

AGENCY FOR INTERNATIONAL DEVELOPMENT  
WASHINGTON, D. C. 20523  
BIBLIOGRAPHIC INPUT SHEET

FOR AID USE ONLY

BATCH #18

1. SUBJECT CLASSIFICATION	A. PRIMARY Agriculture	AM00-0000-G326
	B. SECONDARY Fisheries--Jamaica	

2. TITLE AND SUBTITLE  
Technical assistance in freshwater fisheries development in Jamaica

3. AUTHOR(S)  
Prather, E.E.

4. DOCUMENT DATE 1974	5. NUMBER OF PAGES 12p.	6. ARC NUMBER ARC
--------------------------	----------------------------	----------------------

7. REFERENCE ORGANIZATION NAME AND ADDRESS  
Auburn

8. SUPPLEMENTARY NOTES (Sponsoring Organization, Publishers, Availability)

9. ABSTRACT

10. CONTROL NUMBER PN-RAA-948	11. PRICE OF DOCUMENT
12. DESCRIPTORS Fresh water fishes Jamaica Technical assistance	13. PROJECT NUMBER
	14. CONTRACT NUMBER CSD-2780 211(d)
	15. TYPE OF DOCUMENT

**TECHNICAL ASSISTANCE IN FRESHWATER  
FISHERIES DEVELOPMENT IN JAMAICA**

**by**

**E.E. Prather  
International Center for Aquacultures  
Auburn University  
Auburn, Alabama 36830**

**Project: AID/csd-2780**

**Date of Survey: June 17 - 29, 1974**

## TABLE OF CONTENTS

	PAGE
ITINERARY . . . . .	iii
INTRODUCTION . . . . .	1
FRESHWATER FISHERIES PROGRAM . . . . .	2
FRESHWATER SHRIMP CULTURE . . . . .	4
TROPICAL FISH OPERATION . . . . .	4
RECOMMENDATIONS . . . . .	5
REFERENCES CITED . . . . .	9

## LIST OF TABLES AND FIGURES

Table 1	Fisheries Division Present Personnel . . . . .	7
Figure 1	Location of Fish Ponds in Jamaica . . . . .	9

**ITINERARY FOR E.E. PRATHER IN JAMAICA**

**June 17 - 29, 1974**

- June 17** Arrived Kingston 5: 35 P.M.
- June 18** Discussions with USAID personnel including Mr. Charles Campbell, Mission Director, Mr. John Dunlap and Mr. Peter Kolar. Visited Fisheries Division, Ministry of Agriculture, and arranged program with Mr. Eustice Royer, Deputy Fisheries Officer and with Mr. Roy Moo-Young, Mr. Denzil Williams, Assistant Fisheries Officers and with Mr. Winston Barrett, Fisheries Instructor. Mr. Allan G. Kirton, Chief Fisheries Officer, was attending the Law of the Sea conference in Caracas, Venezuela, and was not present. Field trip in afternoon to salt water ponds at Yallahs, Mona Reservoir and Hermitage Reservoir near Kingston.
- June 19** Tour of the island to observe freshwater fishery activities and resources. Visited Twickenham Park Experiment Station at Spanish Town, D.N. Turner pond at Bog Walk, 4-H Club pond at Lindstead, Discovery Bay Marine Laboratory of University of British West Indies and Mystery Lake at Port Rhodes.
- June 20** Continued field trip and observed Mr. Cecil Chuck's pond at Ramble, Truro Government Food Farm Pond near Frome and Mr. Washington's ponds near Savanna-La-Mar.
- June 21** Continued field trip and observed Ocean Protein Co. freshwater shrimp operation near Ferris, commercial fishing for freshwater shrimp and hand-line fishing for tarpon at Black River.
- June 24** Consultations with Fisheries officers to arrange additional field trips.
- June 25** Visited Tulloch Estate, Ltd. for discussions with Mr. D.N. Turner and Alex Lanigan, his foreman, on management of fish ponds for maximum tilapia production, including fertilization and feeding.
- June 26** Visited dock area at Kingston to observe unloading of marine fish caught by crew of the Dolphin during extended voyage at sea.
- June 27** Conference with Fisheries officers.
- June 28** Field trip to Falmouth with Mr. Royer to inspect potential pond sites with Mr. Desmond Leakey, Parliamentary Secretary, Ministry of Agriculture. Discussions with Peter Kolar and John Dunlap regarding possible ways AID might support freshwater fisheries program in Jamaica.
- June 29** Departed Kingston for Auburn at 12: 15 P.M.

TECHNICAL ASSISTANCE IN FRESHWATER FISHERIES  
DEVELOPMENT IN JAMAICA

June 17 - 29, 1974

by

E.E. Prather  
International Center for Aquaculture  
Auburn University  
Auburn, Alabama 36830

INTRODUCTION

At the request of the Jamaican government, USAID/Jamaica provided for two weeks technical assistance in freshwater fisheries through the International Center for Aquaculture, Auburn University, Auburn, Alabama. The main objectives were to make a survey of the freshwater fishery resources and culture systems and to make recommendations for increasing fish production.

The island of Jamaica is roughly 146 miles long and 51 miles wide with an area of approximately 4,411 square miles. About 2/3 of the area is hilly and mountainous with the tallest peaks in the Blue Mountain range reaching a maximum height of 7,402 feet. Approximately 42 percent of the land is satisfactory for agricultural use; with a population of 2 million this is 0.6 acre per capita (1).

There are few desirable native freshwater food fish on the island. Introduced food fish include tilapia (T. mossambica), carp and brown trout

but the tilapia is the only one that has made a significant contribution to the fishery (2).

With a population density of 460 per square mile, combined with annual population growth of 1.9 percent and limited agricultural land per capita, food production falls far short of domestic needs. Imported food accounts for one-fifth of total imports. In 1972, total fishery imports were 28.2 metric tons costing J\$12,180,000, while fishery exports amounted to only J\$39,000 (3). Therefore, an expanded freshwater fishery has great potential for reducing imported fishery food products and would help reduce budgetary deficits

#### FRESHWATER FISHERIES PROGRAM

The freshwater fisheries program is under the direction of the Fisheries Division in the Ministry of Agriculture (Table 1). The fisheries division has on file a total of over 700 ponds and lakes (3,500 acres estimated) on the island which have been stocked and serviced by fisheries officers (Figure 1). The majority of the ponds are less than 2 acres in surface area and were constructed without drains. The principal species used is Tilapia mossambica. In recent years, monosex culture has been practiced and fishery officers stock only male tilapia in a majority of the ponds. The source of fingerlings is from brood ponds at Twickenham Park Experiment Station near Spanish Town and fingerlings are produced there to a size of 2 ounces and are then sexed by fisheries division personnel before they are delivered to private ponds. Upon delivery the sex is double checked and then the fish are stocked

at rates of 800 - 1,500 per acre. Fertilization of ponds is not usually practiced and daily feeding is not presently utilized. Therefore, fish production under the current cultural system is considerably lower than it would be if the ponds were properly fertilized. In addition, daily feeding of the fish could increase fish production several times above that obtained with fertilization. Thus the level of production obtained from the culture system presently used is quite low.

Polyculture is being used in the larger lakes as well as in some small ponds with tarpon and snook being stocked along with male and female tilapia. It is hoped that the tarpon and snook will reduce the numbers of young tilapia sufficiently so that the majority of those left will reach a desirable size. Several of these lakes were seined and the preliminary results appeared promising. Snook had reached 1.5 lb, tarpon had grown to 5 - 6 lbs and tilapia to 1 lb were present. Additional testing will be required to determine whether or not this culture system is desirable. Apparently tarpon and snook can be seined from coastal waters in sufficient numbers for use in stocking a limited number of lakes. However, periodic checking and restocking may be necessary to obtain desirable results.

Since practically none of the ponds or lakes have drains, complete harvesting is difficult. The normal practice currently used is for the fisheries officers to harvest the crop by seining when the majority of the fish have reached harvestable size. Since little or no fertilization is used, the presence of aquatic vegetation makes harvesting more difficult. When harvesting

has been completed, the ponds are then restocked and another crop is produced. Winter temperature is not a limiting factor and fish growth is obtained each month of the year.

#### FRESHWATER SHRIMP CULTURE

The only shrimp farm on the island is near Ferris and is operated by Ocean Protein, Ltd. with the parent operation located at Dania, Florida (4). In 1974, there were five, 1-acre ponds used for shrimp production. Water is pumped into each pond continually to provide good aeration. Daily feeding with a sinking-type trout feed is used and appeared much superior to the catfish-type feed used previously. They reported that they had learned to spawn Macrobrachium rosenbergii successfully during the past year and were no longer dependent on the Florida operation for young shrimp for stocking the ponds in Jamaica. However, they claimed they still had problems with high losses of shrimp by predaceous birds as well as with contamination by tilapia in the shrimp ponds. It appears that several more years of operation will be required before it is determined if successful shrimp farming is possible in Jamaica.

#### TROPICAL FISH OPERATION

There are several tropical fish farms on the island where aquarium-type fish are grown. One farm of this type was visited near Falmouth where 50 - 60 ponds 1/20-acre each were dug near the Martha Brae River. The ponds were constructed with a drag-line and filled with water that seeped from under ground. No drains were provided so harvesting was accomplished



by seining. However, severe flooding from the nearby river caused almost total loss of the tropical fish crop and subsequently this operation appeared abandoned at the present time.

### RECOMMENDATIONS

1. The fisheries facilities at Twickenham Park Experiment Station are inadequate. There are insufficient ponds for an adequate research program in addition to the production of fingerling tilapia presently needed for stocking ponds throughout the island. The buildings at the station are in need of major repairs. Since adequate water supplies and land are available, it is recommended that USAID provide financial assistance for the construction of twelve one-half acre research ponds. This should be possible for a cost of approximately \$15,000. The repair of some of the buildings should cost about \$10,000. These much needed improvements would allow the fisheries division to initiate a more meaningful research program with hybrid tilapias, mountain mullet, carp, mud fish and perhaps other introduced species including channel catfish and Chinese grass carp.

2. There is great need for a well managed demonstration fish farm utilizing improved techniques of fertilization, daily feeding and parasite and disease control for maximum production of hybrid tilapia (5). After maximum production has been obtained in the demonstration ponds, an active extension program in pond culture should result in greatly increased fish production in private ponds. It is recommended that USAID provide funds for construction of 10 - 15 acres of demonstration ponds with adequate drains

at a cost of approximately \$30,000. Adequate holding tanks, and a building for this facility should be constructed for approximately \$20,000. The area inspected near the Martha Brae River, just south of Falmouth, appears to be a good location for this facility. Additional surveys will be needed to determine the best method of controlling occasional flooding.

3. It is recommended that one Assistant Fisheries officer be sent to Auburn University for one year of additional training in fisheries. This should cost about \$6,000. It is also recommended that financial assistance be provided for Mr. Eustice Royer so that he can receive 2 months practical fisheries training at Auburn University and at other fisheries stations in the southeastern U.S. This would cost about \$800.00.

4. It is recommended that two Auburn University staff members return to Jamaica in the fall of 1974 to provide one week of intensive fishery training for selected fisheries division personnel.

Table 1

Present Personnel

Fisheries Division - in Ministry of Agriculture - M. Garvey Drive, Kingston

P.O. Box 470

Phone: 92-38811

Mr. Allan G. Kirton - Chief Fisheries Officer

Mr. Eustice Royer - Deputy Fisheries Officer

Mr. Denzil Williams - Assistant Fisheries Officer

Mr. Roy Moo-Young - Assistant Fisheries Officer

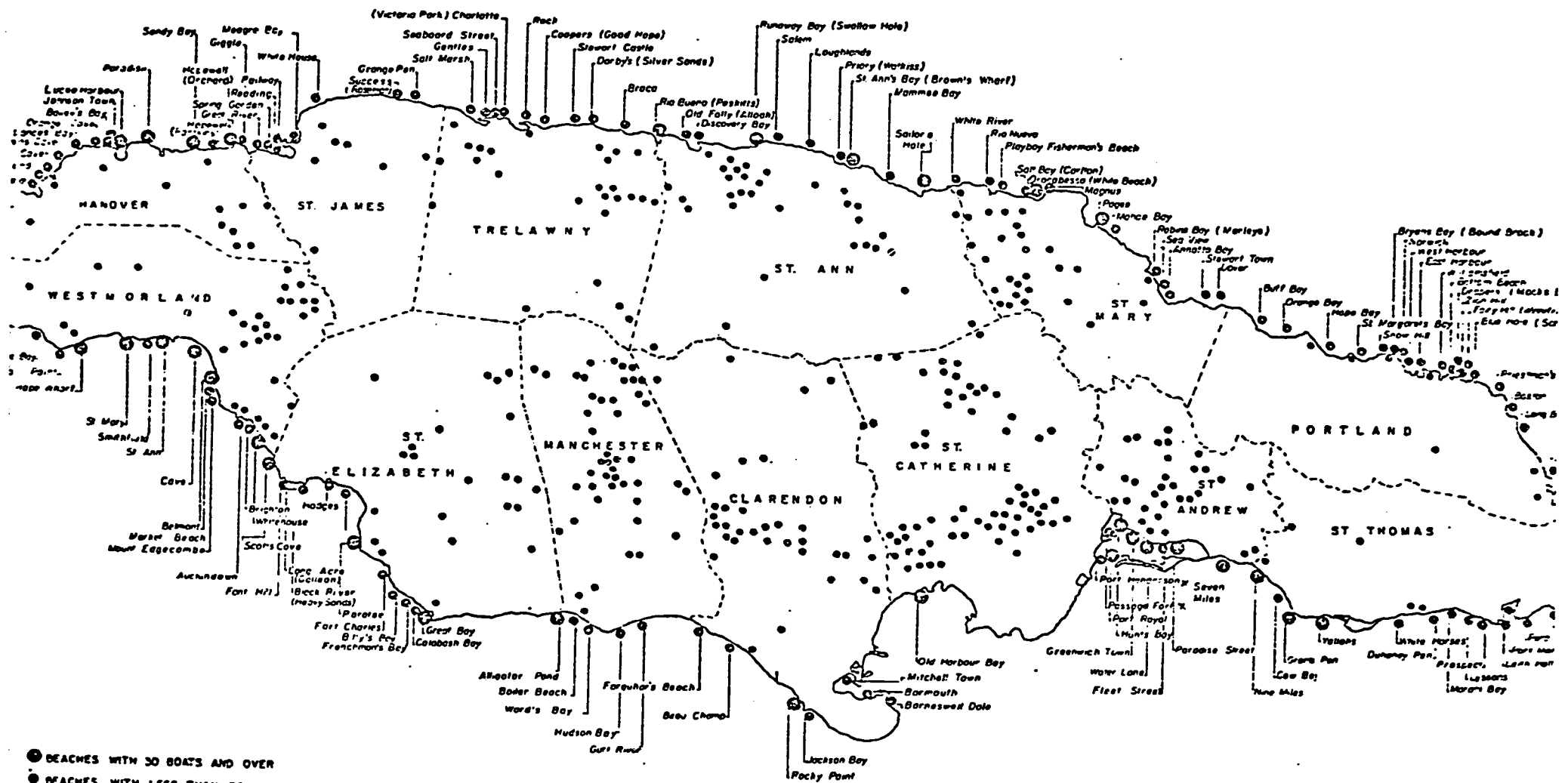
Mr. Winston Barrett - Fisheries Instructor

+ 31 other Fishery Instructors or field assistants

Mr. Karl Aitken - Marine Fisheries Officer

Mr. Eric Hamblyn - Marine Fisheries Officer

Figure 1 Location of fish ponds in Jamaica



● BEACHES WITH 30 BOATS AND OVER  
 ○ BEACHES WITH LESS THAN 30 BOATS  
 ● FISH PONDS STOCKED BY THE FISHERIES DIVISION WITH *TILAPIA MOSSAMBICA* (AFRICAN PERCH)  
 NOTE: Most swamps, streams and canals in the southern parishes are also stocked with African Perch

Map based on 1967-70 data  
 6,400 ACRES or 10 Sq MILES  
 0 5 10 MILES  
 1:300,000

## REFERENCES CITED

- (1) A.I.D. Economic Data Book - Latin America. PB190 286. Revised February, 1970.
- (2) Caldwell, David K. 1966. Marine and freshwater fishes of Jamaica. Institute of Jamaica Bulletin, Science Series, No. 17.
- (3) Yearbook of Fishery Statistics. Vol. 35. F.A.O.
- (4) Provenzano, Anthony J., Jr. 1973. Some results of a pilot project on freshwater prawn culture in Jamaica. Proc. Fourth Annual Workshop, World Mariculture Society.
- (5) Lovshin, L.L. and A.B. DaSilva. 1974. The intensive culture of the all male hybrid of Tilapia hornorum (male) x Tilapia nilotica (female). Special Report, International Center for Aquaculture, Auburn University, Auburn, Alabama.