

COMMUNITY OPPORTUNITIES IN AQUACULTURE

WHAT ARE THE POSSIBILITIES AND LIMITS?

KEY ISSUES

- If fish protein is to be affordable and readily available in Africa, urgent innovations are needed to tackle the continent's fish shortage.
- Aquaculture is underdeveloped in Africa and South Africa. Intellectual property for new technologies, if not suitably managed, could limit aquaculture growth in South Africa.
- Huge start-up capital is needed to get aquaculture enterprises off the ground; community-based aquaculture therefore needs financial support at the outset.
- Aquaculture is highly technical, with different fish types and practices demanding different production regimes.
- South African consumers are not used to farmed catfish which is a barrier to marketing this product.
- Networks and partnerships must be established if community-based aquaculture is to reach the market.
- South Africa has a legislative vacuum on freshwater aquaculture, with policies and laws guiding proper conduct from freshwater aquaculture enterprises urgently required.
- Reliable infrastructure and stable currency is needed to support aquaculture; for example, electricity is an essential part of some forms of fish farming.

INTRODUCTION

Aquaculture now contributes 47% of fish available for human consumption – up from 9% in 1980. This shift to aquaculture offsets the stagnation in the production from capture fisheries (FAO 2012). By 2030, demand for fish is expected to reach 261 million tonnes, but fish production is only expected to rise to 210 million tonnes; demand will therefore exceed supply by 50 million tonnes. Africa is likely to produce 11 million tonnes by 2030, but the demand will be as high as 18 million tonnes (FAO 2013).

Developing countries are more likely to feel the fish shortfall as cheap and accessible fish protein becomes less available (HLPE 2014; Delgado et al 2003). Increased aquaculture production could be critical in bridging the gap. However, despite huge advances in aquaculture in China, Southeast Asia and other regions, Africa's contribution to global aquaculture production was still less than 3% in 2012 (FAO 2014). Africa's low aquaculture productivity is mirrored in South Africa where less than 5 000 tonnes of fish per year comes from aquaculture, while over 600 000 tonnes is from capture fisheries (Britz 2007; George Warman Publications 2007). Even at continental level, South Africa contributes less than 1% to Africa's aquaculture production (FAO 2014). Nevertheless, aquaculture has great potential to increase fish production in South Africa and Africa (DAFF 2012).

In South Africa, the Department of Agriculture, Forestry and Fisheries (DAFF) sees the potential for commercial aquaculture to expand the range of aquatic food products on the local market, and consequently improve food security, job creation,

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economic development and export opportunities (DAFF 2012). DAFF has therefore launched a few Community-Based Aquaculture (CBA) pilot projects. This Policy Brief is based on a study that investigated appropriate institutional and organisational arrangements for CBA in three of these pilot projects – Siyazama Aquaculture Cooperative, Hamburg, Eastern Cape; Imbaza Farm, Saldanha Bay, Western Cape; and Camdeboo Satellite Aquaculture Project, Graaff-Reinet, Eastern Cape. The study provides evidence-based recommendations for sustainable CBA in South Africa.

INNOVATORS AND PIONEERS: WHO CONTROLS THE INTELLECTUAL PROPERTY?

In South Africa, aquaculture is a budding industry, which usually needs to innovate with new technologies – the pioneering companies and individual technical people being the holders of any intellectual property. Communities entering the industry start up without the relevant technologies, knowledge, skills or the sources of investment that pioneering aquaculture companies and individuals have.

While it is important to protect intellectual property for new technologies as they are developed, if intellectual property owners deny others access to the new technologies, it could limit the quick growth and spread of aquaculture. Stakeholders therefore need to find a win-win solution; in the early days, government may also need to protect the aquaculture industry from unfair external competition, such as cheap competing fish imports and other substitute products.

AQUACULTURE A MAJOR INVESTMENT

Aquaculture is capital intensive and needs millions of rands of investment even before the first fish is harvested. Apart from the capital investments, operational expenses are high – even in the development phase. Government grants and conciliatory loans – used as part of empowerment deals with other major investors – supported all three aquaculture pilot projects in our study.

While grants and soft loans can provide crucial start-up funding, government must be careful that funding encourages communities to run aquaculture as investment-based businesses, not social programmes. Critically, community enterprises must be able to transit into financially viable and sustainable business arrangements, without constant government bail outs. Providing capital and operational funding

is essential to launching community-based aquaculture projects as part of social responsibility towards previously marginalised communities, but government also needs an exit strategy that will allow communities to continue successfully on their own.

AQUACULTURE ENTERPRISES NEED TECHNICAL SKILLS AND TRAINING

As a practice and undertaking, aquaculture can be highly technical. For example, to farm dusky kob (*Argyrosomus japonicus*), communities need the knowledge and skills to produce fingerlings from wild kob; create and maintain the right medium and ambience for wild dusky kob to produce fingerlings in captivity; investigate, create and maintain the right medium for optimal growth from fingerlings to commercial-size fish in cages; and monitor and control the physical, environmental and biological parameters and conditions for optimal breeding and growth so as to maximise production 24 hours a day and seven days a week. This long list of technical procedures and tasks required on a 24/7 basis for dusky kob farming means that there is need for well-trained, highly technically-skilled and dedicated staff to run a successful dusky kob farming operation. A single mistake could spell disaster.



Figure 1. Technical equipment used for kob aquaculture

Most community groups and individuals come into the aquaculture industry without any knowledge or skills, unless they have been previously employed in the industry. Communities, therefore, need skills transfer and training, which can be done through experiential on-the-job training or by attaching to established practitioners in partnership agreements between community groups and established aquaculture

operators. It will be a challenge to ensure that partnership arrangements result in empowered community groups that can eventually run aquaculture enterprises on their own and can eventually be successfully weaned from such partnerships.

Unlike dusky kob, other types of aquaculture, such as mussel, oyster and catfish farming, do not require such onerously high levels of technical skills and monitoring of parameters. Therefore, investors should explore whether communities should start with simpler forms of aquaculture such as oyster and mussel mariculture, then graduate to the more complex forms such as dusky kob and abalone once they have the know-how and skills.

GROWING MARKETS FOR FARMED FISH

Careful consumer and market research is needed so that aquaculture technologies can develop in a consumer-oriented and market-based way. The practitioners for commercial aquaculture in South Africa (including communities) need to make sure that markets exist for the aquaculture products that they develop and that there are markets for commercial production. Market research can also look into developing new products as is the case with catfish, which is not a fish traditionally eaten by the typical South African consumer.

Communities may therefore need to partner with bigger companies that have done market research and product development as part of a basis for aquaculture initiatives. On the other hand, such partnerships could mean that communities cannot add value to their produce, and so may lose out on the possible additional revenues and profits that could be derived from such value-adding.



Figure 2. Dusky kob experimental breeding tanks in one of the pioneering companies in the East London Industrial Development Zone (IDZ)

WHO GOVERNS THE VALUE CHAIN?

Currently, most communities have no direct link with consumers since they move their produce through intermediaries that have established links to consumers. Therefore, in terms of the value chain (from market research, to product development, growing, processing and moving the product onto the consumer), communities face challenges in improving their participation in value-chain governance for improved benefits. Retailers and consumers could be encouraged to look at how they could help communities improve benefits by buying from them directly and sourcing produce at the farm gate. This would only be possible for produce that does not need to be processed or which retailers can process and pack themselves.

LEGAL AND ORGANISATIONAL MODELS FOR AQUACULTURE

All three of our case studies involved communities in commercial aquaculture using different legal and organisational arrangements, though all of them used mixed arrangements. The Hamburg group is a cooperative, the Saldanha Bay group are shareholders in Imbaza, while the Graaff-Reinet group are part of a trust. All of the enterprises studied used technical and marketing partnerships which, given the shortcomings with which communities enter the industry, seem to be the most workable approach. These arrangements all recognise the need for initial managerial, business and technical support to assist the communities.

Depending on the type of aquaculture being practised and the competence of a specific community, the model – cooperative, private company (shareholder-based) and trust – and the length of time spent in incubation, partnerships will vary. Communities entering the industry would have to select the model or a combination of legal arrangements that best suits their capabilities and their situation, since all have their advantages and disadvantages.

LEGISLATIVE ENVIRONMENT

While marine aquaculture is regulated by the Marine Living Resources Act (MLRA 1998), there is no legislation to regulate freshwater aquaculture. The absence of a clear legislative and policy framework for aquaculture is resulting in conflicting and contradictory messages. Furthermore, the responsibilities of relevant government and environmental agencies, and between

different levels of government, are unclear. According to the participants in the study, many permits are needed to practise aquaculture, making the industry difficult to enter and operate in. For example, permits are needed for possessing, selling and transporting fish species, certification of the species, import and export of marine fish and aquatic plants, etc.

While government has moved in a positive direction in terms of developing policy for aquaculture, it needs to revise the regulatory framework and the permitting system in favour of aquaculture in general and especially for community-based aquaculture. In particular, the process of meeting legal requirements and getting permits and licences must be simplified.

THE EXTERNAL ENVIRONMENT

Reliable electricity is essential to some forms of aquaculture (for example, dusky kob), as tanks need to be kept in specific physical and chemical conditions. It is therefore important to factor into planning electricity fluctuations, such as loadshedding. Currency fluctuations can also damage the potential of aquaculture, particularly in relation to import and export prices. Such factors need to be taken into account during planning.

RECOMMENDATIONS

1. Develop policy around aquaculture intellectual property rights that allows the industry to grow.
2. Government should invest in community-based aquaculture, but ensure it has a sustainable exit strategy.
3. Training and skills development support must be implemented through the relevant government programs and private sector partnerships
4. Support the industry in finding and developing markets for farmed fish.
5. Develop information packages for communities to understand the different partnership and investment models available.
6. Create a favourable legislative environment.
7. Promote cooperation among government departments and other agencies to nurture and support sustainable community-based aquaculture.

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