

I. PROJECT IDENTIFICATION

1. PROJECT TITLE INLAND FISHERIES DEVELOPMENT		APPENDIX ATTACHED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
3. RECIPIENT (specify) <input checked="" type="checkbox"/> COUNTRY <u>JAMAICA</u> <input type="checkbox"/> REGIONAL <input type="checkbox"/> INTERREGIONAL		2. PROJECT NO. (M.O. 1095.2) 532-11-180-038
4. LIFE OF PROJECT BEGINS FY <u>1976</u> ENDS FY <u>1978</u>		5. SUBMISSION <input checked="" type="checkbox"/> ORIGINAL <u>2/7/75</u> <input type="checkbox"/> REV. NO. _____ DATE _____ CONTR./PASA NO. _____

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

A. FUNDING BY FISCAL YEAR	B. TOTAL \$	C. PERSONNEL		D. PARTICIPANTS		E. COMMODITIES \$	F. OTHER COSTS \$	G. P SA/CONTR.		H. LOCAL EXCHANGE CURRENCY RATE: \$ US _____ (U.S. OWNED)		
		(1) \$	(2) MM	(1) \$	(2) MM			(1) \$	(2) MM	(1) U.S. GRANT LOAN	(2) COOP COUNTRY (A) JOINT (B) BUDGET	
1. PRIOR THRU ACTUAL FY	-	-	-	NEW PROJECT		-	-	-	-	-	-	-
2. OPEN FY 1976	114	-	-	13	13	10	-	91	15	-	-	715
3. BUDGET FY 1977	126	-	-	13	13	20	-	93	16	-	-	725
4. BUDGET +1 FY 1978	115	-	-	4	4	20	-	91	15	-	-	750
5. BUDGET +2 FY												
5. BUDGET +3 FY												
7. ALL SUBQ. FY												
8. GRAND TOTAL	355			30	30	50		275	46			2,190

9. OTHER DONOR CONTRIBUTIONS

(A) NAME OF DONOR	(B) KIND OF GOODS/SERVICES	(C) AMOUNT
None	-	

III. ORIGINATING OFFICE CLEARANCE

1. DRAFTER Peter Kolar	TITLE Program Officer	DATE 2/7/75
2. CLEARANCE OFFICER Charles P. Campbell	TITLE AID Affairs Officer	DATE 2/7/75

IV. PROJECT AUTHORIZATION

1. CONDITIONS OF APPROVAL

Acc PP 10/30/75

2. CLEARANCES

BUR/OFF.	SIGNATURE	DATE	BUR/OFF.	SIGNATURE	DATE

3. APPROVAL AAs OR OFFICE DIRECTORS SIGNATURE _____ DATE _____ TITLE _____	4. APPROVAL A/AID (See M.O. 1025.1 VI C) SIGNATURE _____ DATE _____ ADMINISTRATOR, AGENCY FOR INTERNATIONAL DEVELOPMENT
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A. THE PROJECT GOAL

1. Statement of Goal

It is the ultimate goal of this project to improve the nutritional content of indigenous Jamaican foods through the creation of a viable inland fish industry on the island.

2. Measurement of Goal Achievement

The following will be the primary indicators for goal achievement:

(a) An increase in the Jamaican diet of locally produced and reasonably priced fresh water fish. Current prices for Jamaican fresh water fish are between J\$40 and J\$60 per pound. Present annual fish production in Jamaica is estimated at 38 million lbs of which 22 million lbs come from off-shore fishing; 10 million lbs from deep-sea fishing; 1 million lbs from sport fishing; and 5 million lbs from fresh water fishing. The fresh water component of fish production should be increased to about 15 million lbs to result in an impact on the island's diet.

(b) The institutional capability within the Government of Jamaica's Fisheries Division should be created to stock, maintain and harvest fresh water fish from adequately supervised ponds.

(c) Fish storage facilities should be established and a functioning marketing and distribution system for fresh water fish implemented.

(d) Maintain the current level of fish imports which in 1973 reached J\$14.5 million as compared to J\$8.6 million in 1970, thus preventing an increase in the foreign exchange drain.

3. Basic Assumptions of Goal Achievement

(a) Continuing acceptance of fresh water fish as part of the basic Jamaican diet.

(b) Government support for an increased role of the Fisheries Division in inland fisheries development.

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(c) Involvement by the private sector in particularly the marketing and distribution aspects of fresh water fish production.

B. THE PROJECT PURPOSE

1. Statement of the Purpose

To create within the Government of Jamaica Fisheries Division the institutional capability and technical expertise to design and implement an inland fisheries program involving research, experimentation, fish farm development, storage, marketing and distribution.

2. Conditions Expected at End of Project

(a) A competent inland fisheries section within the Fisheries Division by the end of 1978. The present complement of the Fisheries Division consists of about 40 fisheries officers, fisheries instructors and field assistants. The majority of the staff is engaged in marine fishing activities with only three assistant fisheries officers and four field assistants involved in inland fishing. By 1978 this number should be increased to at least 20 adequately trained personnel.

(b) An efficient and improved Fisheries Experiment Station at Twickenham Park near Spanish Town, including a modernized laboratory and upgraded fish storage facilities. Addition of four brood ponds to the seven ponds now at the Station.

(c) A new fish farm including ponds and appropriate buildings and storage facilities covering a 40 acre tract of Government land at Falmouth, Parish of Trelawny.

(d) Research capability within the Fisheries Division covering experimentation with new fresh water fish varieties, feeds and fertilizer; availability of research results to the private fishing industry.

(e) Increase in the 100 - 200 lbs of fresh water fish per acre realized at present to at least 500 - 600 lbs per acre.

(f) Supervision and assistance in stocking by the Fisheries Division of the approximately 700 Government and privately ~~owned ponds scattered throughout the island.~~

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(g) Establishment of adequate and accurate records and statistics within the Fisheries Division pertaining to inland fish production.

3. Basic Assumptions about Achievement of Purpose

(a) The Government of Jamaica lives up to its commitment set forth in its Green Paper on an Agricultural Development Strategy to intensify research in fish pond culture with special attention to the selection of varieties best suited to Jamaican conditions; and expand training programs for fisheries officers.

(b) Reasonably competent counterpart specialists are assigned to any U.S. experts assigned to the project.

(c) Construction equipment and labor force are made available for the upgrading of the physical plant at the Twickenham Park Experimental Station, as well as the construction of a fish farm at Falmouth.

(d) Personnel selected for advanced training in the U.S. and observation assignments at U.S. fish farms are assigned upon their return to Jamaica to inland fisheries development.

C. PROJECT OUTPUTS

1. Outputs and Output Indicators

<u>Outputs</u>	<u>Output Indicators/Target Dates</u>
(a) Inland Fisheries Section operating within Inland Fisheries Division.	The Section should be operational by mid-1978, comprising two trained inland fisheries specialists and supporting staff.
(b) Personnel trained in inland fisheries development.	At least two Assistant Fisheries Officers should have completed advanced academic agriculture training in the U.S. by mid-1978; about 6 field assistants should have completed on-the-job training at fish farms in the U.S. by mid-1978.

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OutputsOutput Indicators/Target Dates

- | | |
|---|---|
| (c) Survey of inland fisheries development potential completed. | Under the direction of a U.S. fisheries specialist, a survey of existing Government and privately owned ponds with a view toward well-managed stocking with viable fish varieties, appropriate feeds and fertilizers should be completed by March 1976. |
| (d) Upgrading of the Twickenham Park Experimental Station. | Completion of improvements to the physical plant of the Station including modernization of the laboratory by June 1976; improvements of the 7 existing ponds by December 1976; construction of 4 additional ponds by June 1977. |
| (e) Inland fisheries re research program operational. | Institution of an inland fisheries research program within the Fisheries Division in early 1976 with the possible cooperation of the Fisheries Ecology Research Program at the University of the West Indies. |
| (f) Development of a fish farm. | Survey of the potential site at Falmouth to be completed by March 1976. Construction of ponds and physical plant for the fish farm to be completed by March 1977; permanent staff assigned to the fish farm by June 1977. |

2. Basic Assumptions about Production of Outputs

(Sub-heading letters refer to items in section C1 above.)

- (a) The Fisheries Division will make the necessary personnel available to the inland fisheries section.
- (b) The Fisheries Division will detail the suggested personnel for training.
- (c) The Fisheries Division will detail personnel and give logistic support to the U.S. specialist implementing the inland fisheries survey.

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- (d) The GOJ will provide a budget for upgrading of the facilities at Twickenham Park.
- (e) The Fisheries Division will detail personnel to participate in the research program and explore the possibility for coordination with the UWI's Fisheries Ecology Research Program.
- (f) The GOJ will provide a budget for the construction of a fish farm; upon completion of the fish farm the Fisheries Division will assign an adequate staff to the farm.

D. PROJECT INPUTS

1. Proposed Inputs by the U.S.

(a) The services of one agriculture specialist, for a two year period beginning in early FY 1976. This specialist will be responsible for over-all project management, the coordination of the initial inland fisheries survey, assistance in establishing the research program and in developing plausible statistics.

(b) Short-term consultant services including those of a fish farm specialist to advise in the lay-out and construction of a fish farm.

(c) Participant training grants.

(d) Commodities consisting of laboratory equipment and educational materials. Decision on further commodities may result after the initial survey.

2. Proposed Inputs by the GOJ

(a) An adequate budget for the Fisheries Division's inland fisheries section, including funds for necessary construction at Twickenham Park; the proposed fish farm and the research program.

(b) International travel for participants.

(c) Local transportation for advisors and consultants; logistic support to those specialists including office space and secretarial services.

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3. Other Donors

Other donors are primarily engaged in off-shore and marine fishing activities. This includes some technical assistance and equipment provided by the UNDP, and one specialist provided by the U.K. Overseas Development Ministry.

4. Budget

Proposed AID Obligations (US \$000)

	<u>FY 76</u>	<u>FY 77</u>	<u>FY 78</u>
<u>Contract Services</u>	<u>91</u>	<u>93</u>	<u>91</u>
Long Term	85	85	85
Short Term	6	8	6
<u>Participant Training</u>	<u>13</u>	<u>13</u>	<u>4</u>
Long Term	9	9	-
Short Term	4	4	4
<u>Commodities</u>	<u>10</u>	<u>20</u>	<u>20</u>
TOTAL	<u>114</u>	<u>126</u>	<u>115</u>

5. Basic Assumptions about Supply of Inputs

(a) Specialist and short-term consultants can be provided through a contract with a qualified institution.

(b) Qualified candidates for participant training will be nominated by the Jamaican Government.

(c) Commodities to be procured under this project will be worked out jointly by the Jamaican and U.S. Government and will be procured through U.S. and local procurement channels.

E. RATIONALE

The basic rationale for initiating this project is the creation of a viable fresh fish industry in Jamaica in order to make available sources of protein in palatable foods rich in vitamins and minerals at prices within the range of the lower income groups. A secondary rationale for the project is to at least prevent an increase in the island's foreign exchange drain.

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The import of fish during 1973 had reached a value of J\$14.5 million for approximately 30 metric tons of fish products brought to the island.

The Government of Jamaica has stated the great necessity for the re-invigoration of the agricultural sector in general, an increase in the production of all indigenous food stuffs in particular in its Green Paper of November 1973. Concrete efforts in upgrading the nutrition content of indigenous foods have already been undertaken as illustrated by the P.L. 480 Title I program. The Government is not using the concessional credit granted under the program to obtain foods for re-sale to the market place, but rather to obtain foods for its own constructive social program purposes, at present primarily school lunches. Since April 1973 an ultra-modern food processing plant has been in operation in Kingston for the preparation of those lunches, built by the Government at a cost of \$1.3 million. Consisting of a nutritious blend of U.S. imported foods with indigenous Jamaican foods, the approximately 40,000 lunches prepared daily are only one step required in improving the nutrition content of Jamaica's diet. Exploitation of the considerable potential for inland fish production could well result in a major development for not only upgrading the nutrition content, but also expanding domestic food production as a whole.

Fish and fish products are a completely acceptable part of the Jamaican diet. Concentration in the past has been on the exploitation of off-shore and marine fishing resources with only minimal attention given to exploring the potential for inland fisheries development. The Fisheries Division of the Ministry of Agriculture has been virtually the only agency attempting to address the problem. However, at present only about 5% of its recurring budget of J\$650,000 is devoted to inland fishing and no resources from its capital budget of some J\$570,000 have in the recent past been programmed for inland fisheries development. Assistance from other donor agencies such as the UNDP and the U.K. has also centered on off-shore and marine fishing.

The possibility of developing an inland fish culture in Jamaica dates to 1949 when a British fisheries expert suggested the introduction of the African Chichlid Tilapia mossambica to the island. The then just established Fisheries Division followed this advice, introduced the fish from the island of St. Lucia and in 1950 built an experimental fish culture station at Twickenham Park.

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The above mentioned fisheries expert demonstrated the technique of sexing the Tilapia mossambica so that males and females could be separated and breeding prevented. The monosex culture technique prevents the development of so-called runt fish populations characterized by the presence of large numbers of small fish which never attain a desirable size. The fingerlings were developed in brood ponds at the Twickenham Park Experimental Station to a weight of 2 ounces and delivered by Fisheries Division personnel to private ponds throughout the island.

Over the past 20 years, the Fisheries Division claims to have stocked some 700 ponds in Jamaica, covering an area of between 500 and 1000 acres. No exact measurements exist. None of the ponds have adequate drainage which is making harvesting difficult. The normal practice currently used is for the fisheries officers and field assistants to harvest the crop by seining when the majority of fish have reached harvestable size. Since little or no fertilization is used, the presence of aquatic vegetation makes harvesting difficult. When harvesting has been completed, the ponds are restocked and another crop is produced. The Fisheries Division estimates that at present between 100 and 200 lbs per acre are realized. With proper fertilization and feeding methods it should be possible to produce at least 500 to 600 lbs per acre.

As stated earlier only about 7 members of the 40-man Fisheries Division are involved in inland fishing activities, reflecting the Division's emphasis on marine fishing. Good management is absent, while experimentation and research with other fish varieties, fertilizer and feed is negligible. The Experimental Station at Twickenham Park is run down. The fish are usually sold immediately after the harvest in the fresh state. Preservation and adequate marketing methods are rudimentary.

While intent and the will on part of the Jamaican Government and the Fisheries Division in particular to develop inland fishing are evident, expertise in research, experimentation, pond development and management, as well as advice on subsequent processing and marketing practices are sorely needed.

It is the purpose of this project to assist in meeting the above requirements and to contribute to the development of an important yet neglected resource potential in Jamaica.

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F. COURSE OF ACTION

In April 1974, the Fisheries Division through the appropriate GOJ channels made a request to USAID/Jamaica for an aquaculture specialist to visit the island and appraise the potential of freshwater fish resources and culture systems with a view to making recommendations for increasing fish production. The services of a specialist were subsequently obtained through the International Center for Aquaculture of Auburn University, with Dr. E. E. Prather visiting Jamaica during the period June 17 - 29, 1974. His report was submitted to the Mission in November 1974.

This PROP is based on the general recommendations contained in Dr. Prather's report which include reconstruction and upgrading of the Twickenham Park Experiment Station; the establishment of a well-managed demonstration fish farm; and training for Fisheries Division personnel, both in Jamaica and the U.S.

Subsequent conversations between Mission officers and Fisheries Division personnel served to quantify the various activities proposed under this project. It was agreed, however, that the initial step of the project should be an in-depth survey of the entire island's freshwater fisheries potential. This survey should result in a more precise outline of the activities covered by this project.

Upon approval of the PROP, the Mission proposes to proceed with project implementation along the following lines:

1. Negotiation with the Government of Jamaica of a FY 1976 funded Project Agreement providing for the services of a full-time contract specialist, initially charged with an in-depth survey of all aspects of an inland fisheries program. The ProAg will also contain funds for supporting TDY services as well as training assignments. The GOJ will be initially committed to logistic support for the U.S. contract specialist as well as required TDY consultants; the assignment of counterpart personnel; and the nomination of at least one qualified Assistant Fisheries Officer for long-term training and two field assistants for on-the-job training in the U.S. A more general commitment is to be contained in the ProAg for adequate GOJ budgetary support to the Fisheries Division for all phases of inland fisheries development. The following FY 1977 and FY 1978 ProAg's will contain more precise budgetary commitments by the GOJ.

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2. The survey should begin no later than October 1975 and be completed no later than March 1976. The U.S. aquaculture specialist will also be requested to assist in setting up a permanent research capability within the Fisheries Division, hopefully in cooperation with the University Fisheries Ecology Research Program at the University of the West Indies. It is expected that research and data collection on all phases of inland fisheries development will become a continuing activity of the Fisheries Division; it is hoped that a well-managed and competently staffed research program will be fully operational by mid-1978.

3. Work at restoring the facilities at the Twickenham Park Experiment Station should begin no later than upon the completion of the survey in March 1976, with upgrading of the Station's physical plant completed by June 1976; improvement and particularly the construction of adequate drainage systems for existing ponds should be completed by December 1976; and construction of an estimated four additional brood ponds terminated by June 1977. While the U.S. specialist with TDY assistance, as required, will advise on the improvement and construction, physical labor and required construction materials are to be provided by the Jamaican Government.

4. A key aspect of this project will be the creation of the institutional capability within the Fisheries Division to manage and administer an inland fisheries program. Training and on-the-job experience with functioning inland fisheries programs is considered an important element in developing this institutional capability. U.S. funds will provide for a one-year academic course in the U.S. for two Assistant Fisheries Officers, to be obligated in FY 1976 and FY 1977 respectively, and for two three-months work/study assignments at fish farms in the U.S. in each of the project's three years. The work/study assignments will be directed at qualified and interesting field assistants. The Jamaican Government will be committed to assign trained personnel to the inland fisheries activity upon their return. An important task of the Fisheries Division will comprise extension with the field assistants advising and assisting private pond owners in proper feeding and fertilization practices as well as during the harvest.

5. With the assistance of a qualified TDY specialist familiar with the operations of a fish farm, an appropriate site of such a farm is to be selected, presumed to be near Falmouth, Trelawny. The specialist will assist in designing

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the farm's physical plant and in the lay-out of the ponds. Physical labor and construction materials will be the responsibility of the Jamaican Government. The farm should be operational by June 1977.

6. An important element of this project will be fish storage, marketing and distribution. While U.S. consultants will be in a position to give technical advice regarding this aspect of the program it will be the primary responsibility of the Government of Jamaica acting through the Ministry of Agriculture, the Agricultural Marketing Corporation and the Fisheries Division to assure the proper contacts and interest within the public and private sector to assure supply to the ultimate consumer.