INSTITUTE FOR POVERTY, LAND AND AGRARIAN STUDIES (PLAAS)

WORKING Paper 48

Community opportunities in commercial agriculture: Possibilities and challenges

7 November 2017

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Copy Editing and Proofreading: Liz Sparg
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Cite as: Hara et al (2017) 'Community opportunities in commercial agriculture: Possibilities and challenges', *Working Paper 48*. PLAAS, UWC: Cape Town.

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ACKNOWLEDGEMENT

We thank all interviewees for accepting to be part of this study and their time. This study was funded by the Department of Agriculture, Forestry and Fisheries; branch fisheries. The views and interpretations in this article though are solely those of the authors. We (the authors) do not have competing interests in the manuscript

ABSTRACT

Aquaculture has potential to contribute towards food and nutrition security, job creation and income for South African communities, provided that the challenges and limitations for their participation in commercial aquaculture value chains can be overcome. Most communities lack investment funding and enter the industry from a base whereby they do not have the knowledge, technical skills, managerial capacity and marketing know-how for aquaculture. Partnerships with established aquaculture companies and entrepreneurs provide the best opportunities for bringing communities into mainstream commercial aquaculture. The partnerships need to include the sharing of relevant knowledge, technical and managerial skills for aquaculture and marketing. Partnerships based on closely knit shareholdership arrangements appear to hold the best chance for successful and sustainable community participation in commercial aquaculture.

Keywords: community-based aquaculture, food security, income, job creation, investment funding, knowledge and skills, business partnerships

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ABBREVIATIONS

BKT	Blue Karoo Trust
CBA	Community-based aquaculture
CSAP	Camdeboo Satellite Aquaculture Project
DAFF	Department of Agriculture, Forestry and Fisheries
FAO	Food and Agriculture Organization of the United Nations
HLPE	High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security
IDZ	Industrial Development Zone
NEF	National Empowerment Fund
SEAFDEC	Southeast Asian Fisheries Development Centre

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1. INTRODUCTION

Aquaculture presents potential for increase in fish production in South Africa to meet increase in demand, given that most of the key commercial capture fish species are maximally exploited (DAFF, 2012a). The decline in capture fisheries production is a worldwide problem that has concentrated minds and efforts on how aquaculture could help bridge the growing gap between fish food supply and increasing demand as the world's population grows (FAO, 2014; HLPE, 2014).

Although aquaculture production in South Africa started in the 1980s (Hecht & Britz, 1990), production remains negligible at around 5,000 tonnes, valued R200–300 million; compared to over 600,000 tonnes annually from capture fisheries, valued at over R2 billion (Shipton & Britz, 2007; George Warman Publications, 2007, 2015). The low production from aquaculture in South Africa relates to constraints, such as environmental conditions (for example, the largely exposed rough and high-energy coastline that is unsuitable for mariculture), lack of appropriate species for aquaculture that are in line with the local South African conditions, high production costs and lack of appropriate technologies (DAFF, 2012b; Ministry of the Economic Affairs of the Netherlands, 2013).

More than two decades after the end of apartheid, poverty and unemployment remain huge socio-economic and political challenges for South Africa, in particular among formerly marginalised communities. The role that aquaculture could play in poverty reduction, food security and job creation is in line with the National Development Plan, the National Aquaculture Policy Framework and the Aquaculture Policy Framework (DAFF, 2010, 2012b, 2013; National Planning Commission, 2011). In addition, aquaculture is one of the four focus areas for Operation Phakisa: Oceans Economy[1].

In order to operationalise the involvement of formerly marginalised communities and bring them into the mainstream economy, the South African government has created vehicles for public sector funding, such as the National Empowerment Fund (NEF) and the Comprehensive Agricultural Support Programme (CASP) for investment and capitalisation of community involvement in the economy and also for incentivising private sector partnerships with communities. Based on this thinking, the fisheries branch of the Department of Agriculture, Forestry and Fisheries (DAFF) launched or facilitated community involvement in a number of commercial aquaculture projects.

In this paper, we refer to these commercial initiatives as community-based aquaculture (CBA). CBA refers to situations whereby communities are empowered through skills,

[1] 'Operation Phakisa is an initiative of the South African government designed to fast-track the implementation of solutions on critical development issues [and] an innovative and pioneering approach to translate detailed plans into concrete results through dedicated delivery and collaboration.' (http://www.operationphakisa.gov.za/operations/oel/pages/default.aspx).

financial investment and the legal authority to practise aquaculture (Ateweberhan et al., 2013; NACA and FAO, 2002; SEAFDEC, 2008). CBA is founded upon the principle that community members with common interests come together to undertake aquaculture for the benefit of the whole group (Radheyshyam, 2001). The rationale for CBA is to increase fish production for local consumption (and thus contribute towards protein security), create local employment, generate income and reduce poverty (Ateweberhan et al.; HLPE, 2014, 2013; SEAFDEC, 2008).

At a workshop to address the main issues facing CBA in the Western Indian Ocean region[2] the key issues identified were 'unsuitable environmental and biophysical conditions; shortage of seed supplies; low levels of knowledge and skills; negative attitudes and behaviour towards aquaculture; weak organization and governance; poor participatory approach; and unclear terms of agreement for business partnerships between communities and external players' (Ateweberhan et al., 2013:1). Similarly, the constraints for the growth of the South African aquaculture industry had been identified as being: uncoordinated institutional environment; lack of appropriate technology; difficulties in obtaining suitable culture sites; inadequate public sector support measures to pioneer farmers; high production costs; lack of local quality feed; and lack of access to suitable water quantity and quality for freshwater aquaculture (DAFF, 2012c).

One of the selection criteria for some of the CBA pilot projects in South Africa was high unemployment and food insecurity[3] in the target communities. One of the main objectives for DAFF instituting the pilot projects was to investigate the most viable models for bringing marginalised communities into commercial aquaculture. Government's aim was to evaluate what models and best practice could be used for scaling-up viable and sustainable participation of formerly marginalised communities and individuals in commercial aquaculture. Three CBA projects were used as case studies, namely Siyazama Aquaculture Cooperative Project (Hamburg, Eastern Cape), Masake Closed Corporation (CC) within Imbaza Mussels (Saldanhna Bay, Western Cape) and satellite farms within the Camdeboo Satellite Aquaculture Project (Graaff-Reinet, Eastern Cape). The three case studies were selected in consultation with the client, DAFF, based on the different business and organisational approaches that each project was using; that is a cooperative (Siyazama), a shareholdership (Imbaza Mussels) and a trust (Camdeboo). The selection criteria also took into account the different locations of each project and the different species each was using. The key general performance areas evaluated for the three cases were: source and type of investment capital; technical and management skills requirements for aquaculture; partnerships for skills,

[2] 'Community-based aquaculture in the Western Indian Ocean: Challenges faced and lessons learned', 9–11 December 2013, Zanzibar

[3] While communities might venture into commercial aquaculture and farm species that they would not necessarily consume themselves, the income generated from such activities could indirectly provide for food security.

management and marketing; consumers' markets and marketing; and business organisational approaches. The study was undertaken between 2013 and 2015.

The case study communities

The following is an overview of the demographic and socio-economic characteristics of the communities in which each of the three projects are situated (all statistics from Stats SA, 2012).

Hamburg is a small coastal town (population 1,348 in 2011) situated in the Ngqushwa local municipality with very high unemployment. In 2011, the unemployment rate for Ngqushwa Local Municipality was 53.1%, which was higher than that for the Amathole District (43.1%), where the municipality is located, and the Eastern Cape (37.5%). Saldanha Bay is in the Saldanha Bay Municipality (population 99,193 in 2011).

In 2011, the unemployment rate for Saldanha Bay Municipality was 23.1%, which was higher than that for the West Coast District (14.5%) and the Western Cape Province (21.4%). Graaff Reinet is situated in the Camdeboo Local Municipality, Cacadu District. The town had a population of 35,672 in 2011. The unemployment rate for Cacadu was 24.9% in 2011, which was lower than the provincial average of 37.5%.

2. METHODOLOGY

We conducted interviews with twenty-six key informant individuals and five focus groups from the communities employed in or involved with the three projects. Most of these interviews were conducted on-site, which meant that observation of what was going on also formed part of the methodology. About ten members of the community not involved in the projects were also interviewed, in order to find out whether they knew about the relevant project, and, if they did, their opinions on its objectives and whether these were being achieved.

Other interviewees included: four managers/shareholders at Blue Ocean Mussels and Blue Karoo Trust (BKT), the two companies that are in partnership with Masake and Camdeboo satellite farmers, respectively; the site manager for the Siyazama Project implementing company (Jaymat Enviro Solutions); about ten managers, entrepreneurs and some employees at two pioneering private companies farming dusky kob (*Argyrosomus japonicus*)[4] in the East London Industrial Development Zone (IDZ), who were seen as potential partners for the Siyazama Project; and about five officials from DAFF Aquaculture Directorate, the directorate responsible for the projects.

The interviews were semi-structured, using question guides based on the research objectives.

[4] The local restaurant name is 'kabeljou'.

3. STATUS AND PERFORMANCE OF THE THREE PROJECTS

This section provides the findings from the study and evaluation of each of the three projects. The stated key areas of performance for each are narrated under each case study heading. The key characteristics of each project are summarised in Table 1.

Table 1: Key characteristics of the three case study projects

Project	Year established	Size of group	Sources & funding types	Total funds invested by 2014	Business entity	Source of technology	Management and mentorship
Siyazama Aquaculture Cooperative Project (Oysters & dusky kob)	2011	Started with 58, reduced to 22	Government grants	11 million	Cooperative	Private sector	Government & service provider
Camdeboo Satellite Aquaculture Project (CSAP), BKT (catfish)	2006	54	Private loans & government/ NGO grants	65 million	Trust	Private sector	Partners & consultants
Imbaza, Masake (mussels)	2004	6	Private loans & government grants	11.8 million	Shareholdership	Private sector	Industry partners

3.1 Siyazama Aquaculture Cooperative Project

The Siyazama Aquaculture Cooperative is a project based on farming oysters (*Crassostrea gigas*) and dusky kob. The oyster farm and the live oyster holding facilities were bought by government from a private company for the Hamburg community. Between 2011 and 2014, DAFF invested a total of over R11 million in the purchase of the farm, maintenance of the farm and holding facilities, and for construction of a new facility for dusky kob farming. DAFF, through a contracted implementing agent, then established a cooperative comprised of 58 members, all of whom were employed by the project at the time it was being established. The service provider then reduced the number of employees to 22. The cooperative sold all the harvested oysters to an appointed buyer, who, in turn, sold the product to restaurants and processors in East London.

In response to the growing shortage of high-value marine finfish, the world's mariculture industries are increasingly developing technologies to breed and grow some of the wild species in captivity. In South Africa, dusky kob – or kabeljou – is seen as one of the prime candidate species in this drive. A number of private companies are pioneering the technologies for farming dusky kob. The Siyazama Project also involved piloting dusky kob aquaculture for the community.

The following were the key insights from interviews with some of the pioneering companies for dusky kob farming.

Dusky kob farming is still in its infancy and the technologies were still being developed. Thus the pioneering companies were still investing heavily in technology development. For example, by 2014, one company had already invested at least R40 million, yet had still not started commercial production. Another company had begun commercial operations in 2009, with the first harvest in 2011/12. By 2014 the company had already spent over R50 million, with a further R200 million projected to be spent in the five years, on expansion to commercial production of 600 tons per annum (Liam Ryan, pers. comm., 3 June 2014).

Siyazama Cooperative faced a number of challenges, given that dusky kob farming is highly technical. Fingerlings are produced from domesticated wild kob and thereafter stocked in production tanks, where the natural, physical and environmental conditions have to be recreated and maintained. Maintaining optimal conditions for growth (for example temperature, pH levels, dissolved oxygen levels, the right food mixtures, ammonium nitrates, carbon dioxide, etc.) requires technical knowledge, dedication and close supervision twenty-four hours a day. In addition, there are many other routine tasks, for example, the fish have to be graded into same sizes so that they do not start to cannibalise each other and the tanks have be cleaned routinely. One mistake causing the fish to die could ruin a whole project cycle. Thus, to run a successful dusky

kob farming operation requires adequately qualified, well-trained, highly committed and dedicated staff.

It was estimated that a properly run dusky kob facility had the potential to produce 20 tons of fish annually, at full capacity, and create 20 full-time jobs. However, a major issue for the cooperative was getting its members skilled and trained in the highly technical requirements of dusky kob farming. One of the pioneering companies expressed its willingness to assist with training through a technical partnership agreement. This would involve selecting Siyazama Cooperative members for attachment to their facility on a full-time basis for a period of 12–24 months for on-the-job training in the various required skills sets, including business management.

A second option that was suggested by another pioneering company was a shareholdership agreement, whereby the company would become the majority shareholder in the project. The company expressed the view that they would have been reluctant to absorb any major risks involved in the project unless they had full management control – thus the condition for majority shareholdership. One of the benefits for going into a technical partnership agreement or shareholdership agreement would be that the pioneering companies had already developed processing and marketing infrastructure, which could be used by the aquaculture project.

In summary, the Siyazama Aquaculture Cooperative Project was organised as a community cooperative business, wholly funded by government through a grant that had been used to buy the existing oyster farm, pay wages for all members of the cooperative, pay operational and maintenance expenses and construct of a new (high tech) kob farming facility. The management of the project was through an independent service provider, with DAFF overseeing the overall project. The cooperative members lacked skills and knowledge in aquaculture, in particular for kob farming. At the time of the study there was a proposal for a technical, management and marketing partnership with one of the companies developing technologies for kob farming in the East London IDZ.

A key issue that was identified in the study was that government did not have a business plan to ensure that Siyazama Cooperative would have sufficient technical skills, management capacity and capability, and financial independence by the time government exited from the project. There was also lack of clarity in terms of how much funding had to be invested in the project and how long government would continue to provide technical and material support. This had resulted in a cooperative that lacked capacity to take over the project and be accountable for its success. At the same time, there was indecision as to whether to transfer the project into a technical partnership or shareholdership arrangement with one of the private kob farming companies.

3.2 Imbaza Mussels and Blue Ocean Mussels

About 95% of mussel farming production in South Africa is based on the blue mussel (*Mytilus galloprovincialis*) which originated from Spain[5]. In 2013, there were two mussel farms in the Saldanha Bay – Blue Ocean and Imbaza. Blue Ocean Mussels was formed in 2000 out of an existing mussel farm that had been bought from Sea Harvest as a private company, solely to farm mussel for the live and processed markets.

Imbaza Mussels was formed in 2004 from Masiza Empowerment Project. Blue Ocean had identified six individuals from previously disadvantaged backgrounds. Each person was given two rafts for growing mussels, using a loan from a commercial bank (Bankfin) and guaranteed by Blue Ocean Mussels to make the purchases. For seven years, the six partners in Masiza were trained and mentored by Blue Ocean management. Initially, there were problems with loan re-payments, to the extent that Blue Ocean had to step in with a monthly re-payment plan. Slowly, the Masiza group learned to budget and repay their loans on their own.

When Imbaza Mussels was formed in 2011, the Masiza group became an independent major shareholder of the new company. The name of the group changed from Masiza to Masake Closed Corporation (Masake CC) so that they would not carry over liabilities into the new company. Ten million rand was used to recapitalise the expanded mussel farm. Of this R10 million, R8 million came from the NEF as a loan payable over seven years, at an interest rate of 3% less than prime, and R2 million came from the Department of Trade and Industry (DTI) as a grant. Imbaza Mussels also received an additional R1.8 million grant from DAFF through the Western Cape Comprehensive Agriculture Support Programme. The shareholders for Imbaza Mussels were comprised of: Masake CC (37%); NEF (20%); Blue Ocean Mussels (28%); the workers' trust (comprised of general workers from Imbaza Mussels and Blue Ocean Mussels) (10%); and managing director (5%).

The plan was that, once the loan was paid off, 5% of NEF's shares would be given to the managing director and the rest (15%) would be given to the workers' trust, Masake CC or another black empowerment group. The shareholders were not collecting any dividends, as priority had been given to finishing paying off the loan as quickly as possible. The owners of Masake CC continued working on the farm, together with the general workers, and were also being paid as workers.

The entire mussel harvest from the two farms was being sold for processing to Blue Ocean Mussels, located in Velddrif, 30 kilometres from Saldanha. In turn, the Blue Ocean Mussels sold all its produce to a seafood distributor, which distributed the products to wholesalers, or directly to shops and restaurants.

[5] The indigenous mussel species (*Chromytilus meridianalis*) is not favoured due to its slow growth rate and secondly, and more important, the flesh of the blue mussel has orange/white colour, which most consumers prefer compared to the black/white flesh colour of the indigenous mussel.

In summary, Masake CC, an empowerment group originally called Masiza, was within Imbaza Mussels, a private company based on shareholdership. Masake CC was the majority shareholder. The project had been funded mainly through loans from a private bank and government grants. From the start, the business model was to run the farm as a profitable business. Blue Ocean Mussels, the company that formed the group, had been a business partner since Masake CC was formed and had mentored the group. Management of the farm remained in the hands of an independent manager, who was also a shareholder of Imbaza Mussels.

3.3 Camdeboo Satellite Aquaculture Project

The Camdeboo Satellite Aquaculture Project (CSAP) is a project of the BKT which aims to establish a freshwater aquaculture industry in the Eastern Cape. The business idea is based on creation of demand for catfish among public institutions (such as hospitals, prisons, schools[6]), potential market among the growing population of people from sub-Saharan African countries living in South Africa who are already used to eating catfish (Alawode & Jinad, 2014; Isyagi et al., 2009; Pouomogne, 2008) and export markets to these sub-Saharan countries (Liesl de la Harpe, pers. comm., 4 August 2014). The species to be farmed was the African sharptooth catfish (*Clarias gariepinus*). The CSAP concept was based on the establishment of a network of satellite aquaculture farms linked to a central management farm.

There were two phases to the project – the incubation phase and the commercial phase. The incubation phase was for the establishment of a hatchery, development of the technologies and training of the farmers. In the commercialisation phase, the central farm would produce and provide fingerlings, feed, technical support and a processing and marketing outlet for the produce by the satellite farms – a form of contract aquaculture farming (Krishnan & Birthal, 2002). At the time of the study, the project was still in its incubation phase, and only the central farm was operational, with little involvement of satellite farmers (communities).

The Camdeboo Project was based on the formation of a trust. The BKT was the umbrella body for three separate legal entities, as follows: Camdeboo Aquaculture Trust (project development and management); Ter Morshuizen Trust (technical expert); and Sondelani Trust (central farm and factory workers' trust). A trust was to be created for the satellite farmers as the fourth legal entity within the BKT. The BKT would process, bulk package and sell the fish products under the brand name KAROO CATCH. The intention was to find a niche market, rather than compete with established fish consumer brands.

[6] Demand for catfish among South Africans is still very insignificant due to consumer resistance to fish with reddish (bloody) flesh (Stander H. [n.d.] The Sharptooth Catfish [*Clarias gariepinus*]. Unpublished).

It was envisaged that the project could create 500 primary jobs and over 2,500 indirect jobs. In 2014, the project already had R22.43 million in hand, as well as a commitment from the Development Bank of Southern Africa (DBSA) Green Fund to contribute R23.5 million towards the commercial phase. The BKT had also received both grant and loan funding from government and a number of local and foreign organisations. In total, R65 million (loans and grants) had been received by or committed to the project.

Based on what it promised to achieve and deliver, the project had obtained or got commitment for large amounts of loan and grant funding. However, the underlying problems and challenges were stated as being: low literacy rates and a lack of aquaculture knowledge among the potential satellite farmers; high capital costs for the establishment of the satellite farms; satellite farmers lacked finance for capital investment; and keeping fish farmers 'focused' until their first harvest (pers. comm., Ter Morshuizen, 17 August 2014). A number of questions could, thus, be raised about the project:

- Could the satellite farmers operate independently as commercial enterprises, given their poor literacy skills and lack of knowledge of aquaculture?
- Could the fish be farmed at a competitive price by the satellite farmers?
- How viable was the project, given that it was based on intensive marketing of a product that was not locally favoured by consumers and had no established export markets?
- Was the project (Graaff Reinet) situated in a suitable region for catfish farming, given that the species requires temperatures of around 30 degrees centigrade for optimal growth (Isyagi et al., 2009; Pouomogne, 2008), while the project site experiences very cold winters? Do economies of scale facilitate availability and affordability of food?

4. LESSONS LEARNED AND IMPLICATIONS FOR COMMERCIAL CBA

4.1 Investment and business planning

Aquaculture is a highly capital intensive undertaking. Apart from the capital investments, operational expenses are also incurred and must be factored in, even during the developmental phase, when infrastructure and technologies are being developed. For example, the pioneering companies farming kob, and the entrepreneurs on the Camdeboo catfish project were paying salaries and operational costs from public sector grants and loan investments, with the prospect that these would be recouped once commercial production began. Equally, the wages of the cooperative members employed on the Siyazama Project were being covered from project grants, with the view that these would eventually be covered as operational costs once the business was fully operational. For the Siyazama Project, what needs to be noted is that it takes 18–24 months after stocking the kob fingerlings before the

first batch of fish are ready to harvest and sell. In the meantime, all the operational costs must be covered, so it can take another four years of full-capacity production after first harvest, before breaking even. One of the key problems for the Siyazama Project was that there was no business plan that stated timelines – especially how long it would take for the project to become a fully independent commercial operation – which made the project unsustainable without continued government grants.

The Camdeboo Project was based on a model that grant money would be used for construction of the satellite farms, but that the satellite farmers would start paying back for the investment, fingerlings and extension services once they started production. Again, there appeared to be no timeframe as to when this would happen, and, most critically, how long it would take for farmers to start making a profit and thus start earning incomes from their farms.

Unlike the Siyazama and Camdeboo projects, Imbaza Mussels had been instituted as a commercial undertaking, accountable to the rest of the shareholders, from the very beginning.

In all three cases (especially the Siyazama and Camdeboo projects), a huge amount of investment (especially by community standards) was pumped into the projects, in terms of both capital infrastructure and operational costs. Government and donor grants and private loans had been used for direct capitalisation of the projects or as part of empowerment deals with other main investors. The key question that arises is how to transit these arrangements to financially viable and sustainable commercial aquaculture ventures, independent of external grant support.

The Siyazama and Camdeboo projects lacked clear business plans to show that the former could become a viable, sustainable, independent commercial operation, and, for the latter, to show how the satellite farms would function as separate and individual commercial entities. Government and other donors needed to have clear, solid business plans for the Siyazama and Camdeboo projects, including time frames for project incubation, showing when commercial production would start, and, most of all, showing for how long the projects would receive external funding.

Masake CC demonstrates that the funding for CBA needs to be structured in such a way that it builds accountability and independence from grant funding from the very beginning. Therefore, one of the important issues for government and other donors to CBA ought to be planning how to use grant money to build capacity for financial independence and commercial viability, instead of perpetuating conditions that turn such projects into social projects, which require ongoing government financial support and rescue. For the Siyazama and Camdeboo projects, then, government and donors needed to build clear exit strategies into the business plans.

4.2 Skills and technical knowledge requirements – the need for partnerships

All types of aquaculture require well-trained, technically skilled and dedicated staff to run a successful operation. Most communities involved in aquaculture, for example the Siyazama Cooperative and the satellite farmers under the Camdeboo Project, start from a situation whereby they do not have the requisite knowledge and skills. In order to empower the Siyazama and Camdeboo projects, plans to provide technical and management skills and knowledge needed to have been included in the CBA business plans, which ought to have been developed jointly by all stakeholders (government, communities, private sector, banks and donor agencies).

The satellite farmers in the Camdeboo Project received some training in the initial stages, and, while the long-term partnership with the central farm provided them with extension services, they were largely required to manage and operate their farms on their own. Given the required technical and management skills, most farmers were likely to struggle without close support and mentoring. Kob farming, in particular, requires high technical skills. How to deal with the lack of such technical knowledge and skills by Siyazama Cooperative members, who both owned the operation and were employed to work on it, was not included in the business plan. At the time of this study, the management of the whole operation was under a service provider, with cooperative members mainly employed as unskilled workers. Although government had put out a tender for a technical and management partner for the project, prospective private sector business partners had demanded to have majority shareholdership.

Government appeared undecided about ceding control to a private company, probably because the project was still seen as a community social project, but the private company felt that only through a majority shareholdership would they could be able to institute the necessary changes to run a profit-making operation. For example, critical decisions needed to be made about how many people to employ in specific capacities, what further investments to undertake, and where to source investment funding. Without a long-term, technical management and marketing partnership, Siyazama Cooperative faced technical and skills challenges for running a successful dusky kob farming venture.

In all three case studies, pioneering companies and entrepreneurs demonstrated their willingness to share knowledge, technical skills and marketing outlets with communities:

- The kob farming companies in the East London IDZ were selling fingerlings to the Siyazama Cooperative for their project and had expressed their willingness to train cooperative members and impart the requisite technical knowledge and skills for kob farming.

- The Camdeboo Project depended on the central farm providing both fingerlings and extension services to the satellite farms.
- Masake CC had been formed and mentored by Blue Ocean Mussels and continued to benefit from the knowledge and skills, and marketing arrangements provided through this partnership, demonstrating that technical, management and marketing partnerships between the private sector and communities provide the best chances of success for CBA.

Through such current or envisaged partnerships, knowledge and skills for aquaculture could be increasingly transferred to communities so that they actively and productively participate in the growing aquaculture industry. Technical, management, and marketing partnerships appear to be the most workable approach, given the challenges that communities face when entering the industry. Although Masake CC was successfully running as a profitable commercial operation, management and marketing remained in the hands of the original partner. The success and sustainability of the Siyazama Project depended on the cooperative entering into a technical, management and marketing agreement with one of the kob farming companies in the East London IDZ, while the success of the Camdeboo Project depended on a very close partnership between the satellite farms and the central farm in terms of technical and management support. The key question is how long such incubation should last and whether communities could ever have the skills, knowledge and confidence to eventually take over and run with things on their own as independent successful commercial CBA businesses as government would wish in terms of transformation of the sector.

4.3 Consumer and market orientation

Commercial CBA has to be based on consumer and market orientation. Given the complexity and costs involved in market research and product development, it would be more practical and cheaper for communities to go into partnerships with established and pioneering companies that had already done (or were doing) market research and product development, rather than re-inventing the wheel. Masake CC did not have to undertake market research regarding the type of mussel product that could meet market requirements, since Blue Ocean Mussels (or its predecessor) had already done this. The entrepreneurs leading the Camdeboo catfish project were undertaking market research on type of catfish and size of market, on which the project was to be based. The market research was also looking at developing new domestic and export markets; in positioning the catfish within the South African market, an important consideration was to avoid competing with well-established fish brands, such as Lucky Star (South Africa's biggest brand of canned sardines). The satellite farmers could piggyback on these findings. For Siyazama, the most viable marketing plan was to process their produce at one of the companies in the IDZ that had already developed the products and market distribution channels and outlets.

These various marketing models and value chains were based on arrangements that did not require the communities in the case studies to get involved in marketing and product development or in dealing directly with consumers. Such marketing and distribution arrangements were probably ideal in the initial years of community involvement in the industry, given the complexity that marketing research, processing, packaging and delivery of final products involves. On the other hand, it meant that the communities could not add value to their produce, thereby losing out on possible additional revenues and profits[7]. The difficulty of going it alone, in terms of forward integration in value chain activities, could be seen in the case of Masiza, which had been in existence for more than ten years, yet still relied on Blue Ocean Mussels for the processing and marketing of its produce.

4.4 Organisational arrangements for commercial CBA

Each of the case studies used a mix of different basic types of legal and organisational arrangements for the involvement of communities in commercial aquaculture.

The dusky kob and oyster farm used the Siyazama Aquaculture Cooperative as the vehicle for involving the Hamburg community in aquaculture. The community wholly owned the cooperative and membership was comprised only of people from the community. While there was willingness for a shareholdership arrangement, the cooperative and government seemed to be reluctant to cede majority shareholdership to a private company, given the social and community empowerment origins of the project. One needed to understand, though, that the pioneering companies – which were also still in the investment and developmental stages of business – were reluctant to risk technical and capital investment in the Siyazama Project unless they had business and managerial control.

Masake CC was the majority shareholder in Imbaza Mussels, while other shares were held by the NEF, Blue Ocean Mussels, the workers' trust and the managing director. Once the loan had been repaid, the NEF intended to transfer most of its shares to the workers' trust or another empowerment group. Eventually therefore, Masake CC and other empowerment groups would hold a total of 62% of the shares in Imbaza Mussels. Blue Ocean Mussels would continue to hold 28% of the shares, which would provide Imbaza Mussels with an assured processing and marketing outlet. The shares for the farm manager were to be doubled to 10%, thereby ensuring continuity in terms of technical expertise for management of the farm.

[7] Value adding is a common problem for small-scale agricultural producers. Empowering small-scale producers to add value to their produce requires appropriate government policies and institution support (Vermeulen et al., 2008).

CSAP was set up as a trust: the BKT. In this context, the BKT was the umbrella body under which four separate legal entities existed, including satellite farmers. During this study, it was not clear what proportion of shares the various partners held. However, as with Imbaza, the fact that the central farm and the project manager had shares in the BKT, ensured there would be continuity in terms of management and technical expertise and marketing support.

Thus, the Siyazama Project was organised as a *cooperative*, Masake CC was a *shareholder* in Imbaza Mussels, and the satellite farmers and central farm workers' trusts were to have shares in the Blue Karoo *Trust*. Of the three, Masake CC appeared to be the most successful arrangement as a commercial enterprise because of the tightly knit partnership with Blue Ocean Mussels from the very beginning, when Masake CC was formed. This relationship was based on running a profitable commercial aquaculture enterprise, and the group had been mentored over the years into being accountable in their business practices, for example, paying loans on time and re-investing profits into the business.

Government was undecided about relinquishing control of the Siyazama Project into the hands of the private sector, even though – based on the Masake experience – that could have given it the best chance for success as a commercial enterprise. Although the central farm was to provide extension services for the satellite farms in the Camdeboo Project, the farmers would still have to manage the farms on their own. The lack of technical and management skills and low literacy, and the lack of close support and mentoring meant that most farms would struggle to run as successful enterprises. This raised serious questions about the success of the project as a whole, since it depended on the satellite farms producing and delivering fish to the central farm.

5. CONCLUSIONS

Although commercial CBA has potential for contributing towards food security and income and job creation, it is a capital-intensive undertaking, especially in the set-up stages when communities have to invest in infrastructure and technologies and obtain the knowledge and skills for aquaculture. Communities require business management training and the discipline to run CBA operations as businesses, based on loan investment that has to be repaid. In most instances, government and donors assist communities to raise capital through grants and conciliatory loans. This study shows that government and other donors should be careful in their decisions about the type of funding for communities and should have clear exit strategies, to encourage the development of investment-based businesses, rather than social programmes.

Most community groups and individuals come into the aquaculture industry without any knowledge or skills, unless they have been previously employed within the

industry. This entails the need for skills transfer and training to capacitate them for commercial aquaculture. This can be done through partnership agreements with established practitioners. The challenge is to ensure that such arrangements result in empowered community groups that can eventually run aquaculture enterprises independently of partnerships.

One of the challenges that communities face is how to improve their participation in value chain governance for improved benefits. Retailers and consumers could be encouraged to source and buy produce directly from farmers, thereby increasing farmers' advantages and benefits in the market. This is possible for produce that does not need to be processed or that retailers can process and pack on their own (for example, oysters).

This study looked at three models of community involvement in aquaculture: cooperatives, shareholderships and trusts. Although all have their merits and also their problems, the shareholdership arrangement appears to be the most potent for successful and sustainable involvement of communities in commercial aquaculture in South Africa, as it provides for knowledge and skills transfer, and managerial and marketing support for communities.

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