

Integrated fish farming concept catches on (The Nation, Bangkok, 19 December 90)

Mr Sakhon Phromthasan is exceptional. He has four rai of fish ponds that he dug in his paddy land on the edge of the town of Nongkhai and is experimenting with a kind of fish that he calls a “biguee”, a cross between a local catfish and what he calls a Russian catfish. Russian catfish, which probably originated in Africa not Russia, are bigger but more aggressive and harder to raise than traditional varieties. Sakhon hopes the cross will give the advantages of both.

If it works the experiment will give Sakhon his second advantage in the local market. Already he gets an extra five baht per kilogramme for his fish by feeding them a mixture of cassava flour, rice bran and commercial pig feed.

“Our Nongkhai traders notice the smell from fish raised on chicken or pig manure,” he says. “My fish smell better, and they pay 25 baht a kilogramme.” He hopes to get 35 or 40 baht per kg for his biguees.

Mr Sathit Phanibut of Phonphisai district is another exception in the field of fish farming. As a compromise he uses pig manure as fish feed, but takes the trouble to carry it to the pond in an oil drum which can be removed when the fish have finished feeding, instead of keeping the pigs in stalls over the pond. By using the oil drum any uneaten manure can be removed before it pollutes the pond and taints the fish.

Sathit is not sure if the extra effort is worthwhile. He says his Phonphisai buyers won't pay more for quality.

Mr Thew Baphrom raises fish in the neighbouring province of Sakon Nakhon. Like Sakhon and Sathit, Thew has become successful. After some experimentation and initial setbacks he built a rearing house for 500 chickens over his two rai pond and finds that the manure provides enough feed for 10,000 fish. He will raise the fish for 6-8 months and sell them during the dry season when few fish are available in natural waterways and prices rise to around 20 baht per kilogramme. He expects to get about 40,000 baht, gross.

What is interesting about these three farmers is not so much that they have succeeded at raising fish in the Northeast, but that so many others have tried and failed. Why?



Fish raising appears to be a promising activity in the upper part of the Northeast region. There is traditionally a strong local demand for fish, and production from natural waterways has been declining. Consequently prices are good, almost double those in the central region. Water resources in Nongkhai and Sakon Nakhon are better than in most of the Northeast. There are several irrigation schemes, including the large-scale Nam Oon scheme from which Mr Thew benefits. But the rainfall is also better than in provinces to the south like Khon Kaen and Mahasarakham. Mr Sathit relies solely on rain water for his five ponds, and by careful water management is able to keep at least the two or three lowest-elevation ponds in production during the dry season when fish prices are highest.

With all these good omens the Bank for Agriculture and Agricultural Cooperatives (BAAC) started in 1987 to encourage farmers to capitalise on the potential for fish farming, and prepared special freshwater fisheries promotion projects designed to attract 1,110 farmers in 7 Northeastern provinces. The projects were part of an overall Northeast Poor Farmers Development Scheme initiated in consultation with and supported by funds from the European Economic Community (EEC). On paper, all should have gone well.

According to the original concept participating farmers would be trained in the technical aspects of fish raising by the local Department of Fisheries officers. The farmers could borrow up to 70,000 baht as a long term loan at a concessional interest rate of 9 percent to dig two one-rai ponds and buy fish fingerlings. Loan security was based on either a mortgage or joint-liability agreements among small groups of project farmers. The farmers would also need a short-term loan each year to cover normal operating costs, primarily the costs of buying fish feed.

Production was expected to stabilise at 1,400 kgs

from the second year onwards, yielding a gross income of 25,200 baht. Based on these assumptions the rate of return for the project was estimated at a highly attractive 48 percent, and as a result of participating, farmers' incomes were expected to increase 51 percent over the ten year life of the project.

The fish fingerling production enterprise of the irrepressible Mr Chana Philakhon was one of the essential components of the project in Nongkhai. Chana started with 120 baht 25 years ago and now owns a business that supplies fingerlings to buyers from all over the NE and as far away as Lampang. His enterprise and infectious enthusiasm have enormously assisted BAAC's fisheries promotion in Nongkhai, not only by reliably supplying fingerlings but also by acting as an informal source of technical expertise for farmers trying fish farming for the first time.

But people like Mr Chana are hard to find, and while they have eventually become successful fish farmers it would be misleading to describe Mr Sakhon, Mr Sathit and Mr Thew as typical project participants. They have become successful because they were intelligent enough to identify problems as they arose and listen to advice, and diligent and adaptable enough to implement countermeasures. Others have not been so able, or so lucky.

Some ponds were dug in unstable soil, so the banks have collapsed and reduced the capacity of the ponds. Snakehead fish have invaded ponds and eaten the stock. Birds and other two-legged thieves have stolen the fish: farmers have had to build houses near their ponds and Mr Sakhon keeps a shotgun close to hand to try to protect his fish from the birds.

In some areas water supply has been a problem. Farmers with rainfed land have been reluctant to dig their ponds on their best, lowest lying plots and the



ponds have dried out as a result. Even in irrigation areas water supplies are not completely reliable, and are almost always geared to the needs of the paddy crop which means no water is available for fish farmers in the harvest season. The project planned for Mahasarakham had to be closed prematurely for lack of water.

But the availability of fish feed has been the biggest single difficulty. Under the original project design farmers were expected to buy commercial feed and mix it in the way that Mr Sakhon does. This is time consuming and, more important, expensive. Sakhon for example spends 40,000 baht per year on feed. He can afford it and after 20 years of fish raising is confident enough to take the risk. Few farmers have either of these advantages. Many who joined the project and dug their ponds were subsequently reluctant to buy enough feed, and production levels were far below the target.

Problems are normal for projects designed to introduce new activities to farmers. The test of success is not so much whether problems arise, but rather the extent to which those problems are identified and dealt with. BAAC had to propose substantial changes to the project design to help farmers save their investments.

The main recommendation to farmers already in the project was to raise poultry or pigs in association with the fish ponds. Mr Sathit was already raising pigs, and he expanded his operation in order to produce enough manure for his five fish ponds. He finds that pig raising as a separate enterprise is profitable, so in effect he is creating fish feed at no cost. He may buy cassava flour occasionally when it is cheap, to use as supplementary fish feed, but in general he finds the pig manure is enough.

The recommendation to raise livestock helped many project farmers, like Sathit, but not all. Mrs Kong Rot-ut and Mr Suphat Sopapong in the Nam Oon project, Sakon Nakhon both dug their ponds early in 1989. Both have been unlucky in that members of their households moved away to get work elsewhere, leaving insufficient labour for the fish ponds and certainly not enough to get involved in additional livestock raising activities.

Labour shortages are becoming serious in this area, partly because of the construction of several processing factories nearby, with the result that labour costs have risen from 30-35 baht three or four



years ago to a present rate of 50 baht per day.

Perhaps more important in these two cases is that neither farmer has ever regarded fish raising as the principal occupation of the household, always giving priority to their paddy fields. This is in contrast to the obvious commitment to the project by Mr Sakhon and Mr Sathit. There are other differences. Sakhon and Sathit are both well educated, though neither is trained specifically in the field of fisheries, and often busy elsewhere. In Sathit's case it is his mother who takes care of most of the day-to-day work of collecting and moving the manure and selling the fish in the local market.

Neither Mrs Kong nor Mr Suphat has yet sold any fish. They have eaten a few, so perhaps the project has made them healthier. But eating fish won't repay their debts. Both are behind in their loan repayments. Their half-filled, unattended ponds are eloquent reminders of the problems of introducing new farming activities in the Northeast.

Despite failures like these, the idea of promoting diversified farming activities in the Northeast for the benefit of small-scale farmers is important, not only for BAAC but also for many other agencies. What lessons can be learned from the freshwater fisheries projects?

Clearly, farmers are rarely willing to invest in commercial fish feed and it would be a mistake to design more projects based on that technology. Perhaps there are alternative, lower-cost approaches. A research team at the AIT funded by the British ODA has been investigating the fish-feed potential of materials normally available on the farm as waste or by-products. This could be a successful and low-cost solution, provided that the farmers commit enough time to their fish-farming.

The alternative which the BAAC has introduced is the concept of integrated farming, where fish are raised from the start in conjunction with livestock

and the water from the ponds supports also small vegetable plots and perimeter fruit trees. Under this concept ponds are larger than in the original fish-only project, and rearing houses are built over the ponds so that manure is constantly available to the fish without the extra labour required for carrying it from the rearing shed to the pond.

This concept, also supported under the BAAC-EEC Northeast Poor Farmers Scheme, has proved more successful than the original fish-only project. Mr Ubon Laphanit in Muang district, Nongkhai, for example has a total of only six rai of farmland and has devoted all of it to a five-rai pond with two chicken rearing houses and a few mango trees. He gets about 2,600 baht per month from selling chicken eggs, net of the feed and other costs. He expects to get another 70,000 every 6-8 months from fish sales, against costs of 15,250 baht for fingerlings and negligible additional costs for supplementary fish feed, fertilizer and chemicals.

Mr Ubon is unusual: he records all the costs and revenues from his integrated plot in a simple accounting book. His records indicate that he should get a total profit of over 100,000 baht from his six rai this year, without including the cost of his BAAC loans. He would get under 1,000 baht per rai per year from cassava.

While this approach appears to have been highly successful for Mr Ubon and reportedly for most of the farmers who followed the same course as he did, the drawback is that it is expensive. Mr Ubon's initial investment to dig the pond, build the chicken houses and buy the stock was 150,000 baht, followed by regular monthly outlays of about 7,000 baht for chicken feed and, twice a year, 15,000 baht for fish fingerlings. Even with the BAAC's relatively liberal loan interest rates and security requirements this technology may not be attractive or accessible to farmers unless they are already financially secure and/or have excellent technical support and close supervision. Although Mr Ubon for example has a very small farm he is able to earn additional income from repairing farm machinery.

Fish farming, integrated or not, has a place as part of a farm lending portfolio in the Northeast. But BAAC's experience suggests there are other technologies and loan packages better suited to the needs of very small-scale farmers who depend solely or mainly on farming for their living.