

Can tilapia be grown successfully in the UK?

Kathleen Grady, Francis Murray, Jimmy Young, Andrew Watterson and Dave Little explain as part of their project looking at 'Warm Water Fish Production as a Niche Production and Market Diversification Strategy'

The tilapia has long since been recognised as a hardy, adaptable, warm water fish with considerable potential for further contribution to aquatic food supplies (Beveridge and McAndrew, 2000). More recently an FAO report described it as 'the fish of miracles': one that can solve the protein problems of developing countries while satisfying the increasing demand for fish in the developed

world (Josupeit, 2005). Tilapias are noted to be highly suitable for low cost aquaculture as they thrive on a herbivorous diet, cutting out the requirement and high cost of fish feeds (typically representing up to 80% of production costs and a dependence upon diminishing wild stocks). Farming herbivorous tilapia therefore has the potential to be a more sustainable source of protein with fewer environmental impacts; and with its firm, white flesh and mild taste could be a suitable substitute for wild whitefish stocks such as cod and others, which are over-fished and increasingly expensive.



Figure 1. Farmers in the UK could be producing this

world (Josupeit, 2005). Tilapias are noted to be highly suitable for low cost aquaculture as they thrive on a herbivorous diet, cutting out the requirement and high cost of fish feeds (typically representing up to 80% of production costs and a dependence upon diminishing wild stocks). Farming herbivorous tilapia therefore has the potential to be a more sustainable source of protein with fewer environmental impacts; and with its firm, white flesh and mild taste could be a suitable substitute for wild whitefish stocks such as cod and others, which are over-fished and increasingly expensive.

Developing a sustainable system for tilapia culture as a potential diversification strategy for small scale agricultural farmers in the UK is currently under investigation at the University of Stirling. The research team, consisting of the Institute of Aquaculture, Public Health Research Group and the Department of Marketing, began this three-year collaborative project in January 2005. The unique tri-Faculty grouping is funded by the Research Councils UK Rural Economy and Land Use Programme (RELU) which aims to advance understanding of the challenges that rural areas in the UK are experiencing and

The RELU Research Team

promote sustainable development. Our research aims to develop a novel aquaculture approach, adopting a sustainable and environmentally friendly production method for farmed fish and encouraging the integration of the warm water species, tilapia, into mainstream farming in the UK. This might allow diversification and other benefits for small scale producers whilst stimulating growing niche markets for fresh fish in the UK.

The Stirling-based RELU project involves a collaborative approach, with a principal investigator from each of the three key disciplines involved: Professor Andrew Watterson from the Public Health Research Group, Dr Dave Little from Aquaculture and Professor Jimmy Young from Marketing. Dr Francis Murray and Kathleen Grady are the project researchers, working with all three University departments. Two commercial partners, Pisces Aquaculture in Stirling and Fresh Water Fish Farms Ltd in Devon, will also be involved with the project. Both partners will help with the development of the innovative culture system by undertaking technical trials. In addition, further international collaborations have been organised to promote the wider perspectives of the project. This multi-disciplinary approach allows a detailed assessment, integrating technical research with market and social analysis at the farm, market and general public levels.

Research Problem and Progress

The primary aim of this project is to develop technical guidelines for tilapia production, appropriate to integration within UK agricultural farms as a diversification strategy. The current knowledge and perceptions of industry and consumers will be examined, specifically regarding sustainability, health benefits, food safety and costs and risk data on tilapia farming. The social and economic factors that may facilitate or obstruct consumers' propensity to access new products will be identified and the comparative advantage of domestic tilapia production compared with the potential competition from imports will be explored.



Figures 2 and 3. Consumers in the UK could soon be eating more home-grown tilapia

Diversifying from conventional agricultural production poses major challenges, including lack of market information, the novelty of the products and the lack of appropriate production models. Therefore, our research will develop new knowledge around the opportunities for production of tilapia in rural areas, examine the concerns in small fish farming enterprise decision-making and investigate the potential for organic certification and other routes to enhance product values. Consumers' perceptions of such products and assessment of their impact on environmental and public health factors will also be considered.

The main marketing focus for the first year is to conduct an assessment of world tilapia markets with specific interest in Europe and the three tilapia target groups: ethnic consumers, green consumers and the gastro-pub set (a growing component of the wider foodservice market). Recent developments in the USA

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are also of interest, where tilapia consumption has moved beyond these three niche markets and become more mainstream. This secondary data analysis will be followed up with interviews and focus groups of consumers and producers in the next few months, developing a detailed understanding of consumer perceptions and attitudes towards seafood products, food and organic aquatic food products. Health, welfare, environmental and sustainability impact analyses are also underway, developing an evidence base of current knowledge in respective areas which will be further developed when combined with evidence from technical trials.

The first round of technical trials (Phase 1) are underway, assessing tilapia growth rates and water quality with various stocking densities and feeds in a sustainable dark-water system (as opposed to the conventional energy-intensive, fish meal based, clear water recirculation system). Trials with our commercial partners will be based

on the outcomes of these and are scheduled to commence later this year. Tilapia welfare and microbiological trials are scheduled for early 2006. Phase 2 laboratory and commercial trials are scheduled for late 2006 using results from all previous trials to refine the technology and assess the practicality of sustainable tilapia farming in a commercial base.

The health, environmental and sustainability impact analyses will be on-going throughout the three year duration. Marketing efforts will continue to focus on consumers and organic potential, examining tilapia acceptability and appropriate market positioning through tasting sessions and interviews with producers and retailers. Year 3 will focus mainly on dissemination, and tilapia production trials with interested farmers may be undertaken.

Our RELU project web page, <http://www.aquaculture.stir.ac.uk/Systems/TilapiaProject>.

htm, has further details of the project and team members. Further questions on our research programme are welcome through the above website or f.j.murray@stir.ac.uk or Kathleen.grady@stir.ac.uk The RELU Programme web page, which details the programme rationale as well as information about other RELU projects, can be accessed at www.relu.ac.uk. Our commercial partners in Stirling can be found at <http://www.pisces-aqua.co.uk/> while Fresh Water Fish Farms Ltd in Devon is currently undergoing website development.

References

Beveridge, C M & McAndrew, B J (2000) *Tilapias: Biology and Exploitation*. Kluwer Academic Publishers Dordrecht, The Netherlands 505p.

Josupeit, H (2005) *World Market of Tilapia*. Globefish report April 28p.

High dykes in the Mekong Delta in Vietnam bring social gains and environmental pains

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Changes to agricultural technology and an increase in population over the past thirty year have led to significant changes in water and land management in the Mekong Delta, Vietnam. Parts of the delta are now completely protected from the annual flood by systems of high dykes and farmers living inside them are able to cultivate three or more crops per year, as well as raising cattle and aquaproducts. High dykes have brought some economic gains, some environmental disbenefits but also some so-far unrecorded social gains. This short article reports preliminary findings from fieldwork carried out with staff from An Giang University (AGU) between 2002-04. It begins by setting out the changes that have taken place in the delta in the past 30-35 years. It describes some of the advantages and disadvantages of high dykes and suggests how the gains might be maintained while some of the disadvantages might be reduced.

The Mekong Delta lies in the tropical monsoon belt. It has an area of some 6 million hectares, two thirds of which lie in Vietnam, the remainder in Cambodia. The monsoon rain occurs between June and December and for part of this time much of the delta is covered with flood water. At the back of the delta, near the border with Cambodia, this rainwater is added to by water

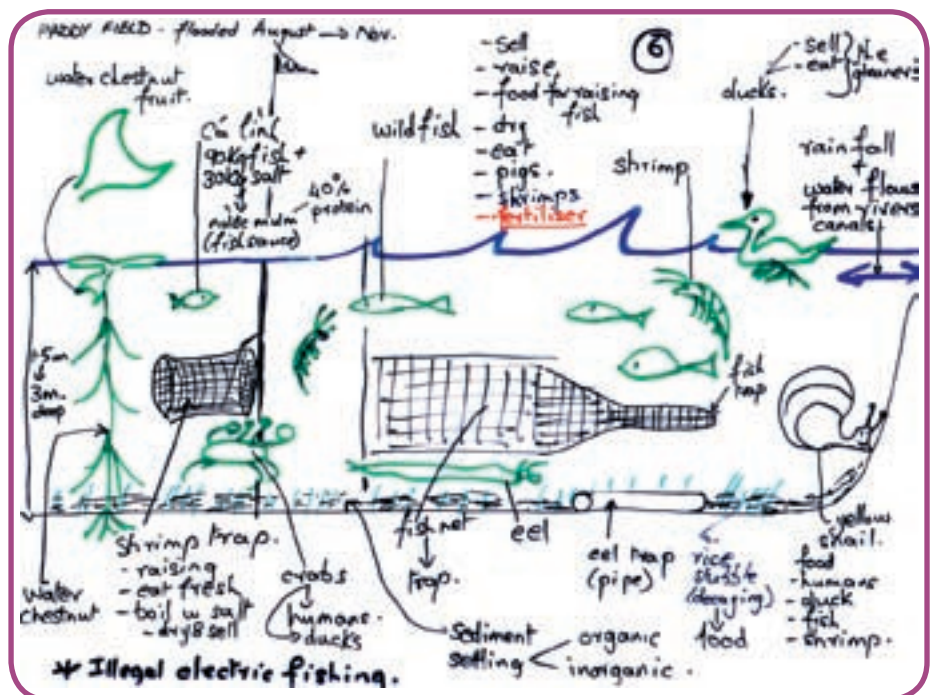


Figure 1. What a flooded paddy field provides.

flowing out of rivers and canals and over the land. In some places in An Giang province at the back of the delta, low-lying areas of land are inundated by 2-3 metres of water for three

or four months from August onwards. Each cubic meter of river water contains up to half a kilogram of sediment, silt and organic matter. This natural fertiliser and soil has built the delta