



## ASSESSING ENERGY EFFICIENCY ON THE FARM

*Keith W. Hipel*



Producing food consumes a lot of energy — and, as a result, creates a significant proportion of the world’s greenhouse gases. As the global population grows and the planet continues to heat up, it becomes more important than ever to produce food efficiently.

That’s why WISE member Keith Hipel, along with colleagues at York University and Queen’s University, recently scrutinized five different agricultural systems in coastal Bangladesh to compare energy efficiency and greenhouse gas emissions.

Traditionally, rice has been the staple crop in Bangladesh. In recent years, however, shrimp production has increased to supply export markets. Meanwhile, farmers in some regions focus on intensive production of a single crop, while in other regions, they combine several crops in an integrated system.

To assess each system, the researchers calculated the energy costs of inputs — everything from human labour to fuel, machinery, fertilizers and pesticides. They also calculated the energy value of each crop. Subtracting the first from the second yields net energy efficiency.

The study revealed that shrimp was the most energy-intensive crop, while integrated systems were more efficient than those focused on a single crop. The most efficient of all was integrated prawn-rice-vegetable production, which also created the lowest levels of greenhouse gas emissions.

For farmers and policy makers in Bangladesh, these findings provide important insights. More broadly, Hipel and his colleagues have established a model that can be applied elsewhere, helping identify the most sustainable agricultural systems around the world — and thus the most efficient ways to feed the planet.

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