

ORIGINAL : ENGLISH

SOUTH PACIFIC COMMISSION

SIXTH TECHNICAL MEETING ON FISHERIES

Suva, Fiji, 23 - 27 July 1973

THE ACTIVITIES OF THE MICRONESIAN MARICULTURE DEMONSTRATION CENTRE

by

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ABSTRACT

The Micronesian Mariculture Demonstration Center in Koror, Palau, is run by personnel of Marine Resources Division of the Trust Territories with the assistance of Peace Corps volunteers. An oyster culture consultant funded by Sea Grant is also presently working at the centre. There are eight Micronesian trainees.

The Center is developing the culture of oysters, rabbitfish, turtles and possibly, in the future, the Giant Tiger Prawn, Penaeus monodon, which has been found to occur in Palauan waters.

A new laboratory is being constructed on Malakal Island which will provide excellent facilities for the experimental work proposed. Fish ponds will be constructed under the guidance of a Philippine consultant. At present, local oysters are being successfully marketed. As the development work with imported oysters, Crassostrea gigas, seed progresses, it is hoped to establish a sound market for large quantities in Guam.

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Imagine in Micronesia a restaurant by the ocean featuring oysters on the half shell, steamed mangrove crabs, fresh reef fish. Imagine a local store which sells smoked oysters, smoked fish and those delicious giant prawns which are so famous in the Philippines. Visualize in a supermarket in far away Tokyo a display of oysters with the sign - FRESH OYSTERS - FLOWN IN DAILY FROM PALAU. These are the distant but not impossible dreams that brought about the creation of the Micronesian Mariculture Demonstration Center (MMDC) in Koror, Palau.

The MMDC has evolved from a variety of plans designed to introduce the concept of sea farming to Micronesia. Sea farming or mariculture or aquaculture has been in practice for hundreds of years in Asia, particularly where warm water conditions prevail. Micronesia's climate and exceptional water quality make it an ideal area for developing mariculture.

The MMDC is located in Koror where there are a wide variety of habitats and marine animals for study. Financial support comes from the Trust Territory Marine Resources Division, Sea Grant (Department of Commerce) and the Manpower Development and Training Act. Support for some of our personnel also comes from Peace Corps/Micronesia.

The logistics for our MMDC program was slow to evolve. Both facilities and personnel were needed as well as financial support. Peace Corps and Marine Resources supplied most of our personnel. Eight Micronesian mariculture trainees were selected by the Palau Community Action Agency from various villages outside Koror with the hope that they will return to their villages with what they have learned and will attempt to apply some of these techniques to mariculture projects of their own. The staff for the project presently consists of the project director, five biologists, a teacher, eight Micronesian trainees and clerical staff as well as an oyster consultant from the United States.

In the spring of 1972 a temporary laboratory was set up in an empty room adjoining the Fisherman's Co-operative. Peace Corps and Micronesian biologists worked elbow to elbow and with limited equipment - but ideas began to evolve.

A field site also selected is located just outside Malakal Harbor. Three adjoining bays of various depths nestled in protected areas were chosen. The center bay provides a projection of land for boat loading and for location of a building for field work. In May of 1972 a field-work building was prefabricated and erected on this farm site through the co-ordinated efforts of Marine Resources and the Micronesian Occupation Center. This one-room building provided storage, work space and fresh water for cleaning tools and equipment. When the Peace Corps personnel arrived, the MMDC farm site also became living quarters for one of the biologists.

The establishment of the farm site was through the efforts of many groups. The second of these was the Palau Civic Action Team. During the summer of 1972 they provided heavy equipment and operators to clear areas for fish ponds within the bay and to close part of the bay for regulation of water flow. This task would have been extremely time-consuming and difficult without the aid of the Civic Action Team.

In the outside bay of the MMDC farm site rafts were constructed and nets were hung from them for oyster and fish growth experiments. Several rafts had to be built and rebuilt before the most economical and the most durable materials were decided upon.

In the fall of this same year the mariculture trainees were enrolled in the Micronesian Occupational Center where they took courses in the mornings in related English, business maths and science. In the afternoon the trainees were released to work with the biologists on various projects. Throughout the year they have made trips to villages to help in the negotiations and applications of mariculture projects.

In December of 1972 our two Micronesian biologists, Obichang Orak and Beketaut Madraisau, were sent to Taiwan for three months training under Dr. I-Chiu Liao, a leader in the field of mariculture. They have returned and appear eager to continue work relating to what they have learned. Unfortunately, we will be losing one of the Micronesian biologists. He feels that his education in Taiwan was just the beginning of what he needs to know to work successfully in mariculture, and he is returning to college in the summer of this year.

At present, the MMDC is moving from our crowded laboratory to a new facility being constructed on Malakal Island. This facility will feature, among other things, a running sea-water system which is essential to the culture of any marine animals. The biologists will have more room to work as well as additional equipment with which to work. This move to Malakal will be completed once electricity has been connected.

Since the MMDC's conception the following biological information has been obtained:

The natural oysters of Palau have been surveyed and described. Four main species of oysters have been found and each has a different marketing potential. Two species are abundant enough to be of immediate commercial importance. Monthly samples of juvenile abundance have shown peaks of reproduction that indicate times when the most juvenile oysters could be collected. It has been found that this time varies with the species and with the location. It is now possible to predict when and where juvenile oysters could be collected for farming.

Several methods of growing oysters have been tried and evaluated. We have found that bottom, tray and suspended oyster culture are possible in Palau. However, exactly which method is best depends on the species.

The wild oysters of Palau vary considerably in market quality and the majority are good only as cooking oysters. A large market for half shell (raw) oysters exists in Guam and throughout the Trust Territory. Because of this, 100,000 juvenile Japanese oysters were flown in from an oyster hatchery in the United States. These are faster growing and of better quality than those found in Palau. Considerable effort has gone into perfecting the techniques of growing these oysters in the Palau environment. Initial observations indicate that the Japanese oyster can reach market size in Palau within the first year. More work needs to be done in the early handling of the spat (juvenile oysters) in order to reduce mortality.

We now have an oyster expert from the state of Washington here with us funded by Sea Grant. He was formerly associated with the State Oyster Management program in Washington. His many years of experience in the oyster industry should be an aid in establishing a small industry in the Palau area.

The rabbitfish (meyas) of Palau is among the most popular and abundant fish in Micronesia. Large concentrations of juveniles can be seen around Guam and Palau during the spring. Initial studies show that these juveniles can be captured and raised to market size in one year using low cost feeds. In addition, adults have been captured and successfully spawned at MMDC indicating that there is a possibility of commercial hatcheries similar to those for salmon and trout. We now know the exact days and the location of rabbitfish spawning as well as length of time for hatching and length of time before juveniles appear inshore. We also have data on the growth rate under different diets.

At this time, we are experimenting in methods of rearing these fish for commercial sale. They have been raised in large tanks and in floating nets with good success. Predators and theft have been our greatest problems. We hope to build fish ponds in the Palau area this summer in order to try pond culture. Negotiations are being made to bring a consultant from the Philippines on construction of the ponds. Sites which are being considered initially are Ngeremlengui and Peleliu.

Our work with commercial shrimps has been limited to surveys of natural abundance. The surveys have shown the presence of a commercial quality prawn in the fresh water streams of Palau. Macrobrachium rosenbergii has been found in limited numbers, and this is the first time that this shrimp has been documented in the Palau area. Penaeus monodon, the famous sugpo shrimp of the Philippines, has been located in substantial numbers in the estuaries of Palau. Palau alone has over 13,000 acres that could be used for the cultivation of salt water shrimp. Production of P. monodon has exceeded 500 pounds per acre valued at \$2.00 per pound in some areas of the Philippines.

Unfortunately, without a well-equipped laboratory and a running sea water system, commercial production of shrimp is impossible.

Marine turtles play a very important part in the culture of Micronesia. A Peace Corps biologist has been assigned to Ulithi Atoll because of the large breeding population of green turtles that is located there. In addition, Ulithians have long incorporated the turtle into their social life and have kept a close supervision over their turtle populations. The biologist will be responsible for tagging adult turtles. He will gather information on growth rates, migration patterns and reproduction. Data gathered will be used for instigating a meaningful conservation project for the green turtle.

In Palau, work with hawksbill turtles has given us information on growth rates under different diets, methods for controlling disease, and egg-laying times for females.

The total mariculture effort has been directed toward providing people with food and with a means of income. These objectives are being partially realized. One man presently processes and sells oysters to the local Continental Hotel and to individuals. Shortly he will be selling his processed oysters to the Fisherman's Co-operative who will in turn handle their sale to the public. The residents of Aimeliik are able to harvest oysters and sell them to this man for processing. Transportation for the product is being provided by Marine Resources.

A market has been established in Guam and we are awaiting successful production of the Japanese oyster to begin this aspect of operation.

Two of the mariculture trainees have been hired by Palau Continental Hotel to construct pens for live seafood and rafts for oyster culture as well as to maintain these animals. Future plans are to establish a seafood restaurant at the site.

This summer we hope to begin construction on fish ponds at Peleliu. One mariculture trainee will be assigned to this project upon pond completion with the intended outcome being a successful fish-raising business and food for the people of Peleliu.

Utilizing the ocean's resources is one way of providing economic independence for Micronesia. But, the protection and development of these resources will not be easy nor inexpensive. Projects will fail and in the beginning, income on successful projects will not be large. But those who are willing to learn will find that they have helped to build an industry that will raise the standard of living for all of Micronesia.
