

AGENCY FOR INTERNATIONAL DEVELOPMENT WASHINGTON, D. C. 20523 BIBLIOGRAPHIC INPUT SHEET	FOR AID USE ONLY Batch #22
---	--------------------------------------

1. SUBJECT CLASSIFICATION	A. PRIMARY Serials	Y-AM00-0000-G514
	B. SECONDARY Agriculture--Fisheries--Brazil	

2. TITLE AND SUBTITLE
 Fishculture extension project: Brazil, June-Nov. 1972

3. AUTHOR(S)
 Jensen, J.W.

4. DOCUMENT DATE 1972	5. NUMBER OF PAGES 8p.	6. ARC NUMBER ARC
--------------------------	---------------------------	----------------------

7. REFERENCE ORGANIZATION NAME AND ADDRESS
 Auburn

8. SUPPLEMENTARY NOTES (*Sponsoring Organization, Publishers, Availability*)
 (Research summary)

9. ABSTRACT

10. CONTROL NUMBER PN-RAB-345 12. DESCRIPTORS Brazil Extension	11. PRICE OF DOCUMENT
	13. PROJECT NUMBER
	14. CONTRACT NUMBER CSD-2270 GTS
	15. TYPE OF DOCUMENT

FISHCULTURE EXTENSION PROJECT - BRAZIL
June 1, 1972 - November 30, 1972

Submitted by

John W. Jensen
Fishculture Extension Advisor
Brazil Aquaculture Project
USAID - Auburn University
Task Order No. 8
Contract AID/csd-2270

FISHCULTURE EXTENSION PROJECT - BRAZIL
June 1, 1972 - November 30, 1972

Submitted by

John W. Jensen
Fishculture Extension Advisor

Objective

The objective of the fishculture extension project is to assist DNOCS extension agents (specifically those of the Convenio USDENE/DNOCS/USAID - DPAN) in the planning and installation of pilot fishculture enterprises on private farms in Northeast Brazil for the purpose of increasing animal protein production of that region.

Background

Considerable progress has been made in creating the momentum and cooperation needed to attain the objectives of the project. Progress was slow in the beginning due to an insufficient number of vehicles available for transportation for the diverse projects of the Convenio. USAID/Recife alleviated the crises by donating a vehicle to DNOCS solely for the use of the extension personnel. Throughout the period there were insufficient funds to carry out extension work with farmers but recently CR\$200,000.00 (U.S.\$33,333.00) was solicited from SUDENE/SUBIN funds and is presently close to being liberated for that purpose. With the prospect of receiving this money, planning is in progress for the implementation of the first intensive fishculture work with farmers in Northeast Brazil.

Two small reservoirs in Umirim, Ceara, were chosen for a semi-intensive fishculture study. After present standing crops of fish were determined,

Tilapia melanopleura and T. hornorum were stocked for determining management techniques for raising fish on a semi-intensive basis in the many similar bodies of water throughout the Northeast region. Fish produced in these small reservoirs would improve the diets of the people in this region. The following report summarizes work to date on the various aspects of fishculture extension and presents work priorities for the period December 1, 1972 - May 30, 1973.

Intensive Fishculture Extension

Presently, plans are being formulated for the first implementation of intensive fishculture in Northeast Brazil. The DNOCS (National Department of Works Against the Droughts) expresses great interest and hopes for making fishculture into a viable, small investment enterprise among farmers who own land bordering the DNOCS irrigation canals and many reservoirs throughout the Northeast. Previously, the Convenio had planned to begin extension work in the irrigation basin near the city of Pentecoste, Ceara, but due to land reorganization and disappropriations it was agreed to begin at the DNOCS demonstration and pilot irrigation project in Morada Nova, Ceara. The only apparent disadvantage in choosing Morada Nova is that it is located 3 hours from the Fishculture Experiment Station at Pentecoste where technical assistance would have been more readily available. The advantages are that this site, chosen by the DNOCS, has superior organizational infrastructure and more qualified farmers in general, which are most important in carrying through a project with the greatest chance of "success".

Soon after the money comes from the USDENE/SUBIN funds, contacts will be made with the approximately 150 farmers that own land along the irrigation canal. Three to five farmers will be chosen at a later date according to the

suitability of their land, personal interest, and educational qualifications. These contacts will be made only after the money is given, due to the fear of future delays and subsequent loss of credibility among the farmers.

Semi-Intensive Fishculture Extension

In Ceara and all the Northeast, there exist thousands of roadside "borrow-pits" and small reservoirs that, except for the driest of years, maintain water throughout the year. These small bodies of water, generally less than five hectares, are not being efficiently utilized or are not being used at all for fish production. Through the stocking of a suitable species of fish and the teaching of some basic principles of fishculture to local people, it is possible that these ponds can become a source of needed protein reaching and benefiting thousands of poor families in the Northeast.

To initiate this type of program, two small reservoirs were chosen within the city limits of Umirim, Ceara, approximately 100 kms west of Fortaleza. The city's population is approximately 2,500 people, the majority being farmers of the lowest economic levels. These two reservoirs (Grande and Umirim) are being used to raise fish for local consumption and to gather as much production information as possible to aid in the development of management techniques which can be applied to other similar bodies of water.

Because local residents depend entirely on these two small reservoirs for all their water needs, any foreign material added to the water may create suspicion and fear among the people. For this reason rotenone was not used for sampling areas to estimate standing crops, even though its toxic qualities do not affect warm-blooded animals. Instead, four known areas in each reservoir were chosen and during the night, gill nets of 3 and 4 cm stretch mesh were set

to prevent the escape of fish. Seins were used to collect the fish in each area. Fish gilled inside the areas and fish seined were measured, counted, and weighed. The standing crops were calculated from an average of these four areas. The process will be repeated every four months in the same areas to make comparisons in changes of standing crops and species composition.

Umirim, approximately 2.5 hectares in surface area, was found to have a standing crop of 35.3 kg/ha composed largely of piabas (Astynax sp.) and guarus (Poecilia vivipara) which are not used by residents because of their extremely small size. The reservoirs were stocked with an omnivorous tilapia, T. hornorum at a rate of 500/ha. Aquatic vegetation is nearly absent, although the water is extremely fertile due to over 20 head of cattle that are continually maintained for fattening in a corral partially in the water. A large quantity of organic fertilizer is added from this source.

In Grande, 5 hectares in surface area, the standing crop was found to be 62.0 kg/ha composed of mostly small, non-harvestable fish. Large quantities of an aquatic weed, "pirrixiu", commonly known as coontail (Ceratophyllum sp.) are found in this reservoir, so Tilapia melanopleura, a herbivore, was stocked at a rate of 950/ha to take advantage of this valuable fish food source. After a period of six months, or up to the point that growth and reproduction are deemed sufficient, the prohibition of fishing with nets will be discontinued and the people allowed to fish at will. A creel census will be initiated at this time to gather production data.

Manual

Materials and information are presently being gathered for the writing of a simple, comprehensive fishculture manual with the objective of assisting the semi-literate farmer and other interested persons in raising fish intensively. The manual will be comprised of information about stocking rates, feeding, fertilizing, water quality control, etc. A section on problem-solving will also be included. Drawings and photographs will be extensively used to more easily reach the education level of the farmers. The expected date for completion of this manual is June 1, 1973.

Counterparts

Antonio Carneiro Sobrinho and Jose Anderson Fernandes have been working part-time as counterpart extensionists with John Jensen but at this time their duties also include managing the research station at Pentecoste, Ceara. Both biologists are over-taxed with this double role and the fishculture extension program will need a permanent extension specialist selected from within the DNOCS organization.

Other Activities

1. An extension plan was devised to cover intensive and semi-intensive fishculture plans from September 25, 1972, to March 1, 1973.
2. Bids are now being received for the construction of a fish transporter to be used in extension projects and at the Pentecoste experiment station.
3. Three days were spent in Rio de Janeiro in November to clear live channel catfish through customs. The catfish were in transit from the United States to Fortaleza to be used at the fishculture experiment station in Pentecoste,

Ceara. At the same time 50 live fish, Tilapia hornorum, T. melanopleura, and T. nilotica from Fortaleza were dispatched to Panama where they will be used in studies at the Panama Aquaculture Project/USAID - Auburn University.

4. Preparations are presently being made to take air-photos of the Pentecoste Fishculture Experiment Station.

5. Attended a meeting at the University of Ceara, School of Agronomy, to discuss possible areas of cooperation in developing their newly organized fisheries department.

6. Spent five days in July observing fish sampling on the Oros reservoir in Ceara done by the Convenio DPAN biology team.

7. Sent preserved fish specimens to Auburn University for identification. The fish came from sampling areas in the Parnaiba River in the State of Piaui and the basin of the Curu River in Ceara.

Priorities for Period December 1, 1972-May 30, 1973

1. Become familiar with farmers at Morada Nova irrigation project so that 3 to 5 qualified farmers can be chosen to begin a pilot intensive fishculture program. Construction of their ponds should also begin and various short courses and visits to the fishculture experiment station in Pentecoste will be organized for their basic orientation.

2. A simple, comprehensive fishculture manual for use by the local fish-farmers is expected to be published before the end of the next quarter.

3. Stocking of roadside "borrow-pits" and small reservoirs will continue along with sampling of the two community reservoirs in Umirim, Ceara. A

creel census in the two Umirim reservoirs will also be initiated in this period.

4. Assignment of a permanent DNOCS extension specialist in Fisheries to work with the Convenio DPAN will be sought with the goal of obtaining a person by the end of the period.

5. A fish transporter will be constructed to meet the demands of an expected increase in moving fish for the extension and research projects.

6. Visits will be made to the State of Ceara Agricultural Extension Service (ARCAR-PESC) and the State of Santa Catarina Ocean Fishery Extension Service (ANCAR-PESC) to study the work they are doing and see what may be applicable to the DNOCS freshwater fishculture extension.

7. Meetings will continue with the School of Agronomy of the University of Ceara, the University of Arizona/USAID project and the Convenio DPAN to investigate ways in which all three organizations can collaborate in developing the newly formed Fisheries Department of the University of Ceara.

8. A trip is planned to observe fishculture facilities of local fish-farmers in the region of Penedo, Alagoas, on the San Francisco River.