

Integrated fish farming in Thailand

by Somsak Janesirisak*

About 23,568 ha distributed in 20,974 farms are used for fish culture in Thailand. Thai fish farmers are now using modern technologies enabling them to produce a high fish yield. One such technology is the spawning techniques to induce fishes like chinese carps, to spawn. This enables farmers to produce more fingerlings than they need. Excess fingerlings are sold to other farmers.

The Thai farmers' critical problem is capital because feed is expensive. To reduce the cost of feed, they have come up with the method of integrated farming. Instead of raising fish only, they also grow livestock such as pig, chicken and others. Excrements of these animals are directly utilized by fish or used to enrich the pond for the growth of natural fish food organisms. Moreover, fish farmers usually grow crops such as banana or coconut trees on the dikes of the pond for more income.

Advantages of Integrated Farming

1. Integrated farming reduces the high cost of feed. There is no need to give additional fish food because fish utilizes directly the waste products from the animals staying over the pond. The excess waste materials can also cause the growth of phytoplankton and zooplankton. It was found that about 60% of the daily consumption of the pig is excreted as feces and urine. Therefore, fish can directly consume it and the valuable nutrients that these contain cause the growth of natural food organisms. (Table 1).

2. All areas in this type of farming will be utilized for maximum yield and production. Pens will be built over the fish pond or near the edge of the pond. Economic plants such as banana, coconut trees will be grown near by for more profit.

Building of Pens

There are two popular ways of building the pen in Thailand:

1. Those of wood or bamboo built over the fish pond in such a way that animal excrements fall into the pond.
2. Pens are built on the edge of the pond, with concrete floor sloping down towards the pond. This is more expensive than the first one.

Table 1. Chemical composition of pig excrements

From 100 kg of Excrement	
Components	Weight (kg)
Water	71.0
Organic matters	25.0
Nitrogen	0.5
Phosphorus (P ² O ₅)	0.4
Potassium (K ₂ O)	0.3
Calcium	0.09
Others	

Adapted from Woynaronich (1976)

Steps of Management

1. General practices of preparing the pond must be done. Lime should be

sprinkled on the pond to control parasites. After one week of raising livestock, fish can be stocked in the pond.

2. The water level should be kept at no less than 75 cm.

3. Pens should be cleaned every day or at least five times a week so that food scraps and animal excrements may fall into the pond.

Culture Species

The following are a few species which the farmer may raise in the ponds in combination with livestock:

Thai name	Common name	Scientific name
Pla nile	Nile	<i>Tilapia nilotica</i>
Pla song	Bighead carp	<i>Aristichthys nobilis</i>
Pla Tapien	Puntius	<i>Puntius gonionotus</i>
Pla swai	Catfish	<i>Pangasius sutchi</i>

Rate of Stocking Fishes and the Number of Animals

To get rid of water pollution and to maintain sufficient fish food organisms, it is necessary to know the rate between the species of fish and the number of animals to be raised in combination.

In Thailand, farmers prefer to culture fish with pigs. Some researches in this area were conducted by Extension Unit of the National Inland Fisheries Institute (NIFI), Bangkok, Thailand. The results are summarized in Table 2.

Table 2. Number of pigs and fishes in one Rai pond (0.16 ha)

Species of Fishes	One Rai Pond	
	No. of Pigs	No. of Fishes
1. <i>Tilapia nilotica</i>	7 - 10	1,600
2. <i>Pangasius sutchi</i>	10	1,000
3. <i>Puntius gonionotus</i>	8	4,000
4. <i>Aristichthys nobilis</i>		150
<i>Tilapia nilotica</i>	7	1,600