



More Than A Rice Field



When you look at this field you know, straight away, that it is a rice field. No doubt about that. The green rice plants, about 30 cm tall, stand in low water, and will be ripe for harvest two months from now. Still, there is something different about this rice field. But what is it? Well, the field is surrounded by a tall dyke and, just below the dyke and encircling the plants, is a narrow canal of muddy water. This looks rather like a pool, and Tran Van Viet (sitting on the dyke observing the field) is prepared to agree—this is actually both a field and a pool.

Viet understands why you are confused, because all this is also pretty new to him. Not only is this new, it has changed his family's life over the last five years. As we walk back to his house in Dao Village, in the Red River Delta on the coast of the Northern Vietnamese Province of Nam Dinh, he will tell you something of his background.

Like the other young men of his generation, Viet spent years in the army. He left in 1979, and came back to his native village to take up farming as part of the co-operative. His parents' private lot was about one acre, their own garden, while virtually all the rest of the landscape was taken up by rice fields, owned by the State and worked upon collectively by everyone from the surrounding farms.

When Viet took over from his parents, the land was still distributed in this way. Nothing much happened in Viet's life in terms of farming until 1997. Then, as part of the economic reforms which took place in the country and which included the redistribution of land, he was allotted some private fields and was also allowed to rent more. Between what he was allotted and the land he rented, Viet eventually acquired 3.5 ha.

Life was harsh for the Viet family. They lived on the edge of subsistence and there was very little for the four children. So, the family looked around for new options. Viet travelled to neighbouring provinces, where land redistribution had begun earlier, to see what had been achieved there. He came across a new way to grow rice, and talked a lot to the farmers. In this way he learned the basics of the new technique, and came back to grow some of his rice in the pool-like fields.

As he was the first one in his village to do something so different, he soon attracted a lot of interest from his neighbours. It was a radical breakaway from tradition, but many were eager to change. One by one they copied what they saw; now more than 100 farmers in the area have opted to grow rice using unconventional deep rice fields.

Turning the tide

In these flat plains, the mighty Red River and the rains used to dictate land use. Flooding would occur every year once the rains started in July, and the water would only pull back some time in December. These floods were a blessing, giving the necessary water for rice and providing fertile mud to revitalise the fields. But the floods were also an unreliable partner and difficult to regulate, giving too much in some years and too little in others. Roads and houses could only be secured by building them on



Both the rice and the fish produced in this field are thriving, as each benefits from the other.

dams and platforms, constructed using earth from canals and ponds. Any water left over from the flooding was diverted into the flat fields by means of small irrigation canals and, basically, this is still the way agriculture works in the delta. One small detail must be added: with the floods came wild fish, washed into the flat lands. This was everyone's opportunity to enrich their diet by catching this rich source of protein as it came by.

During the last few decades a major flood protection system was constructed, canals were opened everywhere and pumps and sluices built, all to make sure that excess water could be diverted into the river. And, in years when less rain falls, this system also allows water to be retained, providing security for irrigation during the drier parts of the year.

All these measures gradually gave Viet and his co-operative much greater security in terms of crop production. Now they could rely on two rice crops a year: one late in the year (based on the rains) and one even later (based on water left over from the rains and on irrigation). But, no one in the area realised the new opportunities the system provided until the land was privatised and Viet undertook his study tour.

Viet discovered that in other places two separate occupations had melted into one. The fisher and the farmer had become the fish-farmer. Until then, fishers had been specialists. Not only did they fish in marine waters, they also grew fish in fish ponds—a technique which was centuries old. Farmers tended their crops and had little to do with fish. They would capture any fish that happened to swim across their land during the floods, but otherwise they ate little of this nutritious food during the year.

Getting the complete story

Soon after Viet changed his farming techniques, fisheries experts from the Research Institute for Aquaculture (RIA 1), near Hanoi, found out about his work. When they discovered that Dao Village contained a pioneer, they came by to give advice and see Viet's experiment unfold. Though they perceived Viet as breaking new ground in the province, the institute and its experts had actually been behind the new projects seen by Viet in other regions and from which he learned the basics of this new technique.

Like Viet, these researchers were also implementing new ideas based on techniques used elsewhere. Through a growing international network, they had learned about possible new farming techniques being used in certain areas of other countries where the climate is similar to that of Vietnam (for example, parts of Bangladesh, Eastern India, Cambodia and Thailand).

The WorldFish Center has studied aquaculture for many years in this part of the world, and has invited many countries to co-operate on different research programmes covering a lot of themes. The WorldFish Center gives expert advice based on its own research. But, the Center also learns just as much from observing how things work in different countries. It then makes sure that its findings are shared, so that these countries learn from each other.

In the early 1990s, a series of experiments on Fish-Rice production, as the technique is called, started in Vietnam. As far back as 1998, some farmers from Viet's village had been selected to be partners in this project. The idea behind the project was that the research station should



A few of the ponds used to produce fish are so large that farmers need a boat to make sure that all the stock are fed.

look into the science behind the technique. The staff at the research station would then advise the farmers, so that they could try out what seemed to be the best methods for use in their fields or, to be precise, their pools.

Specialists coming to the Hien Khanb Commune (which is where Dao Village is to be found) and to the neighbouring Tan Khanb Commune were not only fisheries experts. This project was just as much concerned with agriculture. So, researchers from the Vietnam Agricultural Science Institute were also present. By providing expertise in social science and economics, they helped everyone involved learn about more than just the technical details of the project. And the reports being used to 'wind up' the project contain a lot of statistics which are concerned with exactly those social and economic factors. During a refreshing tea break under the electric fans in their house, Viet and his wife, Le Thi Thom, will tell you many details of the project from the perspective of their household. But first, we must go back to the fields again.

Sitting on the dyke

Taking a rest in the green shade of a banana palm on a dyke will help you understand how things work here. The bottom of the field lies more than a metre below the top of the dyke and, as you can see, there are pipes for taking in and draining off water. At certain times of year this field is really a pool, at such times the rice looks as if it is swimming to stay above the water. But, it is only the middle of the field which is green with rice: the canal around it is deeper, and is filled with water.

The idea behind the system is this. You let in just a small amount of water when the new crop of rice is planted. Once it starts growing you can add more water and put in small fish, who swim and grow among the rice in the warm water. They will thrive on the biological life in the

pool, eating up insects—some of which are harmful to the rice—and making sure that the water will not carry plant diseases to the growing crop. The fertiliser you add to make the rice grow will also feed plankton and algae, so you do not need to feed the fish to get them to grow.

In this part of Vietnam, it is very hot on many days of the year, which is unhealthy for the growing fish. This is where the deeper canal around the field comes in handy. Because the deeper water will be somewhat cooler than the shallow water in which the rice grows, the fish can relax here and keep cool.

Based on trials carried out both by themselves, and by WorldFish Center partners in Bangladesh and in the Mekong delta of southern Vietnam, the RIA 1 researchers knew that using a mixture of fish gives the best results. Some fish will take a lot of insects, others will go for the tiny weeds among the rice, while still others will prefer the floating algae, grass or leaves. It turned out that the ideal mix for this part of Vietnam consisted of 50 per cent common carp, along with four other types of carp, and a few other fish species.

As you look into the water, you will not be able to see many fish. Why? Because the water is, as it should be, rich in food and therefore pretty dark. Plus, when there is enough oxygen, as is the case here, the fish only come to the surface to snap up an insect sitting on the water or flying too low. But you can be sure that the fish are there, because this pool was loaded with fingerling-sized fish early in the year. A one hectare pond can hold more than 3,000 fingerlings as well a crop of rice.

In September, Viet will start using his net, and taking away the biggest fish so that he can sell them. This can be done every month, securing a nice, regular cash income. In December, before everything dries up,



Vietnamese farmer Tran Van Viet takes advantage of a quiet moment to reflect on the profitable new method he is using to grow rice and fish together.

he will drain the rest of the water from the system and catch the last of the fish. If there are a lot of fish, a trader will come and buy up Viet's fish harvest so that it can be sold at market.

This is the time when Viet will repair the pool if it needs it. He will also take away some of the mud and prepare the land for the next growing season, which starts after the Vietnamese New Year, some time in February.

More than fish, of course

Another important lesson that has been learnt from practical experience is that the water in the pool can rise so close to the top of the dyke that the growing fish escape, just by jumping. If an interesting insect comes along, and if the water in the pool is too high, they may very well jump, and disappear into one of the many canals that lead to the river. So, it is a good idea to put a low net around the pool, to make sure you do not lose your valuable fish.

But what about the rice? Will it not drown at the peak of the flood season? Well, this is an age-old problem, and over time a solution has been found. Modern, low rice, which has the highest yield, is grown when the water is low and watering is based on irrigation. In the rainy season, a traditional variety is used. This is a type of rice that will grow taller if the waters rise due to rain, making sure that the grains stay above water when they start to mature. Researchers have tried different varieties of rice during different seasons, and can now give good advice to every province of all the countries involved in the experiments.

Looking back to the days of his co-operative, which were not so long ago, Viet recalls that not only did he not have fish in his fields then,



Like many other villagers who farm fish, Viet's family has used a small proportion of their new income to improve their house, both inside and out.

he was also missing the ducks which now swim on his pool. They are useful in many ways. First of all, they provide another source of money and food while, at the same time, their droppings also fertilise the pool (good for the rice and the fish). An added bonus is that they also keep the pond clean as they feed amongst the weed.

On a small platform in a corner where four ponds meet is Viet's small hen house. Chickens are also a new addition to the farm. If you come closer, you can see that there are pigs resting under the grass roof of an enclosure. But you will have to come close and look, because you will not smell them. Their pigsty is remarkably clean, and perhaps you have guessed why. Their manure is taken to the pools or to other fields—for not all the land has been turned into pools, about two thirds of the farm is still used to grow rice alone.

A lot of sense

Researchers who have observed Dao village over the last five years will tell you that growing only rice on a farm is not a very good idea. They have compared the results achieved by farmers who have gone into fish-rice farming with the achievements of those who still farm rice alone. Their calculations are a bit complicated, but the results are easy to understand. If you set aside one hectare of land to produce rice alone, your profit in a full year would be less than 13 million Vietnamese Đông, a bit below US\$ 1,000. Had you instead combined fish farming with rice farming you could expect to make a profit of 17.5 million Đông, around 30 per cent more.

You do have to lay out more to farm fish, because the fry must be bought, in most cases, while labour costs are also higher in this type of production. But, you will make savings too, because there is no need to



Not only do these ducks provide a good income when sold, they produce fertilizer, which helps both the fish and the rice to grow.

use pesticides to kill insects: the fish take care of that for you. Plus, the amount of rice produced is not lower, even though it shares the land with fish.

And a better future

Mrs Thom knows that farming fish has made life better for her family. She looks back to the years before they had their own land, and recalls insufficient meals of rice, with a few vegetables and some fish sauce to make it a little tastier. These days the servings are bigger, and fish and meat are a regular part of their daily fare. She thinks that all the families in the village make a better living now, because everyone is keener to work hard, since they need not rely on less-productive partners in the co-operative. But, the families who have gone for fish are definitely better off than the traditional farmers—real life corresponds with the statistics.

And if you doubt those statistics, take a look around her house while you sip your bitter green tea. In the corner of the room is a colour television set—bought two years ago, she will tell you. Also, the house has been overhauled recently, and the tile roof is new. Just outside the door is a motorbike which it took five years to save for. But the first thing they saved for was a hand-drawn tractor, which is now taking care of much of the hard field work.

But Thom and Viet smile their biggest smiles when they confirm that their children's prospects for the future are better than their own were. Why? Because now Thom and Viet can afford to send them on to high school, something which few people in the previous generation could afford. In fact, the oldest has already continued on to vocational training. And what do you think they qualified in? Fisheries!