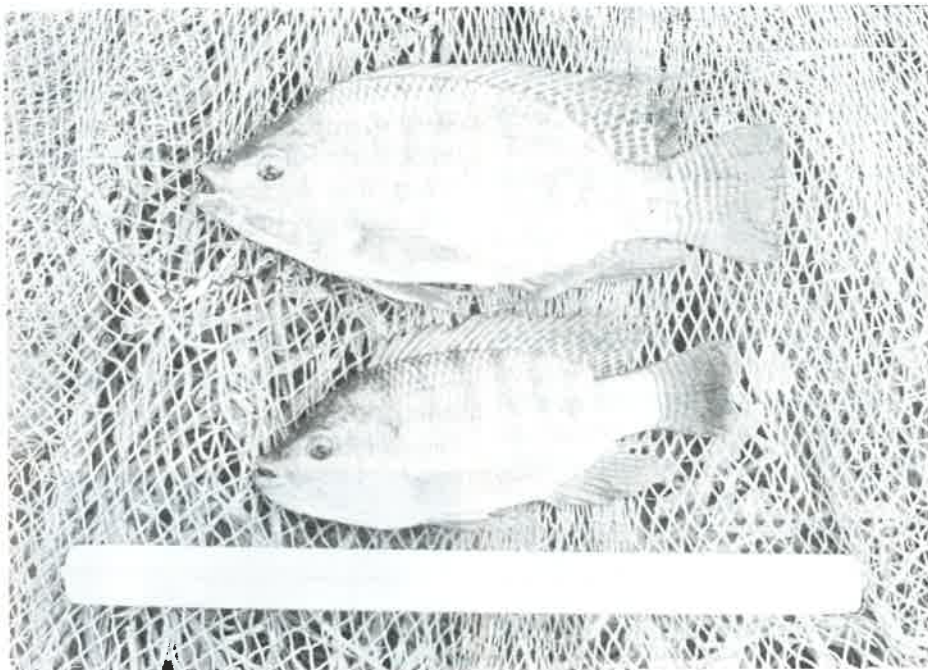


# Outstanding Yields and Profits from Livestock-Tilapia Integrated Farming

K.D. HOPKINS  
ICLARM



Adult *O. niloticus* – ♂ (top) and ♀ (below).

Despite setbacks that included typhoons and floods, and experimental animals that once ate precious data sheets, the most intensive research on integrated farming in Southeast Asia was successfully concluded at the end of 1981. It was carried out by scientists and technicians from ICLARM and the Freshwater Aquaculture Center (FAC), Central Luzon State University, Nueva Ecija, Philippines, using specially prepared ponds at the FAC. The results of eighteen major experiments carried out over nearly four years, quantified the potential for producing high yields of tilapia and carp, providing at the same time an efficient way of disposing of livestock manures.

Farming of Nile tilapia (*Oreochromis niloticus*) with pigs or chickens provided the most spectacular results. Some 1.7 tonnes/ha of marketable tilapias were produced in three months at the optimum manure loading of 100 kilograms of dry matter per hectare per day. That is equivalent to flushing the manure from 80

pigs or 4,400 chickens into a one hectare pond containing 20,000 fish (17,000 tilapia, 2,800 carp (*Cyprinus carpio*) and around 200 snakehead (*Channa striata*) as predators).

In these experiments, the problem of stunting of the tilapia due to overcrowding from spawning was overcome using a predator fish, the snakehead. When no predator was introduced, total fish production (market-size and fingerlings) was even higher—equivalent to over 10 tonnes/ha/year. The marketable fish were smaller but at least 2,500 two-gram fingerlings could be produced per hectare each day.

These are remarkable results considering that no inorganic fertilization or supplemental feeds were given at any stage.

The experiments highlighted the hardiness of tilapia, which were able to withstand oxygen levels that ranged from near-zero for several hours to 200% (super) saturation over a 24-hour period.

A tasting panel found that fish grown

in manured ponds were preferable to those grown in ponds fertilized with inorganic fertilizer. No parasites harmful to humans were found, despite regular examinations of the experimental fish. It is stressed, however, that the experimental livestock used were “parasite-free,” which cannot be expected on many small farms.

Economic benefits of integration were also analyzed. Pig-fish or poultry-fish culture significantly increased operating profit over that from a livestock operation alone. However, there are marked economies of scale and large pig-fish ponds can give returns of over 70% per year; chicken-fish systems can yield more than 90%.

Some big questions remain of course. The major one for growers is how broadly applicable the results may be. To assist them and other researchers, a detailed report of the project is shortly to be published by ICLARM. It includes full experimental results and economic projections based on some 25,000 sets of observations and measurements. An earlier report of the project appeared in the ICLARM Newsletter, Vol. 3, No. 4, p. 12-13 (1980). Results also appeared in the book “Integrated Agriculture-Aquaculture Farming Systems” and “The ICLARM-CLSU Integrated Animal-Fish Farming Project: Poultry-Fish and Pig-Fish Trials” available from ICLARM at \$25 and \$4.75, respectively, including airmail postage. They are available in the Philippines at ₱80 and ₱20, respectively.

Fingerlings of *O. niloticus* for stocking in experimental ponds.

