motorcycles for visiting farmers on a regular basis. Each station will have one pick-up for transporting fingerlings to farmers, feed to stations, and farmers to demonstration sites. In addition, Fouban will have an extra pick-up which will do the same as the above when not transporting extension agents to the Fouban training center. This vehicle will be used by the AID financed fish breeding expert upon his arrival. The fisheries coordinator will use the fifth pick-up for fulfilling his duties and responsibilities.

#### 4. Inputs

USAID. The project will train 30 candidates to the M.S. level in aquaculture. They will major in personnel management and they will take courses covering the following subjects: fish breeding, hatchery management, management of aquatic flora, management of small impoundments, fish diseases and parasites, fish nutrition, water quality control and personnel management.

Six candidates chosen from the staff of existing fish stations will receive nine months of training in fish pond management. Six months will be academic training and three months of practical experience on a fish farm. Three will receive their training in third world countries and three from U.S. universities. These candidates will be taught fish breeding, hatchery management of food fish, fish nutrition, management of small impoundments and management of aquatic flora.

Two candidates will receive three weeks of training on preventive maintenance for USAID vehicles. They will receive their training at the Maroua USAID vehicle maintenance center.

A fisheries coordinator will be stationed in Bamenda for a period of eighteen months. The coordinator will demonstrate and assist in the following areas: aquaculture extension in the Western Highlands and management of the three fish stations (fish breeding, hatchery management, management of small impoundments, mixing rations for fish, and transporting fingerlings). The coordinator will be responsible for procuring locally purchased materials and equipment and insuring that they reach the project sites on a timely basis. In addition, the coordinator will supervise construction and help facilitate the transportation of materials to the project sites. (See Annex G for the job qualifications and duties for this position).

A fish breeder aquaculturist will assist the three stations for a period of seven months. He/she will advise and supervise the stations on brood stock, artificial breeding, fry and fingerling care, ration formulation, aquatic vegetation in fish ponds, fingerling transportation and management of personnel. This person will arrive after the construction of the fish hatcheries is completed and during the carp breeding season. He/she will work with those candidates who will have returned from short term training in fish pond management. This person will work at the three stations for four months and return for the last three months of the project. He/she will participate in the final evaluation. This person will act as a catalyst by easing the transition from USAID support to full GURC support. In addition to the above two people, an economist and fisheries expert will participate in the final evaluation.

Funding for construction materials for a hatchery building and a feed warehouse building will be provided by USAID. USAID will co-finance the provision of electricity to the Foumban station.

Technical equipment and vehicles will be provided for the operation of the fish stations and the extension service. Extension agents will receive motorcycles and the following extension equipment to help them demonstrate and extend fish pond culture throughout the country: spring balances, measuring tapes, hand levels, plastic bags, hand nets, and hand tools, which will be loaned to farmers for pond construction. The motorcycles will be sold to the agents who will pay for them over a twenty-four month period. The money will be used to buy additional motorcycles for agents. This policy of the GURC has proven to insure better maintenance and care of motorcycles.

GURC. 45 extension agents will be trained in fish pond culture for six months at the Foumban training center. They will be taught the following subjects: farmer selection, pond site selection, cooperative methods of constructing a pond, fingerling transportation, fingerling care, pond fertilization, water management, harvesting, nutritional benefits of fish and marketing.

The GURC will be responsible for maintenance of existing structures at the fish stations. This will include dikes, canals, ponds, and buildings. They will construct pig pens and chicken coops and provide all labor for construction purposes. They will do all land preparations prior to construction.

The GURC will provide pigs and chickens and their feed for the three stations. They will also provide additional fish feed for the stations. In addition, they will provide some vehicle support prior to the arrival of the USAID purchased vehicles.

All salaries of the personnel in the Inland Fisheries program and extension agents will be paid by the government.

Housing for the fisheries coordinator will be provided by the government in Bamenda. The Government will provide operating costs for their vehicles. They will also provide operating costs for USAID-purchased vehicles after the first year of operation.

Peace Corps. Peace Corps will provide a total of thirty volunteers yearly up to 1985 for the Inland Fisheries program. Two volunteers will be located at the Foumban training center and twelve will be located throughout the Western Highlands. The remaining volunteers will be stationed throughout the rest of the country.

#### D. Project Beneficiaries

The direct project beneficiaries will be the 5,000 families or approximately 31,000 people, living in the Western Highlands.

At the beginning of the project 100 extension agents and 27 Peace Corps volunteers will work with 20 farmers for a period of 18 months. At the end of the eighteen months, 2,540 farmers will have benefited from the project. After the first eighteen months, there will be an additional 15 extension agents giving a total of 142 agents demonstrating fish pond culture to farmers. These agents will continue to make occasional visits to the original farmers and will work intensively with another 17-18 farmers. At the end of the three years, 5,000 families will have benefited from the project. These 5,000 families represents approximately 31,000 people, as the average number of people per household is 6.2 in the Western Highlands.

As the social soundness analysis indicates, pond harvesting benefits the neighbors and local population as the bulk of the harvest is sold at pond side. The families can eat fish as they mature as a table supplement which directly benefits the family. Women and children often are responsible for fertilizing and feeding ponds and realize their efforts when fish are consumed and/or sold at pond side. Thus, the primary beneficiaries will be the 5,000 fish farmers and their families, and the secondary beneficiaries will be the fish farmers' neighbors.

## II. PROJECT ANALYSIS

### A. Social Soundness Analysis

The project design assumes that the farmer success with fish culture will have a spread effect as neighbors share information and their harvest. Extension services and field days will help improve pond management, yielding an increase in production of fish for table use and for sale.

Fish cooperatives and shared labor are traditional and economically helpful. Project design calls for provision of fingerlings at a modest cost with pay back of tool rental or other fees at harvest time. Initial capital outlay to farmers, fingerling costs, and material costs for water inlets and outlets, is considered minimal, and family labor is considered readily available.

The project will continue the training of women as extension agents and as monitors at the fish stations. Several women have received training at the Fouban training center, and have been successful with the natural breeding of carp. One in particular is being proposed as a possible candidate for overseas training in more scientifically oriented aspects of fish culture. Training is considered an important component of upgrading mid-level management and enhancing the scientific and technical capabilities of fish station personnel.

Inland fish culture has been practiced for a number of years in Cameroon. Project fish stations are also currently operational, though the project is designed to make them more efficient and to improve the cadre of technicians currently working in inland fish culture. The basic social soundness of the project and its cultural acceptability is demonstrated by the hundreds of farmers who currently are practicing fish culture, consuming and marketing their production.

The following points summarize the social soundness analysis:

1. There is no cultural bias against accepting fish as a food of choice.
2. Fish is not perceived as a protein source as much as a dietary preference.
3. Fish combines well with staple, traditional food preferences such as tubers and legumes.
4. The sale of fish in the market place is brisk and the demand constant, indicating an increased quantity demanded if supplies increased.
5. Pond harvesting benefits the neighbors and local population as the bulk of the harvest is sold at pond side.
6. The family can eat fish as it matures as a table supplement which will directly benefit the family.
7. Fish farming is considered a cash crop and the farmer often belongs to a fish cooperative with shared labor for constructing ponds. His income will benefit at harvest time.
8. Women and children often fertilize ponds, and realize their efforts when fish are consumed and/or sold at pond side.

### B. Technical Feasibility

The technical feasibility of fish culture in Cameroon is reestablished each time a farmer successfully raises a crop of fish. Pond digging, pond management, and pond harvesting are considered to be fundamental technologies which can be easily acquired by the farmer if efficient extension services exist. Most ponds are built by hand using locally available construction materials and fish are generally fed kitchen and agricultural wastes readily accessible to the farmer. Thus, there is no question of introducing a technology that is beyond the scope of the rural population.

Tilapia nilotica is the fish most frequently raised. Introduced over thirty years ago, Tilapia has proven compatible with the local environment and suitable to basic fish culture methods which exist in Central and West Africa. As a filter feeder, they grow well in ponds without supplemental feeding programs. Well known for their reproductive potential, there is seldom a problem with obtaining fingerlings to restock ponds. Since tilapia are resistant to disease and poor handling, they are an appropriate fish to be stocked in ponds which will have mid-level management. They also offer higher level productions when used in a polyculture system.

In the early 1970's carp (Cyprinus carpio) and catfish (Clarias lazera) were introduced into Cameroon by the Peace Corps and the FAO respectively. Both species have shown considerable promise. Carp do not present the problem of stunting which is common with tilapia when ponds become overcrowded due to prolific reproduction. Carp also have a slower maturation cycle which allows them to remain in a pond up to two or more years without a loss in production. They are better fitted to culture in cooler climates having wider temperature tolerances.

Clarias are proficient predators and are most often stocked in polyculture with tilapia to avoid over-production of fingerlings and the stunting of genitors. When in mixed culture, productions in excess of 2,000 kgm/ha/yr have been attained.

The major drawback to the culture of carp and clarias is that neither species reproduces naturally with any degree of certainty. The project design provides initial funds to buy sufficient carp pituitary hormone and testosterone for inducing spawning. After sufficient brood stock is available on a regular basis these hormones can be extracted from the mature fish. Although natural spawns of carp are becoming more frequent, farmers must still rely upon government stations for regular supplies of either carp or clarias fingerlings. (The fact that they do not reproduce naturally is an advantage as the stock rates and frequencies can be controlled by extension agents, which is not the case with tilapia, a factor resulting in disappointing harvest or production and neglect of ponds)

Given the three species already mentioned, plus Heterotis niloticus, an efficient filter feeder used in some polyculture schemes, it is felt that a sufficient variety of fish exists for fish culture purposes. It is not the intention of this project to introduce new species.

Effectual use of these various species by the farmer demands technically competent extension agents. Although the skills of raising fish are rudimentary, the extension agents must be able to train the farmer in these skills. Moreover, the agents must know what constitutes a good site for ponds and be able to assist farmers select them (good sites). He must have a basic knowledge of elementary surveying, use of cement and cement mixtures; be able to calculate stocking rates and productivities; and have a working knowledge of fish handling, feeding and fertilization, and water dynamics. Thus, the National Fish Culture Center at Foumban provides the needed framework for the training of local extension agents. It functions as a key part to the overall fisheries program. After an analysis of this station's technical abilities, it was determined that: (1) the entrance requirements are regarded as adequate and (2) the six-month program was judged to be satisfactory in providing the needed training for the agents.

Considering the history of fish culture in Cameroon and the sphere of this project, from a technical point of view it is considered feasible.

### C. Administrative Feasibility

#### 1. The United Republic of Cameroon

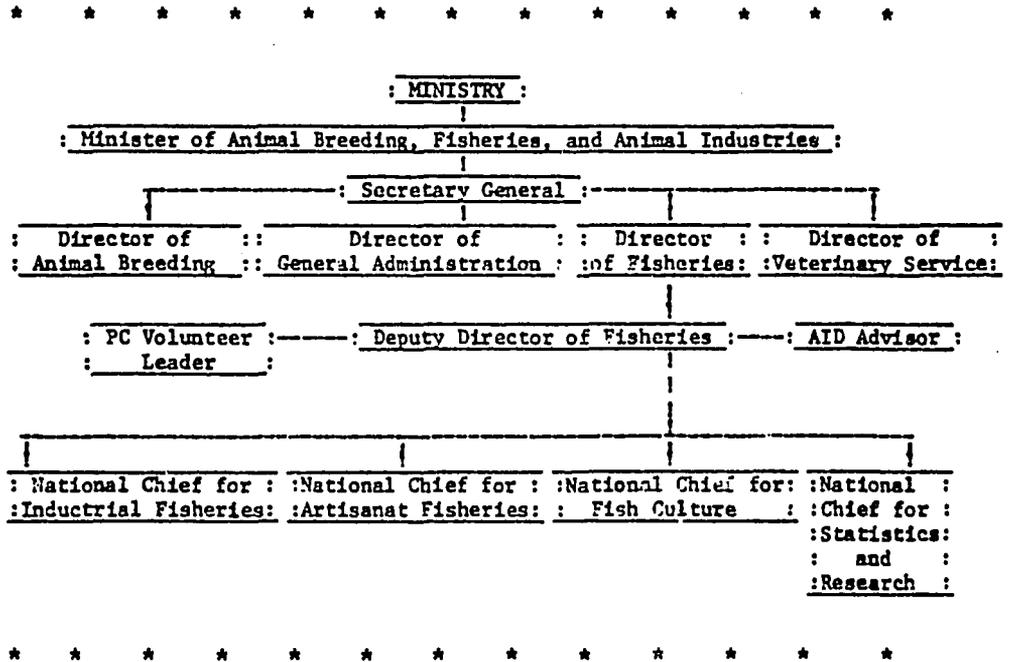
The administration of this project will be the responsibility of the Ministry of Animal Breeding, Fisheries and Animal Industries (see organization chart below). The project design took into consideration the availability of qualified personnel and the existing management systems in regards to making administrative arrangements for the schedule of implementation. The Ministry is responsible for all the fishery programs throughout the country. It is the intention of the Ministry to assign presently available personnel and to recruit specialists where called for in the project. An example of the government's interest in the fisheries program is the maintaining of a series of fish stations, the supplying of qualified Cameroonians for extension training and committing people and funds to the continuing maintenance and growth of fish farming. The Ministry has recognized the need for improved management by requesting overseas university training for people in upper and mid-level management. Upon return to Cameroon, the people trained in upper and mid-level management will receive increases of salary which is parallel to others having similar levels of training. Construction at the three fish stations will be supervised by the Ministry and carried out by Genie Rural.

#### 2. USAID

The project manager will be responsible for processing all the necessary AID documents to enable efficient implementation of the project. He will help coordinate the implementation of the project with the project personnel, Peace Corps, and the Ministry. A USAID engineer will approve the final design for the buildings being constructed after insuring that Cameroonian construction codes are incorporated into the design. The administration of this project is within the current capabilities and capacity of the USAID/Y Mission.

3. Peace Corps

The Peace Corps Volunteer leader of the fish program will be responsible for all the extension volunteers and the two teachers at the Fouban training center. He will continue the program of receiving pond production data sheets (see Annex I) from each volunteer, an important component for evaluating the project.



#### D. Environmental Concerns

The major environmental concerns are the water-vector-borne diseases such as malaria, intestinal and urinary schistosomiasis, onchocerciasis, guinea worm (dracontiasis), and fecal related diseases.

Several parameters of fish ponds are relative to their deleterious health impact. These include, in addition to size and number, their proximity and attractiveness to human populations, their management, the type and prevalence of disease vectors they support, the prevalence of the disease in the vector, and the prevalence of the disease in the human populations.

In Cameroon fish ponds have been in various stages of development for the past 30 years. The current estimate of 4,450 active ponds totals 1.4 square kilometers in area. The area covered by natural waters with contact of human populations dwarfs the segment influenced by fish ponds. Thus, fish ponds are not a new environmental impact. During the design phase of the project a study of possible detrimental health effects of fish ponds and measures of control was done and the recommendations incorporated into this project. The primary recommendations were concerned with the location of ponds and the training of fisheries workers. The project includes a training component for fisheries extension workers and these agents will receive information about snail identification and procedures for obtaining health advice. The agents will use possible environmental health as one of the criteria used in selecting an appropriate pond location. The chemicals used for this project will be the same as those used during previous AID/PC fisheries projects. These chemicals will be used for fish transport and for water quality testing. Due to the small quantities of usage of these chemicals, the project envisions no environmental problems.

#### E. Financial and Economic Feasibility

##### 1. Introduction

The Government of Cameroon intends to make private fish culture a technically sound and financially viable proposition throughout Cameroon. This policy is being carried out through the establishment of a network of fish breeding/training stations and extension agents who service inland fish farmers. The economics of fish farming in general, and this project in particular, are usefully analyzed from a micro and macro economic perspective. It seems clear that one does not want to encourage on-farm fish culture, nor will it ever succeed, if the financial feasibility from the farmers' viewpoint cannot be proven. Looking at the equation from the macro side, government must also allocate its scarce resources in an efficient manner, and, as such, the project should be expected to produce a positive rate of return to the economy.

We can expect that nonquantifiable and/or equity considerations will modify conclusions reached using only hard data. Further, Cameroon's small farmers make a considerable contribution to its economic development with their production of cash crops - primarily cocoa and coffee. Therefore, they have a right to expect government services, e.g. a fish culture

extension service, where it is to their personal benefit, even if such a project does not produce the highest I.R.R. within a listing of investment alternatives. By supporting and encouraging rural development projects one encourages the channelling of internal resources toward the rural sector, one returns to the farmers (as opposed to the urban dweller) a portion of their taxes, and supports diversification/alternative investment opportunities of the small farm enterprise. Lastly, prior to proceeding with the analysis, a portion of fish station costs might more properly be classified as research and development and, therefore, subjected to a different type of analysis than that presented in the following pages.

## 2. Micro Level Analysis of Farmer Fish Production

For the purposes of this analysis, we shall consider five costs and one generalized return to the factors of production.

**Labor costs:** Labor requirements for constructing a pond vary depending on the site selected, the season, and local labor practices. Site selection is probably the most important consideration when looking at labor costs. For example, labor costs for a reservoir pond are much cheaper than digging a pond. With this in mind, extension agents must consider site selection as an important criterion in selection of interested fish farmers. Labor costs include those costs associated with site preparation and actual pond construction.

**Management Costs:** These may be estimated in the range from low to high/intensive management. Mid-level management is defined as approximately one-half hour per day devoted to weed cutting, occasional feeding with scraps, manioc washings, harvesting, fertilizing, and controlling the water level. Mid-level management leads to an annual production of 1,200 kg/ha/yr, which at 350 FCFA per kilo of fish sold, gives a gross return per hectare of 420,000 FCFA (\$2,100).

**Material Costs:** These costs can also have a wide possible spread depending on the design and technologies chosen for pond development. Material costs are primarily comprised of costs associated with the entry and exit of water to the pond. In the long run they are probably not critical to the farmers' returns to investment, however, they must be able to make the initial out-of-pocket expenditure.

**Fry or Fingerlings:** The recommended practice for Tilapia is to stock one fry per 1.5 square meters for mid-level management. At 5 FCFA, a 500 square meter pond would cost 1,665 FCFA to stock. This cost is minimal as project design calls for provisions of fingerlings at little or no cost with payback to fish stations at harvest time.

**Fish Loss Cost:** a twenty percent mortality is generally figured when stocking the pond. Successful farmers generally make gifts to local officials. Also, poaching can be a serious problem entailing considerable lost time to guard the pond.

Return: Gross returns per hectare per harvest of 420,000 FCFA would be expected with mid-level management. In practice, 500 square meters is the normal size pond giving a gross return of 21,000 FCFA.

Our analysis is based on a one pond per family unit system. The data base on which our calculations are made result from the following statistics and assumptions.

FIGURES FOR A NEWLY DUG POND\*

Costs - First Year

Digging Pond

62.5 days at 300 CFA per day 18,750

Rental of Hand Tools

5 days at 333+ CFA per day 2,000

Material

Cement and local materials for water  
Inlet and Outlet 4,500

Fingerlings

333 fingerlings at 5 CFA (plus 20% mortality) 1,995

Labor (mid-level management)

26 days at 300 CFA per day for pond harvest  
and management 7,800

TOTAL FIRST YEAR COSTS 35,045

Returns - First Year

50 kg. fish at 350 CFA per kg. 17,500

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\*Figures may be rounded several FCFA for convenience

\*Management level and yields expected to increase over time.

TABLE 1. CASH FLOW PROJECTION (FCFA)

	<u>Year 1</u> <sup>2/</sup>	<u>Year 2</u> <sup>2/</sup>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
<u>Cash Provided By:</u>					
Kg. Fish Produced	50	110	121	133	146
X Sales Price/Kg.	350	403	464	534	614
<b>Total Cash From Sales</b>	<b>17,500</b>	<b>44,330</b>	<b>56,144</b>	<b>71,022</b>	<b>89,644</b>
<u>Cash Outlay:</u>					
<u>Start Up Costs:</u>					
Tool Rental	2,000	2,309			
Materials	4,500	5,175			
Fingerlings	1,995	4,589	5,277	6,069	6,979
Feed <sup>1/</sup>					
<b>Total Cash Outlay</b>	<b>8,495</b>	<b>12,064</b>	<b>5,277</b>	<b>6,069</b>	<b>6,979</b>
<b>Net Cash Available</b>	<b>9,005</b>	<b>32,366</b>	<b>50,867</b>	<b>64,953</b>	<b>82,665</b>
	<u>Year 6</u>	<u>Year 7</u>	<u>Year 8</u>	<u>Year 9</u>	<u>Year 10</u>
<u>Cash Provided By:</u>					
Kg. Fish Produced	161	201	201	201	201
X Sales Price/Kg.	706	812	934	1,074	1,235
<b>Total Cash From Sales</b>	<b>113,666</b>	<b>163,212</b>	<b>187,734</b>	<b>215,874</b>	<b>248,235</b>
<u>Cash Outlay:</u>					
<u>Start Up Costs:</u>					
Materials					
Tool Rental					
Fingerlings	8,026	9,230	10,615	12,207	14,038
Feed <sup>1/</sup>		4,200	4,800	5,520	6,360
<b>Total Cash Outlay</b>	<b>8,026</b>	<b>13,430</b>	<b>15,415</b>	<b>17,727</b>	<b>20,398</b>
<b>Net Cash Available</b>	<b>105,640</b>	<b>149,782</b>	<b>172,319</b>	<b>198,147</b>	<b>227,837</b>

1/ Computations for Feed

Kg. of feed purchased	120	120	120	120
	35	40	46	53
	<u>4,200</u>	<u>4,900</u>	<u>5,520</u>	<u>6,360</u>

To attain higher pond production of more than 161 kilograms/yr., additional feed must be purchased and higher levels of management utilized (controlling wastes, oxygen, stockage rates, etc.). This type of management level could not easily be achieved by the small farmer.

2/ One dug-out pond is constructed in year one and second one is constructed in year two.

TABLE 2. PROJECT ANALYSIS - Cost used in macro economic analysis

(US \$000)

<u>Year</u>	<u>USAID</u>	<u>GURC</u>	<u>OTHER</u>
1 (6 months)	375.3	308.3	107.8
2	261.1	684.5	215.6
3	176.9	852.6	215.6
4 (6 months)	44.7	366.6	107.9
5	-	200.0	-
6	-	200.0	-
7	-	200.0	-
8	-	200.0	-
9	-	200.0	-
10	-	200.0	-

Assumptions for the cash flow projection (Table 2):

1. Labor totally provided by the farmer and his family.
2. Each farmer will have an average of two ponds, 500 m<sup>2</sup> each by the end of the second year.
3. No middle person, farm-market direct.
4. Fingerlings will be restocked each year.
5. 15% inflation factor on both sales and costs.
6. No purchase of feed up to year seven, after year six increased production may necessitate the purchase of feed.
7. Management level increases yearly up to the end of year six and production increases 10% each year to the end of year six.
8. Management level and feed input level remain the same from year 7 through 10.

An increase of production over 201 kg. in two ponds of 500 m<sup>2</sup> would require management levels and harvesting schedules which could not be achieved by the small farmer (controlling wastes, oxygen, stockage rates, etc.). Thus, management level and feed input level remain constant.

9. For IRR and NPV calculation we assume all investment is made in year one.

Our cash flow financial analysis, assuming the conditions stated below, presents a very favorable investment environment at the farmer level. Table 1 shows a positive cash flow as soon as the farmers' ponds are put into production. Even accounting for in-kind labor costs the farmer realizes an internal rate of return (IRR) of 61 percent over ten years and a net present value (NPV) (discounted at 15 percent) of 278,888 FCFA over the same period. If one assumes that the data used presents optimistic yield and cost projections, the project still has considerable room for downside error before becoming financially non-viable.

Our macro analysis uses the cost figures presented in Table 2. This analysis does not add anything to the benefit stream, and spreads the infrastructural costs added by the project over the 5,000 families (6,500 ponds). Labor costs are also increased 10 percent per year. Adding project investment costs and not attempting to quantify improvements in staff from training, and resultant increases in station/farmer efficiency, results in an IRR of about 40 percent.

**Conclusion:**

If one accepts the data given as being representative of the realities of fish farming in the Western Highlands of Cameroon, one must also conclude that the project, as presented, is economically and financially viable.

### III. FINANCIAL PLAN

Total costs over the three year life of the project are estimated to be \$3,716,800 and include funding from USAID (23%), the GURC (60%) and the Peace Corps (17%).

Project beneficiaries will be the approximately 5,000 rural families who will have reached a management level of 1,200 to 1,600 kg/ha/yr principally in the Northwest, West and neighboring provinces. First, emphasis will be on increasing production in existing ponds, and secondly, emphasis will be on creating new ponds in the most advantageous location. AID's total contribution of \$858,000 is distributed as follows:

#### Technical Assistance \$178,100

Technical assistance will consist of 25 person months budgeted at \$7,124 per month for a fisheries coordinator and a fisheries breeder who will advise and supervise the project. An end of the project evaluation will cost \$9,700, and is included in the 25 person months.

#### Training \$226,100

There will be 120 person months of training in the U.S. for upper and mid-level management, and three weeks of in-country training for four people in maintenance and repair of USAID provided vehicles.

#### Construction \$48,300

Materials for three hatchery buildings, and three feed warehouses will be provided.

#### Commodities \$228,700

This includes 5 4-W/D 1/2 ton pick-ups and their spare parts, 45 motorcycles, electrical wiring and poles, hand tools, and other supplies necessary for the fish stations and extension services. (See itemized input list, ANNEX C.)

#### Operating Costs \$26,000

This is for the operation costs of five vehicles for the first year of service.

#### Contingency \$70,700

A contingency allowance of 10% is provided.

#### Inflation \$80,100

Inflation is calculated at 15% compounded yearly.

The Cameroon Government will provide over the life of the project a total of \$2,212,000 which is distributed as follows:

Personnel \$1,350,000

This is salaries for personnel in fisheries.

Training \$40,500

This is for training 45 extension agents for six months at the Fouban training center.

Construction \$47,400

This is for labor costs for all construction taking place at the fish stations, including the costs of materials for pig pens and chicken coops.

Commodities \$154,000

This includes the purchase of pigs, chickens and their feed for the station and additional fish food.

Other Costs \$246,900

This is the operating costs for USAID's purchased vehicles for the second two years of operating costs, housing, and other vehicle operating costs.

Inflation \$337,200

Inflation is calculated at 15%.

Other Donors - Peace Corps:

Technical Assistance \$646,800

Peace Corps will maintain a 14-volunteer level in the project zone valued at \$15,400 per year which includes in-country costs and all training.

GURC Recurring Costs \$200,000/Year

The Government of Cameroon has shown its interest in the Inland Fisheries program by maintaining a series of fish stations, supplying qualified people for extension training, and committing continued funding for maintenance and growth of the program.

After the 3-year project period, GURC will replace the vehicles plus spare parts and provide running costs, estimated at \$160,000 per year. In addition, GURC will provide \$40,000 per year for materials needed to repair new facilities.

TABLE I  
 USAID EXPENDITURES BY FISCAL YEAR  
 (\$000)

	(6 mo.) FY 80	FY 81	FY 82	(6 mo.) FY 83	TOTAL
<u>Technical Assistance</u>					
Long-Term	9.8	58.6	19.5	-	87.9
Short-Term	-	34.5	23.0	32.7	90.2
	<u>9.8</u>	<u>93.1</u>	<u>42.5</u>	<u>32.7</u>	<u>178.1</u>
<u>Training</u>					
U.S.	54.4	88.8	80.9	-	224.1
In-Country	-	1.0	1.0	-	2.0
	<u>54.4</u>	<u>89.8</u>	<u>81.9</u>	<u>-</u>	<u>226.1</u>
<u>Construction</u>					
Materials	<u>48.3</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>48.3</u>
<u>Commodities</u>					
Vehicles	143.0	-	-	-	143.0
Equipment:					
Electrical	11.0	-	-	-	11.0
Equipment:					
Technical	74.7	-	-	-	74.7
	<u>228.7</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>228.7</u>
<u>Other Costs</u>					
Vehicle Operations	<u>-</u>	<u>26.0</u>	<u>-</u>	<u>-</u>	<u>26.0</u>
Subtotal	341.2	208.9	124.4	32.7	707.2
Contingency	34.1	20.9	12.4	3.3	70.7
Inflation	-	31.3	40.1	8.7	80.1
TOTAL USAID EXPENDITURES	<u>375.3</u>	<u>261.1</u>	<u>176.9</u>	<u>44.7</u>	<u>858.0</u>

TABLE II  
GURC AND OTHER DONOR EXPENDITURES BY FISCAL YEAR  
(\$000)

	(6 mo.) FY 80	FY 81	FY 82	(6 mo.) FY 83	TOTAL
<u>GURC EXPENDITURES</u>					
<u>Personnel</u>	198.9	427.7	481.5	231.9	1,350.0
<u>Training</u>					
In-Country	11.6	15.4	13.5	-	40.5
<u>Construction</u>					
Labor	10.0	20.0	4.0	-	34.0
Materials	13.4	-	-	-	13.4
	23.4	20.0	4.0	-	47.4
<u>Commodities</u>					
Livestock	13.0	12.0	12.0	3.0	40.0
Feed	28.5	38.0	38.0	9.5	114.0
	41.5	50.0	50.0	12.5	154.0
<u>Other Costs</u>					
Motorcycle Operations	9.0	18.0	18.0	9.0	54.0
Vehicle Operations	-	-	30.0	15.0	45.0
Housing	1.6	9.6	3.2	-	14.4
Peace Corps Housing	22.3	44.5	44.5	22.2	133.5
	32.9	72.1	95.7	46.2	246.9
Subtotal	308.3	595.2	644.7	290.6	1,838.8
Inflation	-	89.3	207.9	76.0	373.2
TOTAL GURC EXPENDITURES	308.3	684.5	852.6	366.6	2,212.0
<u>OTHER DONORS - PEACE CORPS</u>					
Technical Assistance	107.8	215.6	215.6	107.8	646.8

TABLE III  
SUMMARY COST ESTIMATE AND FINANCIAL PLAN  
(\$000)

	USAID		GURC		PEACE CORPS		TOTAL	
	FX	LC	FX	LC	FX	LC	FX	LC
Technical Assistance	:106.8	: 71.3	:	:	:258.7	:388.1	:365.5	: 459.4
Training	:224.1	: 2.0	:	: 40.5	:	:	:224.1	: 42.5
Construction	:	: 48.3	:	: 47.4	:	:	:	: 95.7
Commodities	:157.4	: 71.3	:	:154.0	:	:	:157.4	: 225.3
Other Costs	:	: 26.0	:	:246.9	:	:	:	: 272.9
Personnel	:	:	:	:1350.0	:	:	:	:1,350.0
Subtotal	:488.3	:218.9	:	:1838.8	:258.7	:333.1	:747.0	:2,445.8
Contingency	: 48.8	: 21.9	:	-	:	:	: 48.8	: 21.9
Inflation	: 55.3	: 24.8	:	: 373.2	:	:	: 55.3	: 398.0
TOTAL PROJECT COSTS	:592.4	:265.5	:	:2212.0	:258.7	:333.1	:851.1	:2,865.7

TABLE IV  
COSTING OF PROJECT OUTPUTS/INPUTS  
(\$000)

	---OUTPUTS---				TOTAL
	Institutional Capacity	Physical Facilities	Extension Services	Vehicle/Equip. Support	
<u>INPUTS</u>					
<u>USAID</u>					
Technical Assistance	77.8	22.5	77.8	-	178.1
Training	224.1	-	2.0	-	226.1
Construction	-	48.3	-	-	48.3
Commodities	26.4	39.7	49.1	113.5	228.7
Other Costs	7.7	-	18.3	-	26.0
Contingency	33.6	11.0	14.7	11.4	70.7
Inflation	38.1	12.5	16.7	12.8	80.1
<b>TOTAL USAID</b>	<b>407.7</b>	<b>134.0</b>	<b>178.6</b>	<b>137.7</b>	<b>858.0</b>
<u>GURC</u>					
Personnel	270.0	-	1,080.0	-	1,350.0
Training	21.2	-	19.3	-	40.5
Construction	-	-	47.4	-	47.4
Commodities	23.1	15.4	115.5	-	154.0
Other Costs	68.1	1.9	176.9	-	246.9
Inflation	77.6	3.5	292.1	-	373.2
<b>TOTAL GURC</b>	<b>460.0</b>	<b>20.8</b>	<b>1,731.2</b>	<b>-</b>	<b>2,212.0</b>
<u>PEACE CORPS</u>					
Technical Assistance	258.7	-	388.1	-	646.8
<b>TOTAL PROJECT COSTS</b>	<b>1,126.4</b>	<b>154.8</b>	<b>2,297.9</b>	<b>137.7</b>	<b>3,716.8</b>

#### IV. THE IMPLEMENTATION PLAN

The following implementation schedule, beginning with USAID/Y approval of the project, shows the timing of key events in the project's implementation.

1. Project Authorization

USAID/Y approval of the project is the point of departure for the project's implementation schedule, June 1980.

2. Project Agreement Signed

Once USAID/Y has approved the project and funds are allotted, the Project Agreement can be negotiated with the GURC. We expect the Project Agreement to be signed in July 1980.

3. Procurement of Commodities and Technical Services

All PIO/Ts and PIO/Cs will be drafted and issued in July 1980.

4. Negotiate Project Technician Contract

A host country contract with the Ministry of Livestock, Fisheries and Animal Industries and the fisheries coordinator will be signed in November 1980. An IQC firm will be used to provide the fish breeding expert.

5. Training: Long-term U.S.

The two long-term candidates will have been selected and started their training in fish pond culture by January 1981. They will be expected to return in February 1983.

6. Training: Short-term U.S.

a. Two candidates will have been selected and trained in fish pond culture from January to September 1981. One candidate will have been selected and trained in fish nutrition at the same time period.

b. Two candidates will have been selected and trained in fish pond culture from September 1981 to May 1982. One candidate will have been selected and trained in fish nutrition at the same time.

c. Two candidates will have been selected and trained in fish pond culture from May 1982 to January 1983.

7. Training: In-Country

- a. Three groups of fifteen new extension agents will have been selected and trained at the Fouban training center on the following months: November 1980 to May 1981, September 1981 to March 1982, and July 1982 to January 1983.
- b. Short-term training courses will be offered to current extension agents in January, March, August 1981 and June 1982.
- c. Two candidates will have been selected and trained in maintenance of vehicles in February 1981.
- d. Thirty PCVs will have workshops on fish pond culture during months November 1980, November 1981 and November 1982.
- e. Every two months a field day will take place at the fish stations or at selected farmers' ponds. Extension agents will demonstrate various stages of fish pond culture to farmers.
- f. 127 extension agents will have demonstrated improved fish pond culture to 2,540 farmers by November 1981 and 142 extension agents will have demonstrated improved fish pond culture to 2,414 farmers by May 1983.

All technical equipment ordered for the fish stations in July 1980 will have arrived in Douala by January 1981 and delivered to the fish stations by February 1981.

Vehicles

- a. 45 motorcycles will be delivered by January 1981.
- b. All pick-ups will be delivered by April 1981.

Construction

- a. Ku Bome: All construction materials will have been delivered and construction completed for a hatchery building, feed warehouse, a chicken coop and repair of a pig pen during January through June 1981.
- b. Fouban: All construction materials will have been delivered and construction completed for a hatchery building, feed warehouse, and a chicken coop during May through October 1981.
- c. Bamessing: All construction materials will have been delivered and construction completed for a hatchery building, feed warehouse, a pig pen and a chicken coop during July through December 1981.

Evaluation

Three on-going evaluations will take place during months January, October 1981 and July 1982. A final project evaluation will take place during June 1983.

#### V. EVALUATION

Three evaluations are scheduled throughout the implementation of the project and one final evaluation.

During months eight, seventeen and twenty-six an evaluation will take place in the Western Highlands. The evaluation team will evaluate the effectiveness of the extension system in demonstrating fish pond culture to fish farmers and the ability of each fish station to supply fingerlings to farmers. In addition, the team will evaluate the health aspects of fish ponds. The evaluation team will consist of the fisheries breeder, one representative from the Fisheries Department, one representative from the Ministry of Health, Peace Corps, and the USAID project manager.

A final evaluation will take place at the end of the project. Six people will participate in the final evaluation: two consultants, an economist and a fish breeder, a representative from the Fish Department, a representative from the Ministry of Health, Peace Corps, and the USAID project manager.

VI. CONDITIONS, COVENANTS AND NEGOTIATING STATUS

Conditions

There are no special Cameroon Government actions which must be taken prior to the execution of the Project Agreement.

Covenants

The GJRC will participate in the three evaluations and a final evaluation and report any increase incidence in the project area of schistosomiasis, onchocerciasis and guinea worm.

ANNEX A  
PID APPROVAL CABLE

The Mission was authorized to begin the design of the Small ~~er~~ Fish Project by STATE 066900 dated March 18, 1979. A number of suggestions were made in the PID approval cable for the guidance of the Mission and the design team. The cable is quoted in full below. Each paragraph is followed by the Mission response and is marked by an R.

- 1 Subject PID was reviewed on February 28, 1979. The project committee approved the project for further development. Since the estimated LOP costs are only dols 450 thousand USAID/Y has the authority to proceed with completion of the PP and authorization of the project. Implementation of the project is, of course, contingent upon allotment of funds from AID/W. The Mission should forward a copy of project authorization documents to AID/W when the project is authorized. PAF Part II is needed to initiate allotment of funds.  
R After Mission approval, PP will be sent with PAF II to initiate allotment of funds.
- 2 The operations appraisal staff has recently completed a review of Auburn's fisheries activities under a 211D grant. It should be useful reference document for the Mission in preparation of the PP and a copy of it is being forwarded.  
R Mission referred to the document and incorporated some of the recommendations.
- 3 With increased delegation of authority to the field for PP preparation and review and project authorization, it is important that a PID state explicitly how the project fits into the strategy contained in the CDSS. Since the current Cameroon CDSS is not yet a definitive document, the connection between PIDs and the CDSS is not always self-evident.  
R USAID's target group, in terms of income and quality of life indicators, is the rural population of the North Province, the Western Highlands, and the East Province. This project's area of implementation is the Western Highlands, the target group - small farmers.
- 4 The PID is ambivalent in terms of the project's geographic focus. Page 3 of the PID states that the project will give particular emphasis to

those areas of Cameroon where root crops are a dietary staple, yet an analysis of the planned utilization of project resources does not appear consistent with this statement. The eight participants trained will be assigned among the seven provinces. A traveling seminar for fish farmers will be initiated in each province. The PID is silent on the geographic allocation of the PCV's, sixty additional GURC extension agents and project financed vehicles. While the project committee was in no position to judge whether the payoff would be greater from a national program or an area-focused program, it felt that the ambivalence of the PID must be resolved during PP preparation, particularly in view of the area-focused strategy projected in the CDSS.

- R Project concentration is in the Western Highlands, an area where root crops are a dietary staple. Trained participants, vehicles and extension support will all be focused in the above-mentioned area.
- 5 If the final project design results in an essentially area-specific project then it would appear that both the Peace Corps and the GURC's contribution would have to be recomputed. This is particularly important for the GURC contribution since they must meet the 25 percent contribution criteria as required by FAA section 110 (A).
- R GURC's contribution is 60%, Peace Corp's contribution is 17% and AID's contribution is 23%.
- 6 The PID is unclear as to who or what classes within the rural population are likely to participate in or benefit from the proposed intervention. Since the development of fish ponds requires either an existing pond for renovation or land accessible to water for development of a new pond, the possibility exists that only those farmers/rural dwellers who are relatively better off may be able to participate. The project committee noted that such skewing of project benefits had apparently occurred in small fish production projects elsewhere (see OAS report on Auburn University 211D grant activities), for reasons which included factors of better economic status as well as local political connections by some rural dwellers. This issue of access to required assets could not be adequately addressed during the PID review for lack of available information. It is the project committee's view, however, that the Mission must address how the project will benefit in fact those persons whose diets and incomes most need improving and not the rural elite. If the Mission determines project must work with individuals who are better off than the majority of the rural population in order to work at all, then the PP design must clearly detail how the benefits of small fish ponds will be distributed to the rural poor.
- R Social Soundness Analysis addresses issues of farm produce distribution.

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- 7 A related target group/beneficiary question raised at the PID review relates to the sex of the participants. Jana Guyer's work on farming systems in southern Cameroon notes that men's agricultural labor is devoted in many cases to cash crops (coffee, tomatoes, etc.), while women's farming work provides the household food. If fish are to be produced for household diet improvement, then it may be essential for women to do the production. If men are to be the fish producers, then the diet impact upon the producer's family may only be achieved through expenditure of the increased income as the fish are sold. Thus sex of the producer may be an important determinant of project impact and should be taken into consideration in the PR design.
- 8 Summary review of Social Scenarios Analysis indicates fish ponds as men's assets, but the bulk of the produce is sold at roadside resulting in a benefit to the local population. Women and children often ferment the ponds and utilize the benefits at harvest time.
- 9 The project committee recognized the significance of the nutrition objectives of the project. The rationale for emphasizing areas where fish crops are a staple is a good one but as previously noted the PID is ambivalent as to whether or not project resources will actually be devoted in these areas or not. It is important to assess intra-family fish distribution so that measures can be developed within the program to foster increased equity of fish consumption based on nutritional needs, especially for the at-risk groups of pregnant/nursing mothers, growing infants and young children. The PR design should also consider expanding the training of extension agents to include improved dietary practices and the mobilization of women to effect the practices of intra-family fish stock distribution.  
  
The project is training 40000 with train forty-five extension agents in various areas of fish pond culture of which the benefits of fish nutrition is a part.
- 10 The PID identified Auburn as the training institution for project participants. Auburn's regular programs require a B.S. in biology for entrance which may be a requirement difficult for participant candidates to meet. Auburn and other U.S. institutions do conduct special training programs in fish culture which might be more appropriate to project needs.
- 11 Mission has looked into special training programs of U.S. institutions, as well as third country training in the Philippines and Thailand.
- 12 The PID is working on economic and cost/benefit analysis. A rough calculation of LCP costs (AED, GIRC, and Peace Corps) divided by estimated LCP increases in fish production indicates a cost per pound of three dollars.

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We realize this is a crude measure but it does indicate a need for the Mission to make a refined analysis early in the PP preparation process to validate the economic feasibility of the project. A related assessment should also be made of the GURC's ability to meet recurrent costs of the fisheries programs after U.S. assistance is terminated.

- R The economic analysis gives a breakdown of cost/benefit over a ten year period for an individual farmer pond. A statement of recurrent costs and the ability for the GURC to meet these costs is in the financial plan. The GURC has proposed an additional \$100,000 for their 1980-81 budget, excluding salaries.
- 11 Schistosomiasis is a potential problem in the operation of fish ponds. We believe that baseline data should be collected on the incidence of schistosomiasis before fish ponds are rehabilitated or constructed. For comparative purposes the data should be collected from both farm families who will participate in fish pond operations and nonparticipating families. The dynamics of snail populations should also be monitored while the ponds are in operation, when they are drained and when they are refilled. The question was raised as to whether the farmers or the GURC will have the resources to replace the boots and gloves provided by the project for protection from schistosomiasis when these items are worn out.
- R A study, Possible Detrimental Health Effects of Fish Ponds and Measures to Control, was done during the design process and is available at the Mission upon request.
- 12 The engineering aspects of fish pond construction vary and tend to be site specific. The Mission should take steps to assure itself that either Peace Corps, USAID or the GURC will have the expertise to address this potential problem area and to develop reasonably firm cost estimates with engineering input as appropriate.
- R Site selection and construction of fish ponds are key elements of the training program at Foumban.
- 13 The PID states that the project will involve renovation of abandoned ponds and establishment of new ponds, but does not specify the extent to which USAID will be involved in the construction/renovation aspect of the project. If construction/renovation costs, including technical assistance and commodities, are to be shared by USAID, then engineering plans may be required under FAA Section 611 (A) prior to authorization, and compliance with Section 611 (B) also may be necessary.
- R Mission has complied to 611 (A).

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- 14 DS/AGR/F has three technicians on its staff. The Mission may wish to utilize the office's expertise during the design phase of the project.
- R AID/W negotiated the PIO/T for the design of the project, and Resource Development Associates was awarded the contract.
- 15 The project committee raised the question of the appropriateness of the Project for Title XII implementation, noting a prior recommendation of the Regional Working Group (RWG) for use of the collaborative assistance mode. The project concentrates on institution building and training functions which are a central concern of Title XII. The design team composition in the PID suggests the Mission intends to use a different approach. Departure from the recommendation of the RWG will require submission of adequate justification and approval by AID/W. If the Mission accepts Title XII, AID/W will initiate the selection process including Mission participation.
- R Adequate justification for not using Title XII may be found in files in AID/W, AFR/DR/CANA.
- 16 A substantial portion of PID and IEE is devoted to the health hazards associated with human contact with fish pond waters and to procedures to minimize such hazards. The PID acknowledges, however, that a complete resolution of the possible adverse effects from water-borne diseases which may accompany fish farming has not been made, and that therefore, a health study will be undertaken as part of the project design activities. AID/W feels that without the study outlined in PID, project committee not in position to recommend a negative determination.
- R See Approved Initial Environmental Examination.
- 17 The PID states that water will be diverted from streams to fill and maintain fish pond levels and that the ponds will be drained periodically. In addition, animal wastes and other possible pollutants will be introduced into waters to promote algae growth. The IEE, however, does not address the potential environmental effect of drainage and/or filtration on water sources for human use and consumption.
- R A study, Possible Detrimental Health Effects of Fish Ponds and Measures of Control, was done during the design process and is available at the Mission upon request.
- 18 The IEE therefore is not accepted. It must be revised to include findings and recommendations of the health study and to address the potential pollution problems referred to above. AID/W anticipates receiving the revised IEE in June 1979, the date estimated in the PID

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for completion of the health study. AID/11 will review the revised IEE immediately upon receipt in order to avoid delay in preparation of the PP.

R See Approved Initial Environmental Examination.

ANNEX B

TELEGRAM STATE 278917

Subject: Cameroon Small Farmer Fish Production, 631-0022,  
Response to Auburn Aquaculture study team recommendations.

A. Technical Evaluation

- 1 Use of *Tilapia Nilotica* seems to be justified in Cameroon.
- R This is a species which fish farmers are familiar with. It is easy for them to manage and produce adequate yields.
- 2 Carp and *Clarias* not likely to produce comparable yields without use of feeds.
- R Contracts with the breweries, West Corn and Mezan Oil will insure adequate feed for the fish stations.
- 3 Feed inputs appear to be limited due to lack of availability and cost.
- R The breweries, West Corn and Mezan Oil will provide feed on a regular basis at low cost for the fish stations. Fish in the farmers' ponds already are feeding on low cost foods which are readily available. In addition, field days will demonstrate the use of locally available feed material to farmers at little or no cost to them. IRZ will also provide mixed feeds from their Mankon station.
- 4 In areas of Cameroon with cooler temperatures, mixed culture of the 3 species may have some promise.
- R Experimental polyculture is already being investigated by GURC fisheries department.
- 5 Hatchery efficiency could probably be improved through training and technical assistance.
- R The project is quite specific in providing training for upper-level and mid-level management personnel and extension agents. Technical assistance is being provided by a fisheries coordinator and an experienced fish farmer.
- 6 By improving hatchery efficiency expansion would not be required at this time.

R The project does not propose to enlarge fish stations but to improve the facilities and equipment of three selected fish stations.

B. General Evaluation of Past Fishery Efforts

1. Peace Corps has been a major force in fish culture efforts in Cameroon.

R Peace Corps is supplying fourteen volunteers for the project.

2 Production demonstrations are not as dramatic in Cameroon as in Zaire, possibly because of cooler climate in Cameroon.

R Management practices in Zaire have been more effective than in Cameroon. This project will train forty-five extension agents in fish pond management.

3 Team was impressed with dedication of Peace Corps.

R Peace Corps efforts are a strong component of this project.

4 Peace Corps sphere of influence and impact is small to date in Cameroon.

R This is due in part to high ratio of farmers to volunteers.

5 Did not sense grass roots interest in fish culture in Cameroon that was apparent in Zaire.

R The design team, during its six week survey, found a great interest in fish culture and a large enthusiastic number of farmers throughout the country who were very anxious to become involved. This interest is perhaps one of the most significant findings of the team. We recognize that beneficiary receptivity to the program is essential to its success.

6. It is felt that a modest input by USAID in Cameroon would be justified.

R The project is concentrating on improving three fish stations out of twenty-six, training ten candidates, and improving the extension system. USAID/Y participation is considered modest as it comprises only 23% of the total project costs.

ANNEX C

ITEMIZED INPUT LIST

	<u>QUANTITY</u>	<u>UNIT COST</u> (\$)	<u>TOTAL COST</u> (\$)
<u>AID</u>			
<u>Training</u>			
Long-term training in U.S. (fish culture) 48 pm	2	44,320	89,640
Short-term training in U.S. (fish culture) 54 pm	6	16,897	100,345
Short-term training in U.S. (fish nutrition) 13 pm	2	16,897	33,615
Short-term training in Maroua (vehicle maintenance) 3 wks.	2	1,000	2,000
<u>Technical Assistance</u>			
Fisheries coordinator	1	4,800/mo.	\$7,900
Fish breeder	1	11,500/mo.	80,500
Evaluation	1	9,700	9,700
<u>Construction Materials</u>			
Hatchery buildings	3	7,100	21,300
Feed warehouses	3	9,000	27,000
<u>Commodities</u>			
a) <u>Technical Equipment</u>			
Plastic sacks 30x60 cm.	9,000	0.76	6,800
Spring Balances 50 kg.	60	33.33	2,000
Hip Boots	25	52.00	1,300

	<u>QUANTITY</u>	<u>UNIT COST</u> (\$)	<u>TOTAL COST</u> (\$)
Waders	10	100.00	1,000
Measuring Tape 3 m.	100	8.00	800
Hand Level	40	30.00	1,200
Hand Net (no frame)	40	25.00	1,000
Fingerling seine	6	125.00	750
Juvenile seine	6	125.00	750
Thermometer (centigrade)	20	10.00	200
Sensitive Balance	3	200.00	600
Agitator (air for fish transport)	9	70.00	630
Transport Tank (large wood)	3	150.00	450
Transport tank (small metal)	9	22.00	200
Spawning jars	30	50.00	1,500
Microscope (oil immersion)	1	400.00	400
Carp Pituitary hormone	40	100.00	4,000
Testosterone	40	100.00	4,000
Other Chemicals			1,500
Fertilizer 10-20-10	3 tons	500.00	1,500
Hand Tools	20	450.00	9,000
Fish Feed (rice, bean, seed cake)	60 tons	500	30,000
Dissecting set	6	50	300
Tagging guns and tags	10	10	100

PROJECT: Small Farmer Fish Production  
Project number: 631-0022

ANNEX D  
LOGICAL FRAMEWORK

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><u>Goal:</u> To assist the GURC in its efforts to increase income, improve diet, and diversify farm production of the rural population by improving the existing Inland Fisheries program.</p>	<p><u>Measure of Goal Achievement</u> 1. Increased income of rural population, (50 867 CFA for a new farmer). 2. Increased fish consumption, (121 kg/family/yr). 3. Increased number of agriculture products produced per family, (2-3 agriculture enterprises/family).</p>	<p>1. Field surveys of household incomes, family diet and types of agriculture production per family.</p>	<p>1. GURC developmental and budget priorities stress agriculture production and rural development. 2. Implementing agencies coordinate efforts to maximize effectiveness.</p>
<p><u>Project Purpose:</u> To increase fish pond production by developing GURC's capacity to supply fingerlings to fish farmers and to improve fish pond management through the extension service.</p>	<p><u>Conditions Which Indicate Purpose Has Been Achieved</u> 1. Fingerling demand by fish farmers is supplies for 5500 ponds. 2. Fish pond production will reach mid-level management (1200-1600 kf/ha/yr).</p>	<p>Project Records Evaluations</p>	<p><u>Assumptions</u> 1. Fish stations can produce enough fingerlings. 2. Extension agents can effectively demonstrate fish pond culture to farmers.</p>
<p><u>OUTPUTS</u></p>	<p><u>MAGNITUDE OF OUTPUTS</u></p>	<p><u>VERIFICATION</u></p>	<p><u>ASSUMPTIONS OF OUTPUT</u></p>
<p>1. A Cameroonian staffed institution with the capacity for small farmer fish production. 2. Physical facilities and equipment for supplying fingerlings to fish farmers. 3. Trained extension agents demonstrating fish pond culture to fish farmers.</p>	<p>1. Trained staff: 2 - U.S. trained in management, 6 trained for 5-9 months in fish station management, and 2 trained for 5-9 months in fish nutrition. 2. 3 - Fish stations with necessary equipment supplying fingerlings. 3. 45 extension agents trained in fish pond culture.</p>	<p>1. GURC records. 2. GURC records and site inspection. 3. Foumban training center records.</p>	<p>1. Personnel can be released for training and once trained return. 2. Materials and commodities arrive on a timely basis, labor is supplied, construction is completed on a timely basis, and management is effective resulting in adequate supply of fingerlings. 3. Participants are selected and are capable of demonstrating mid-level management on all ponds supervised.</p>

<u>OUTPUTS</u>	<u>MAGNITUDE OF OUTPUTS</u>	<u>VERIFICATION</u>	<u>ASSUMPTIONS OF OUTPUTS</u>
4. Farmers managing fish ponds to mid-level production	4. 5000 farmers managing 1-2 ponds with a yield of 1200-1600 kg/ha/yr.	4. Production data records Evaluations	4. Farmers are receptive to extension agents and are able to practice the methods demonstrated.
<u>INPUTS</u>	<u>MAGNITUDE OF INPUTS</u>	<u>VERIFICATION</u>	<u>ASSUMPTION OF INPUTS</u>
1. <u>AID</u>	1. <u>AID</u> (\$858,000)	1. US/AID records, and evaluations.	1. That adequate funds be made available promptly.
a) Technical Assistance long-term expert and short-term	a) Technical Assistance (\$178,100 for long-term & short-term assistance		
b) Training U.S. In-country	b) Participants (\$226,100) 10 trained; 4 trained		
c) construction	c) Materials (\$48,300)		
d) commodities	d) Commodities (\$228,700)		
e) other costs	e) Other costs and inflation and contingencies (\$176,800)		
2. <u>Host Country</u>	2. <u>Host Country</u> (\$2,212,000)	2. GURC records and project evaluation.	2. The GURC makes funds available on a timely basis.
a) Personnel	a) Salary (\$1,350,000)		
b) Training	b) Participants (\$40,500)		
c) Construction	c) Labor (\$47,400)		
d) Commodities	d) Commodities (\$154,000)		
e) Other costs	e) Other costs and inflation (\$520,100)		



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Ministère de l'Economie  
et du Plan  
DIRECTION DE LA PROGRAMMATION

ANNEX F

United Republic of Cameroon  
Ministry of Economic Affairs  
and Planning  
DIRECTION OF PROGRAMMING

Ref:V/L du 23 Avril 1979  
Objet: Projet Pisciculture.

Le Ministre de l'Economie et du Plan  
The Minister of Economic Affairs and Planning

à Monsieur le Directeur de l'Agence Américaine  
pour le Développement International  
B.P. 817 - YAOUNDE

Monsieur le Directeur,

Faisant suite à votre lettre citée en référence et relative  
à l'objet repris en marge,

J'ai l'honneur de vous marquer l'accord du Gouvernement pour  
la préparation et la réalisation en collaboration avec les  
services gouvernementaux compétents d'un projet de développement  
du potentiel de l'aquiculture au Cameroun.

En vous remerciant de la disponibilité de votre organisme,  
je vous prie d'agréer, Monsieur le Directeur, l'assurance de ma  
considération distinguée.

## ANNEX G

### JOB QUALIFICATIONS AND DUTIES

#### FISHERIES COORDINATOR

##### I. Qualifications:

A. Educational level: BA, BS, AB or equivalent with a strong background in fisheries, biology, zoology, ecology and/or related fields.

B. Experience: A minimum of 4-5 years actively involved in the culture of aquatic animals preferably Africa or Asia; should have practical experience in hatchery construction, operation and maintenance, aquatic diseases, and parasites, food and feeding, diet and nutrition, pond construction and pond management. At least 2 years should be at the management, supervisory and/or administrative level. At least 2 years overseas experience (need not be concurrent) in aquaculture development and/or production. Previous experience in tropical aquaculture is preferred. Related service in the U.S. Peace Corps would receive special consideration.

C. Language: A proficiency in French at the S3 level is required.

##### II. Duties:

The Fisheries coordinator will be concerned primarily with implementation and administration of the project. He/she will work closely with the Government of Cameroon and USAID providing technical information, advice and assistance and will oversee the implementation of the project. The coordinator will consult with the Director of Fisheries and USAID/Y to insure that commodities, equipment and finances for the project are available and conform to the agreed project plan, schedule and objectives. The coordinator will be required to travel extensively and to advise and assist where/when required and to follow up on technical and administrative matters.

Physical requirements: He/she should be in good health, adaptable both physically and psychologically to work under difficult climatic conditions in tropical areas. The coordinator must have a proven ability to work with peoples of different racial, cultural and educational background.

##### III. Duty Station:

Bamenda, Cameroon

##### IV. Length of Tour:

18 months

FISHERIES BREEDING EXPERT

I. Qualifications:

A. Educational level: BA, BS, or equivalent with a strong background in Fisheries Biology and/or related fields.

B. Experience: A minimum of two years actively involved in fish pond aquaculture preferably in Africa or Asia. The expert should have practical experience in artificial breeding and management of fish ponds and personnel.

C. Language: A fluency in French at the E3 level is advantageous.

II. Duties:

The Fisheries breeding expert (aquaculturist) will assist the Fouban, Ku Bome and Bemessing fish stations. The expert will concentrate on the following species of fish: Tilapia Nilotica, Claria Lazera, Cyprinus carpio and Heterotis niloticus. The expert will advise and supervise the stations activities with brood stock, artificial breeding, fry and fingerling care, ration formulation and management of personnel. He will arrive after the construction of warehouses and laboratories are finished and after two of the short term candidates have returned from training. This person will act as a conduit by easing the transition from USAID support to full Cameroonian implementation.

III. Duty Station:

Bamenda or Fouban, Cameroon

IV. Length of Tour:

Seven months

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## ANNEX H

### POND SITE SELECTION

- 1) Existing and Abandoned Ponds. These ponds will be used if they are determined as feasible. For example, the following will be considered: previous problems, water availability, enthusiasm of farmer, possibilities of expansion, etc.
- 2) New Ponds. These will be constructed after a survey of existing and abandoned ponds is made. They will be chosen on the following criteria: topography, soil conditions, market, population, farmer enthusiasm and water availability.
- 3) Topography. An area must be selected where water is available throughout the year, and where ponds can be built in a series.
- 4) Soil Conditions. The subsoil must be impermeable, capable of containing water throughout the year.
- 5) Labor Costs. Consideration will be given to a reservoir pond due to its low construction costs.
- 6) Market. Consideration must be given to the population in the area and the distance to the nearest market.
- 7) Ponds will not be constructed near villages or river blindness areas.

ANNEX I

INLAND FISHERIES PRODUCTION DATA

Farmer Name \_\_\_\_\_  
Province \_\_\_\_\_ Department \_\_\_\_\_  
Arrondissement (if applicable) \_\_\_\_\_  
Ecological zone (check one) \_\_\_\_\_ Forest \_\_\_\_\_ Savannah \_\_\_\_\_ Transition \_\_\_\_\_  
\_\_\_\_\_ Other (Please indicate) \_\_\_\_\_  
Average yearly temperature \_\_\_\_\_ Range of temperature \_\_\_\_\_  
Length of rainy season \_\_\_\_\_ months; Length of dry season \_\_\_\_\_ months

I. Private Ponds

Total number of functioning ponds \_\_\_\_\_  
Number of functioning barrage ponds \_\_\_\_\_  
Number of functioning deviation ponds \_\_\_\_\_  
Number of functioning ground water ponds (basins) \_\_\_\_\_  
Total area of all functioning ponds \_\_\_\_\_ m<sup>2</sup>  
Total area of all functioning barrage ponds \_\_\_\_\_ m<sup>2</sup>  
Total area of all functioning deviation ponds \_\_\_\_\_ m<sup>2</sup>  
Total area of all functioning ground water ponds \_\_\_\_\_ m<sup>2</sup>  
Total number of abandoned ponds \_\_\_\_\_  
Total area of all abandoned ponds \_\_\_\_\_ m<sup>2</sup>  
Number of ponds in an abandoned state in January 1978 \_\_\_\_\_  
Number of ponds in an abandoned state in December 1978 \_\_\_\_\_  
Number of new ponds constructed and stocked in 1978 \_\_\_\_\_  
Area of these constructed ponds \_\_\_\_\_ m<sup>2</sup>

Type of ponds \_\_\_\_\_  
Total weight of fish harvested in 1978 \_\_\_\_\_ kgm  
Total weight of Tilapia harvested in 1978 \_\_\_\_\_ kgm  
Total weight of Clarias harvested in 1978 \_\_\_\_\_ kgm

Month	Specie	Area Harvested	Kgm Harvested	Number Harvested
Jan.				
Feb.				
Mar.				
April				
May				
June				
July				
Aug.				
Sept.				
Oct.				
Nov.				
Dec.				
Total		m <sup>2</sup>	kgm.	

Average growing season (i.e. number of months between stocking and harvesting) \_\_\_\_\_

Average annual production \_\_\_\_\_ kgm/ha/yr  
Range (lowest vs. highest) \_\_\_\_\_  
Average production for barrage ponds \_\_\_\_\_ kgm/ha/yr  
Average production for deviation ponds \_\_\_\_\_ kgm/ha/yr  
Average production for ground water ponds \_\_\_\_\_ kgm/ha/yr  
Average annual Tilapia production \_\_\_\_\_ kgm/ha  
Average annual Clarias production \_\_\_\_\_ kgm/ha  
Average annual Carp production \_\_\_\_\_ kgm/ha

Average annual Heterotis production \_\_\_\_\_ kgm/ha

Other (indicate species) \_\_\_\_\_ Production \_\_\_\_\_ kgm/ha

Average fingerling production (tilapia): \_\_\_\_\_ kgm/are

\_\_\_\_\_ nbr/are

Number of months between stocking and first spawn \_\_\_\_\_ months

Fingerling production other than Tilapia: Specie(s): \_\_\_\_\_

\_\_\_\_\_ kgm/are

\_\_\_\_\_ nb /are

Percent ponds which are fertilized \_\_\_\_\_ %

Percent of deviation ponds which are fertilized \_\_\_\_\_ %

Percent of barrage ponds which are fertilized \_\_\_\_\_ %

Percent of ground water ponds which are fertilized \_\_\_\_\_ %

Types of fertilizer used \_\_\_\_\_

How applied \_\_\_\_\_

Ratio organic vs. inorganic fertilization \_\_\_\_\_

Percent of ponds with a supplementary feeding program \_\_\_\_\_ %

Percent of deviation ponds with a supplementary feeding program \_\_\_\_\_ %

Percent of barrage ponds with a supplementary feeding program \_\_\_\_\_ %

Percent of ground water ponds with a supplementary feeding program \_\_\_\_\_ %

Types of feed used \_\_\_\_\_

Methods of feeding \_\_\_\_\_

N.B. Fertilization and feeding programs are taken to mean that these activities are done on a regular basis as demanded by good pond management.

Stocking rate (fish/m<sup>2</sup>): Tilapia \_\_\_\_\_ Clarias \_\_\_\_\_

Carp \_\_\_\_\_ Heterotis \_\_\_\_\_ Other (indicate specie and rate) \_\_\_\_\_

Average size of fish stocked: Tilapia \_\_\_\_\_ gm Clarias \_\_\_\_\_ gm

Carp \_\_\_\_\_ gm Heterotis \_\_\_\_\_ gm

Other (indicate specie and weight) \_\_\_\_\_ gm

Average size of fish harvested: Tilapia \_\_\_\_\_ gm Clarias \_\_\_\_\_ gm

Carp \_\_\_\_\_ gm Heterotis \_\_\_\_\_ gm

Other (indicate specie) \_\_\_\_\_ gm

Number of months after stocking before obtain harvestable size:

Tilapia \_\_\_\_\_ Clarias \_\_\_\_\_

Carp \_\_\_\_\_ Heterotis \_\_\_\_\_

Other (indicate specie) \_\_\_\_\_

Production in polyculture ponds and type of polyculture (if applicable):

Comments as to the potential production in rural ponds after five years considering an ever-increasing degree of good pond management by the farmers:

Estimated annual production for an average pond in 1983 \_\_\_\_\_ kgm/ha

How could this productivity be maximized \_\_\_\_\_

Comments/Remarks:

BY: \_\_\_\_\_  
Agent

Date \_\_\_\_\_

ANNEX J

PROJECT CHECKLIST

A. GENERAL CRITERIA FOR PROJECT

1. App. Unnumbered; FAA Sec. 653 (b);  
Sec. 671

(a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project;

(a) USAID FY 1980 Congressional Presentation describes the project.

(b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that figure).

(b) Yes

2. FAA Sec. 611(a) (1). Prior to obligation in excess of \$100,000 will there be:

(a) engineering, financial, and other plans necessary to carry out the assistance; and

(a) Yes

(b) a reasonably firm estimate of the cost to the U.S. of the assistance?

(b) Yes

3. FAA Sec. 611(a) (2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?

N.A.

4. FAA Sec. 611(b); App. Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per the Principles and Standards for Planning Water and Related Land Resources dated October 25, 1973?

N.A.

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5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project? N.A.
6. FAA Sec. 209. Is Project susceptible of execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. This project has been developed in conjunction with the complements Peace Corps activities.
7. FAA Sec. 601 (a). Information and conclusions whether project will encourage efforts of the country to:
- (a) increase the flow on international trade; No impact
  - (b) foster private initiative and competition; Yes
  - (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; No
  - (d) discourage monopolistic practices; N.A.
  - (e) improve technical efficiency of industry, agriculture and commerce; and Yes
  - (f) strengthen free labor unions. N.A.
8. FAA Sec. 601 (b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including the use of private trade channels and the services of U.S. private enterprise). Technical assistance, equipment and supplies under this project will be of United States origin.

9. FAA Sec. 612 (b); Sec. 636 (h).  
Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.
10. FAA Sec. 612 (d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?
11. FAA Sec. 601 (e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?
12. FY 79 Am. Act Sec. 608. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar, or competing commodity?
- The GURC is making a substantial local currency contribution to this project for local personnel costs and operating costs for facilities and vehicles.
- No
- Yes
- N.A.

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COUNTRY CHECKLIST

Listed below are, first, statutory criteria applicable generally to FAA funds, and then criteria applicable to individual fund sources: Development Assistance and Security Supporting Assistance funds.

A. GENERAL CRITERIA FOR COUNTRY:

- |  |  |
|--|--|
| <p>1. <u>FAA Sec. 116.</u> If assistance is to a government, has it engaged in consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that such assistance will directly benefit the needy?</p>  | <p>No. The project aims at helping the needy by strengthening the Inland Fisheries program within the agriculture sector of the economy, where one finds the majority of the needy. Through the GURC's strong emphasis on agriculture, this increased capability of the GURC to carry out its policy decisions should benefit small farmers.</p> |
| <p>2. <u>FAA Sec. 481.</u> Has it been determined that the government of the recipient country has failed to take adequate steps to prevent narcotics, drugs, and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the U.S. unlawfully?</p> | <p>No.</p>   |
| <p>3. <u>FAA Sec. 620(a).</u> Does recipient country furnish assistance to Cuba or fail to take appropriate steps to prevent ships or aircraft under its flag from carrying cargoes to or from Cuba?</p>   | <p>No.</p>   |
| <p>4. <u>FAA Sec. 620(b).</u> If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement?</p>   | <p>Yes.</p>  |

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5. FAA Sec. 620(c). If assistance is to a government, is the government liable as debtor or unconditional guarantor of any debt to a U.S. citizen for goods or services furnished or ordered where: (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government? No.
6. FAA Sec. 620(e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities. No.
7. FAA Sec. 620(f). Is recipient country a Communist country? No.
8. FAA Sec. 620(i). Is recipient country in any way involved in: (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression? No.
9. FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property? No.
10. FAA Sec. 620(l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, has the AID Administrator within the past year considered denying assistance to such government for this reason? Not applicable.
11. FAA Sec. 620(o), Fisherman's Protective Act, Sec. 5. If country has seized, or imposed any penalty or sanction against any U.S. fishing activities in international waters: Not applicable.

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- a. Has any deduction required by Fishermen's Protective Act been made?
- b. Has complete denial of assistance been considered by AID Administrator? Not applicable.
12. FAA Sec. 620(q). Is the government of the recipient country in default on interest or principal of any AID loan to the country? No.
13. FAA Sec. 620(s). What percentage of country budget is for military expenditures? How much of foreign exchange resources is spent on military equipment? How much spent for the purchase of sophisticated weapons systems? (Consideration of these points is to be coordinated with the Bureau for Program and Policy Coordination, Reg'l Coordinators & Military Assistance Staff (PPC/RC). In 1979/80, the budget allotment for the Ministry of Armed Forces was 14% of the GURC budget. The expenditures for arms and munitions represented 0.8% of total budget costs. No sophisticated weapon systems were purchased.
14. FAA Sec. 620(t). Has the country severed diplomatic relations with the U.S.? If so, have they resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption? No.
15. FAA Sec. 620(u). What is the payment status of the country's U.S. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget? The GURC's payments are not in arrears.
16. FAA Sec. 666. Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under the FAA? No.
17. FAA Sec. 520. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of terrorism? No.
18. FAA Sec. 669. Has the country delivered or received nuclear reprocessing or enrichment equipment, materials or technology without specified arrangements on safeguards, etc.? No.

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19. FAA Sec. 901. Has the country denied its citizens the right or opportunity to emigrate?

No.

**B. FUNDING CRITERIA FOR COUNTRY:**

Development Assistance Country Criteria

1. FAA Sec. 102(c), (d). Have criteria been established, and taken into account, to assess commitment and progress of country in effectively involving the poor in development, on such indexes as: (a) small farm labor-intensive agriculture, (b) reduced infant mortality, (c) population growth, (d) equality of income distribution, and (e) unemployment?

Yes. The GURC is committed to a policy of involving its citizens in the developmental process (see items B3 and B6 below). There are few established quantifiable social indicator indices measuring this GURC commitment. However, one of the outputs of the project will be data which will allow the formulation of such indices, particularly for (a) small farmer labor-intensive agriculture.

2. FAA Sec. 201(b) (5) (7) and (8); Sec. 208; 211(a) (4), (7). Describe extent to which country is:

- (1) Making appropriate efforts to increase food production and improvements for food storage and distribution.
- (2) Creating a favorable climate for foreign and domestic private enterprise and investment.
- (3) Increasing the public's role in the developmental process.

The GURC is presently financing several major organizations and programs as well as supporting appropriate studies devoted to increasing food production and improving food storage and distribution. Over 17 percent of the current Five Year Plan is apportioned to the rural sector with food crop production receiving increasing emphasis.

The GURC has adopted a liberal investment code.

The GURC has made a remarkable effort to involve its citizens in the developmental process by having had Cameroonians, beginning at the village level, meaningfully participate in the formation of the government's Five Year plan for economic, social and cultural development.

- (4) (a) Allocating available budgetary resources to development.

An estimated 70% of the GURC planned allocation of budgetary resources is earmarked for development or development-related projects or services for new or ongoing activities.

(b) Diverting such resources for unnecessary military expenditure and intervention in affairs of other free and independent nations.

See A.13. The GURC has kept to a policy of non-intervention in the domestic affairs of its neighbors.

- (5) Making economic, social and political reforms such as tax collection improvements and changes in land tenure arrangements, and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.

Cameroon has a stable and reasonably democratic elective government which is very interested in providing social justice and equal benefits for its very diverse population. The government recognizes the importance of private enterprise and has accorded it a key role in the development of the Cameroonian economy. Individual freedom is prized in Cameroon and its citizenry under law enforced by the courts, is free to participate in political, social, and economic activities.

- (6) Otherwise responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.

The GURC is very sensitive to the economic, political and social concerns of its people. In the words of President Ahidjo, "Self reliant development, which for us means primarily development of the people by the people, is an answer to the need to direct all national resources and energies to development...The essence of social justice is that the improvement of the standard of living resulting from the productive and creative effort of the people will benefit all Cameroonians and lead to an equitable redistribution of the fruits of progress among various social groups...In this way, national historical and social imbalance will be reduced and the fruits of development be distributed more equitably among the population as a whole."

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- c. FAA Sec. 201(b), 211(a). Is the country among the 20 countries in which development assistance loans may be made in this fiscal year; or among the 40 in which development assistance grants (other than for self-help projects) may be made? Yes.
- d. FAA Sec. 115. Will country be furnished, in same fiscal year, either security supporting assistance, or Middle East peace funds? If so, is assistance for population programs, humanitarian aid through international organizations, or regional programs? No.

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ANNEX K

SELECTION PANEL FOR PARTICIPANT TRAINING

All candidates who will receive training in the U.S. and third world countries will be selected from a panel made up of the following people: USAID/Y project manager, fisheries advisor, Peace Corps fisheries volunteer leader, and director and deputy director of the Inland Fisheries program or their representatives.

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## ANNEX L:

PREVENTIVE MAINTENANCE CHECK LIST

	3	6	9	12	15	18	21	24
* A. Basic maintenance schedule	-	6	12	18	24	30	36	42
	A	B	C	D	E	F	G	H
<u>BASIC ENGINE COMPONENTS</u>								
1. Adjust valve clearance.....			—			—		
2. Retorque engine head bolt.....	—							—
3. Change engine oil.....	—	—	—	—	—	—	—	—
4. Change oil filter.....		—		—		—		—
5. Change engine coolant.....								—
6. Inspect all vacuum fittings, hoses and connections.	—	—	—	—	—	—	—	—
7. Inspect exhaust pipes, manifold, and exhaust pipe mountings.....		—		—		—		—
8. Inspect water pump.....				—				—
9. Test engine compression.....								—
<u>FUEL SYSTEM</u>								
10. Adjust idle speed and idle mix.....		—		—		—		—
11. Inspect choke system.....		—		—		—		—
12. Change fuel filter.....	—	—	—	—	—	—	—	—
13. Change air filter (when necessary).....	—	—	—	—	—	—	—	—
14. Inspect fuel tank cap, lines and connections.	—	—	—	—	—	—	—	—
15. Check carburetor and dash pot.....	—	—	—	—	—	—	—	—
<u>IGNITION SYSTEM</u>								
16. Ignition timing and dwell angle.....		—		—		—		—
17. Spark plugs, inspect and change if necessary.	—	—	—	—	—	—	—	—
18. Inspect ignition wires.....	—	—	—	—	—	—	—	—

\* For specifications always refer to service manual.



	x 1000 km	3	6	9	12	15	18	21	24
	or months	-	6	12	18	24	30	36	42
	schedule	A	B	C	D	E	F	G	H
<b>BODY AND CHASSIS</b>									
35. Check manual steering gear box oil level.....		—	—	—	—	—	—	—	—
36. Inspect steering linkage for abnormal looseness or damaged seals.....		—	—	—	—	—	—	—	—
37. Check front end alignment.....		—	—	—	—	—	—	—	—
38. Check manual transmission and differential oil level..		—	—	—	—	—	—	—	—
39. Change manual transmission and differential oil.....									—
40. Change automatic transmission fluid.....									—
41. Adjust automatic transmission bands.....					—				—
42. Lubricate transmission controls, kickdown linkage, and clutchlinkage (every 3,000).....		—	—	—	—	—	—	—	—
43. Inspect leaf spring bushings and replace if necessary.....					—				—
44. Lubricate front and rear wheel bearings.....									—
45. Check front and rear suspension.....					—				—
46. Rotate tires change if necessary.....					—				—
47. Check and adjust head light alignment.....			—		—		—		—
48. Grease all nipples.....		—	—	—	—	—	—	—	—
49. Check air conditioning system.....					—				—
50. Lubricate all latches and fixtures.....			<u>88</u>		—		—		—
51. Clean body drain holes.....			—		—		—		—

‡ Every 66,000 km drop manual transmission and inspect clutch disc and pressure plate.  
‡ Every 66,000 km re-adjust differential play.

