



Transporting of hilsa from primary market to wholesale market by a boat



Hilsa trading at retail market

markets (US\$ 0.37 per kg) followed by retail (US\$ 0.22 per kg) and primary markets (US\$ 0.14 per kg). Similarly, the highest average marketing profit was found in secondary markets (US\$ 0.30 per kg) compared with retail (US\$ 0.18 per kg) and primary markets (US\$ 0.09 per kg).

Marketing Constraints

In general, facilities at fish markets are minimal, with poor hygiene and sanitation. There are currently no standard practices for handling, washing, sorting, grading, cleaning and icing of fish. At the primary market level, the main constraints for fishermen are a lack of bargaining power and market information. The marketing infrastructure, including cold storage, ice and transport facilities are generally inadequate, unhygienic and in

disrepair. Political disturbances (i.e. strikes, road blocks, etc.) also affect fish transportation as well as marketing. Comparatively, wholesale markets have better facilities, but in general conditions in primary and retail markets are far from satisfactory with regards to stalls, parking, spacing, sanitation, drainage and management.

Further Development

A number of issues are important for the development and sustainability of hilsa marketing including:

- Infrastructure: improvements of fish landing, modern wholesale and retail markets, road and transport systems, handling, and preservation facilities are essential to supply quality products.
- Supply of ice: insufficient supply of ice in markets is one of the most serious problems for hilsa preservation. Ice is fundamental for good quality fish storage and preservation. Having ice readily available on the premises would facilitate the enhancement of appropriate fish handling. It is therefore necessary to establish a sufficient number of ice factories for marketing of quality hilsa.
- Credit facilities: fishermen, traders and intermediaries do not have easy access to bank and non-government organization (NGO) credits due to too much official paperwork and collateral arrangements. Therefore, assisting traders to obtain cheaper adequate bank credit for market operating costs should be considered.
- Hygiene and quality: there seems to be very limited knowledge amongst fishermen, traders and intermediaries with regard to sanitary standards and fish quality. It is also imperative that the fish markets

are kept clean. Proper management with regard to day-to-day maintenance of the premises from a sanitary point of view has to be ensured. Improvements to hygienic conditions of fish landing centres and markets are essential for producing good quality products. Thus, training of fish market operators in areas of preservation, handling, icing and curing should be provided.

- Government policy: a positive policy at government level should be considered for sustainable hilsa marketing systems.

Acknowledgements

The study was funded through the UK Department for International Development (DFID) as part of their Aquaculture and Fish Genetics Research Programme (AFGRP). The author wishes to thank Professor James F. Muir of the Institute of Aquaculture, University of Stirling, UK for his excellent research support. The author is also thankful to Professor M A Wahab, President of Bangladesh Fisheries Research Forum (BFRF) for his guidance and encouragement.

References

- DOF. 2005. National Fisheries Fortnight – 2005. Department of Fisheries (DOF), Government of the People's Republic of Bangladesh, Dhaka.
- Fisheries Sector Review. 2003. The Future for Fisheries: Economic Performance. Commissioned with the Association of the World Bank, DANIDA, USAID, FAO and DFID with the cooperation of the Bangladesh Ministry of Fisheries and Livestock, and the Department of Fisheries, Dhaka.
- Jacinto, E.R. 2004. A Research Framework on Value Chain Analysis in Small-scale Fisheries. Tambuyog Development Center, Philippines.
- Kanji, N. and S. Barrientos. 2002. Trade Liberalization, Poverty and Livelihoods: Understanding the Linkages. IDS Working Paper No. 159, Institute of Development Studies (IDS), Brighton, UK.
- Kaplinsky, R. and M. Morris. 2000. A Handbook for Value Chain Research. International Development Research Center (IDRC), Ottawa, Canada.
- Kleih, U., K. Alam, R. Dastidar, U. Datta, N. Oudwater and A. Ward. 2003. Livelihoods in Coastal Fishing Communities and the Marine Fish Marketing Systems of Bangladesh. NRI Report No. 2712, Natural Resources Institute (NRI), Greenwich University, London.
- Porter, M.E. 1980. Value Chain Analysis. Oxford Press Ltd, London.
- Trondsen, T., K.G. Mapp and J.A. Young. 2004. The Strategic Role of the Value Chain in Fish Marketing. Paper Presented in EAFE, Rome, Italy.

Tilapia UK...OK, but AST out as RAS prevails

Kathleen Grady, Dave Little, Jimmy Young, Andrew Watterson and Francis Murray give an update on the tilapia project: 'Warm Water Fish Production as a Niche Production and Market Diversification Strategy for UK Farmers'

The project is developing a sustainable system for the culture of tilapia in the UK while investigating the health impacts and potential markets for this warm water species. Now in the third and final year of the project and with the bulk of research entering

the final phases, public, academic and stakeholder dissemination is a top priority. This year we will also engage farmers who are interested in adopting small scale tilapia production as an income supplementing diversification strategy.

Research

Technical results so far have shown that the novel Activated Suspension Technology (AST) system will not be a viable option for farmers, as originally envisaged. Conventional recirculation systems (RAS) are a more financially realistic option with higher tilapia growth rates and the capacity to operate at higher stocking densities without negative impacts on growth or fish welfare. Therefore, the final tilapia trials are

exploring the factors that impede feed intake and growth in AST systems and developing feeding strategies that use ingredients produced on-farm by UK farmers.

Consumer focus groups were undertaken throughout 2005 and 2006, in various parts of the UK, exploring attitudes towards health, food and fish. Participants discussed issues such as sustainable food production, organic fish, the health benefits associated with fish consumption and their awareness and purchase habits of tilapia. Following this, product testing was undertaken to assess the reaction to tilapia within the foodservice sector. Tilapia was well received in Devon when it was featured on the menu in a restaurant and a pub, to gauge both chefs' and customers' reaction to tilapia in their normal working and dining environment. Interviews with various fish processor and wholesale suppliers, fishmongers and restaurant chefs were also undertaken to obtain a broader spectrum of knowledge and reaction to high quality, locally farmed tilapia in Devon.



'Pan Fried Medallions of Tilapia, Oriental Vegetables & Sherry Vinegar Jus', Masons Arms, Devon, September 2006

During the summer of 2006 Sarath Kodithuwakku, from the University of Peradeniya, Sri Lanka visited Stirling to undertake three months of farming entrepreneurship research with the project team. This further disciplinary perspective explored the entrepreneurial challenges faced when diversifying from conventional agriculture; in-depth interviews with a range of agricultural farmers in Central

Scotland brought light to the factors that either encouraged or prevented them and their families from adopting diversification strategies. Follow-up research is intended to explore the entrepreneurial characteristics of UK farmers who adopt small scale tilapia production as a diversification strategy. Through this multidisciplinary approach, an improved understanding is being generated of the business and market environment for small scale producers; this is particularly relevant given the current increasing interest and activity in tilapia production within the EU and elsewhere.

For further information on our project and team members please see our project web page: <http://www.aquaculture.stir.ac.uk/Systems/tilapiaProject.htm>

Further questions on our research programme are welcome through the above website or by emailing Francis.f.j.murray@stir.ac.uk or Kathleen.Kathleen.grady@stir.ac.uk Details on the RELU Programme which is funding this research and other RELU projects can be accessed at www.relu.ac.uk.

Stirling Aquaculture - Update

Sue Paffrath, Researcher

In 2006 Stirling Aquaculture collaborated with the Caledonian Business School, Glasgow Caledonian University to evaluate the economic impact of the salmon parasite *Gyrodactylus salaris* (Gs) should it be introduced into Scotland. The aim of the study was to estimate the economic consequences of the introduction of Gs and to identify the costs of prevention, eradication and containment.

Gs is a freshwater ecto-parasite that infects Atlantic salmon (*Salmo salar*) and a number of other salmonid species. It is one of many salmonid-infecting gyrodactylid species, which belong to the monogenea – a larger group of relatively simple, soft bodied flatworms that are primarily fish parasites. At less than 1mm in length, Gs infests the skin, fins and gills where its attachment and grazing activity can lead to host death through salt and water imbalances. The parasite has been present in Norway for over thirty years and since the 1980s is thought to have been responsible for the loss of an estimated 300 tonnes of Atlantic salmon from Norwegian rivers.

It is generally assumed that the parasite would be introduced to a single catchment and would spread throughout the entire river system. If no action is taken to prevent transfer of Gs to other locations then, eventually, it could become established throughout Scotland. The main outcome of the study showed that should no action

be taken to prevent the spread of Gs the country would see the loss of 2,000 full time-equivalent jobs, a decrease in net economic value of £633m and a reduction of £34.5m in annual household income. In addition to salmon angling, the aquaculture sector could be seriously affected by Gs. However, the sector would have the incentive and ability to invest in more biosecure facilities to protect themselves. Effectively, the economic consequences of Gs infestation would be confined to the loss of salmon angling.

Measures that would potentially reduce the probability of Gs entering the UK could be taken by the provision of disinfection stations at ports and by extensive publicity and education highlighting the dangers of the parasite. The cost of these measures is put at £6m, which is small in comparison to the potential economic and social losses. An eradication strategy might be possible depending on the size and complexity of the river system. This strategy would have implementation costs, but overall would generate economic benefits as the river recovers its full use.

A strategy of containment to prevent infestation elsewhere in Scotland might be the most appropriate policy for large, complex river systems. Such a policy might be limited to minimal exclusion focusing on the greatest transmission risks, or it could extend to the total exclusion of the public from the water.

The full Economic Impact Report, the Gs Contingency Plan and the Chair's Report can be found at the link below

<http://www.scotland.gov.uk/Topics/Fisheries/Fish-Shellfish/18610/13929>

and the accompanying news release:

<http://www.scotland.gov.uk/News/Releases/2006/12/07101414>

BBSRC Short Courses

Designed to accommodate the known time constraints of the key workers towards whom they are geared, the University of Stirling and University of Glasgow offer a series of intensive residential courses and internet-based follow-up discussion, in the areas of Feed Management and Environmental Monitoring.

The following courses are available in 2007:

Feed management, 10-11 May
Environmental Monitoring and Management, 14-16 May

Lectures, discussions and practical exercises are given by experts from academia and industry covering issues of relevance across the sector. Feed Management deals with the biology, technology, impact and future direction of this critical area of aquaculture. Environmental Monitoring and Management concentrates primarily on the impacts of cage culture, addressing Environmental Impact Assessments (EIA) and other regulatory data requirements.

For more information please see <http://www.atc.stir.ac.uk/courses>