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Fishing in the Rice Paddy

by Peter Newton

The traditional Asian practice of raising fish in rice paddies is making a comeback in the lush rice fields of West Java, Indonesia and Thailand.

The technique of rice-fish farming is the simultaneous production of fish and rice in the same flooded fields. The 2000-year old system was abandoned by many countries because of the "green revolution"'s prescriptions of high-yielding, monoculture rice varieties that required the use of pesticides and fertilizers, and double- and triple-cropping of rice. Although productive, these practices reduce soil fertility and are expensive for farmers to maintain.

The rice-fish project, supported by IDRC, is the work of Dr Achmad Fagi, a food crop scientist in West Java, Indonesia and Niran Tongpan of the Farming Systems Research Institute in Bangkok, Thailand, who collaborate with Canadian researchers. The project fits well with IDRC's goal of sustainable development. The researchers are "basically showing that this is an efficient, low-input system," says IDRC's director of aquatic resources, Brian Davy.

PROTEIN SOURCE

According to Greg Chapman, a Canadian who worked on the project in Thailand, "fish take useless things and turn them into protein." Chapman is now working on aquaculture projects in Laos. He notes that fish eat algae, rice pollen, weeds and insects while also fertilizing the soil more effectively than commercial products. Fish also reduce pests by eating leaf-hoppers, stem borers, and aphids and lower the incidence of several rice diseases. Rice-fish farming also creates a reliable source of protein for the farmers, offsetting the decreased availability of wild fish in many countries.

In the West Java Project, the introduction of ducks has enhanced the rice-fish ecosystem. They eat crabs and insects and their droppings act as a nutritive addition. Rice-fish culture can actually increase the yields of rice (up to 25 to 30%) while providing farmers with extra income. According to Davy, this is important in areas such as northeastern Thailand, where the farmers are marginalized, cultivate under difficult conditions and find the cost of pesticides and fertilizers financially burdensome.

"The program is aimed at the poor farmer, since it requires a minimal capital outlay," says Rolf Schoenert, a senior environmental fisheries and aquatic specialist at Agrodev Canada Incorporated, an Ottawa-based company involved in the project.

FISH REFUGE

To begin a rice-fish operation, the farmer digs a small pond or trench up to a metre deep in a low-lying area of the rice field, to act as a "refuge" for the fish. The excavated soil is used to raise the banks of the field to ensure good water control.

When the field is flooded by irrigation water (or by the rains, as in northeast Thailand), rice is planted as usual. Soon after, however, fish fingerlings are introduced. The most frequently cultivated fish in Indonesia are carp, tilapia and catfish.

After about three weeks, during which time the rice plants become established, the fish are let out of the refuge and allowed to forage in the paddy. At harvest time, the water is drained and the fish are collected from the refuge.

The main cost is buying fish fingerlings. The supply of fish is also a problem since some areas do not have well developed hatcheries, says Davy.

In Indonesia, rice-fish culture is being practiced in more than 70,000 hectares of rice fields. The potential for further reviving the valuable practice is huge. In Indonesia alone, there are another 4.2 million hectares of rice fields that could benefit from the rice-fish culture method.

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