Marine Research at the University of San Carlos, Cebu City

Norbert Rau [1]

One of the largest departments of the University of San Carlos is the Department of Biology. It is therefore not surprising that faculty members and students have always been interested in marine biology and later also in nonbiological processes in the ocean.

Although marine biological investigations have been conducted sporadically ever since the founding of the University of San Carlos in 1948, it was only in 1970 when a Marine Biological Program was systematically introduced, that these investigations became strongly supported and encouraged. This was done through the expertise of consultants and with the financial support of the German Academic Exchange Service, a governmental agency of the Federal Republic of Germany, which then started a 10-year joint project with the University of San Carlos to introduce a curriculum and research in marine biology.

At the beginning in 1970, a low budget presented a serious obstacle for successful implementation of the project. The first courses in marine biological subjects were introduced, some smaller research projects were carried out, and eventually a small marine station was built, but this station later had to be abandoned because of heavy industrial water pollution in the surrounding area. Later, when the conditions were more favorable, another marine research station (Fig. 1) was built on Mactan Island and a wooden research catamaran constructed for students' excursions and research at sea.

Up to now a number of small- and large-scale research projects have been conducted, such as experiments on the culture of algae and rabbitfishes, investigations on primary productivity, studies on species diversity and seasonal abundance of fishes landed in Cebu fish markets, research on the quality of fish stored on ice, and extensive pollution research in the harbor of Cebu City. The results of these studies have been published in numerous articles, one of the most recent being a book on "Commercial Marine Fishes of the Central Philippines (Bony Fishes)" by Norbert Rau and Anke Rau, which is being jointly published by the University of San Carlos and the German Agency for Technical Cooperation (GTZ). The book will contain illustrations and descriptions of more than 550 commercial fish species in about 800 pages.

Cooperation with other institutions in the Philippines has always been very important, but only recently have the results of research conducted at the University of San Carlos attracted scientists and scientific institutions in the Philippines and abroad. Every year there are more than 50 scientists from all over the world who come to see the marine station and often they stay for some time to do research themselves. Scientific institutions of the Philippines, the United States, the Federal Republic of Germany, and Japan have approached the Marine Research Office to propose joint research projects in a tropical oceanic environment, for which the location of the University of San Carlos' marine station is ideal.

The attraction which the station exerted on the outside has had a similar effect on the university itself. Each year more and more students are enrolling in the marine biological subjects, with as many as 115 students in 1978. Another positive effect is the attraction of teaching personnel, mostly USC graduates who left the university some years ago and are now returning to an interesting institution, where research is as important as teaching.

Since 1970 the Marine Research Office and station have been headed successively by four marine scientists sponsored by the German Academic Exchange Service. These scientists each stayed 2 to 3 years and were supported by short-term lecturers from Germany giving special courses such as marine chemistry, cytology, and phycology.

Marine station provides relaxing atmosphere for undertaking research in tropical aquatic ecology.

[1] Department of Biology, University of San Carlos, Cebu City, Philippines.

ICLARM-CLSU Project Shows Early Promise
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size. They were therefore grown again in association with fish as in the first test.

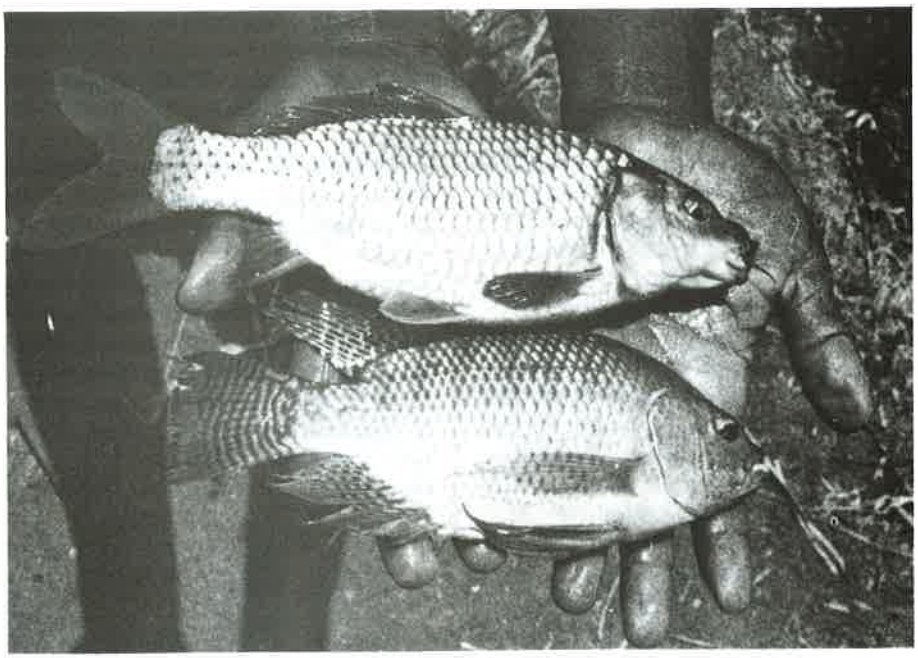
Fish yields at the end of the second 90-day period were substantially higher than from the first test because pigs were older and larger and produced more waste. Ponds stocked with 10,000 fish/ha and receiving wastes from 40 and 60 pigs/ha yielded 4.5 and 5.2 tons/ha, respectively. Ponds stocked with 20,000 fish/ha yielded 5.0 and 5.8 tons/ha. The duck-fish ponds are presently being harvested. Income from sale of fish, pigs, and ducks is reinvested in the project.

In future experiments pig stocking rates of 80-100/ha and duck stocking rates of 2000-2500 will be tested and new fish species added to develop a more efficient fish polyculture system.

The ranks of staff involved with the CLSU project will continue to swell as new scientists contribute to the research effort. Dr. Cruz will be joined in September by an ICLARM postdoctoral Fellow who has been named co-leader of the project and will be posted at CLSU. Mr. J. van Weerd of the Department of Fish Culture and Inland Waters, Agricultural University in Wageningen, The Netherlands, will arrive in May for a 6-month study on a specific aspect of the project.

ICLARM and CLSU were fortunate in being visited in March by Dr. Gerald Schroeder of the Fish and Aquaculture Research Station, Dor D. N. Hof Hacarmel, Israel, who gave project scientists the benefit of his expertise and experience in integrated fish/animal husbandry and offered advice for the project's improvement. In-depth discussions between Dr. Schroeder, Dr. Ziad H. Shehadeh, Associate Director General of ICLARM, and other members of the research team were valuable in identifying new lines of inquiry which appeared promising and on which the project might follow up. Dr. Schroeder will return to ICLARM as a consultant in August to draft a research proposal for investigating the biological basis of productivity of ponds subjected to organic waste loading under tropical conditions and how these ponds can best be managed.

Duck wastes are a source of fertilizer for 12 of the experimental ponds. Ducks now live on pond dykes but will eventually be maintained on platforms over the ponds, as other workers have demonstrated that ducks are healthier and fish production is improved under the latter regime.



Common carp (top) and Tilapia nilotica *about 175 g and 125 g, respectively, were raised in ponds treated with effluent from pigs stocked at 60/ha during the second test period.*