



Cage Aquaculture in Malawi

PURPOSE

This briefing note summarizes the current status of the cage aquaculture industry in Malawi, development opportunities, and economic social and environmental concerns that need to be addressed to ensure sustainability of the industry.

BACKGROUND

Malawi has experienced a sharp decline in tilapia production in recent decades. The total production of chambo (*Oreochromis karongae*) declined from a record high of over 9,400 tonnes in 1985 to as low as 1,400 tonnes by 1999, contributing only 7% to total capture fisheries production, down from 49% in 1982. These developments contributed to the increased emphasis on developing aquaculture as a major source of fish and income. Aquaculture now occupies a strategic position in the fisheries sector. The projected demand for large chambo (greater than 150-200 g per piece) is estimated at around 10,000 tonnes per year for 2008-2018. Development of a viable and sustainable cage aquaculture industry has therefore been identified by the Government of Malawi (GoM) as a flagship programme. It will contribute to meeting market demand for tilapia and meeting its strategic aquaculture objectives, as outlined in the National Aquaculture Strategic Plan (NASP), the Chambo Restoration Strategic Plan (CRSP) and the Presidential Initiative for Aquaculture Development (PIAD). The above context presents opportunities for private sector investment in this sector.

CURRENT STATUS

The GoM has taken a precautionary approach to the development of the cage aquaculture industry and to date

has allowed only one private sector investor, Maldeco Aquaculture Limited, to produce fish in cages. Maldeco Aquaculture is a vertically integrated firm which produces its own feed, fingerlings and table fish. Maldeco has a production target of 3000 tonnes per annum but is currently producing 750 tonnes of fish from 48 salmon-type cages in the south-east arm of Lake Malawi. Retail prices for farmed fish from cages range from MK350 (low grade; 100-200 g) to MK650/kg (high grade; >300 g), equivalent to US\$2.33 to US\$4.33/kg.

Other cage aquaculture investments have been implemented at a pilot scale by Malawi Government and the NGOs Total Land Care, Project Concern International and the COMPASS II, primarily to establish the feasibility of small-scale community based cage aquaculture. Africa Novel Resources has shown a strong interest to invest in a small-scale cage aquaculture out-grower scheme with a production target of 12,000 tonnes per annum. This project is currently in the planning phase.

Despite the cage aquaculture industry being declared a flagship programme, government support has so far been limited to the facilitation of environmental monitoring studies and research for pro-poor cage culture technology with the view of encouraging the participation of small-scale producers in cage aquaculture.

KEY CONSIDERATIONS

The following key issues need to be considered and addressed for the sustainable development of the emerging cage aquaculture industry to develop and contribute towards food security and economic development:

- Private sector development
- Regulatory framework
- Research and extension
- Environmental and social impact

PRIVATE SECTOR DEVELOPMENT

Development of contractual partnerships between growers and commercial aquaculture companies for cage aquaculture, establishment of an aquaculture marketing framework, public and private sector investment in research and development and enhanced networking between private sector investors have been identified by stakeholders in Malawi as key preconditions to increased participation of the private sector in aquaculture development.

Development of out-grower schemes

The term 'out-grower scheme' is often applied to schemes where agri-business has considerable control over the smallholder production process, providing a large number of services, such as input credit, extension, harvesting and processing. The smallholder provides land and labour in return for this comprehensive extension/input package. Out-grower schemes have been identified as a practical model to increase the participation of small-scale producers in cage aquaculture. The major advantages of out-grower schemes are that they:

- Provide farmers, who naturally would not have invested in cage aquaculture due to high capital requirements, opportunities to participate in the sector.
- Enhance marketing of products.
- Improve competitiveness in input supply, consistency in quality of inputs procured and allows small-scale operators to benefit from bulk purchase discounts.

Several out-grower models such as franchising, satellite model driven by processors and wholesalers, or cooperatives evolving from a mentorship program have been found to be practicable. However, choice of model must be determined on a case by case basis.

Marketing Framework

Existing aquaculture markets in Malawi are generally unsophisticated and information on standards and product differentiation is not generally available. Because of its targeting of national and formal markets, cage aquaculture is likely to address issues of standards and product differentiation better than pond aquaculture.

To improve the market framework there is need to consider the entire aquaculture value chain, starting with the development of reliable fingerling and feed supply and a sound understanding of consumer preferences, potential volumes, and purchasing power of consumers. The development of a marketing and legislative framework that would allow a truly competitive cage culture industry to evolve, should also be considered.

Networking

There is need for the nascent cage aquaculture industry in Malawi to learn from successes and failures of cage aquaculture in Africa and elsewhere. Improved information/knowledge sharing and dissemination between investors and researchers in Malawi and the rest of the continent must be promoted. Cage culture operators and investors in Malawi should be encouraged to participate in regional networks such as the Sustainable Network for Aquaculture Research in Sub-Saharan Africa (SARNISSA); Tilapia Group; Commercial Aquaculture Producers of Africa (CAPA).

REGULATORY FRAMEWORK

There remains a lack of institutional capacity and arrangements to establish guidelines and regulations to facilitate the sustainable development of the industry and allow the public sector to respond to investment needs. These include tax incentives, environmental management and licensing guidelines, availability of trained personnel, stable power supply and availability of foreign exchange to import equipment and materials. It should be noted that a general lack of regulatory instruments is in itself not an impediment to the development of the sector and that many European countries have used general statutory instruments. In Malawi, special consideration should be given to identifying general regulatory instruments that could be used to guide cage aquaculture development. However, there is specific need to develop guidelines for investors within a context of multiple uses of water and land resources.

RESEARCH AND EXTENSION

Cage aquaculture investment models

Cage aquaculture is a new industry in Malawi; consequently it has proven difficult to attract investment to the sector. Before cage aquaculture can be promoted nationally, there is need to develop different cage aquaculture investment models that can be presented to potential investors and banks.



Genetic improvement of local species and mono-sex culture

Use of improved fish strains and mono-sex culture can improve profitability of cage aquaculture and result in the production of consistent products for the market. Genetic improvement breeding programs, targeting traits such as improved growth, disease resistance and other market attributes, should be developed and implemented through collaboration between the public and private sectors. However, it is also essential to develop risk assessment and management plans that identify potential impacts of improved strains on indigenous chambo genotypes and how these can be managed. Once developed, genetically improved strains should be made available to private hatcheries for mass production under licenses granted by a government regulatory agency.

Feeds

Low quality feed and the lack of proper feeding guidelines for cage aquaculture significantly affects profitability and environmental quality of natural waters and sediments. Investments in feed development can increase profitability and reduce pollution. Research to understand the feeding behavior of local species used in cage aquaculture is

needed to reduce feed wastage, increase feed conversion efficiencies and maximize growth and profits. There is also a need to develop fish feeds for different stages of the life cycle and to promote use of extruded, floating feeds, which are more digestible and stable in water. Research on the incorporation of local ingredients in fish feed is also required to reduce the ecological footprint of cage culture and increase complementarities with other agricultural production systems.

Extension and capacity building

The cage culture industry needs well trained extension personnel to support the development of a sustainable industry in Malawi. There is need to build capacity of existing personnel and develop new capacity building programs at university level that will focus on training personnel to ensure sufficient skills in environmental regulation, cage culture technology development and business development facilitation and management. It is also essential to develop capacity of local institutions, private companies in business development services provision to the cage culture industry.

Environmental and social impacts

Cage aquaculture can be both highly profitable and pro-poor, but there is abundant evidence from Asia and elsewhere that to maximize impacts on the resilience of riparian communities and on economic growth and food security the sub-sector must be properly planned and regulated. Cage aquaculture makes heavy demands on ecological services (e.g. waste dispersal and assimilation). To sustainably deliver such services, without significant adverse effects on other stakeholders, production must be matched to the capacity of the environment.

Cage aquaculture can also be socially divisive, increasing the vulnerability of riparian communities dependent upon the lake or river for essential ecosystem services, such as drinking water and fishing. The potential of cage aquaculture to stimulate economic growth and increase food security is often not fully realized because of a failure to understand the various benefits – employment, food security, etc. - to be derived from different sorts of development within a designated cage aquaculture zone e.g. many SME-type operations or a few, larger scale export-oriented businesses.

CONCLUSION AND/OR RECOMMENDATIONS

Cage aquaculture has significant potential to contribute towards food security, economic growth and employment in Malawi. However, for the cage aquaculture industry to realize its full potential the following actions are recommended:

Private sector development

- GoM should seek financing or provide funds for EIA in designated cage aquaculture zones so that (smaller-scale) investors within that zone do not have to carry out additional EIAs
- Encourage, through market research, promotion and infrastructure investments, the development and penetration of national and regional markets

Regulatory framework

- Develop criteria and designate zones for cage aquaculture
- Invest in the development of practical, environmental carrying capacity models

Photo credits

M. Beveridge
D. Jamu

For further details contact:

Dr. Daniel Jamu

Email: d.jamu@cgiar.org

The WorldFish Center – Malawi Office
National Aquaculture Center, Domasi, MALAWI
P.O. Box 229, Zomba, MALAWI
Tel: (+265-1) 536 298, (+265-1) 536 274, (+265-1) 536 313
Fax: (+265-1) 536 274
E-mail: worldfish-malawi@cgiar.org

For more information on cage aquaculture in Africa:
Sustainable Network for Aquaculture Research in Sub-Saharan Africa (SARNISSA)
Website: www.sarnissa.org

Commercial Aquaculture Producers of Africa (CAPA)
Website: www.aqua.stir.ac.uk/development/CAPA/

Briefing Note 2119. The WorldFish Center, August 2010

© 2010 The WorldFish Center
All rights reserved. This brief may be reproduced without the permission of, but with acknowledgment to, The WorldFish Center.

- Implement transparent and sufficiently long-term leasing/licensing agreements based on zoning and quotas based on carrying capacity and annual monitoring and verification procedures
- Reinforce and continue simplifying permitting in general; institute a “one-stop-shop” for cage licenses (e.g., implemented through Malawi Investment Promotion Agency)
- Legislate tax incentives or otherwise subsidize private sector-led R & D
- Establish certification system to enforce quality standards on food fish.
- Build institutional capacity to implement and enforce an adaptive management regime for cage aquaculture throughout the country.
- Promote the development of a platform for experience sharing in cage aquaculture among African states.

Research and Extension

- Develop/identify genetically improved strains material for cage aquaculture based on a critical review of associated/potential cost/benefits relative to national development priorities
- Identify and fund systems for the building of human resource capacity in aquaculture
- Seek support from Regional and Sub-Regional organizations, and from Advanced Research Institutes actively researching in this area, to conduct fundamental research on impacts of cage aquaculture on sub-Saharan African lakes.

