Harnessing the power of diversity

Prior to COVID-19 constraints, the Lighthouse Farms team travelled south in search of the secret ingredient that is common to all Lighthouse Farms – diversity, writes Rogier Schulte.

The entire village of Kepanjen came out to welcome Annemiek, co-ordinator of our Global Network of Light- house Farms. Annemiek is on a quest to find the secret to the success behind our Indonesian Lighthouse Faming system – ‘Complex Rice Systems’. On the back of a motorbike, she is brought into the rice paddies of East Java. Here, Dr Uma Khumairoh explains how communities have learnt to harness the power of diversity.

“First, farmers add Azolla to the paddies – an aquatic plant that fixes nitrogen from the air, just like clover in grassland.

“Then, they add ducks that gorge on the pests of the rice crop. Fish are grown in hatcheries and added to the fields to perform the same function below water. Together, these animals also provide additional sources of protein and cash. Finally, crops grown between the paddies diversify the diet and give shelter to the natural enemies of the pests.”

In brief
- Identifying ecosystems that can co-exist and benefit each other can also bring additional profit to that farming system.
- Understanding how systems co-exist helps to better match them together to help the functioning of a farm.
- The challenge with complex biodiversity is that it takes substantial expertise and a lot of labour to manage it profitably.

Organising farming to mimic the Atlantic Rainforest in Brazil

Dr Annemiek Pas Schrijver (left), co-ordinator of the Global Network of Light- house Farms, learns about the workings of the Complex Rice Systems from Dr Uma Khumairoh of Brawijaya University.

The best of all worlds

For years, Dr Uma has painstakingly measured the effectiveness of all these components, and their combinations. Her team at Brawijaya University has measured crop yields, weed infesta- tions, nitrogen balances, observed duck foraging, even studied the content of their stomachs in the finest detail. Her treasure trove of data, published in high-ranking scientific jour- nals, shows that when the right com-ponents are put together, Complex Rice Systems provide more income and better diets for the community. And, equally important, they are more reliable and resilient in the face of cli- mate shocks, such as the droughts and floods, that are increasingly common in that part of the world.

In his next article, Rogier will explain how many managing complex farm systems, even with much larger farm scale. This is now possible because we have a much greater knowledge and understanding of how systems interact. We also have many important technology tools to help us manage and optimise these systems. Rogier’s next article will include an Irish farm and be based around managing complex farms. Our ability to understand the strengths and weaknesses of individual systems is important to help mould systems together for the betterment of farm profitability.