

Aquaculture in South Africa: FROM FINGERLING TO PRIZE CATCH

A recently completed project initiated and funded by the Water Research Commission (WRC) has done much to raise the profile of aquaculture in South Africa. Article by Lani van Vuuren.

Today, the farming of aquatic organisms, or aquaculture, is the fastest growing animal food producing sector in the world. According to the Food and Agriculture Organisation of the United Nations (FAO), farmed fish now accounts for nearly half of the world's total food fish consumption. In 2008 (the latest figures available), global production of fish from aquaculture reached 52,5 million tons. The sector is dominated by the Asia-Pacific region, which is responsible for nearly 90% of global farmed fish production.

The accelerated growth of the sector has mainly been ascribed to concerns around wild fisheries and threats of overfishing to world fish populations; increases in the demand for fish due to population

growth and awareness of health benefits of fish; an increase in the real price of fish as well as the development in fish farming technology, resulting in a significant rise in the number of new species being farmed.

The sector has been slower to take off in sub-Saharan Africa, and only 0,5% of the world's farmed fish comes from this region, however, the last decade has seen the sector taking off in many African countries as governments have realised the

importance of fish as a high-protein food source and seen the potential of aquaculture to relieve hunger and improve livelihoods. The bulk of aquaculture production in sub-Saharan Africa is from freshwater, predominantly of the indigenous and ubiquitous species of tilapias and African catfishes.

AQUACULTURE IN SOUTH AFRICA

The aquaculture sector in South Africa remains low in regional and world terms. The sector has a complex history in South Africa. Various government agencies promoted freshwater aquaculture here during the late 1960s to 1980s, and several well-equipped hatcheries were constructed mainly in the



former 'homeland' areas to supply fingerlings to private and government projects. However, of the 13 government hatcheries then existing, only three are still operational but at reduced capacity and efficiency. Some commercial aquaculture enterprises have been established successfully since 1994, the most successful being focused around high value fish (like trout for restaurants) and shellfish (like abalone).

The potential of freshwater aquaculture in South Africa is said to be partly constrained by the natural environment. Firstly, water is a scarce resource, while the country is subjected to extreme seasonal temperature fluctuations over much of the interior. For example, winters over large parts of the interior are too cold for economically viable production of many warm-water aquaculture species, yet the summers in the same areas are too warm for cold water fishes.

However, despite these constraints, it is believed that aquaculture can make a valuable contribution in alleviating hunger and improving rural livelihoods. "In recent years government has, through initiatives such as the Zero Hunger Programme, encouraged rural communities to not only become self sufficient in food production, but also to produce enough to sell. Aquaculture can certainly add to these efforts," says Qurban Rouhani, WRC project leader and Programme Manager of the Rural Fisheries Programme at Rhodes University. "We are also seeing a local increase in the demand for fish from both the urban and rural sectors linked to its health benefits, although the connection to aquaculture as a method of meeting this demand for fish has not sufficiently been made."

AQUACULTURE AND THE WRC

Over the last decade, the WRC has initiated and invested in a number of research projects on



Courtesy Rhodes University



Courtesy Rhodes University

aquaculture. The first was a baseline study on the contribution of aquaculture to rural livelihoods in South Africa. In this report, published early in 2004, a number of priorities for further research were identified. (For more on this study see 'Aquaculture gets a second chance in South Africa' in *the Water Wheel*, May/June 2005).

Top: Fish being sold along the roadside in Limpopo. Farmers can establish a considerable number of customers by selling fish informally.

Above: Stocking a dam with trout fingerlings in the Western Cape Province, as part of a project to develop emerging farmers.

Courtesy Rhodes University



Courtesy Rhodes University



Top: Extension officers from the Limpopo Department of Agriculture visiting a rural fish farmer.

Above: An emerging farmer with fish from a dam in the Eastern Cape.

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In cooperation with Rhodes University, widely-based consultation with provincial departments of agriculture followed. Given the support that was expressed, a participatory action research project was consequently undertaken to evaluate the role of State hatcheries. This finally led to the latest report from Rouhani and colleague, Prof Peter Britz of the Department of Ichthyology and Fisheries Science, namely *Participatory Development of Provincial Aquaculture Programmes for Improved Rural Food Security and Fisheries Science*, published late last year.

WRC Director: Water Utilisation in Agriculture, Dr Gerhard Backeberg, explains that this research work coincided with the evolvement of a national policy on aquaculture, driven by the Department of Agriculture, Forestry & Fisheries (DAFF), who also co-funded the WRC solicited research projects. “This makes the implementation of policy through provincial aquaculture strategies possible.”

PROVINCIAL AQUACULTURE STRATEGIES

One of the outputs of this project was the formulation of aquaculture strategies in participation with department of agriculture personnel in most provinces. According to Rouhani there was significant support from the various provinces for this project. “All of our counterparts in the various provincial departments expressed a need for the technical support this project brought them, and were genuinely engaged with the team.”

Interestingly, for many provincial department officials, it was their first involvement with aquaculture. Unfortunately, the project exposed the often severe organisational and capacity challenges faced by the provincial departments. “In evaluating the project it is clear that some of the

project goals were not achieved due to organisational constraints within the provincial departments," it is stated in the final report. "Of particular concern is that farmers were not effectively engaged with or support provided. Aquaculture capacity building within the department is a long-term process that will require national guidance and coordination."

A key requirement for successful aquaculture programmes is that provincial departments are well organised, notes Dr Backeberg. "It requires recognition of a separate function for aquaculture with trained and dedicated staff and coordination of technical services at hatcheries as well as extension services to farmers. Continuity of personnel is essential for achieving service delivery to establishing viable aquaculture enterprises in rural areas."

This raises the question of whether the provincial departments are the most appropriate public sector organisation for establishing a new sector such as aquaculture. However, it is believed that some form of State intervention will always be required, especially for emerging farmers.

"Aquaculture will only be viable if it is profitable and attractive for investment by private sector commercial interests," adds Dr Backeberg. "This means that aquaculture development has to be market led, meeting consumer demands at lowest possible cost, but also requiring government support."

Specific attention has to be given to establishing new, emerging small business farming enterprises with opportunities for employment creation in rural areas. "This purpose can be achieved with public-private partnerships in which State hatcheries are operated by competent technical personnel producing fingerlings for profitable enterprise by farmers with extension services linked to these development nodes," adds Dr Backeberg.

An important first step in the development of rural aquaculture



Courtesy Rhodes University

Left: Aquaculture is not just about producing food. Here a farmer in KwaZulu-Natal is sorting fish for the ornamental fish trade.

Below: The African aquaculture sector has grown drastically in the past decade.

has been the development of draft provincial aquaculture strategies in participative workshops for the Limpopo, Mpumalanga, KwaZulu-Natal, Free State, Northern Cape and North West provinces. The strategies provide a valuable 'road map' for the provincial agriculture departments to plan and develop aquaculture in the provinces.

REVITALISATION OF STATE HATCHERIES

In addition, the project undertook the revitalisation of selected existing provincial hatcheries to act as development hubs for emerging farmers, from which to provide services such as advice, training and fingerlings. The facilities were found to be in a general state of disrepair, operating on low budgets and with few skilled staff, and were not performing. A critical aspect was that the operation of these provincial facilities had no guiding policy and their existence seemed to be dislocated to the needs of the province. The project team was able to provide technical support not only in the training of staff at various provincial hatcheries, but also to develop strategic plans on the revitalisation and operation of these hatcheries in close cooperation with the provincial agriculture departments.

One of the hatcheries to receive

a makeover was Turfloop hatchery near Polokwane, in Limpopo, which was originally established in 1982 as a catfish production and research facility under the former Lebowa homeland. The facility, which ceased operation in the early 1990s, began operating again following investment of the provincial agriculture department and support by the WRC project team.



Niall Crotty/Wikipedia

In 2008, catfish were spawned again on the site for the first time in ten years. By 2009, Turfloop was producing its first male tilapia with technical assistance from Limpopo University's aquaculture unit. Although there is still much work to be done a valuable and substantial aquaculture facility is once again in operation.

According to Rouhani, the most valuable lesson learnt during this project is that emerging farmers are not looking for handouts. "Emerging aquaculture farmers need practical advice on how to produce more efficiently and assistance to compete with commercial farmers in the market on a more equal level. While we can provide the technical assistance, it is up to government to create an enabling environment for emerging farmers to become successful."

VIABLE FUTURE

Arguably, the most important contribution of the WRC project was to increase the profile of aquaculture in the eyes of the government. "Through our constant communication and interaction with various agriculture department personnel and stakeholders, aquaculture has been placed firmly on the agenda where before it had a very low priority," notes Rouhani. "We have now reached a point of

no return with regards to the role of government in aquaculture development. This project has played a role in the process."

A highlight for Dr Backeberg has been the publication of a manual for rural freshwater aquaculture as part of this project, which was guided through the various stages of testing by the Rural Fisheries Programme. "This manual is a most useful practical guide for both farmers and extension officers." The manual covers everything from basic fish biology to setting up ponds, production and shipping, to feeding, health and disease issues. It is envisaged that the manual will continue to be modified and reviewed as aquaculture in South Africa grows.

The WRC is continuing its investment into aquaculture-related research, with a current project aiming to determine the potential of small and large storage dams in South Africa for recreational, subsistence and commercial fishing and the related contribution to rural livelihoods. "If the revitalisation of State hatcheries can be continued successfully, there is a link between freshwater aquaculture and inland fisheries, which as a whole can open up many new opportunities to establish small businesses, create employment, reduce poverty and improve household food security in rural areas,"

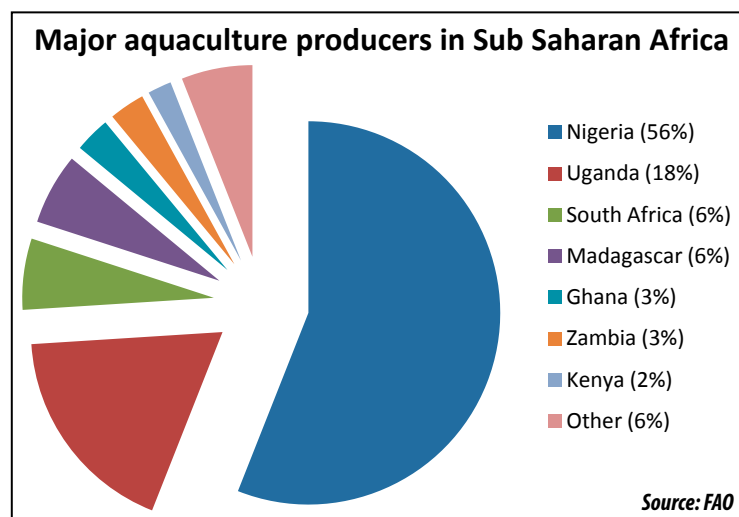
MAIN RECOMMENDATIONS FROM THE WRC AQUACULTURE PROJECT

- Aquaculture development strategies should be market-driven and appropriate State-supported special purpose vehicles, such as public-private partnerships or provincial aquaculture project promotion agencies should be established to drive public and private sector investment projects.
- In terms of hatchery revitalisation, it is recommended that suitable non-governmental organisations, university or economy development agencies facilitate this process in partnership with the provincial departments of agriculture to create viable, market-driven service hubs which address the needs of rural farmers.
- The training of provincial department staff in aquaculture needs to continue at all levels.

Source: FAO

says Dr Backeberg.

Rouhani believes strongly that there is a future for aquaculture in South Africa. "What we lack in climatic conditions for aquaculture production, we make up for in research, technology and innovation. If as a country we can bring all the elements together, such as technical support for emerging farmers and a more level playing field in the market, aquaculture can become a viable, established sector in South Africa."



- To access the reports, *Participatory Development of Provincial Aquaculture Programmes for Improved Rural Food Security and Livelihood Alternatives* (Report No: TT 502/11) and a *Manual for Rural Freshwater Aquaculture* (Report No: TT 463/P/10) contact Publications at Tel: (012) 330-0340; Fax: (012) 331-2565; Email: orders@wrc.org.za or Visit: www.wrc.org.za to download an electronic copy. □