

UNITED STATES GOVERNMENT

Memorandum

6880220-(2)
PD-AAC-856-61

TO : Distribution

OPC → 3/10/79
DATE: November 8, 1979

FROM : USAID/MALI/PROG, Helen Vaitaitis *HV*

82p

SUBJECT: 688-0220, San Pilot Fish Production, PVO Grant to Africare and Project Paper

Subject documents are provided for your files. Funding of \$294,000 has been obligated by means of an operational program grant to Africare, to carry out the subject project.

The purpose of the San Pilot Fish Production project is to promote fish production in Mali's Fourth and Fifth Regions and to help villagers increase cash income. Activities will be to establish and operate a pilot station at San for fish breeding and production of tilapia and clarias species; to train station and extension staff; to sell fingerlings to rice farmers and help them undertake fish production with rice paddy cultivation; and to study and recommend improved approaches to fish culture integrated with other aspects of rural development.

Enclosure: Subject documents

DISTRIBUTION:

Grantee:
AFRICARE Mali

USAID/MALI

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5010-110

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USAID au MALI
AMBASSADE AMERICAINE



July 12, 1979

AFRICARE INC.
1601 Connecticut Ave. N.W.
Washington, D.C. 20009

Subject: Grant No. 688-0220

Dear Sirs:

Pursuant to the authority contained in the Foreign Assistance Act of 1961, as amended, the Agency for International Development (hereinafter referred to as "A.I.D." or "Grantor") hereby grants to the AFRICARE INC. (hereinafter referred to as "AFRICARE" or "Grantee") the sum of \$294,000 to provide support for a program in San Pilot Fish Production as more fully described in the attachment to this Grant entitled "Program Description".

This Grant is effective and obligation is made as of the date of this letter and shall apply to commitments made by the Grantee in furtherance of program objectives during the period September 15, 1979 through September 14, 1981.

This Grant is made to AFRICARE INC., on condition that the funds will be administered in accordance with the terms and conditions as set forth in Attachment A entitled "Program Description", and Attachment B entitled "Standard Provisions", which have been agreed to by your organization.

Please sign the Statement of Assurance of Compliance, enclosed herein, and the original and one (1) copy of this letter to acknowledge your acceptance of the conditions under which these funds have been granted.

Sincerely yours,

Mission Director

Attachments:

1. Program Description
2. Standard Provisions
3. Statement of Assurance of Compliance

ACCEPTED:

AFRICARE INC.

By: [Signature]

Title: [Signature]

Date: July 17, 1993

FISCAL DATA

Appropriation : _____
Allotment : _____
PIO/T No. : _____
Project No. : _____
Total Grant Amount: _____

ASSURANCE OF COMPLIANCE WITH THE AGENCY FOR
INTERNATIONAL DEVELOPMENT REGULATION UNDER TITLE VI
OF THE CIVIL RIGHTS ACT OF 1964

AFRICARE, INC. (hereinafter called the "Grantee")
(Name of Grantee)

HEREBY AGREES THAT it will comply with Title VI of the Civil Rights Act of 1964 (P.L. 88-352) and all requirements imposed by or pursuant to the Regulation of the Agency for International Development (22 CFR Part 209, 30 FR 317) issued pursuant to that title, to the end that, in accordance with Title VI of that Act and the Regulation, no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Grantee receives Federal financial assistance from the Agency; and HEREBY GIVES ASSURANCE THAT it will immediately take any measures necessary to effectuate this agreement.

If any real property or structure thereon is provided or improved with the aid of Federal financial assistance extended to the Grantee by the Agency, this assurance shall obligate the Grantee, or in the case of any transfer of such property, any transferee, for the period during which the real property or structure is used for a purpose for which the Federal financial assistance is extended or for another purpose involving the provision of similar services or benefits. If any personal property is so provided, this assurance shall obligate the Grantee for the period during which it retains ownership or possession of the property. In all other cases, this assurance shall obligate the Grantee for the period during which the Federal financial assistance is extended to it by the Agency.

THIS ASSURANCE is given in consideration of and for the purpose of obtaining any and all Federal grants, loans, contracts, property, discounts or other Federal financial assistance extended after the date hereof to the Grantee by the Agency, including installment payments after such date on account of applications for Federal financial assistance which were approved before such date. The Grantee recognizes and agrees that such Federal financial assistance will be extended in reliance on the representations and agreements made in this assurance, and that the United States shall have the right to seek judicial enforcement of this assurance. This assurance is binding on the Grantee, its successors, transferees, and assignees, and the person or persons whose signatures appear below are authorized to sign this assurance on behalf of the Grantee.

AFRICARE, INC.
(Grantee)

BY(Signature) _____

TYPED NAME R. J. BENN

TITLE Representative

DATE 1/6/68

SAN FISHERIES PROJECT

PROGRAM DESCRIPTION

No. 688-0220

A. Purpose of Grant

The purpose of this Grant is to provide support for a project located at San, Mali, to promote fish production in Mali's 4th and 5th Regions without endangering existing fish reserves, in order to help increase the quality and quantity of protein available for local consumption and assist the rural people to add to their cash income.

B. Specific Objectives

The specific objectives of this Grant are as follows:

1. To establish and operate a pilot station at the village of San for fish breeding, fish production and the hatching and distribution of fingerlings;
2. To train station and extension staff in fish culture;
3. To distribute fingerlings to rice farmers at a minimal cost;
4. To assist farmers to undertake fish production in conjunction with existing paddy rice production;
5. To recommend improved practices for fish culture and production;
6. To promote the self-sustaining potential of the fish station and extension activities;
7. To evaluate the program at the end of year one and year two, and recommend procedure for improvement where needed.

C. Implementation

1. The Grantee will enter into an agreement with the Government of the Republic of Mali (GRM) to formalize the GRM participation and contribution to this project within the scope stated in Section 5.1 of the project proposal.
2. The Grantee will submit to the USAID Project Manager for review and concurrence a revision to Implementation Schedule, outlined in Section 5.4 of the project proposal, which is adjusted to the dates of this grant.
3. To achieve the objectives of Section B above, the Grantee shall carry out the following activities with funds provided by this grant:

- a. Provide for assistance of U.S. consultants, and Malian workfor except for those Malians indicated in Section C.3 b and c below
- b. Provide for technical training of 2 Peace Corps Volunteers (PCV and 2 Malian counterpart personnel in a third country in Africa at start of year 1.
- c. During year 2 provide for technical and management training of 3 PCVs and 3 Malian counterparts at the San Station.
- d. Purchase all commodities listed in grant proposal except as otherwise agreed to by Africare and A.I.D.
- e. Provide for construction of ponds, canals, holding tanks, buildings and sanitary facilities as specified in Grant Proposa unless otherwise agreed to in writing by Africare and A.I.D.
- f. Provide necessary travel and per diem for U.S. hire personnel.
- g. Provide for rental and other support of project activities within the scope of the project proposal and of the budget provided herein.

D. Reporting and Evaluation

Grantee is responsible for coordinating and submission of periodic assessments and reports from the cooperating agencies involved in the project implementation. Grantee shall submit quarterly progress reports to A.I.D. by the end of the following month. These reports shall address progress of the stated objectives, Implementation activities and such other items as are necessary to identify the extent to which the project inputs and intermediate outputs are leading towards the project's intended outputs, purpose and goal.

End of year 1 and year 2 evaluations will be intended as more comprehensive in nature, providing analysis and recommendations concerning desirable directions for self-sustaining continuation of the operation .

The yearly evaluation process shall include but not be limited to the following items:

- Has progress toward planned targets been achieved: How has this been measured: Have any unplanned results occurred?
- Does this project design have continuing relevance in the light of changes over time in host country circumstances?
- What apparent internal elements of project design and/or apparent external factors caused success or failure?

Grantee shall secure concurrence of A.I.D, on evaluation format and composition of evaluation team.

Copy of each completed end of year evaluation shall be submitted to A.I.D, within 60 days of completion but in no event later than prior to final payment of Grant funds.

E. Budget

The funds, including local currency, herein shall be used to finance the following cost elements:

<u>Cost Elements</u>	<u>Total Obligated Amount</u> <u>From Date of Grant to 30 Months Thereafter</u>		
	<u>U.S.\$ Costs</u>	<u>Equivalent in US\$ of Local Currency Costs</u>	<u>Total U.S.\$</u>
1. Salaries & Wages	40,200	27,435	67,635
2. Travel & Per Diem	25,060	8,100	33,160
3. Equipment & Materials			
Rental	-o-	9,500	9,500
Commodities	8,000	50,000	58,000
4. Operational Cost	-o-	16,300	16,300
5. Participant Cost	-o-	12,500	12,500
6. Overhead 26.5%	19,413	32,816	52,229
7. Inflation	10,989	18,574	29,563
8. Contingency	-o-	15,113	15,113
TOTAL	103,662	190,338	294,000

The Grantee may not exceed the total amount of the Budget. Adjustments among line items are unrestricted.

F. Reimbursement Payment Procedures

1. U.S. Currency Costs

After the effective date of the Grant, A.I.D. will issue to the bank specified by the Grantee in (g) below a Letter of Commitment in the amount of \$103,662, which amount is the U.S. currency costs of the total grant. The Letter of Commitment issued by A.I.D. to the Grantee shall include among others the following documents:

- a) Voucher: An original and three (3) copies of completed SF 1034, "Public Voucher for Purchases and Services Other than Personal."
- b) Grantee's Invoice: One copy describing the services performed. Such invoice shall itemize costs incurred during the current billing period and shall include a breakdown of personnel costs, allowances, travel and transportation, other direct costs, overhead, commodities etc. based on the contract budget.

- c) Certification requesting reimbursement under a Direct Contract or Grant (To be executed by the Grantee).

The undersigned hereby certifies (1) that payment of the sum claimed under the cited grant is proper and due and that appropriate refund to A.I.D. will be made promptly upon request of A.I.D. in the event of non-performance, in whole or in part, under the grant or for any breach of terms of the grant; (2) the information on the fiscal report is correct and such detailed supporting information as A.I.D. may require will be furnished, at the grantee's home office or base office, as appropriate, promptly to A.I.D. on request; and (3) that all requirements called for by the grant to the date of this certification have been met.

- d) Requests for reimbursement of U.S. procurement shall include one copy of photocopy of Suppliers Commercial Invoice showing quantity, description, gross sales price (after deducting discounts and purchasing agents commission), and basis of delivery of the equipment and supplies.

2. Local Currency Costs

- a) Africare/Washington will submit to USAID/Mali documentation indicated in 1.a,b,c and d (as it relates to local procurement) for expenditures of local currency based on the budget in the Grant Proposal. Reimbursement for local currency cost shall be paid to the account of Africare/Mali.

Advance Payment

1. A.I.D. will deposit, upon request by Grantee, after issuance of Letter of Commitment, and after the Conditions Precedent have been met, an advance payment not to exceed \$36,000 to a non-interest bearing bank account at Riggs National Bank, 1913 Massachusetts Avenue, Washington DC. 20036, as specified by Grantee.

Each monthly reimbursement request shall include necessary documentation as required in (F) above for all expenditures.

2. The final reimbursement payment under this grant shall account for the total amount of the outstanding advance payment.

H. Condition Precedent to First Disbursement of Funds

Prior to first disbursement under the Grant, Africare will furnish to A.I.D., in form and substance satisfactory to A.I.D., evidence that the Government of the Republic of Mali and P.C. concur and are in agreement with the San Fish Production Project and that the GRM & Peace Corps will provide assistance to the project as stipulated in Africare's grant proposal.

I. Overhead Rate

The Grantee's provisional overhead at the rate of 26.5% will be based on total cost of Participant Costs, Salaries and Wages, Travel and Per Diem, Equipment and Material and other direct costs of the project for the period of the Grant Agreement. Prior to final payment the Grantee will request an amendment to this agreement that sets forth the final AID approved overhead rate, at which time the Grantee may invoice for any additional amounts that may be payable for the Grant period or for a credit if excessive amounts have been paid.

J. Title to Property

All commodities purchased under this Agreement shall be vested in the Ministry of Rural Development.

The Grantee shall establish a program for the receipt, use, maintenance and protection of all material and equipment in his custody.

K. Marking

All vehicles and equipment and program sites of this project shall be identified by markings or signs appropriate to size of item which clearly indicates that funding for materials or construction of this project are financed by the Government of the United States.

L. Amendment and Modification

Modification of the terms of this Grant shall be made by amendment signed by both parties. Any amendment must be approved in writing by AID.

ACTION MEMORANDUM FOR THE DIRECTOR, USAID/MALI

THROUGH: AGR, L. Jepson *LJ*
FROM : AGR, R. Casey *RCasey*
SUBJECT: San Pilot Fish Production, Project 688-0220

I. Problem: Your approval and authorization are required for the following:

- A. Approval of a two-year pilot fish production project at San as presented in the proposal from Africare for an Operational Program Grant (OPG) (TAB C);
- B. Approval of a vehicle waiver not to exceed \$25,000 and a waiver for local architectural and construction services and materials (TAB A);
- C. Approval of a negative determination of the Initial Environmental Examination (TAB B); and
- D. Project Authorization and Request for Allotment of Funds (PAF II) for an Operational Program Grant to Africare, Inc. not to exceed two hundred ninety-four thousand dollars (\$294,000).

II. Background:

The proposed project grew out of discussions and studies involving the Government of Mali (GRM), Africare and the Peace Corps/Mali. The National Department of Water and Forest Resources (Eaux et Forêts) recognizes that Mali's rivers and streams have an inadequate supply of fish to promote a fishing industry. This situation has been created by overexploitation of the fish supply by fishermen and a reduced level of reproduction caused by the drought years. When the Peace Corps inquired about the GRM's interest in having an aquaculturalist study the feasibility of a fish production project, the GRM agreed to a study and suggested that the specialist also explore project possibilities in the rice growing areas of the 4th Region. Subsequently, the Peace Corps undertook an intensive study of the possibilities for fish culture and made a series of recommendations of how an inland fisheries project can be implemented.

III. Discussion:

A. The purpose of the project is to promote fish production in Mali's 4th and 5th Regions, and to help villagers increase cash income. Principal project activities will be:

- 1) to establish and operate a pilot station at the village of San for fish breeding and production of the Tilapia and clarias species;
- 2) to train station and extension staff on-the-job and in a third country for technical skills;
- 3) to sell fingerlings at a nominal cost to rice farmers;
- 4) to assist farmers to undertake fish production in conjunction with existing paddy rice production;
- 5) to study and recommend improved approaches for fish culture and production, and integration with other aspects of rural development;
- 6) to assess the self-sustaining potential of the fish station and extension activities; and
- 7) to prepare a report by the end of years 1 and 2 on results obtained, problems encountered, program potentials and shortcomings and recommendations for future actions.

The fish production project is designed (1) to put a minimum of 25 hectares of land under fish culture by farmers living near San by the end of the year; (2) to stock a minimum of 5 barrages in the 5th Region with fingerlings from the fish station; (3) to stock 7 fish production ponds at the station with fish for production throughout year 2 of the project; (4) to train 5 Malian counterparts; and (5) to establish systems for fish distribution, marketing, collection of monies from sale of fish and use of monies to pay station costs.

This project is consistent both with the goal of the Malian Government for sufficiency in local food production and with USAID/Bamako's country strategy and the Sahel Development Program.

B. Financial Summary

ITEM	(\$000)	
	<u>FY 1979</u>	<u>LOP</u>
Technical Assistance	\$49,860	67,960
Training	12,000	12,500
Commodities	49,900	54,600
Other Costs	51,620	70,460
Contingencies and Inflation (15%)	21,507	27,077
Overhead (26.5%)	48,815	61,393
TOTAL	<u>233,702</u>	<u>294,000</u>

Local currency procurement costs are detailed in Annex D (Procurement Plan) of the OPG proposal (TAB C), and include costs for vehicles and services and materials for which waivers are requested herein. Your approval of this project herein and your authorization of a grant to Africare (TAB A) will constitute approval for local currency procurement totalling \$99,720.

The GRM will contribute \$10,200 in value of in-kind support (personnel, in-country training and land) to the project. The other donor will be the Peace Corps, which will contribute \$78,000 for technical assistance and training. The 25% host country contribution required under Section 110(a) of the Foreign Assistance Act is not applicable to this project.

C. Sociological, Economic and Technical Aspects

1) Sociological constraints and incentives have been examined. The majority of the people in the project areas share a common culture and their traditions are well-established. Great attention will be focused on the traditional role of women in the fishing economy. Extension agents will run experiments with the women for better methods of preservation. With the expected increased fish production, the villagers will eat more and better fish, which will provide them with a better diet, better health and better child care. During the course of the feasibility study, the special interest groups which control the fish industry were contacted, and no resistance to the project was identified.

2) The immediate beneficiaries of the project will be the 100 rice farm families in the vicinity of the fish station. On the Dogon plateau, there will be 1,250 people in 5 villages who will directly benefit from the stocking of the Dogon barrages. It is estimated that another 11 barrages and 2,750 people will benefit from the immediate spread effect of a successful project. The project designers have been told by the director of Operation Riz at Sikasso that the Operation wants to be part of such a project. They estimate that the spread effect of fish cultures for rice fields could eventually include all rice growing areas of Operation Riz Segou, Operation Riz Mopti and Action Riz-Sorgho and reach a population of 903,000. In similar Peace Corps fish projects in Africa, the efforts have become almost self-sufficient and the difference has been made up by the host governments who recognized the advantages of the projects.

Costs in terms of capital, land and labor for the project will not be unreasonable. The nature of the land tenure system in the area convinces the project planners that there will be no opportunity, rental or purchase costs of land involved. Labor costs and capital costs of the project will leave the intended beneficiaries without the burden of these costs.

In conclusion, the long-term benefits will exceed the costs. The project is economically sound.

3) The OPG is to Africare, Inc., which will be the financial manager of this project and will serve as comptroller for all grant funds expended on the project. Africare and the Peace Corps see an explicit profitmaking potential in this project for participant villagers, even though it is a pilot effort. This profit potential will, they argue, motivate the participants in the project to expand their scales of operation in the future.

4) The technical aspects of the project involve simple and appropriate technology which should be applicable beyond the life of the project. The Peace Corps will provide the technical expertise and has had extensive experience with similar projects in other African countries. Malians will be involved in every phase of the project, and will be able to replicate the technology elsewhere in Mali.

D. Implementing Agency

The major GRM implementing agency for this project will be the Water and Forest Resources Department (Service des Eaux et Forêts).

E. Mission Action

1) The Ad Hoc Committee for project proposal reviews met 5 October 1978 and recommended approval of this project. The committee recommended inclusion of a vehicle waiver which you can authorize. (TAB E).

2) The USAID/Mali project officer is yet to be identified. The responsible officer in Peace Corps/Mali will be Dague Clark and in Africare/Mali will be R.J. Benn.

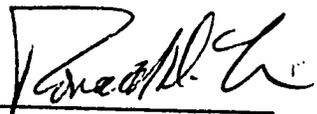
F. An Advice of Change for Congressional notification is at TAB D to be forwarded to the Desk Officer for appropriate action.

IV. Recommendations:

That you sign the Authorization and Request for Allotment of Funds (PAF II) for an Operational Program Grant to Africare, Inc., in the amount of \$294,000, and the waiver for vehicles and local architectural and construction services and materials at TAB A.

That you sign the negative determination of the Initial Environmental Examination at TAB B.

That, in accordance with authority delegated to you under Africa Delegation of Authority No. 140, dated October 18, 1978, you hereby approve Project 688-0220, San Pilot Fish Production, as described in the OPG proposal from Africare at TAB C.

Approved: 

Disapproved: _____

Date: 3/10/79

Part II

Country: Mali

Project: San Pilot Fish Production

Project No.: 688-0220

Pursuant to Part I, Chapter 1, Section 121 of the Foreign Assistance Act of 1961, as amended, (the "Act"), I hereby authorize an Operational Progr. Grant (OPG) to Africare, Inc., ("Grantee") of not to exceed two hundred ninety four thousand dollars (\$294,000) to assist in financing certain foreign exchange and local currency costs of goods and services required for the project as described in the following paragraph.

The project shall consist of a two-year program designed (a) to establish and operate a pilot station for fish breeding and production through financing the construction of a station and 7 ponds in San, and operating costs for two years; (b) to train station and extension staff on-the-job and/or in a third country; and (c) to prepare yearly reports on results obtained, program potentials and problems encountered and recommendations for future actions that will improve approaches to fish culture and production in Mali and how these activities may be integrated with other aspects of rural development.

I hereby authorize the initiation of negotiations and execution of the Grant Agreement by the officer to whom such authority has been delegated in accordance with A.I.D. regulations and Delegations of Authority subject to the following terms, together with such other terms and conditions as A.I.D. may deem appropriate:

a). Source and Origin of Goods and Services.

Except for ocean shipping, goods and services financed under the Grant shall have their source and origin in Code 941 countries and the cooperating country, except as A.I.D. may otherwise agree in writing. Any ocean shipping to be financed under the Grant may be procured in any eligible source country except the Cooperating Country.

b). Condition. Precedent to First Disbursement of Funds.

Africare will furnish to A.I.D., in form and substance satisfactory to A.I.D., evidence that the Government of the Republic of Mali concurs and is in agreement with the San Fish production Project and that the Peace Corps will provide assistance to the project as stipulated in Africare's grant proposal.

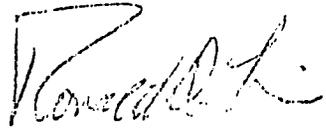
c). Waivers

Notwithstanding paragraph a. above and based upon the justification set forth in Annex D (Procurement Plan) of the OPG proposal, I hereby:

1. approve a procurement source waiver from Code 000 (U.S. only) to Code 935 of the A.I.D. Geographic Code Book for the procurement of a four-wheel drive vehicle and motorcycles and spare parts; provided that the amount of such waiver shall not exceed \$25,000, and the procurement of local architectural and construction services and materials;

2. certify that the exclusion of procurement of the above-described motor vehicles and spare parts from the requested countries in Code 935 would seriously impede attainment of U.S. foreign policy objectives and the objectives of the Foreign Assistance Program;

3. find that special circumstances exist to waive, and do hereby waive, the requirements of Section 636 (i) of the Act.



Ronald D. Levin
Mission Director

3/10/77

Date

Clearances:

AG : LJepson date 3-5-77
PROG : HVAitaitis date
CONT : KKlomp date 3-4-77
A/DIR: GEaton date

ANNEX B

INITIAL ENVIRONMENTAL EXAMINATION

PROJECT LOCATION: San, Mali
PROJECT TITLE: San Pilot Fish Production, Project 688-0220
FUNDING: \$294,000
LIFE OF PROJECT (Funding): 2 years
IEE prepared by: Dague B. Clark DATE: October 9, 1978
ENVIRONMENTAL ACTION RECOMMENDED: Negative Determination, page 6

Concurrence

N/A
Ronald D. Levin
Mission Director

Date:

Threshold Decision: The project will have a positive effect on the environment in increasing natural resources, and monitoring will continue throughout the life of the project by station and extension staff to identify and correct any possible negative effects. A negative determination is recommended.

Approval

Approved:


Ronald D. Levin
Mission Director

Date:

3/10/79

Disapproved:

Ronald D. Levin
Mission Director

Date: _____

I. EXAMINATION OF THE NATURE, SCOPE AND MAGNITUDE OF ENVIRONMENTAL IMPACTS

a. Project Description

The purpose of the project is to promote fish production in the fourth and fifth regions of Mali without endangering existing fish reserves, in order to help increase the quantity and quality of protein available for local consumption and assist the rural people to add to their cash income.

The project and proposed plan of action has grown out of discussions and studies involving, in varying capacities, the government of Mali, the Peace Corps, USAID/Mali and Africare. The Mali National Director of Eaux et Forêts recognizes that intensive fish collection methods along major rivers are fast reducing existing reserves, and maintains that proper management of fish will remain important to Mali from both an economic and nutritional stand point.

Under this 2 year project, Africare and Peace Corps propose to work directly with Malian officials and technicians at the national, regional and local levels and with the village people at the village level to:

- a. Establish and operate a pilot station near the village of San for fish breeding, fish production and the hatching and distribution of fingerlings;
- b. Train station and extension staff;
- c. Distribute fingerlings to rice farmers;
- d. Assist farmers to undertake fish production in conjunction with existing paddy rice production;
- e. Study and recommend improved approaches for fish culture and production and integrated with other aspects of rural development;
- f. Assess the self-sustaining potential of the fish station and extension activities.

The fish station will use the pumps of Opération Riz-San which are located on the banks of the Bani river. Extension work will be done with the Bobo farmers at Opération Riz-San and others in the fourth region of Mali. The extension work will also include stockage of some of the resevoirs in the fifth region.

II. IDENTIFICATION AND EVALUATION OF ENVIRONMENTAL IMPACTS:

a. Land Use

1. Changing the character of the land through:
 - a. Increasing the population of people or animals:

Increased opportunities for work will only be in effect for the construction phase of the project. After the

first five months most of the work will be with farmers in the area already cultivating rice. The project is unlikely to accelerate population increase due to immigration. It may however, increase population density due to increased nutrition by the production of fish.
-Impact rating-none

- b. Extracting Natural Resources: the total project pumping requirement for the station is low. The maximum use will be about 10,000 m³/day or 0.125 m³/sec. This is insignificant in relation to the Bani river flow, and is highly unlikely to cause a perceptible downstream effect.
-Impact rating-none to low negative.
- c. Land Clearing : Construction will involve only a minimal excavation of soil at the site of the station. The existing vegetal cover consists of some seasonal grasses only. There are no bushes or trees to be removed. The surrounding land will be regraded and top-soil retained for placing back on top, with natural vegetation planted to maintain a natural cover.
-Impact rating-none.
- d. Changing the Soil Character:
 - i. Texture: the land in the project area is flat and gently sloping. Except for the digging of the ponds and canals, no land leveling is contemplated.
-Impact rating on texture-none
 - ii. Structure: the soils at the station site are at present untilled, barren except for seasonal grasses, very low in organic matter and possessing minimal structure. The running of the station should do nothing to change this except add some organic matter to the soil. The same is true for the farmer's rice paddies.
-Impact on structure-none to low positive.
 - iii. Nutrient status: initial nutrient availability has been sufficient for a satisfactory rice crop. The addition of fish will subtly increase organic matter
-Impact on nutrient status-none to low positive.
 - iv. Aeration and water infiltration: it is highly unlikely to have effect on aeration and water infiltration.
-Impact rating-none.
 - v. Drainage and salinity: The slope of the land and impermeability of the soil in the area may cause drainage problems from the discharges of the production

ponds. Since the project is set up to drain one a month this should not create significant drainage problems.

Considering the sum of these factors, the overall impact on soil character is expected to be none to low negative.

2. Altering natural defenses: impact rating none.
3. Foreclosing important use: the land at the station site is not being used at this time. Extension work will be done with farmers in the fourth region already cultivating rice. Rice/fish polyculture, if it has an effect on rice production, should be positive. The resevoirs in the fifth region are used for irrigation purposes and the project should not interfere in any way with this activity.
-Impact rating none to low positive.
4. Jeopardizing Man or his works: Impact rating none.

B. Water Quality

1. Physical state of water: small demand of irrigated water on gentle slopes (1-2%) will not cause any increased sediment load. The water flowing in the ditches from the pumps presently installed is clear to semi-turbid.
Impact rating none.
2. Chemical and biological status of water: no pesticides or chemical fertilizers will be financed or promoted under the project.
-Impact rating none.
3. Ecological balance: indigenous species of fish to the Niger and Bani river systems will be used for the project. The production ponds and rice paddies will be completely drained and dried in an effort to eliminate any fish parasites or diseases that may be present. Only after many tests on the effect on the ecosystem will a species of fish or other biological methods be introduced for control of the schistosomiasis carrying snails in the resevoirs in the fifth region of Mali.
-Impact rating-none.

C. Atomspheric

1. Air additives: no use of sprayed pesticides or herbicides is contemplated in this project.
-Impact rating-none
2. Air pollution: the amount of exhaust gases generated by the pumps will be insignificant.
-Impact rating-none

3. Noise pollution: the pumps used by Opération Riz are located on the Bani river bank some 15 Kilometers from San. Therefore, they are inaudible in the village.
-Impact rating-none

D. Natural Resources

1. Diversion or increased use of water: The effect of the increased use of water at the fish station will be minimal.
-Impact rating-none
2. Irreversible, inefficient commitments: No alternative development use is foreseen for the area.
-Impact rating-none.

E. Cultural

1. Altering physical symbols: No impact
2. Dilution of cultural traditions: The project is introducing a new crop, fish, to be cultivated in conjunction with rice by traditional rice farmers. It is hard to say what effect this will have on the cultural traditions at this time.
-Impact none to low positive.

F. Socio-Economic

1. Changes in economic/employment patterns: The project should have an effect on the levels of income in the target group by the sale of fish.
-Impact rating-moderate, positive.

2. Change in Population: See A.1.a.

3. Changes in cultural patterns:

The project could increase the income of women, since they are traditionally involved in the preservation and marketing of fish. The project plans to enhance the productivity of women in a traditional economic activity by having extension agents will work with the women on different methods of preservation in an effort to reduce the large loss of animal protein currently attributed to insect damage and spoilage.

-Impact rating-none to low positive.

G. Health

1. Changing the Environment: In so far as changing the environment is concerned the only place this project calls for activities is at the station itself where there will be seven food and 10 fingerling production ponds constructed.
-Impact rating none.

2. Eliminating an element of the ecosystem:

See B.3.
-Impact none to low positive.

3. Other factors: The proposed project in the fourth region of Mali is located along the banks of the Niger and Bani rivers and in the fifth region in association with the resevoirs of water on the Dogon plateau. The rural populations use these water sources for all their personal needs: drinking, cooking, washing, bathing, urinating and defecating. Consequently, water-related disease are hyperendemic. Though there is no base line health data, it is estimated that some 80 to 90% of the people have malaria or schistosomiasis, either in clinical or sub-clinical form. In one sense, the project envisages a potential increase in human contact with water, through the fish ponds and canal system. The same contaminated river water for personal needs will be pumped into the canals and ponds. Similarly, there is a potential increase in breeding sites for disease vectors.

However, to conclude that there will be an adverse impact on human health is not justified.

First of all, the project activities will not result in any significant change in either human contact with water or in breeding sites for disease vectors. The target group of beneficiaries are people already being fully exposed to contaminated water and disease vector breeding sites.

Secondly, although there will be newly retained water in the fingerling and production ponds at the fish station, these ponds will be periodically drained and cleaned as part of the fish program. In addition employees at the station will be advised and educated regarding preventive health methods, and use of the latrines placed well away from all contained water will be required. Also, extension agents will educate and advise farmers on how to break the schistosomiasis cycle.

Thirdly, a biological control of the schistosomiasis host snail will be part of the work carried out at the station.

Furthermore, the added nutritional value of the fish produced should out weigh the small negative effect the newly retained water may have on the population. Therefore, assessing the above, the impact rating: none to low positive.

H. General

1. International impacts: due to the small scale of this project no international impacts are foreseen.
-Impact rating-none.
 2. Controversial impacts: no controversial impacts rating none.
 3. Larger program impacts: fingerlings from this project can be used for other larger projects.
-Impact rating-moderate positive.
 4. Other factors: no other factors are foreseen at this time.
-Impact rating-none.
- I. Other possible Impacts (not listed above).
-Impact rating-none.

III. Recommendation for Environmental Action

The preceding discussion has indicated that the effects of the project on the natural environment are expected to be small and, on the balance positive. No potential negative effects are foreseen which would not be reversible.

Furthermore, an Environmental Assessment or an Environmental Impact Statement at this stage is unlikely to shed much additional light on the situation, since the project activities are essentially new and at present no data exists to study their possible effects on the environment. There will be an evaluation done after the first and second year of the project. These will include any possible negative effects on the environment.

Consequently, a negative determination is recommended, together with a monitoring of environmental effects throughout project life by the station and extension staff for early identification and correction of any possible negative effects.

IMPACT IDENTIFICATION AND EVALUATION FORM

Impact Areas and Sub-Areas

Impact Identification and Evaluation

A. Land Use		
1. Changing the character of the land through:		
a. Increasing the population		N
b. Extracting natural resources	N to L	negative
c. Land Clearing		N
d. Changing soil character	N to L	negative
2. Altering natural defenses		N
3. Foreclosing important use	N to L	positive
4. Jeopardizing man or his works		N
5. Other factors		N
B. Water Quality		
1. Physical state of water		N
2. Chemical and biological states		N
3. Ecological balance		N
4. Other factors		N
C. Atmospheric		
1. Air additives		N
2. Air pollution		N
3. Noise pollution		N
4. Other factors		N
D. Natural Resources		
1. Diversion, altered use of water		N
2. Irrversible, inefficient commitments		N
3. Other factors		N

N NO environmental impact
 L Little environmental impact
 M Moderate environmental impact
 H High environmental impact
 U Unknown environmental impact

- E. Cultural
 - 1. Altering physical symbols
 - 2. Dilution of cultural traditions
 - 3. Other factors

$\frac{N}{N \text{ to } L}$ positive
 $\frac{N}{N}$

- F. Socioeconomic
 - 1. Changes in economic/employment patterns
 - 2. Changes in population
 - 3. Changes in cultural patterns
 - 4. Other factors

$\frac{M}{N}$ positive
 $\frac{N \text{ to } L}{N}$ positive
 $\frac{N}{N}$

- G. Health
 - 1. Changing a natural environment
 - 2. Eliminating an ecosystem element
 - 3. Other factors

$\frac{N}{N \text{ to } L}$ positive
 $\frac{N \text{ to } L}{N \text{ to } L}$ positive

- H. General
 - 1. International impacts
 - 2. Controversial impacts
 - 3. Larger program impacts
 - 4. Other factors

$\frac{N}{N}$
 $\frac{M}{N}$ positive
 $\frac{N}{N}$
 $\frac{N}{N}$

- I. Other possible impacts (not listed above)



CORPS DE LA PAIX
DES ETATS-UNIS D'AMERIQUE
EN REPUBLIQUE DU MALI



March 07, 1979

M E M O R A N D U M

To : Ronald D. Levin, Mission Director, USAID/Mali

From: Henry Homeyer, Peace Corps Director/Mali *H. Homeyer*

Subj: Pilot fish production project in San, Mali.

This is to certify that Peace Corps/Mali is willing to recruit, train and support the Peace Corps volunteers required for the implementation of the pilot fish production project in San, Mali as described in section 5.2 of the Operational Program Grant proposal. Each request for volunteers is contingent upon a written request from the government of Mali.

5.2. - Peace Corps

Under this project, the United States Peace Corps would supply the 5 individuals to work as Peace Corps Volunteers, two volunteers the first year of the project and 3 additional volunteers the second year, and would provide them pre-service training for this project. The Peace Corps will supply them the regular allowances and benefits associated with their tours of service, as well as all other support they are entitled to receive within the framework of their service as Volunteers and the agreements between the U.S. Peace Corps and the Government of Mali.

Once the Peace Corps Volunteers are placed at their work site, Peace Corps will be responsible to provide them with further technical, language, or cross cultural support they may require to serve effectively as technicians, counterparts and administrators within the project. If for any reason a Volunteer is unable to complete the normal tour of service under the project, the Peace Corps will make reasonable efforts to secure, train and post a suitable replacement.

The Peace Corps will periodically assess the work of volunteers at the sites (through site visits, reports received from the volunteers, and discussions with Malian supervisors and counterparts) and will share these assessments with the volunteers, the GOM and Africare.

N° 0338

09 MARS 1979

Monsieur Le Directeur de l'US-AID
S/C de Monsieur Le Ministre des Affaires
Etrangères et de la Coopération
Internationale.

B A M A K O

OBJET : Accord pour exécution
du projet de pisciculture.-

Monsieur,

J'ai l'honneur de vous informer que notre Département
donne son accord pour exécution du projet de pisciculture à
Bam en collaboration avec le Corps de la Paix.

Je suis convaincu qu'avec la conjugaison de nos efforts,
ce projet sera un succès.

Dans l'attente du démarrage rapide du projet, veuillez
serrer, Monsieur Le Directeur, l'assurance de ma très haute
considération.

P/LE MINISTRE
LE DIRECTEUR DE CABINET

Dr. Eoubacar Sada SY

A PROPOSAL FOR AN OPG TO SUPPORT

A PILOT FISH PRODUCTION PROJECT

SAN, MALI

Submitted to

USAID, Mali

BY

Africare in conjunction
with Peace Corps

Mali

SECTION 1 - PROJECT SUMMARY

1.1. Introduction

This project is being submitted to USAID/Mali jointly by Peace Corps/Mali and Africare, for a grant to Africare of 294,000 to assist the Government of Mali in a 2 year fisheries project to be implemented by a team comprised of 5 Malian fisheries agents and 5 Peace Corps volunteers working under the supervision of the Eaux et Forêt, in the fourth and fifth regions of Mali.

The purpose of the project is to promote fish production in Mali's 4th and 5th regions without endangering existing fish reserves, in order to help increase the quality and quantity of protein available for local consumption and assist the rural people to add to their cash income.

The project and proposed plan of action have grown out of discussions and studies involving, in various capacities, the Government of Mali, the Peace Corps, USAID/Mali, and Africare. The Mali National Direction of Eaux et Forêt (Waterways and Woodlands) recognizes that intensive fish collection methods along the major rivers are fast reducing existing reserves and maintains that proper management of fish will remain important to Mali from both an economic and nutritional stand point. Among a series of actions, he expressed an interest in investigating the possibilities of starting a fish culture program. Subsequently, an intensive study of the fish culture possibilities in the Central Delta Region of the Niger River was undertaken by Fisheries Specialist Harry Rea, Associate Peace Corps Director Dague Clark, Fisheries Volunteer Bill Carberry and his Malian Counterpart Mamadou Touaré. The report from that study (see Annex A) was submitted to Eaux et forêt. The recommendations of the study, the continued interest by the Government and peoples of Mali and the subsequent discussions between Peace Corps/Mali, Africare/Mali and USAID/Mali form the basis of the proposed program, of which this project forms the preliminary phase.

1.2. Phase 1 - The Project

Under this 2-year project, Africare and Peace Corps propose to work directly with Malian officials and technicians at the national, regional and local levels and with the village people at the village level to:

- a. Establish and operate a pilot station at the village of San for fish breeding, fish production and the hatching and distribution of fingerlings;
- b. Train station and extension staff;
- c. Distribution of fingerlings to rice farmers;
- d. Assist farmers to undertake fish production in conjunction with existing paddy rice production;
- e. Study and recommend improved approaches for fish culture and production, and integration with other aspects of rural development;
- f. Assess the self-sustaining potential of the fish station and extension activities;
- g. Prepare a report by the end of the year 1 and year 2 on results obtained, problems encountered, program potentials and shortcomings and recommendations for future actions;

1.3 -Phase II-Possible Activities Beyond Year 2

Based on the first annual report and a workshop to involve representatives at involved levels, a preliminary determination will be made regarding possible strategies for maintaining, expanding, or reducing extension activities during Year 2 and subsequent years. This will provide the initial basis for planning and securing early in year 2 any shared support that may be available, needed and desired for Year 3 and subsequent activities. It will also provide the basis to arrange phasing into the government or villages those functions which can become institutionalized and self supporting. Seeking additional outside support may be pursued if early functions have begun to be phased into the Government and villages. It is thus expected that these actions can help give form to Phase II of the program.

1.4 -Technical, Social, Financial and Economic Considerations

The technical methods and the approaches to be used and adapted under the project have already proven successful in fisheries projects in Zaire, Cameroon, C.A.E. and Niger, and no reasons are known to believe that they should not be possible within the social structure, traditions, and practices of the Dobo and Bambara people who live in the project area.

Regarding environmental impact, no pesticides or chemical fertilizers will be financed or purchased under the project, and since the distribution of fingerlings will be to farmers already cultivating rice in paddy areas, there will be no increased risk of schistosomiasis as a result of extension work. Experimentation with possible species of fish for snail control will be undertaken, allowing the possibility that the project may contribute to a reduction in the incidence of schistosomiasis. Although there will be newly retained water in the fingerling and production ponds at the fish station, these ponds will be periodically drained and cleaned as part of the fish program. Also, employees at the station will be advised and educated regarding preventive health methods, and use of latrines placed well away from all contained water will be required. Extension agents will in addition educate and advise farmers on how to break the schistosomiasis cycle. Construction will involve only a minimal excavation of soil at the site of the station. The surrounding land will be regraded and top-soil retained for placing back on top, with natural vegetation planted to maintain permanent cover. Hence, a negative determination is made in the Initial Environmental Examination attached (see Annex B).

The financial practicality and economic rationale of the approach to be taken is supported in part by the program in Zaire, in which farmers have harvested up to 16 tons of fish/year. However, hard cost/benefit data and operational cost information is not available from that program in a manner that includes the value of in-kind as well as cash investment, and returns. It will therefore be a major objective of this project during the first year to identify the cash and in-kind costs associated with operating the fish station and depreciating capital investments. To the extent possible, funds will be set aside during the first and second year to begin preparing for later expenses.

During this time, data will be collected also to measure material and cash returns to participating farmers.

1.5 - Intended Beneficiaries

The immediate beneficiaries of the project in the short run will be the minimum goal 100 heads of families and their dependents (average 7 per family), who will be assisted to raise fish in conjunction with rice culture. Other beneficiaries will be trained extension agents and participating staff. Additionally, fish will be stocked in existing water reserves on the Dogon Plateau and this will increase the availability of fish to the villagers there. If the first two years are successful and further support for expansion can be arranged, there will be considerable room for multiplying the experimental benefits achieved from the pilot program and passing them on to other individuals.

1.6 - Host Country and Peace Corps Contributions to Project

Proposed Host Country contributions to the project in the form of in-kind support are expected to be approximately \$10,200 in value over the two year period. Peace Corps contributions are estimated at \$78,000 for the same time period. These are detailed in Annex C.

1.7 - Waivers

Essential to undertaking this project will be a source/risk waiver for the procurement of one four-wheel drive vehicle, 10 100cc motorcycles, construction services and equipment. Details for the justification of waivers are set forth in Annex D.

1.8 - Other Considerations

The Peace Corps and Africare representatives in Mali are presently awaiting a formal letter of request from the Government of Mali for this project, which should be forthcoming by the end of October 1978. Signing of this agreement between USAID/Mali and Africare should be contingent upon receipt of this properly executed letter. A signed agreement suitable to the three parties should be achieved by January 1, 1979 or the arrival of station personnel including volunteers must be rescheduled accordingly.

This project is strongly consistent with the Government of Mali development goals and achievement of an agreement between the three parties will relate to finalizing administrative arrangements.

SECTION 2 - PROJECT BACKGROUND

Mali is a large land-locked West African country of some five million bordered by Senegal, Mauritania, Algeria, Niger, Upper Volta, Ivory Coast and Guinea. Mali is linked with Dakar, Senegal and the Atlantic by a railroad line built during the colonial era. The Niger River passes through Mali and links the railway with a modest river transport system which is functional from August to January, most years. Half the country lies to the north of the great bend in the Niger at Timbuctoo and is an economically unproductive desert. No mineral or oil reserves have, as yet, been discovered in Mali. This lack of exportable resources, Mali's land-locked position and harsh Sahelian climate have been factors contributing to Mali's position as one of the least developed countries in the world as measured in economic terms. The percapita gross national product is estimated as ninety dollars per year. Despite the obstacles Mali has made much progress and it's people have proven that they are determined to create a society which is free from hunger disease and poverty.

The climate has been capricious in the last decade and Mali suffered badly from the drought of the early 70's. Traditionally a cattle and fish exporting country, Mali experienced heavy losses in reserves of both during the drought. Approximately ninety percent of the people in Mali are subsistence farmers, herdsman or river fisherm . The staple crops produced are millet, sorghum and rice. Most villages use traditional methods of agriculture although a number of development projects are underway to utilize the waters of the Niger and Senegal Rivers to irrigate lands for farming, decreasing the chances of famine created by another drought.

The Bambara are the major ethnic group in Mali; other groups include the Fulani, Dogon, Songrai, Dozo, Moor, Toucouleur, Bobo and Tuareg. The people of Mali are proud of their long history which included great empires and centers of learning dating back to the Middle Ages and before.

The government of Mali expressed in its most recent Five Year Plan (1974-1978) a desire to meet the basic needs of the population. Stated priorities were to increase production of all agricultural products and to become more economically independent. Mali's soil and climate are far from ideal for agricultural production and although rural villagers eke out a subsistence living through hard work and ingenuity, their diets are based on cereal consumption and lack sufficient protein. Meat and fish are expensive and often unavailable.

Peace Corps has been active in Mali since April, 1971. The first volunteers were involved solely in rural development projects, but subsequent programs have included teachers, health workers, and a variety of specialized technicians. Currently there are more than 50 volunteers who are living and working throughout the country. More than half of the volunteers are involved in assisting rural development or health projects.

Africare, a private volunteer organization (PVO) based in Washington D.C. since 1971, and with a regional office in Bamako, Mali since 1974, has undertaken a number of programs of rural development in the Sahel. These programs have been in the domains of famine relief, water resources development, rural health, food production and integrated rural development. Africare's permanent representative based in Bamako, has worked with representatives of Peace Corps/Mali in the formulation of this project and in preparing it for commitment by Africare.

2.2 Recent Developments

Until recently it was believed that the Niger and Senegal River systems were capable of providing a virtually endless supply of fish to the people of Mali. However over the past several years both the quantity and quality (size and preferred species) have declined due to the following reasons:

1. Over exploitation. Traditional fishing methods replaced by more modern techniques and equipment thus increasing the efficiency of the local fishermen. Fine mesh nets are being used to increase the catch, but these nets capture both young and mature fish, thus reducing present and future brood stock. The national director of Eaux et Forêts is aware of this problem but control methods are very difficult to enforce.
2. Reduced reproduction. Along with the depletion of brood stock as mentioned above, the drought of the past few years has greatly reduced natural reproduction. Many species of riverine fishes breed during periods of flooding and much of the breeding takes place on the shallow floodplains. Due to the drought many of these have not flooded therefore, greatly decreasing the spawning areas.

Therefore what exists is a system in which the outputs exceed the inputs, leading to what may be the complete exhaustion of the fishery resources of these river systems.

Large quantities of fish are dried or smoked. Considerable losses occur due to insect infestation. It has been estimated that these losses result in the processed fish having an animal protein content that is less than 15% of that in an equivalent quantity of fresh fish. (1)

Of the estimated annual catch of 100,000 tons, approximately 1/3 is exported and accounts for 15% of the commercial balance of the country. (2)

It is evident therefore that fish are important to Mali both economically and nutritionally making it imperative that efforts be undertaken to increase fish production and to better utilize this important food source. It is on this basis that the National Director of Eaux et Forêts expressed an interest in investigating the possibilities of starting a fish culture program. The areas of concern that he thought should be concentrated on are as follows:

1. Fish production in irrigated rice perimeters.
2. The use of rice fields to breed fish for restocking the rivers.
3. Investigation of lifecycles of important indigenous species in order to determine means of artificial propagation as well as to determine which species may be suitable for culture.

(1) Report of the Fishery Task Force, Model of Development Programme Fishery Sector, by Club of the Friends of the Sahel. (p.43)

(2) *Ibid.*, (page 48)

Peace Corps Volunteers are currently working in fish culture programs in Zaire, Cameroon, C.A.E. and Niger as well as other countries throughout the world. In Cameroon, Volunteers have been working in inland fish production for the past nine years.

Peace Corps Washington responded to the need of a feasibility study for a fisheries program in Mali by sending over Mr. Harry Rea. Mr. Rea is an aquaculture graduate student at Auburn University. He was a Volunteer in fish culture for over three years in Cameroon. In addition, he ran a training session and helped Peace Corps expand their fisheries program in Zaire.

2.3 Study Results

After an intensive one month study of the fish culture possibilities in the Central Delta region of the Niger River by Mr. Harry Rea; Associate Peace Corps Director, Mr. Dague Clark; Mali Fisheries Volunteer Mr. Bill Carberry, and Mr. Mamadou Tourè from the National Hydrobiology laboratory in Mopti; the following recommendations were made:

1. A station should be constructed in conjunction with Operation Riz-San, which is located about 10 kilometers from the village of San, on the Bani River. The station should be used to produce both fingerlings and food fish. Food fish can be raised alone in ponds and also in combination with rice. This station should consist of:
 - a. 10 small ponds (100 m²) for fingerling production and experimentation.
 - b. initially seven production ponds (500-1000 m²) which would make it possible for each pond to be harvested each month. At any one time six ponds would be in production and the seventh would be dried in order to eliminate any fish parasites or diseases that may be present and also allow for any necessary maintenance. In these production ponds experiments, with different types of manures and agricultural waste by products, should be carried out to find optimum growing conditions.
 - c. Four small concrete holding tanks (5m x 1 m) should be constructed to keep fingerlings between the time production ponds are drained and transport can be arranged, to the stocking site.
 - d. Two buildings should be constructed, one being 10 m x 10 m consisting of two rooms used for feed and equipment storage. The second to be 10 m x 5 m which will include laboratory and office space.
 - e. Some rice fields should be constructed to allow for experimentation with rice/fish culture. A system of screens made from local materials, should be designed to prevent wild fish from entering the ponds and rice fields, some of which cause considerable damage to rice crops, ranging

from incidental damage through nesting habits (Protopterus annectens) to actual consumption of the plants and grains (Alestea sp. and Distichordus sp.) (3)

2. The barrages on the Dogon Plateau should be stocked. This program should be started on a small scale in order to find out what problems may arise. Along with this, more work should be done to find a species of fish or other biological means that can be used to control the schistosomiasis carrying snails. The PCV presently in Mopti and his Malian counterpart should undertake these two projects along with their work at the Hydrobiology Laboratory in Mopti.
3. Due to the scarcity of water in many parts of Mali, fish culture will be limited to areas near large rivers and especially the flooded rice perimeters. A Peace Corps fish culture extension volunteer and his Malian counterpart will be working mainly with rice farmers who may be interested in rice/fish culture. But all other possibilities such as cage culture, in rivers, behind dams or in lakes should be considered. Other areas of the country may prove to be suitable for fish culture and extension programs should include these areas. Initially one Peace Corps volunteer and his counterpart should be assigned to work with rice farmers in the San-Ségou Mopti area. Part of their job will also be to determine the need for additional extension agents in the future.
4. The station itself should be managed by a Peace Corps Volunteer and his Malian counterpart. They will oversee all aspects of fish production at the station.
5. Peace Corps should continue to supply the necessary number of volunteers until the date that all parties concerned feel that Malians can run all phases of the program. At such time the project should be turned over to the Malian government.
6. All the Malian counterparts should be assigned by the Ministry of Rural Development.

(3) Matthes, H. The Problems of Rice eating Fish in the Central Niger Delta, Mali. FAO's CIFA Symposium #8 Burundi, 21-26 November '77 (WL6: 5 5) and personal observations by PCV Bill Carberry.

SECTION 3 - PROJECT DESCRIPTION

3.1. Project Goal

3.1.1. Goal Statement

The goal of this project is to improve the quality of life of rural persons living in the 4th and 5th Regions of Mali, by helping them to increase the quantity and quality of protein available for local consumption and by assisting them to add to their cash incomes.

3.1.2. - Measures of Goal Achievement

A fish yield of 300 kilos/hectare/year at minimum on land in the 4th Region being used by farmers for fish culture as a result of the project.

A yield increase of 25% at minimum in barrages of the Dogon Plateau stocked with fish as a result of the project.

A yield of 4 or more tons/hectare/year by the end of year 2 in production ponds of the fish station outside the village of San in Mali's 4th region.

3.1.3. - Means of Verification

Records of Fish Station and of Extension Agents.

3.1.4. - Important Assumptions

That farmers growing fish will keep a portion of their yields for family consumption.

That some of the balance will be sold in village markets and urban areas within the 4th and 5th regions, to rural persons.

No unusual climatic conditions.

3.2 - Project Purpose

3.2.1. Purpose Statement

The purpose of the project is to promote fish production in Mali's 4th and 5th Regions without endangering existing fish reserves.

3.2.2. - Measures of Purpose Achievement

Minimum of 25 hectares of land newly under fish culture by farmers living in Mali's 4th Region by the end of Year 2.

Minimum of 5 barrages stocked with fingerlings from the fish station.

Minimum of 1/2 hectare of fish production ponds stocked with fish and under production throughout Year 2 of the project at the station in San.

3.2.3 - Means of Verification

Records of Fish Station workers and extension agents. Project Evaluations.

3.2.4. - Important Assumptions

Continuity and commitment of Malian and Peace Corps workers posted at the station and serving as extension workers.

Continued cooperation, commitment and support among involved Malian Government, Africare and Peace Corps offices and representatives, in the forms and levels projected under this proposal.

Continued interest and commitment on the part of villagers to participate in the program.

3.3 -Project Outputs

3.3.1. Outputs

A pilot station at the village of San established and operating for fish breeding, fish production, and the hatching and distribution of fingerlings.

Trained station and extension staff.

Systems established for the distribution of fingerlings, the marketing of fish produced at the station, the collection of monies due from the sale of fingerlings and of fish produced at the station, and for the application of these monies to station costs.

Systems established for extension work in support of fish production being undertaken by farmers.

Improved approaches explored for fish culture and production, and for their integration with other aspects of rural development.

Documentation of fish station investment and return data with respect to capital expenses and depreciation, operational costs including losses, and receipts from sales.

A report following the end of Year 1 and a second report following the end of Year 2.

3.3.2. Magnitude/Quality of Outputs

The fish station will consist of two two room buildings, one latrine, seven fish production ponds, ten fingerling production ponds, and four holding tanks. The two buildings (see Annex C) will be of cement block and galvanized steel roof construction, with metal louvered doors and windows. The production ponds will be formed in the earth, but will have concrete lined drainage structures. The holding tanks will be of cement block.

The Malian staff trained during the project will consist of 1 station worker and 4 extension agents.

The systems established for station operation and marketing will conform with Government of Mali official requirements.

Improved approaches to be explored for fish culture and production will include experimentation with biocontrol systems for schistosomiasis to the extent possible, and will likewise evaluate available fish species suitable for production under project conditions.

The documentation of fish station investment and return data will be accomplished in a form suitable for financial analysis.

The first and second year reports will identify results obtained under the project, problems encountered, program potentials and shortcomings, and recommendations for future actions. They will be prepared in English and translated into French.

3.3.3. Means of Verification

Visual observation. Project reports. Supervisor assessments. Year 1 and 2 evaluations.

3.3.4. Important Assumptions

The individuals selected to serve as evaluator, construction expert, Peace Corps Volunteers and Malian fish station worker and extension agents, as well as the persons involved in the construction of the station, will be prone to cooperate and work constructively with each other in their interrelated capacities.

Appropriate logistics supervision and communications systems and personnel can be arranged and maintained.

3.4 Project Inputs

3.4.1. Personnel

a. Government of Mali Contribution

Year 1

Salary of one Fish Station Manager for 10 months	1,300
Salary of one extension Agent for 10 months	600
Subtotal	1,900

Year 2

Salary of one Fish Station Manager	1,560
Salary of four extension agents for 12 months	2,840
Subtotal	4,400

Total	6,300
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b. Peace Corps Contribution

Year 1
Cost of two Peace Corps Volunteers \$20,000

Year 2
Cost of five Peace Corps Volunteers \$50,000
\$70,000

c. Financed Under this Grant

Year 1
U.S. Hire \$32,700
Local Hire (Malian) 17,160
Subtotal \$49,860

Year 2
U.S. Hire \$11,700
Local Hire (Malian) 6,400
Subtotal \$18,100

Total \$67,960

3.4.2. Training

a. Government of Mali Contribution

In year two of the project the Fish Station at San will be used to train the 3 Peace Corps Volunteers and 3 Malian Extension Agents needed for expansion of the project, ~~this~~ saving the cost of training in another country. Estimated value \$1,000

b. Peace Corps Contribution

Year 1

Peace Corps will supply language and cross-cultural training for the two Volunteers for eight weeks \$ 4,000

Year 2

Peace Corps will supply language and cross-cultural training for the 3 new Volunteers for eight weeks \$ 4,000
\$ 8,000

c. Financed under this Grant

Year 1

Technical training of 2 PCVs and 2 Malian counterparts
in Zaire

\$12,000

Year 2

Technical training of 3 PCVs and 3 Malian counterparts
at the Fish Station

500

12,500

3.4.3. Commodities

A. Government of Mali Contribution

-0-

B. Peace Corps Contribution

-0-

C. Financed Under This Grant

Total Commodities financed under this grant are \$54,600

3.4.4. Other

A. Government of Mali Contribution

Year 1

Cost of supplying 2 hectares of land
Insurance and tax on vehicles

1,780

360

Subtotal 2,140

Year 2

Insurance and tax on vehicles

760

760

TOTAL 2,900

B. Peace Corps Contribution

-0-

C. Financed under this grant

Year 1

Other

Inflation (15%)

Overheard (26.5%)

\$51,620

21,507

48,815

Subtotal 121,942

Year 2

Other	\$18,840
Inflation	5,570
Overhead	<u>12,588</u>
Subtotal	<u>36,998</u>

3.4.5. Means of Input Verification

The Africare representative in Mali will verify expenditures utilizing sound accounting practices and inventory records. Personnel time sheets will be maintained.

3.4.6. Basic Assumptions Regarding Inputs

The inputs will follow the schedule as detailed in section 5.4, Project Implementation. The evaluation at the end of Year 1 must satisfy Eaux et Forêt and Peace Corps that increased personnel are necessary and justifiable for Year 2.

4. PROJECT ANALYSIS

4.1 Economic Analysis

For this project in place of complicated cost benefit analysis of benefit-cost ratios internal rates of return, and streams of incremental net benefits we will survey descriptively some of the underlying issues involved in the concepts. In the process we will consider both quantifiable and non quantifiable aspects of benefits and costs.

To begin with, we hypothesize that the intended beneficiaries of this small-scale project have more to gain with the project than without it. That is, by the end of the life of the project we expect some improvement in their economic conditions and an enhancement of their quality of life. The comparison of costs and benefits will enable us make the best possible judgment of the end of project status. Let us now consider some of the costs and benefits involved.

a. Costs

The capital aspects of costs for any project are very important. Funds thus invested often involve opportunity costs and, if borrowed, rates of interest certainly enter costs. For this pilot, small scale project we foresee neither opportunity costs nor costs associated with rates of interest as far as the intended beneficiaries are concerned. This is true because we expect the funds to be a direct grant that will be externally derived. This consideration also frees the Government of Mali from bearing the costs of funds.

Land, too, involves costs. Usually, rental costs, purchase prices, and opportunity costs aggregate to make land expensive for agricultural projects. The nature of land tenure system in the area of the project convinces us that there will be no opportunity, rental, or purchase costs of land involved. The current land use in the area also supports this point of view.

Labor, like capital and land, has costs. But the use of the services of Peace Corps/Mali, U.S. and Malian hires, and the payment for general management out of funds to be acquired for this project virtually leaves its intended beneficiaries with no burden of these costs. Diverting, of course, the services of Malian civil servants supervising the implementation of this project could involve costs derived from salaries paid to them and from the opportunity costs of their services. But Eaux et Forêts, some of whose employees will be involved, will do this as an aspect of their normal work. Therefore, costs derived from their services will be very minimal.

Since this project should be eventually self-sufficient, we anticipate no recurrent costs to the Government of Mali. Besides, the intended scale of operation is too small to worry about costs that could upset price and other production relations. Given all these cost considerations, we are confident the per capita cost to the intended beneficiaries,

related groups, and to the Government of Mali will be very low. Let us see how these compare with benefits anticipated.

b. Benefits

It is usually tempting to exaggerate the potential benefits of a small-scale project. With this cautious note in mind, let us consider the benefits.

It is estimated 90% of Mali's labour force participates in agriculture whose key products are sorghum, millet, livestock, cotton, fishing, peanuts, and rice. An objective of this pilot project is to enhance productivity in fish production in the project area. This is certainly a contribution to the implementation of a national policy.

Redistribution of income in both real and money terms in a rural sector of an economy is a significant contribution. For as fish production expands in the area, the per unit price of fish should decline, thereby making fish available to persons who could not afford it before. This could certainly increase home consumption of fish. But increased home consumption in a subsistence community is a form of wealth. Besides, if all of what is produced cannot be consumed locally, surpluses thereby created could be marketed in distant communities. It would be a great contribution if this project were to help in that direction.

There are, therefore, potentialities for backward and forward linkages for fish and rice-related economic activities in the area in both monetary and real terms.

In conclusion, the long term benefits of this project apparently exceed its costs. It involves an efficient allocation of very scarce resources. Therefore, it is economically sound.

4.2 Social Analysis

Women constitute part of the target group for this project. Traditionally, the rural female group in particular has been neglected by agricultural extension services although these women have always played the major role in many rural communities with respect to agricultural production, marketing, and farm management. In much of Africa, for instance, women grow the family consumption crops as their men grow the commercial crops.

The impact of a small scale project such as this one on the women of a country of some 5.6 million people must not be exaggerated. But we believe that on this small scale we can begin to correct past inequities for women by making the intended female targets of the project, access to fisheries extension services in the preservation and marketing of fish. Extension agents, for instance, will run experiments with the women on different methods of preservation in order to reduce the large loss of animal protein currently attributed to insect damage and spoilage.

This pilot approach to helping women, we believe, will help them become better preservers of fish and managers of its marketing.

By taking this route we are not necessarily changing the traditional role of women among the target population. In Africa, especially in rural Africa, women have always preserved and marketed fish. The project simply plans to enhance the productivity of women in a traditional economic activity. Therefore, negative social consequences from this approach will be very minimal indeed.

Often, small-scale fishing and rice production in rural Africa are at subsistence levels. But production at this particular level leaves many members of an average rural family poorly fed, undernourished, and makes the management of large families very difficult. Experience shows that this is often the lot of many rural families that live by subsistence farming or fishing, a socioeconomic characteristic of this project's target area. Therefore, increases in productivity will enhance the capability of the local community to feed more people and properly. Although this project is not on health per se, we believe that through more extension services (communication) with the poorest majority, they would be able to experience better diets, better health and better child care.

When more fish are produced, the unit price of fish and related products should drop. This will broaden the market, making fish accessible to many people who could not afford it before. The surpluses, given proper marketing and transportation conditions would be "exported" to similar communities within the country. But even if fish are not thus marketed, the eventual increase in the home consumption of fish constitutes an important form of wealth for the affected local community.

Of course, with increased productivity, enhancement of protein content, proper dieting, and related benefits, this would eventually reduce infant mortality from protein deficient related diseases. Indeed, it could raise life expectancy.

Special interest groups whose monopoly of the current fishing industry of the area could oppose this innovation if only to protect their privileged positions. However, our investigation to date has not identified any particular group or groups that might stymie these efforts.

Provision of employment for persons involved is an added social impact. But such an impact would be much more significant in the long run with a large scale follow-up project than with the current scale of intended operation. However, the potential exists. Gains from mechanization and management would certainly help similar communities empirically.

4.3 Financial Analysis

The financial plan is described elsewhere in the project document. Africare, Inc. will be responsible for the financial management of the project. It will assist the U.S. Peace Corps involved in the project and the appropriate agency/agencies of the government of the Republic of Mali in carrying out the provisions of the program. Through its representative in Mali, Africare will act as comptroller for all grant funds expended on the project.

For a small project like this detailed analysis of financial ratios to establish the financial capability of the organization that will manage the funds are

unnecessary. But a very recent audit (1978) and a USAID commissioned evaluation of Africare (1978) have established that Africare is a competent and well managed organization.

Financial analysis of an agricultural project cannot ignore the issue of adequate incentives of its beneficiaries. Since this is a pilot project, its explicit profit making potentiality will, we believe, motivate the participants to expand their scales of operation in the future. This apparent success will also encourage other related groups to get involved as financial benefits increasingly become realities.

In summary, our efforts in assessing the management competence of the financial comptroller of this project in discharging its responsibilities for project implementation, the issue of incentives, and assessment of possible financial impact on the participants are means for establishing a sound and workable financial program for the project.

4.4. Technical Analysis

A very simple and appropriate technology will be employed in the implementation of this project, and should be applicable beyond the life of the project. Malians who will be involved in every phase of the project should be able to duplicate the technology elsewhere in the country.

The United States Peace Corps is one of the implementing entities. This body has had extensive experiences with similar structures in several African and other Third World countries. Therefore, the pre-project training they will give new recruits in, say, Zaire should be adequate and simple enough for transference to the Malians directly involved in the project.

Since the technical methods and the approaches we intend to employ and adapt under the project have been successful in the fisheries projects of Zaire, Cameroon, C.A.E. and Niger, and that the Peace Corps have knowledge of these techniques, we have no reasons now to believe that similar approaches will fail among the highly motivated hard working Bobo and Bambara people who live in the area of the project.

The necessary manpower for the project is available. The biggest single constraint has been the lack of money. This constraint will disappear when funds being requested in the project document become available. Now, Mali is a food deficit country, especially protein rich type of food such as fish. Therefore, the market for a small scale expansion of fish is not a constraint either. We have carefully taken these into consideration.

The project background has details of the techniques to be used in the construction of the station at San and of how the barrages on the Dogon Plateau should be stocked.

4.5. Financial Plan

	<u>Year 1</u>	<u>Year 2</u>	<u>Total</u>
<u>Host Country Contributions</u>			
3.4.1. Personnel	1,900	4,400	6,300
3.4.2. Training	-0-	1,000	1,000
3.4.3. Commodities	-0-	-0-	-0-
3.4.4. Other	2,140	760	2,900
Subtotal	<u>4,040</u>	<u>6,160</u>	<u>10,200</u>
<u>Peace Corps Contribution</u>			
3.4.1. Personnel	20,000	50,000	70,000
3.4.2. Training	4,000	4,000	8,000
3.4.3. Commodities	-0-	-0-	-0-
3.4.4. Other	-0-	-0-	-0-
Subtotal	<u>24,000</u>	<u>54,000</u>	<u>78,000</u>
<u>AID Financed</u>			
3.4.1. Personnel	49,860	18,100	67,960
3.4.2. Training	12,000	500	12,500
3.4.3. Commodities	49,900	4,700	54,600
3.4.4. Other	121,942	36,998	158,940
Subtotal	<u>233,702</u>	<u>60,298</u>	<u>294,000</u>
TOTAL	261,742	120,456	382,200

SECTION 5 PROJECT DESIGN MANAGEMENT ADMINISTRATION AND SUPPORT

5.1 Government of Mali

Under this project, the Government of Mali/Division of Eaux et Forêts will be responsible to supply, with appropriate pre-training qualifications, the five individuals to be trained and to work full-time in the project as the 1 Fish Station manager and 4 Extension Agents, one the first year of the project and three additional agents the second year, paying these persons regular salaries and providing them regular benefits as government employees. The COM will supervise and support these persons as employees of the Division of Eaux et Forêts and will supervise and support the Peace Corps volunteers assigned to the project within the framework of its agreements with the Peace Corps.

Also, the Government of Mali will work with the Africare Representative to establish a system suitable to both parties for the management and administration of fish station equipment, operational commodities and funds provided by Africare under the grant, or earned at the fish station as a result of the sale of fingerlings and fish. The system will be designed in a manner that will allow it to be phased into the designated COM office accounting system as soon as phasing it into the system would be practical and effective. The designated COM office would then be responsible for the full administration and accountability of commodities and funds provided or earned under the grant, and that office could also set aside in special accounts the cash received from the sales of fingerlings and fish, controlling the use of those funds for station operation and eventual replacement of capital investment items to the extent possible.

Government records would be kept on all such commodities and funds in a Jordanian style with sound accounting principles and practices, and reporting schedule could be established under which the designated COM office could provide to Africare, in a form suitable to Africare, any reports it may require on the use of commodities and funds provided or earned at the fish station.

The COM will be expected to maintain in sound repair and good operating condition all facilities constructed and equipment provided under this grant for the normal period of serviceability of such facilities and equipment. Whereas routine fuel, oil, spares and replacement parts for the landrover and five motorcycles would be financed by Africare during the first two years of the project, they would thereafter be financed by the COM. All other maintenance and repair requirements would be the responsibility of the COM from the beginning of the project.

All vehicles will belong in title to the GOM from the beginning of the project, with all registration and insurance requirements being the responsibility of the GOM upon the arrival of the vehicles in Mali, and with the vehicles assigned for the entire duration of the project only to the Malian and Peace Corps personnel assigned to the fish station for work under the project, through the period of the Project Agreement and any extensions to that Agreement that may provide for the use of such vehicles. After the end of the Agreement, the vehicles will fall completely under the control of the Government for use or disposal as it sees fit.

The GOM will test each prospective vehicle operator to insure that the individual is capable of safely operating the intended vehicle(s) before appropriate driving permits are issued, and only ^{when} appropriate permits are issued will the Malian and Peace Corps workers be authorized to drive the vehicles.

The GOM will medically examine all Malian candidates for training outside Mali under the project, allowing to go only those candidates who are medically fit. All responsibility for the health, welfare and actions of Malian nationals sent by the government for training will rest with those individuals and/or the Government of Mali within the framework of their mutual understandings, except for the regular food, travel, instruction and lodging to be arranged by Peace Corps for the period of training.

5.2. - Peace Corps

Under this project, the United States Peace Corps would supply the 5 individuals to work as Peace Corps Volunteers, two volunteers the first year of the project and 3 additional volunteers the second year, and would provide them pre-service training for this project. The Peace Corps will supply them the regular allowances and benefits associated with their tours of service, as well as all other support they are entitled to receive within the framework of their service as Volunteers and the agreements between the U.S. Peace Corps and the Government of Mali.

Once the Peace Corps Volunteers are placed at their work site, Peace Corps will be responsible to provide them and further technical, language, or cross cultural support they may require to serve effectively as technicians, counterparts and administrators within the project. If for any reason a Volunteer is unable to complete the normal tour of service under the project, the Peace Corps will make reasonable efforts to secure, train and post a suitable replacement.

The Peace Corps will periodically assess the work of volunteers at the sites (through site visits, reports received from the volunteers, and discussions with Malian supervisors and counterparts) and will share these assessments with the volunteers, the GOM and Africare.

5.3. -Africare

The overall responsibility for receipt and administration of project funds, and for reporting on the project written reports to USAID, will rest with Africare.

Support from Africare's Central Office in Washington will be accomplished in part by existing personnel and offices (Controller, Accountant, Program Development Team, etc.), and through consultants hired specifically for the project. The procurement of services by U.S. nationals to serve as such special hire staff (1 Procurement Officer to work in Mali for 3 months early in the project, 1 Construction Specialist in Mali for 5 months during Year 1, and Evaluation Specialist input for 1 month at the end of Year 1 and 1 month at the end of

Year 2) will be accomplished by Africare Headquarters/Washington. So will the procurement and shipment of U.S. source and origin commodities to be sent to Mali for the Project. All grant funds received will initially pass to Africare/Washington, and that portion intended for local currency expenses in Mali will then pass to Africare's Representative in Mali to be managed by him there.

Africare's Representative in Mali serves as resident liaison on behalf of Africare with all parties and institutions in Mali and, in addition to managing Africare responsibilities incountry, he is responsible to arrange Africare/Washington inputs, coordinate them with incountry activities, provide as necessary for the logistic support of Africare actions, and report on the general and specific programs of Africare incountry.

With respect to the San Fish Station Project, the Representative will maintain a continuing liaison with host government officials at the national and regional level and with incountry representatives of Peace Corps and USAID, for the continued planning, supply and coordination of Africare inputs. Working with in-country and Africare/Washington staff, the Representative will recommend suitable communication and logistics systems for the management, support, implementation and evaluation of the project. Working with the Procurement Officer to be in-country during the first 3 months of the project, the Representative will help to arrange and manage incountry logistics support in the form of commodities to be procured in Mali and in neighboring countries. The Representative will be responsible to ensure the complete and accurate maintenance of Africare official incountry accounting records on local currency expenses financed by USAID, and will provide Africare/Washington any reports required on those expenses by Africare/Washington and USAID. The Representative will receive and analyze periodic narrative reports prepared by the workers at the fish station, and will compile or condense these into the format required by Africare/Washington for its review and preparation of reports to submit to USAID.

The Procurement Officer to be employed by Africare in Bamako during the first three months of the project will order and arrange for transport to site of all local materials necessary for the project. The Africare Representative will order and arrange for delivery of those commodities to be purchased in neighboring countries. The Construction Specialist will arrange and supervise construction aspects of the project during five months of Year 1. The Procurement Officer will be responsible for remitting receipts to the Representative for all local material and labor costs that he pays during the term of his contract, and will ensure that all transactions handled by him are conducted within pertinent laws of the Government of Mali, particularly with respect to the hire and termination of laborers and skilled workers. After the departure of the Procurement Officer, this function will be carried out by the Construction Specialist with respect to those commodities and services having to do with the construction of the Fish Station. Initial operational costs at the Fish Station will be budgeted in advance on a half yearly basis by the Malian in charge in conjunction with the Peace Corps Volunteer posted at the Fish Station. A petty cash fund will be established under the control of the Malian in charge for any expenses under 25,000 Malian Francs, and a checking account will be

opened for deposit of funds by Africare for those expenses to be paid by that person in the operation of the station for expenses of 25,000 Malian Francs up to 200,000 Malian Francs. Any operational expenses in support of the station over 200,000 Malian Francs must first be approved in writing by the Africare Representative.

5.4 -Project Implementation

(Assuming AID has signed obligation for funds no later than NOVEMBER 30, 1978)

A. Summary of Major Activities to be Undertaken

(Note: The sequence of these activities may vary as necessary)

1. Preparatory (January 1, 1979)

Agreement signed between the Government of Mali, Africare and Peace Corps

2. Training (January 22-April 5, 1979)

The two Peace Corps Volunteers have French and local language training in Mali. Also technical training in Zaire for the PCVs and Malian counterparts.

3. Procurement (January 1 - March 31, 1979)

(a) PSC procurement officer orders all local and third country materials needed for project.

(b) Africare orders all U.S. procured materials and see that they are transported by the fastest means available.

4. Construction (April 1 - August 31, 1979)
(For list of materials see Annex)

PSC Construction expert with the aid of the two PCVs, two Malian counterparts, 4 Malian masons and 30 Malian laborers construct:

(a) 10 small (100 m²) fingerling production ponds

(b) 7 fish production ponds (500 to 1000 m²)

(c) all canals necessary to supply water and drain the above ponds.

(d) 1 two room capacity concrete storage building (10 x 10 m.)

(e) 1 two-room concrete laboratory/office building (10 x 5 m.)

- (f) 4 concrete holding tanks (5 m x 1 m)
- (g) One latrine
- 5. Production (September 1, 1979-December 31, 1980)
 - (a) 10 fingerling production ponds
 - (b) 7 fish production ponds
 - (c) 25 hectars of local villagers fields
 - (d) 5 barrages on the Dogon plateau
- 6. Evaluation (December 1-31, 1979 & 1980)
 - (a) PSC's evaluation of first years activities with recommendations
 - (b) PSC's evaluation of first two years activities with recommendations

B. Implementation Schedule

A detailed project implementation schedule is provided in Annex. E.

SECTION 6 - EVALUATION

The project description (Section 3) provides the logical framework and seven major outputs which should allow achievement of the project's purpose, given the critical assumptions stated.

Since those seven outputs and the purpose will be the focus of project activity, the ongoing evaluation of the project will concentrate on measuring progress along these lines, based on the means of verification stated in the project description.

Routine program monitoring and internal evaluations will be the joint responsibility of the Division of Eaux et Forêts, the Peace Corps and Africare/Mali. Periodic assessments and reports, supported by monthly reports from Malian and Peace Corps workers and extension agents will identify the extent to which project inputs and intermediate outputs are leading toward the project's intended outputs, purpose, and goal.

Where inputs deviate from operational expectations, the differences will be reviewed to determine if they are the result of errors in planning assumptions, project strategy or design, the nature or timing of inputs, or related considerations.

The implementation schedule will be reviewed by the Africare Representative each quarter with the foregoing in mind, and quarterly reports to Africare/Washington will identify the results obtained during the quarter, problems encountered, program potentials and shortcomings, and recommendations for future actions. As necessary or desirable, the implementation schedule may be revised from time to time. Such planned changes will involve discussion and concurrence among the Government of Mali's designated officer, the Peace Corps Representative and the Africare Representative with as much advance notice of underlying reasons as practical.

End of Year 1 and Year 2 evaluations will be intended as more comprehensive in nature, providing analyses and recommendations concerning desirable directions for beyond Year 2.

SECTION 7 - BUDGET
 USAID Appropriated Funds
 Budget Summary

	<u>Year 1</u>	<u>Year 2</u>	<u>Total</u>
	\$	\$	\$
A. <u>Personnel</u>			
U.S. Hire	28,350	11,850	40,200
Local Hire	20,460	6,975	27,435
Subtotal	<u>48,810</u>	<u>18,825</u>	<u>67,635</u>
B. <u>Training</u>			
U.S. Training	-0-	-0-	-0-
Third Country (Zaire)	12,000	-0-	12,000
Local (Mali)	-0-	500	500
Subtotal	<u>12,000</u>	<u>500</u>	<u>12,500</u>
C. <u>Commodities</u>			
U.S. Source/Origin	8,000	-0-	8,000
Vehicles (non-U.S. origin)	25,000	-0-	25,000
Transportation expenses	800	-0-	800
Maintenance	5,000	-0-	5,000
Shelf items from non-US dev. countries	14,000	5,100	19,100
Shelf items origin Mali	8,000	600	8,600
Shelf items origin other LDC's	1,400	-0-	1,400
Imports from other LDC's	1,400	-0-	1,400
Subtotal	<u>63,600</u>	<u>5,700</u>	<u>69,300</u>
D. <u>Other</u>			
U.S. currency costs	6,000	4,500	10,500
Local currency costs	26,920	10,240	37,160
Contingency - local currency	11,145	3,968	15,113
Subtotal	<u>44,065</u>	<u>18,708</u>	<u>62,773</u>
E. <u>Inflation Allowance</u>			
On U.S. currency costs	6,352	2,452	8,804
On local currency costs	17,247	3,512	20,759
Subtotal	<u>23,599</u>	<u>5,964</u>	<u>29,563</u>
F. <u>Overhead (26.5%)</u>	41,692	10,537	52,229
TOTALS...	<u>233,766</u> *****	<u>60,234</u> *****	<u>294,000</u> *****

USAID Appropriated Funds

Year 1 (CY '79)

A. Personnel (\$48,810)

1. US Hire Consultants		
a. Construction specialist (5 MM at \$3300/MM) 5 day week		\$ 16,500
b. Evaluation (3 MM at \$3950/MM) 6 day week		<u>11,850</u>
	Subtotal	\$ 28,350
2. Local Hire (Malian)		
a. Prime de Rendement for counterparts (20 MM x \$30/MM)		\$ 600
b. Masons (24 MM x \$90/MM)		2,160
c. Laborers and Watchmen (300 x \$45/MM)		13,500
d. Casual Hire (60 MM x \$45/MM)		2,700
e. Procurement Officer (3 MM x \$500/MM)		<u>1,500</u>
	Subtotal	\$ 20,460

B. Training (\$12,600)

1. U.S. Training		-0-
2. Third Country Training (Zaire) including travel		\$ 12,000
3. Local Training (Mali)		-0-
	Subtotal	\$ 12,000

C. Commodities including freight (\$63,600)

1. U.S. Source/Origin (lab equipment/supplies and air freight)		\$ 8,000
2. Third Country Origin/Mali Source		
a. Developed country origin/Mali source		
- Handtools		2,300
- Other construction supplies/materials		4,300
- Equipment		2,350
- Office supplies		<u>3,500</u>
	(Subtotal)	\$ 12,250
b. Other IDC Origin/Mali Source		
- Construction supplies/materials		\$ 1,400
c. Fuel		\$ 1,750
	Subtotal	\$ 15,400
3. Third Country Origin/Source		
a. Developed country origin/other LDC source		
Highway vehicles and spare parts plus road transport		\$ 25,000
Road transportation expenses		800
Vehicle maintenance		<u>5,000</u>
	(Subtotal)	\$ 30,800
b. Other LDC origin/source		
Stock fish plus air freight from Niger		<u>1,400</u>
	Subtotal	\$ 32,200

4. Mali Source/Origin	
Construction supplies/materials	\$ 8,000
D. Other (\$44,065)	
1. Travel for U.S. Hire Consultants & Evaluators (4 RT U.S./Mali at \$1500 ea.)	6,000
2. Per diem for U.S. hire consultants 40 days x \$78/day, 200 days x \$35/day	10,120
3. In-country Travel and Expenses	6,300
4. Other consultant related expenses	5,000
5. Rental of storeroom (2 mos. at \$1,000/mo)	2,000
6. Rental of water pumps	2,000
7. Truck rental for transport of materials to site (4 trips at \$375 ea.)	1,500
8. Contingency (local source/origin)	11,145
Subtotal	<u>\$ 44,065</u>
E. Allowance for Inflation (15% x \$157,330)	\$ 23,599
F. Overhead (26.5% x \$157,330)	<u>\$ 41,692</u>
YEAR 1 TOTAL,.....	\$233,766

USAID Appropriated Funds

Year 2 (CY 80)

A. <u>Personnel</u> (\$18,825)	
1. U.S. Hire Evaluation Consultants (3 MM x\$3,950/MM)	\$ 11,850
2. Local Hire (Malian)	
a. Prime de Rendement for counterparts (60 MM x\$30/MM)	1,800
b. Laborers and Watchmen (85 MM x \$45/MM)	3,825
c. Casual hire (30 MM x \$45/MM)	<u>1,350</u>
Subtotal	6,975
B. <u>Training</u> (\$500)	
1. U.S. Training	0-
2. Third Country Training	0-
3. Local Training	\$ 500
Subtotal	<u>\$ 500</u>
C. <u>Commodities</u> (5,700)	
1. U.S. source/origin	0-
2. Third Country Origin/Mali Source	
a. Developed Country Origin/Mali Source	
- fuel	\$ 3,750
- operations supplies/materials	<u>1,350</u>
Subtotal	\$ 5,100
3. Mali Source/Origin	
a. Operating supplies/materials	\$ 600
D. <u>Other</u> (\$18,711)	
1. Travel for U.S. hire consultant (3 RT at \$1500)	\$ 4,500
2. Per Diem for U.S. hire consultant (30 days x \$78/day)	4,440
3. In-country travel and expenses (60 days x \$35/day)	1,800
4. Rental of water pumps	4,000
5. Contingency	<u>3,968</u>
Subtotal	\$ 18,708
E. Allowance for Inflation (15% x \$39,765)	\$ 5,964
F. Overhead (26.5% x \$39,765)	<u>\$ 10,537</u>
Year 2 TOTAL	<u>\$ 60,234</u>

(Details of Host Country and Peace Corps contributions are in Annex C)

USAID APPROPRIATED FUNDS

Currency Analysis

	<u>Year 1</u>	<u>Year 2</u>	<u>Total</u>
	\$	\$	\$
A. U.S. Currency (including inflation)	60,340	23,908	84,248
B. Local Currency			
1. Commodities	48,050	1,950	50,000
2. Training	12,000	500	12,500
3. Operational	44,810	16,525	61,335
C. Inflation	15,729	2,845	18,574
D. Contingency	11,145	3,968	15,113
E. Overhead	<u>41,692</u>	<u>10,537</u>	<u>52,229</u>
TOTAL	<u>233,766</u>	<u>60,234</u>	<u>294,000</u>

ANNEX A
INLAND FISHERIES FEASIBILITY SURVEY
REPUBLIC OF MALI
June 10 to July 12, 1978

Conducted By

Harry Rea

Dague Clark, APCD/Ag & RD

Bill Carberry, PCV

Mamadore Tourè

Introduction

Until recently it was believed that the Niger and Senegal river systems were capable of providing a virtually endless supply of fish to the people of Mali. However, over the past several years both the quantity and quality (size and preferred species) have declined due to the following reasons:

1. Over exploitation, Traditional fishing methods are gradually being replaced by more modern techniques and equipment thus increasing the efficiency of the local fishermen. Fine mesh nets are being used to increase the catch, but these nets capture both young and mature fish thus reducing present and future brood stock.
2. Reduced reproduction. Along with the depletion of brood stock as mentioned above, the drought of the past few years has greatly reduced natural reproduction. Many species of riverine fishes breed during periods of flooding and much of the breeding takes place on the shallow flood plains.

Therefore, what exists is a system in which the outputs exceed the inputs leading to what may be the complete exhaustion of the fishery resources of these river systems.

Large quantities of the fish are dried or smoked. Considerable losses occur due to insect infestation. It has been estimated that these losses result in the processed fish having an animal protein content that is less than 15% of that in an equivalent quantity of fresh fish.¹

Of the estimated annual catch of 100,000 tons approximately 1/3 is exported and accounts for 15% of the commercial balance of the country.²

It is evident therefore that fish are important to Mali both economically and nutritionally, making it imperative that efforts be undertaken to increase fish production and to better utilize this important food source. It is on this basis that the National director of Eaux et Forêts expressed an interest in Peace Corps investigating the possibilities of starting a fish culture program. The areas of concern that he thought that Peace Corps should concentrate on are as follows:

1. Rice/fish culture
2. The use of rice fields to breed fish for restocking the rivers.
3. Investigation of lifecycles of important indigenous species in order to determine means of artificial propagation as well as to determine which species may be suitable for culture.

He also expressed the desire to see the results of a small program centered in the Central Delta region near Mopti. His choice of the Mopti area is based on the fact that this is the center of expertise due to the presence

¹

² Report of the Fisher Task Force. Club of the Friends of the Sahel. p. 43
IBID., p. 48

of Operation Pêche (preservation, marketing, export) and the Hydrobiology Laboratory there.

"Also, approximately 90% of the total annual catch is produced in the Central Delta." ³

In addition several organizations (FAO/UNDP, FED, USAID) have interests in various fisheries projects in the area.

Unlike many of the African countries in which Peace Corps has successful on-going fish culture programs, Mali has no tradition of pond fish culture. In Cameroon and Zaire very basic types of fish culture were practiced even before the colonial period. The colonial powers later introduced more intensive fish culture but much of this was abandoned or neglected around the time of independence. So when Peace Corps began the fish culture programs in these countries the concept of pond fish culture was not unheard of. Peace Corps task consisted of renovating existing ponds, constructing new ponds, and intensifying management techniques in order to increase production and thus making it economically feasible for farmers to raise fish. In both cases volunteers work mainly with local farmers and use appropriate technology. At least initially the scope of a program in Mali may be somewhat different but the essential goals will be the same.

Governmental and Non-governmental Agencies Consulted

Ministry of Rural Development

Eaux et Forêts

Opération Pêche Mopti

National Hydrobiology Laboratory, Mopti

Opération Riz-San

Opération Beguinéda

USAID

Africare

CARE

FAO/UNDP

FED

SITE OBSERVATIONS

1. Mopti

A possible site for the construction at a fish station was recommended by the Director of Operation Pêche. This site is located near a recently installed pumping station. The station with a capacity of 250 m³/hr is meant to service the towns of Mopti and Séraré. The capacity could be increased only by the installation of additional pumping facilities. Also this area floods during rainy season so a large dike would have to be constructed. Because of these two considerations the investment needed to construct a station at this site would be very large. Considering the fact that this is really the only site available at Mopti, it was decided that another location for a station should be chosen.

The Hydrobiology lab is located in Mopti. The purpose of the lab is to collect specimens from the river in order to study the life cycles of the important commercial species in an attempt to find means of artificial propagation of these species for restocking the river. The lab is very poorly equipped. Presently there is a Peace Corps/Smithsonian volunteer working at the lab as part of his job.

At Operation Riz in Mopti considerable damage occurs to the rice crop due to fish that eat the rice plants or physically damage the plants. The volunteer mentioned above is working on a system of screens to keep fish from entering the rice fields. Because of this problem, Operation Riz has been very negative about the possibilities of rice/fish culture.

Because Mopti is located in a very flat flood plain, the construction of ponds, by local farmers would be quite limited and in most cases the land floods during rainy season. Probably the only extension work that could be done in the area would be with rice farmers who could raise fish in their rice fields. Some work could also be done with local fishermen.

2. Dogon Plateau

Water is very scarce in this region, making it impossible to grow fish in most areas. Many wells have been dug to supply villages with water. Also, several barrages have been constructed to collect and store rain water for use during the dry season. Most of these are completely drained each year in an effort to control schistosomiasis which is widespread in Mali. The soils below these barrages are usually too rocky to be suitable for pond construction. Also the formation of additional bodies of water may increase the already existing health problems.

These reservoirs could be stocked with fish and harvested when drained or throughout the year in those that cannot be drained. Snail eating fish could be stocked as a means of controlling schistosomiasis.* However, because the water in these reservoirs is used by several villages problems could occur at harvesting as to who gets how many fish. Also, because

* PCV Bill Carberry is looking into this possibility.

many of the reservoirs are completely drained each year, fish would need to be restocked yearly which would be a considerable input dollar wise for either the villages or GRM.

The following barrages were visited: Djoundjouron, Somoli, Sogodougou, Nombo, Daga, and Amani

3. Borko

This village is a virtual paradise. Located in a valley to the north of the Dogon Plateau, Borko and surrounding villages are supplied with water from 43 rainy season and 32 dry season springs. Because of the abundance of water, food is also plentiful. Many animals (goats, sheep, chickens, and cows) are raised making the need for fish somewhat questionable. Also there is a cultural belief that the fish present in the local streams are sacred and perhaps this would apply to fish raised in ponds even though the fingerlings stocked came from another place. The people however do eat the dried fish that come from Mopti. By far, this area has the greatest potential for the construction and management of small ponds by local farmers. However because the roads to Borko are extremely poor the village is very isolated making it unsuitable as a site for a station.

4. San

Opération Riz San is under the direction of Opération Riz-Ségou. Near San there is a pumping station located on the Bani river with a capacity of 3500 liters/second and the facilities to increase by an additional 2000 liters/second. A system of canals here has been constructed to supply water to the rice fields. At present the water is not being fully utilized. Also there are considerable amounts of land that are not being cultivated and on which ponds could be easily constructed. Rice/fish culture is also very possible.

The Opération provides the water and extension services to local farmers who rent the rice fields. The rice that the farmers produce may then be marketed through the operation or by the farmers themselves. A similar procedure may be worked out for fish ponds.

Because of the year round supply of water and the availability of suitable land, San should be the location of a fish station that will produce food fish as well as fingerlings for stocking in other areas of Mali.

5. Koni

An Agricultural School is operated in Koni by the Catholic Mission there. Each year twenty to thirty five families come to stay at the mission and are trained in various methods of raising crops and livestock. After their stay at the center they return to their villages to implement what they have learned and to teach others. The Director of the center expressed an interest in fish culture in the program. There is a solar pump that is being used to irrigate crops but not to its full capacity. The center uses a diesel pump to pump from a year round source of water. Both of these sources could be used for fish culture. This Center would be an excellent means of bringing fish culture to local villagers.

6. Beguineda

A 27 kilometer long canal originating at the Niger River supplies water to Beguineda and surrounding areas. However this canal has been very poorly maintained over the years. Presently a 7 year project is underway to repair the canal. Because of this the canal must be left dry during certain parts of the year. In order to make sufficient water available for a station, a dam of cement and stone would need to be built across the main canal. This would make it possible to get water even during times when the rest of the canal was dry. The proposed site is about 5 kilometers from the mouth of the canal. The cost of constructing this dam would be quite high thus making the site economically unsuitable for a station. But small ponds could be built by farmers using the small irrigation canals which branch from the main canal. Water would only be available during certain parts of the year. In the future this could prove to be an excellent area for a fish culture extension volunteer to work in.

7. Fia

The director at the office at the Rehabilitation of the Blind in Bamako has expressed an interest in Peace Corps involvement in a model farm in Fia on which blind people will do the work. He would like to have PCVs working in agriculture projects and also fish culture. But there is no year round supply of water so fish culture could only be done during rainy season. A stream runs through the area and during the rainy season it floods out most of the area on which ponds could be constructed. However some fish culture could be done and the director's enthusiasm alone should warrant some involvement by Peace Corps.

RECOMMENDATIONS

1. A station should be constructed at San. The station would be used to produce both fingerlings and food fish. Food fish can be raised alone in ponds and also in combination with rice.

This station should consist of 10 small ponds (100 m²) for fingerling production and experimentation and initially 7 production ponds (500 m² to 1000 m²). Seven production ponds would make it possible for each pond to be harvested twice each year which means one pond to be harvested each month. At any one time six ponds would be in production and the seventh would be dried in order to eliminate any fish parasite or diseases that may be present and also to allow for any necessary maintenance. Also some rice fields should be constructed to allow for experimentation with rice/fish culture. A system of screens will be necessary to prevent wild fish from entering the ponds and rice fields. One volunteer will be necessary for this project.

2. The barrages on the Dogon Plateau should be stocked. But this program should be started on a small scale in order to find out what problems may arise. Along with this more work should be done to find a species of fish that can be used to control the schistosomiasis carrying snails. The PCV

presently in Mopti and his Malian counterpart should undertake these two projects along with continuing his work at the Hydrobiology laboratory in Mopti.

3. Due to the scarcity of water in many parts of Mali, fish culture will be limited to areas near large rivers and especially the flooded rice perimeters. Therefore, a Peace Corps fish culture extension volunteer and his Malian counterpart will be working mainly with rice farmers who may be interested in rice/fish culture. But all other possibilities such as cage culture in rivers, and behind dams or in lakes should be considered. Other areas of the country may prove to be suitable for fish culture and the extension program should include these areas. Initially one PCV and a counterpart should be assigned to work with rice farmers in the San-Ségou-Mopti area. Part of their job will also be to determine the need for additional extension volunteers in the future.

4. Malian counterparts should be assigned to work with each of the PCVs. This is an extremely important aspect of Peace Corps involvement in a fish culture program in Mali as well as elsewhere. The training of Malians by PCV's will help to ensure the continuance of the program even after Peace Corps has ended its involvement. These counterparts should be assigned by the Eaux et Forêts, as agreed by the Directeur National d'Eaux et Forêts.

ANNEX B

INITIAL ENVIRONMENTAL EXAMINATION

PROJECT LOCATION: San, Mali
PROJECT TITLE: Mali Fish Production Station
FUNDING: AID OPG FOR \$250 Thousand
LIFE OF PROJECT (Funding): 2 years.
IEE prepared by: Dague B. Clark DATE: October 9, 1978
ENVIRONMENTAL ACTION RECOMMENDED

CONCURRENCE

Ronald D. Levin
Country Development Officer

DATE:

DECISION

APPROVED:

DATE:

APPROVED:

DATE:

I. EXAMINATION OF THE NATURE, SCOPE AND MAGNITUDE OF ENVIRONMENTAL IMPACTS

a. Project Description

The purpose of the project is to promote fish production in the fourth and fifth regions of Mali without endangering existing fish reserves, in order to help increase the quantity and quality of protein available for local consumption and assist the rural people to add to their cash income.

The project and proposed plan of action has grown out of discussions and studies involving, in varying capacities, the government of Mali, the Peace Corps, USAID/Mali and Africare. The Mali National Director of Eaux et Forêts recognizes that intensive fish collection methods along major rivers are fast reducing existing reserves, and maintains that proper management of fish will remain important to Mali from both an economic and nutritional stand point.

Under this 2 year project, Africare and Peace Corps propose to work directly with Malian officials and technicians at the national, regional and local levels and with the village people at the village level to:

- a. Establish and operate a pilot station near the village of San for fish breeding, fish production and the hatching and distribution of fingerlings;
- b. Train station and extension staff;
- c. Distribute fingerlings to rice farmers;
- d. Assist farmers to undertake fish production in conjunction with existing paddy rice production;
- e. Study and recommend improved approaches for fish culture and production and integrated with other aspects of rural development;
- f. Assess the self-sustaining potential of the fish station and extension activities.

The fish station will use the pumps of Opération Riz-San which are located on the banks of the Bani river. Extension work will be done with the Bobo farmers at Opération Riz-San and others in the fourth region of Mali. The extension work will also include stockage of some of the resevoirs in the fifth region.

II. IDENTIFICATION AND EVALUATION OF ENVIRONMENTAL IMPACTS:

a. Land Use

1. Changing the character of the land through:
 - a. Increasing the population of people or animals:

Increased opportunities for work will only be in effect for the construction phase of the project. After the

first five months most of the work will be with farmers in the area already cultivating rice. The project is unlikely to accelerate population increase due to immigration. It may however, increase population density due to increased nutrition by the production of fish.
-Impact rating: none

b. Extracting Natural Resources: the total project pumping requirement for the station is low. The maximum use will be about 10,000 m³/day or 0.125 m³/sec. This is insignificant in relation to the Bani river flow, and is highly unlikely to cause a perceptible downstream effect.
-Impact rating: none to low negative.

c. Land Clearing: Construction will involve only a minimal excavation of soil at the site of the station. The existing vegetal cover consists of some seasonal grasses only. There are no bushes or trees to be removed. The surrounding land will be regraded and top-soil retained for placing back on top, with natural vegetation planted to maintain a natural cover.
-Impact rating: none.

d. Changing the Soil Character:

i. Texture: the land in the project area is flat and gently sloping. Except for the digging of the ponds and canals, no land leveling is contemplated.
-Impact rating on texture: none

ii. Structure: the soils at the station site are at present untilled, barren except for seasonal grasses, very low in organic matter and possessing minimal structure. The running of the station should do nothing to change this except add some organic matter to the soil. The same is true for the farmer's rice paddies.
-Impact on structure: none to low positive.

iii. Nutrient status: initial nutrient availability has been sufficient for a satisfactory rice crop. The addition of fish will subtly increase organic matter.
-Impact on nutrient status: none to low positive.

iv. Aeration and water infiltration: it is highly unlikely to have effect on aeration and water infiltration.
-Impact rating: none.

v. Drainage and salinity: The slope of the land and impermeability of the soil in the area may cause drainage problems from the discharges of the production

ponds. Since the project is set up to drain one a month this should not create significant drainage problems.

Considering the sum of these factors, the overall impact on soil character is expected to be none to low negative.

2. Altering natural defenses: impact rating none.
3. Foreclosing important use: the land at the station site is not being used at this time. Extension work will be done with farmers in the fourth region already cultivating rice. Rice/fish polyculture, if it has an effect on rice production, should be positive. The resevoirs in the fifth region are used for irrigation purposes and the project should not interfere in any way with this activity.
-Impact rating none to low positive.
4. Jeopardizing Man or his works: Impact rating none.

B. Water Quality

1. Physical state of water: small demand of irrigated water on gentle slopes (1-2%) will not cause any increased sediment load. The water flowing in the ditches from the pumps presently installed is clear to semi-turbid.
-Impact rating none.
2. Chemical and biological status of water: no pesticides or chemical fertilizers will be financed or promoted under the project.
-Impact rating none.
3. Ecological balance: indigenous species of fish to the Niger and Bani river systems will be used for the project. The production ponds and rice paddies will be completely drained and dried in an effort to eliminate any fish parasites or diseases that may be present. Only after many tests on the effect on the ecosystem will a species of fish or other biological methods be introduced for control of the schisto-somiasis carrying snails in the resevoirs in the fifth region of Mali.
-Impact rating none.

C. Atomspheric

1. Air additives: no use of sprayed pesticides or herbicides is contemplated in this project.
-Impact rating none
2. Air pollution: the amount of exhaust gases generated by the pumps will be insignificant.
-Impact rating none

3. Noise pollution: the pumps used by Opération Riz are located on the Bani river bank some 15 Kilometers from San. Therefore, they are inaudible in the village.
-Impact rating-none

D. Natural Resources

1. Diversion or increased use of water: The effect of the increased use of water at the fish station will be minimal.
-Impact rating-none
2. Irreversible, inefficient commitments: No alternative development use is foreseen for the area.
-Impact rating-none.

E. Cultural

1. Altering physical symbols: No impact
2. Dilution of cultural traditions: The project is introducing a new crop, fish, to be cultivated in conjunction with rice by traditional rice farmers. It is hard to say what effect this will have on the cultural traditions at this time.
-Impact none to low positive.

F. Socio-Economic

1. Changes in economic/employment patterns: The project should have an effect on the levels of income in the target group by the sale of fish.
-Impact rating-moderate, positive.

2. Change in Population: See A.1.a.

3. Changes in cultural patterns:

The project could increase the income of women, since they are traditionally involved in the preservation and marketing of fish. The project plans to enhance the productivity of women in a traditional economic activity by having extension agents will work with the women on different methods of preservation in an effort to reduce the large loss of animal protein currently attributed to insect damage and spoilage.

-Impact rating-none to low positive.

G. Health

1. Changing the Environment: In so far as changing the environment is concerned the only place this project calls for activities is at the station itself where there will be seven food and 10 fingerling production ponds constructed.
Impact rating none.
2. Eliminating an element of the ecosystem:

See B.3.
Impact none to low positive.
3. Other factors: The proposed project in the fourth region of Mali is located along the banks of the Niger and Bani rivers and in the fifth region in association with the reservoirs of water on the Dogon plateau. The rural populations use these water sources for all their personal needs: drinking, cooking, washing, bathing, urinating and defecating. Consequently, water-related diseases are hyperendemic. Though there is no base line health data, it is estimated that some 80 to 90% of the people have malaria or schistosomiasis, either in clinical or sub-clinical form. In one sense, the project envisages a potential increase in human contact with water, through the fish ponds and canal system. The same contaminated river water for personal needs will be pumped into the canals and ponds. Similarly, there is a potential increase in breeding sites for disease vectors.

However, to conclude that there will be an adverse impact on human health is not justified.

First of all, the project activities will not result in any significant change in either human contact with water or in breeding sites for disease vectors. The target group of beneficiaries are people already being fully exposed to contaminated water and disease vector breeding sites.

Secondly, although there will be newly retained water in the fingerling and production ponds at the fish station, these ponds will be periodically drained and cleaned as part of the fish program. In addition employees at the station will be advised and educated regarding preventive health methods, and use of the latrines placed well away from all contained water will be required. Also, extension agents will educate and advise farmers on how to break the schistosomiasis cycle.

Thirdly, a biological control of the schistosomiasis host snail will be part of the work carried out at the station.

Furthermore, the added nutritional value of the fish produced should outweigh the small negative effect the newly retained water may have on the population. Therefore, assessing the above, the impact rating: none to low positive.

H. General

1. International impacts: due to the small scale of this project no international impacts are foreseen.
-Impact rating-none.
2. Controversial impacts: no controversial impacts rating none.
3. Larger program impacts: fingerlings from this project can be used for other larger projects.
-Impact rating-moderate positive.
4. Other factors: no other factors are foreseen at this time.
-Impact rating-none.

- I. Other possible Impacts (not listed above).
-Impact rating-none.

III. Recommendation for Environmental Action

The preceding discussion has indicated that the effects of the project on the natural environment are expected to be small and, on the balance, positive. No potential negative effects are foreseen which would not be reversible.

Furthermore, an Environmental Assessment or an Environmental Impact Statement at this stage is unlikely to shed much additional light on the situation, since the project activities are essentially new and at present no data exists to study their possible effects on the environment. There will be an evaluation done after the first and second year of the project. These will include any possible negative effects on the environment.

Consequently, a negative determination is recommended, together with a monitoring of environmental effects throughout project life by the station and extension staff for early identification and correction of any possible negative effects.

IMPACT IDENTIFICATION AND EVALUATION FORM

Impact Areas and Sub-Areas

Impact Identification and Evaluation

A.	Land Use		
	1. Changing the character of the land through:		
	a. Increasing the population	N	
	b. Extracting natural resources	N to L	negative
	c. Land Clearing	N	
	d. Changing soil character	N to L	negative
	2. Altering natural defenses	N	
	3. Foreclosing important use	N to L	positive
	4. Jeopardizing man or his works	N	
	5. Other factors	N	
B.	Water Quality		
	1. Physical state of water	N	
	2. Chemical and biological states	N	
	3. Ecological balance	N	
	4. Other factors	N	
C.	Atmospheric		
	1. Air additives	N	
	2. Air pollution	U	
	3. Noise pollution	H	
	4. Other factors	N	
D.	Natural Resources		
	1. Diversion, altered use of water	N	
	2. Irreversible, inefficient commitments	N	
	3. Other factors	N	

N NO environmental impact
 L Little environmental impact
 M Moderate environmental impact
 H High environmental impact
 U Unknown environmental impact

E.	Cultural		
	1. Altering physical symbols		
	2. Dilution of cultural traditions	$\frac{N}{N \text{ to } L}$	positive
	3. Other factors	$\frac{N}{N}$	
F.	Socioeconomic		
	1. Changes in economic/employment patterns	$\frac{M}{N}$	positive
	2. Changes in population	$\frac{N}{N \text{ to } L}$	positive
	3. Changes in cultural patterns	$\frac{N}{N}$	
	4. Other factors		
G.	Health		
	1. Changing a natural environment	$\frac{N}{N \text{ to } L}$	positive
	2. Eliminating an ecosystem element	$\frac{N}{N \text{ to } L}$	positive
	3. Other factors		
H.	General		
	1. International impacts	$\frac{N}{N}$	
	2. Controversial impacts	$\frac{N}{N}$	
	3. Larger program impacts	$\frac{M}{N}$	positive
	4. Other factors	$\frac{N}{N}$	
I.	Other possible impacts (not listed above)	$\frac{N}{N}$	

ANNEX C

Government of Mali Contributions

Budget Summary

	<u>Year 1</u>	<u>Year 2</u>	<u>Total</u>
A. <u>Personnel</u>			
Fish Station Manager	1,300	1,560	2,860
Extension Agent	600	2,840	3,440
Subtotals	1,900	4,400	6,300
B. <u>Training</u>			
Subtotal	-0-	1,000	1,000
C. <u>Commodities</u>			
Subtotal	-0-	-0-	-0-
D. <u>Other</u>			
Value of 2 hectar of land	1,780	0	1,780
Insurance and tax on			
Vehicles	360	760	1,120
Subtotal	2,140	760	2,900
TOTALS	4,040	6,160	10,200

Peace Corps Contributions

Budget Summary

A. <u>Personnel</u>			
Cost of PCVs	20,000	50,000	70,000
Subtotal	20,000	50,000	70,000
B. <u>Training</u>			
Language training at			
\$500/week	4,000	4,000	8,000
Subtotal	4,000	4,000	8,000
C. <u>Commodities</u>	-0	-0	-0-
D. <u>Other</u>	-0	-0-	-0-
TOTALS	24,000	54,000	78,000

PROCUREMENT PLAN1. Responsible Agency

All procurement under the operational Program Grant will be the responsibility of and conducted by the Service des Eaux et Forêts, an entity within the Rural Development structure of the Government of the Republic of Mali (GRM).

2. Commodity List

A four wheel drive vehicle and ten motorcycles represent the general needs of the project during its two (2) year life span.

3. Source of Procurement

The source and origin of commodities being procured for this project will be Code 941 countries and the recipient country for motor vehicles, ocean shipping and construction services, and as authorized under waivers or exempted as shelf items purchased under sanctioned local currency procurement.

4. Local Currency Procurement

To support activities of the project, local currency authorization will be required to purchase the goods and services indicated:

<u>Cost Elements</u>	<u>U.S.\$ Costs</u>	<u>Equivalent in US\$ of Local Currency Costs</u>	<u>Total U.S.\$</u>
1. Salaries & Wages	40,200	27,435	67,635
2. Travel & Per Diem	25,060	8,100	33,160
3. Equipment & Materials Rental	-0-	9,500	9,500
4. Commodities	8,000	50,000	58,000
5. Operational Cost	-0-	16,300	16,300
6. Participant Cost	-0-	12,500	12,500
7. Overhead 26.5%	19,413	32,816	52,229
8. Inflation	10,989	18,574	29,563
9. Contingency	-0-	15,113	15,113
TOTAL.....	<u>103,662</u>	<u>190,338</u>	<u>294,000</u>

The Grantee may not exceed the total amount of the Budget. Adjustments among line items are unrestricted.

5. Shelf Items Procurement

a. Imported shelf items having their origin in Code 941 countries can be purchased without restriction, except for the limitation on the total amount available for local procurement.

b. Shelf items having their source and origin in the Geographic Code 899 countries are eligible for local cost financing if the unit cost does not exceed \$2,500 and the total of such financing does not exceed 10% of the total local costs financed by AFD or \$10,000, whichever is higher.

c. Commodities mined, produced, or assembled in Mali are eligible for financing without restriction, except the total amount available for local procurement under the terms of the agreement.

6. Waivers

a. A waiver of the source and origin restriction on purchase of motor vehicle is requested to permit the purchase of the following items from Code 899 countries:

1 Four Wheel Drive Vehicle	\$15,000
10 Motorcycles, 100 cc	10,000

Justification: This authorization is needed to allow the grantee to implement and supervise the project effectively. The vehicles will be needed from the onset of the project and the time lapse of shipping one four wheel drive vehicle would delay the start of the project by several months. The motorcycle is a very common means of public conveyance and there is no U.S. manufacturer representative in Mali. Repair parts for the requested foreign made vehicles are available in Mali and maintenance of motorcycles can be performed by relatively unskilled personnel.

b. A waiver is requested in order to permit local architectural and construction services and construction materials to be used for the project buildings.

Estimated Costs	8,000
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Justification: Past experience has demonstrated that a construction element of the size contemplated here is not large enough to attract qualified U.S. firms. The cost of immobilization for a U.S. firm is prohibitive and makes these firms non-competitive with local firms. Moreover, project anticipates negotiating contract with qualified local mason to perform construction services. Therefore a waiver is necessary to allow for the use of this qualified local architectural and construction services and of local construction materials.

7. Marking

The Eaux et Forêts and all participating agencies will be made aware of USAID standard marking requirements.

ANNEX E

IMPLEMENTATION SCHEDULE:

PILTO FISH PRODUCTION PROJECT

SAN, MALI

NOTE: The lines and arrows opposite each entry show the plan of implementation as of October, 1978. The space below the dotted line is provided for subsequent adjustments and revisions of time schedules.

ANNEX F

Locally procured Construction Materials

20	shovels
20	picks
10	wheelbarrows
5	hammers
5	planes
5	screwdrivers
5	chisels
5	pliers
5	punches
5	saws
5	levels
10	trowel (5 bricklayer's, 5 plasters)
4	24" pipe wrench
1	pipe cutter
1	pipe threader
2	plumb bobs
500	50kg. sacks cement
100	6 m x 6 mm reinforcement rods
4	metal doors 1 m x 2.2 meters
10	windows 1 m x 1.5 meters
12	I-Beams 6 m x 10 m
42	6 meter x 1 meter indulated tin
300	fasteners for indulated tin
2	metal sinks
	tile for counter top
6	cabinets 1 meter x .5 meter

Wood (white wood)

12	2.5 cm x 30 cm x 6 m
3	4 cm x 30 cm x 6 m

Plywood

5	pieces 244 cm x 122 cm x 10 mm
3	cans of glue

PVC pipe

25	110 mm x 6 m
4	elbows 110 mm diam.
2	cans glue

Steel pipe

60m	26/34 galvanized pipe
4	26/34 faucets
60m	15/21 galvanized pipe
1	can sealant

Paint & Brushes

5 gal. white non toxic enamel
18 gal. white wall paint
1 gal. metal enamel
1 gal. silicon sealent
2 gal. paint thinner
4 paint rollers
2 1 1/2" paint brushes
4 ' paint brushes

Equipment

10 locks
10 5 liter buckets
6 20 liter plastic tubs
3 drain plugs
1 air compressor
1 generator (1 watt)
34 m² 6 mm mesh screen
30 m² fine mesh screen
1500 20 cm x 3 cm wood screws
5 kg. nails
10 10 m x 1.5 m nets
2 desks
4 chairs
1 typewriter
1 blackboard
paper, books, record books
misc. office materials
1 4-drawer file cabinet
1 money box
1 metal closet with 4 shelves

ANNEX G

Building Description

The fish station at San will call for two cement-block buildings with galvanized steel roofs. The first will house the laboratory and office space and be 10 meters in length and 5 meters in width, and will be divided into two rooms. One of these will contain the laboratory equipment and will be 6 meters long. The other will be 4 meters in length and will be used for office space. Each of these rooms will have one locking steel louvered door, 2.2 meters in height by 1 meter in width, and three locking steel louvered windows, 1.5 meters high and 1 meter wide.

The second building will be used as a storeroom for fuel and equipment. It will be 10 meters in length by 10 meters in width and will also be divided into two rooms. One of these will be 7 meters in length and the other will be 3 meters in length. Each of these rooms will have one locking steel louvered door (2.2 meters in height by 1 meter in width) and two locking steel louvered windows (1.5 meters in height by 1 meter in width).