

# Identification of Potential Aquaculture and Fish Processing Investment Projects and Partners in Selected Countries in Africa



Volume I - Executive Summary

Final Report - April 2009

Nordenfjeldske Development Services

**Nordenfjeldske Development Services**

## Foreword

This report is one of four documents produced during a study conducted on the 'Identification of potential aquaculture and fish processing investment projects and partners in selected countries in Africa'. The study emanates from a memo to the Ministry of Foreign Affairs on strategic priorities for Norwegian cooperation assistance for business development within fisheries and aquaculture. It concluded that commercial companies in Norway have special competence, resources and interest that can be matched with existing or emerging commercial enterprises in developing countries, and provide a basis for collaboration and investments within the aquaculture and fish processing sectors. The purpose of the study was to provide relevant information for Norwegian companies interested in investment and/or joint ventures in African fisheries and aquaculture by identify potential investment projects and partners within the aquaculture, fish handling and processing sectors within selected African countries. The study has been undertaken focusing primarily on commercial viability, but wider issues such as development impact has also been noted<sup>1</sup>.

The study was commissioned and financed by NORAD (Norwegian Development Assistance Agency) and completed by NFDS (Nordenfjeldske Development Services) and Econ Pöyry. The study team consisted of Dr James Muir (Team Leader and Fishery Sector Expert) and Ms. Emelie Aurell (Economist) who completed the field trips, supported by Ms. Sandy Davies, Mr. Per Erik Bergh, Mr. Audun Gleinsvik<sup>2</sup> and Mr. Sveinung Fjose. The study started in mid-2008 and was completed in early-2009; it included a preliminary meeting with NORAD, and visits to four countries (Ghana, Mozambique, Tanzania and Uganda). The descriptions, analysis, conclusions and recommendations are the responsibility of NFDS and Econ Pöyry.

## Acknowledgements

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## Report structure

A large amount of material has been compiled during this study and has been arranged as follows:

- a) **Volume I – Executive Document** – a brief overview of the main study process and findings.
- b) **Volume II – Main Report** – sets out the study findings including background information, the initial assessment of all African countries, summaries of the nine potential countries for investment, further summaries of the four countries visited, and the recommended strategy and conclusions of the study.
- c) **Volume III – Annex A** - contains the nine country profiles (Egypt, Ghana, Kenya, Mauritius, Mozambique, Namibia, South Africa, Tanzania and Uganda) made prior to the field visits. These were compiled as desk studies using publicly available information together with the teams' background knowledge.
- d) **Volume IV – Annex B** - sets out the four country reviews (Ghana, Mozambique, Tanzania and Uganda) where field visits were conducted. These reports are based on locally sourced information and oral consultations. They build on the work done in Volume III and are more focused on the realities on the ground, recent trends and actors involved.

## Note on sectoral data

Effort has been made to include the latest data that were available at each point in the study; however, in some cases older figures were used due to limited availability of information for all countries, to allow comparative analysis. Also it is noted that data from different sources do not always agree – we have used our best judgement to provide the reader with as accurate an overall picture as is possible given the uncertainty around some data.

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<sup>1</sup> The TOR are attached in Annex 1: Volume II

<sup>2</sup> Mr Gleinsvik was unable to participate in field work as initially proposed but continued his involvement in backstopping, while Econ also provided Ms. Aurell as an additional team member.

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# 1 Overview

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Investment in Africa has often been a matter of risk and adventure, great hopes, and uncertain paths either to losses or occasionally great gains; investment in the fishery sector has been somewhat similar. Investment in fisheries in Africa, and now during probably the worst economic downturn in a generation, is perhaps not for the faint-hearted. But nor should it be for the foolhardy, and the argument has always held that well informed and well judged commercial decisions can bring good results in even the most uncertain of conditions. This report, commissioned by NORAD with the purpose to outline the potential for fishery sector investment in Africa, seeks to provide the basis for just such decisions.

The review set out its initial focus on two parts of the fisheries sector where future economic growth is most widely expected; aquaculture and value addition from either aquaculture or capture fisheries. It excludes investment in fishing capacity, as although selected cases can be made, particularly if supporting modern, efficient and responsible fishing, the issues of overcapacity, illegal unreported and unregulated (IUU) fishing and the policy and implementation challenges of fisheries management in the region make it too complex and contentious to engage in directly. However, the review does not exclude service and other functions. It focused primarily on conventional business investment approaches within the fishery sector, but did not exclude Corporate, Social Responsibility (CSR) options for other sectors, or opportunities for linking with Non-Governmental Organisations (NGOs) and community development processes. One guiding principle throughout the project was that development prospects should be socially and environmentally sound.

To take a systematic approach to focusing on opportunities, the review took a series of steps. It commenced with screening all African countries and applied basic criteria for assessment, including the scale of resource and its development, the nature of new local opportunities, competitiveness of existing businesses and prospects of market entry, political and business environments, and the possible synergy effects of the presence of other Nordic enterprises. The results of this first round screening are in Chapter 3 of Volume II, giving three broad groups of high potential, limited potential, and poor potential countries. Without condemning the latter categories for future investment, it simply moves attention to the most likely prospects.

## 2 First round selections

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Following discussion with NORAD, Ghana, Tanzania, Mauritius, Mozambique and Uganda were considered for potential merits in both fisheries processing and aquaculture development. Uganda and Mozambique fall within generic political risk countries, but other factors were thought to outweigh these. For Uganda, Lake Victoria held interest in possible aquaculture development, while Mozambique had a large Norwegian sector development programme paving the way for improvements in opportunities. South Africa, Namibia and Egypt were also identified for their aquaculture development potential. Although these three countries also have capture fisheries, these were not considered to be of significant interest to Norwegian investors, either because earlier approaches had not been successful or that the sector was already heavily invested with local or international capital and would have too high barriers for new entry.

Summary details of the potential for these nine countries are provided in Chapter 4 of Volume II with more detailed individual reports compiled in Volume III. This stage of the review confirmed their generally good potential for resource, business establishment and future markets, provided more detail of the specific areas of opportunity and recognised that for sometimes differing reasons, any of these countries could merit further consideration. Summaries of potential are as follows, with particular emphasis on countries not selected in the next round (see 1.3):



## 2.1 Egypt (aquaculture only)

Modern aquaculture began in Egypt two decades ago and the sector has grown rapidly. Aquaculture now accounts for almost 63% of total fish production, 98% from privately owned farms. Nile tilapia, mullet and Clarias catfish, mullet and sea bass are the key species. The Egyptian government strongly encourages foreign investment, with a unified package of guarantees and incentives, full foreign ownership and guaranteed remittance and repatriation rights. Egypt has established free trade zones to boost industrial development. In 2006, it had a GDP of USD 118 billion, and an annual growth rate of 7.2 %. Egypt was the lowest exporter to the EU among the nine countries reviewed. There is national interest to expand fish export, adding value and to improve handling and post harvest provision.



A range of investment categories could be considered, the key area being major scale agro-industrial development – aiming at 50-100,000 t output or more, based on semi-intensive pond tilapia production with integrated seed, feed and post-harvest links, supplying major markets and premium products for export markets. However this would require significant land area and water rights and would need highest level government endorsement. Margins are likely to be very tight and competition from Asian production could be critical. Medium and smaller scale developments - niche products in export areas, high added value products, inputs (feeds, seed) – possible joint ventures, plus technical supplies and services, but the overall perspective would be that unless there were pre-existing business linkages, potential returns to a foreign business would be insufficient to merit significant attention.

## 2.2 Ghana

As a relatively prosperous and stable country, Ghana has a relatively good potential. Up to 12 % of total fish product is exported, with a consistent rise in exports to the EU and key regional markets in Togo, Mali, Cote d'Ivoire, Burkina Faso, Benin, and Nigeria. Exports were over 24,000 t in 2006 for a total value of USD 51 million, including tuna (whole, loins and canned), frozen fish (mostly demersal species), shrimps, lobsters, cuttlefish and dried and smoked fish. The prospects are rather variable; substantial coastal and marine resources feed a well developed export sector, but much is already tied up in existing business. The aquaculture sector would appear to offer strong opportunities, particularly in meeting domestic demand, for which a total annual shortfall of up to 460,000 t had been projected.



## 2.3 Kenya

Marine capture fisheries potential is estimated at 150,000 t, but the current national production averages 7,000 t. Its coast is located within the richest tuna belt in the Indian Ocean; much of this is caught by distant water fishing nations (DWFN). Lake Victoria continues to dominate overall output, accounting for over 90 % of total catch while marine fishing accounts for only 4 %, with other lakes and rivers (3 %) and aquaculture (1 %).

Aquaculture production since 1999 has increased output to almost 1,000 t in 2006. The focus is now on encouraging the development of private, commercial large-scale aquaculture. About 90 % of farmed fish are tilapias, commonly in polyculture with the African catfish. Intensive, semi-intensive and extensive systems are used, though most are semi-intensive, contributing more than 70 % of total production.



Kenya has a relatively good physical infrastructure in its major urban centres, with reasonable quality road networks, and a rail link to major port facilities in Mombasa. The Export Processing Zones (EPZ) Authority is the one-stop-shop for all export oriented investment under the free zone programme. Kenya has a bilateral trade agreement with Norway. There are no legal requirements on the equity ownership, although foreign firms are encouraged to go into joint ventures with Kenyan companies or entrepreneurs. It has had a steady increase in its fish export peaking in 2005 with USD 60 million. US imports have been a bit more volatile but peaked in 2007 with USD 5 million.

Kenya had an estimated GDP of USD 29.3 billion in 2007 and an annual growth rate in 2006 of 6.1 %. The real GDP growth is forecast to subside to 4.1 % in 2008 due to the violent disruption in January-February 2008. Kenya suffers from poor governance and a relatively high risk in relation to doing business. Political and economic conditions are improving and there are signs of increasing investment confidence in Kenya, but there are still uncertainties. However, resources are relatively good, and a rising economy will increase domestic demand (local and tourist sectors) and purchasing power for aquatic products.

## 2.4 Mauritius

Mauritius has an enormous EEZ of 1.9 million km<sup>2</sup>, with a good resource level, including pelagic and demersal species, with island-based artisanal fisheries, an offshore demersal fishery and the tuna fishery in the Western Indian Ocean, the major industrial fishery, landings and transshipments are very important (about 15,000 t was transhipped in 2004). Foreign purse seiners landed 64,235 t of tuna in 2005, for local canneries. A recent study indicated that offshore fishery earnings from services and licences amount to 250 million EUR annually. Commercial aquaculture of giant freshwater prawn, red tilapia and marine red drum produced 570 t in 2007.



The business climate is friendly yet extremely competitive, with a strong and dynamic private sector, and a well-developed legal and commercial infrastructure. Mauritius is seeking foreign investors and has a legal environment to accommodate this. The country is well developed and governed and is ranked well in terms of stability and risk in relation to protecting investors, paying taxes, trading across borders and enforcing contracts. Mauritius has one of the most successful and competitive economies in Africa. It had a GDP of USD 6,959 billion in 2007, and a real growth rate of 4.6 %. EU has tripled import of fish products from Mauritius in the period 2002 to 2007, from USD 71 million to over USD 203 million. The US import has been more modest amounting to just USD 19 million in 2007.

Mauritius is an attractive location for investment and business development, and has a good reputation for the quality and diversity of its seafood, including an active aquaculture sector which has steadily gained in reputation and market. It has received substantial assistance through the EU in production support and value addition and is well positioned to build further in the development of the sector.

## 2.5 Mozambique

Capture fisheries in Mozambique is an important sector and contributes significantly to export earnings and local diets. The main commercial species are lobster, crabs, gamba (deep-water shrimp), shrimp, crayfish and squid. Aquaculture is a relatively new activity, with a few commercial farms producing marine shrimp and seaweed, and artisanal farms producing tilapia. Mozambique had a GDP of USD 6.4 billion in 2006, with an annual growth rate of 7.9 %. The country is struggling with governance and transparency issues; a significant risk to investors



Mozambique has a huge natural resource potential, particularly for aquaculture, but also for sourcing raw materials. Its current political, institutional and structural constraints represent risks for foreign investors although the situation is slowly improving.

## 2.6 Namibia (aquaculture only)

Namibia has historically had one of the most productive fishing grounds in the world, due to the Benguela Current. The most valuable fish stocks are hake, crayfish, horse mackerel, pilchard (presently under moratorium), orange roughy, sole and kingklip. The fisheries are almost entirely industrial, with the marine fishing industry well developed and well managed. In 2007, Namibia harvested about 415,000 t of fish with a very small inland fisheries sector.



Commercial marine aquaculture is currently dominated by oyster production in Walvis Bay, Swakopmund and Lüderitz, as well as mussels and seaweed. Investors have shown a keen interest in entering the sector especially after the establishment of two aqua parks complying with EU and Asian market demands. Scallops are another high-value shellfish showing great promise, and the newly established abalone industry in Lüderitz also appears to flourish. However Namibia experiences sporadic “red tides” which in 2008 had a serious impact. The freshwater aquaculture sector is very small, but good development potential exists along rivers, as well as in dams.

The country exports more than 90 % of its fisheries production in various forms, to markets including the EU, USA, the Far East as well as African markets, with 2006 total value about USD 460 million. The EU is a substantial importer (USD 317 millions in 2007), while US imports were some USD 7.7 million. Namibia had a GDP of USD 6.3 billion in 2006, and an annual growth rate of 4.6 %. Fisheries contribution to GDP is almost 8 %. Namibia is keen to attract foreign investors and has created Export Processing Zone (EPZ) regimes that offer tax and duty-free environment for foreign investors. It is a relatively well managed and acceptable regime to do business in (ranked third best country in this section).

## 2.7 South Africa (aquaculture only)

Marine fisheries is important, but this profile focused on the aquaculture sector, divided into freshwater (1,000 t in 2006) and marine culture (3,000 t in 2006). Both in terms of production and value, the Western Cape is the most significant contributor to the collective aquaculture output. Species cultivated include freshwater species of: African catfish, Carp, Goldfish, Ornamental fish, Rainbow and brown trout and Largemouth bass, and marine species such as Abalone, various marine finfish, Mediterranean mussel, Pacific cupped oyster and Seaweed.



South Africa is a middle-income, developing country with an abundant supply of resources, well-developed financial, legal, communications, energy and transport sectors, a stock exchange that ranks among the 10 largest in the world, and a modern infrastructure supporting an efficient distribution of goods to major urban centres throughout the region. Exports mainly consist of fresh and frozen fish, while value also derives from fresh crustaceans and molluscs, a total of 142,551 t in 2006 worth USD 406 million. GDP in 2007 was USD 283 billion, with a real GDP growth rate of 5.1 %. It is highly ranked and respected as a well organised society welcoming foreign investment. The Government does not require approval for investment and foreign investors are subject to the same laws as domestic investors. Non-residents may invest directly through a resident company, branch or partnership. Black Economic Empowerment (BEE) has been at the centre of business-government relations in recent years and this requires some strategic thinking by investors, as firms not meeting BEE are less competitive.

South Africa's large and diverse economy makes it an attractive option with a strong fishery resource base. The markets, infrastructure and communications are well developed and make establishment of new businesses relatively easy. The need for local partners and joint ventures is likely due to an increasing nationalism. The current political instability may also deter any potential investor.

## 2.8 Tanzania

Over recent years, annual fishery production in Tanzania has levelled-off at around 350,000 t of which some 290,000 t (85 %) originates from the great lakes, 50,000 t (15 %) from the relatively unproductive inshore marine fishery and the balance from smaller lakes and reservoirs. These exclude the wider EEZ (crude estimates suggest annual capacity >730,000 t) and mainly exploited by foreign fleets for tuna. Despite numerous initiatives, the aquaculture sector remains under developed.



Tanzania looks positively upon foreign investments although entry level is defined on a minimum investment of at least NOK 2.5 million from foreign investors. Tanzania had a GDP of USD 12 billion in 2006, and an average growth rate of 6.2 %. The country scores relatively low on governance and although within limits of what could be acceptable in terms of private sector developments and investments. Tanzania offers potential as a country that has steadily improving social and economic conditions and has made good head roads in improving fishery governance.

## 2.9 Uganda

Fisheries in Uganda play a very important role for subsistence and commercial livelihoods. Lake Victoria fisheries are by far the largest and economically significant. Nile perch catches in 2007 were 210,000 t plus 60,000 t estimated in illegal catch. Aquaculture is insignificant economically but interest is rising. Two species contribute over 90% of production; North African catfish, with production in 2006 at over 34,000 t; and Nile tilapia at over 16,000 t in 2007, set to increase. Exports in 2006 were over 35,000 t for a total value of USD 147 million, mainly to EU, Japan, Hong Kong, Singapore, Australia, Dubai, Israel and USA.



Uganda had a GDP in 2007 of USD 10.8 billion, forecast with an annual growth of 6.4 % in 2008 and 6.6 % in 2009. Investor interest is high and is particularly strong from continental Europe and South Africa. The Government seeks to attract foreign direct investment and markets itself strongly to do so. There is likely to be a series of investments in large scale aquaculture in Uganda, and these will require a range of infrastructure development inputs. There are good opportunities for development partnerships, but the poor ranking in doing business and the social and political uncertainties will require careful investigation before any investments are made.



### 3 Final selections

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After a further round of consultation, four countries with particular potential; Ghana, Mozambique, Tanzania and Uganda were selected for more detailed assessment – these are described in Chapter 6 of Volume II and in full individual reports in Volume IV. To do this short in-country assessments were carried out based on a range of discussions with local respondents in public sector, business and support sectors. A further and finer-grained approach was applied to defining investment opportunities, classifying larger and smaller scale investments, defining possible change or turning points which could catalyse new opportunities; also recognising that external investors would need a certain scale of activity to justify the risks and transaction costs involved.

Without doing detailed financial analysis and business case models, we considered the potential for investment based on available data on costs and returns, on potential markets and on local and international competitive conditions, using our knowledge of the sector to define where businesses could be feasible. What we have shown across all of these countries is that good investment potential exists but that it is not always quickly realisable; here we identified Ghana and Uganda as having the strongest and most immediate investment potentials, with recognisable business opportunities and potential partners which would justify early consideration and expectations of returns. For Tanzania and Mozambique there were also good prospects but these would take more time and care to build up, and a longer view would be needed, although with significant positive longer term outcomes.

We also noted the generic issues of what kinds of aquaculture and what kinds of value addition would be most feasible, and also what type of potential partner would be available and/or useful to engage. For aquaculture, the major large scale opportunities are in cage culture of tilapia in major African lakes where site allocation and environmental management can be established. In coastal zones large scale pond culture of shrimp could be feasible if well integrated and designed for low impact. Diverse smaller scale options, particularly in coastal areas, could also be identified, and the hatchery and feed production sectors could provide small to medium scale opportunities in many areas. Other aquaculture species including marine fish, mussels, oysters, seaweeds, and sea cucumber, together with freshwater species such as African catfish, and other local indigenous stocks could also be considered, but as smaller scale contributions. The introduction of non-native stocks would be too contentious to consider, and would in any case encounter market problems, particularly for export.

Value addition is more difficult to place as the uncertainties of dependency on fished stocks, and the problems of establishing effective management regimes makes it difficult to justify new investment. In many cases, better options are associated with aggregating supplies from artisanal sources, often with community networks, and considering eco-labelling and fair trade approaches. Value addition for aquaculture, sometimes in vertically integrated approaches, is also useful.

We found a range of partners at different levels, many of whom are undercapitalised but have excellent networks and interactions within national business and political contexts. This is an important issue and the status of partners locally needs to be considered carefully. In some cases, links with emerging community development and resource management entities are potentially important and business/NGO and other partnerships would be effective. Innovative and opportunistic approaches may be appropriate to find ways to initiate and develop these types of partnership.

### 3.1 Ghana



Ghana has relatively good infrastructure and business conditions, with a growing economy and good markets. With a decent road network, product safety and accreditation in place, and direct flights to London, Amsterdam, Frankfurt and Rome of less than 7 hrs, it is well placed for exports, in both value addition and aquaculture. It also has good potential for serving the region.

Ghana is very well suited for freshwater aquaculture, particularly cage culture of tilapia in Lake Volta, which is entirely in Ghanaian territory, and avoids shared water resource issues as is common in many other cases. A small number of commercial producers are already established or establishing themselves and thus the potential for further growth is substantially greater. Pond fish culture is also underway, and artisanal coastal aquaculture of shellfish and molluscs, but these are less likely to become commercially significant.

The Government of Ghana is very supportive of aquaculture and any form of local value addition from its resources. High market prices for tilapia are stimulating investment and the sector is growing, with good potential in national, regional and international markets. Value addition prospects can also be identified, although in more specialised contexts. Integration with aquaculture may also be viable. Options include:

- Aquaculture; medium to large scale cage culture of tilapia in Lake Volta for regional and international markets; development and supply of high quality aquaculture starter and on-growing feeds for tilapia, development of specialist hatchery and seed production for tilapia; provision of service and support functions for commercial and artisanal producers.
- Value addition; small-medium scale options based on aquaculture raw materials, for local to international markets; specialised tuna products and small scale value addition associated with high value coastal demersal species.

A number of potential investment partners can be identified, and for CSR oriented approaches, various artisanal development and community organisations could be considered. Investment conditions are relatively sound and particularly in cage culture, feeds and seed, have good potential for early returns. A sound resource strategy and management framework for Lake Volta will be essential, but plans are currently under way to establish this.

### 3.2 Mozambique



Unless reformed fisheries management results in more sustainable stocks and the landing of a greater part of Mozambique's marine resource within the country, opportunities for significant change to value addition are limited. However, there are prospects on a more modest scale to link with artisanal and semi-industrial fishing to add value. Subject to resources, the aim would be to build up partnership agreements, to engage in producing better and more uniform export quality products with a stronger focus on social and environmental attributes through eco-labelling and fair trade standards.

In coastal zones, investment in small-scale, integrated aquaculture has potential, possibly also linked with fisheries and community development for eco-labelled, fair trade product, and if carefully and realistically

approached, larger scale and environmentally sound development of shrimp farming, for which there is substantial resource potential.

Freshwater aquaculture in ponds is likely to remain at artisanal scale, but larger scale development is feasible, particularly in cage culture. As the sector is not well developed, with many gaps in the input supply chain, investment would have to be strategically integrated, inclusive of hatchery and feed development. To establish strategic market power in southern Africa to tap into the potential resources available, the timing could be right to establish a small scale operation with the longer term aim to grow to a regionally significant scale.

Competition from South African firms will be a major issue, and partnership with one of these may be strategically useful, to support commercial entry into Mozambique, ensure a more stable supply base and access a strong regional presence. However, Mozambican partners can also be considered, some of whom have good market links to Southern Europe, and a good potential for building quality image and brand strength.

### 3.3 Tanzania



Although resources in Tanzania are good and investment conditions quite favourable, the fisheries sector is not strongly developed except for the export of Nile Perch via the processors and exporters in Mwanza on Lake Victoria, who export by air or container to coastal ports. More generally Tanzania is well located for regional markets in East and Southern Africa, and also has an expanding tourist market. Infrastructure to the south is improving steadily, but fishery sector distribution links need to be developed further.

Investing in Tanzania's fisheries sector is a long-term commitment that would have to be carefully planned. There is a strong community and conservation ethic, particularly in coastal and island regions, and this would have to be respected. As the sector is largely driven by artisanal production and post-harvest activities, an external investor would have to adapt to local conditions and slowly build up to larger volumes and more organised production. However, to establish long term presence and a strong market position in the region, it could be very opportune to enter now and build together with the sector as it matures and develops. The following options can be considered;

- Acquire an existing processing and exporting firm. A medium scale opportunity with growth potential; at least one processing and exporting company is interested to sell.
- Small scale investment in coastal fisheries and aquaculture, collaborating with community based organisations and developing slowly into a medium/larger business. This could also be linked to a CSR activity.
- Development of larger scale shrimp farming and product export based on existing or new enterprise; this would require careful assessment and scrupulous attention to environmental and social issues.
- Long-term investment in large scale cage farming in Lake Victoria. A number of actors are interested but need investment capital and technical know-how.

### 3.4 Uganda



Uganda has a diverse and relatively well developed fishery sector, with particular investment, production and market strengths associated with Nile Perch in Lake Victoria, but a range of other significant fisheries resources. International export, mainly of fresh and frozen Nile Perch fillets through international standard facilities, and regional trade in a wide range of other species has supported a substantial post-harvest industry.

Nile Perch stocks in particular have declined, though may stabilise under emerging regional management measures. Although aquaculture has been promoted for some decades, mainly in artisanal ponds, it is only recently moving towards becoming an effective sector. It will become more important in meeting national and regional needs, and is potentially tipping towards significant expansion.

Uganda has well established export links with main markets including the EU, USA and the Middle East. It is strategically located, linking the East and Central African communities, and is a major regional market route, supplier and location for added value. Its major infrastructure is located within a 100 km radius of Kampala, around the upper shores of Lake Victoria, providing a good resource cluster for investment. Economic, fiscal and business support conditions are positive, and improving political conditions have been accompanied by good levels of economic growth.

Investment opportunities at a range of scales are available in both the aquaculture and value-added sectors, or in a more integrated approach. These have both national and regional potential, and include:

- Aquaculture; large to very large scale cage culture of tilapia for regional and international markets; development and supply of high quality aquaculture starter and on-growing feeds for tilapia and African catfish (*clarias*); development of specialist hatchery and seed production for tilapia and catfish; provision of service and support functions for commercial and artisanal producers.
- Value addition; diversification of existing Nile Perch processing, and development of tilapia products; organisation of capture and value addition for small-scale pelagics in Lake Victoria and other lakes.

Small-scale, more specialised opportunities may also exist in producing ornamental freshwater species and in organising supply and external markets for ethnic food products. Potential partners can be identified for all of these themes, and indications are that joint ventures or other commercial initiatives could be established in relatively short time. Compared with the other countries reviewed in detail, Uganda has the best opportunities for shorter term commercial development, and could also be the hub of a regional scale aquaculture based business.



## 4 Regional opportunities

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In a small number of cases there were also prospects for regional level development. The primary example was a major regional scale aquaculture based business, with cage culture as its base, linking Uganda, Ghana, Zimbabwe, and possibly Tanzania, Malawi and Egypt, with further options for horizontal and vertical integration. This pan-African enterprise could potentially be developed to a globally competitive scale. A more modest opportunity lies with providing regional sector support – e.g. in equipment and services, where one potential partner with an existing regional presence has made initial inroads but requires technical and operational strengthening to be fully effective.

## 5 What needs to be done next

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As noted earlier, the identification of these opportunities has not been based on detailed financial assessments of individual business proposals. Rather it has been indicative, based on generic experience and primary indicators of costs, performance and output, of what would be most likely to be profitable. Clearly more detailed business appraisals would be required, or at least regionally relevant business models. Decisions need to be made as to whether this can be taken up by commercial interests directly, or whether selected business profiles can be developed.

A range of options for partnering and business development is provided in the main report, and the possible role of NORAD in facilitating these is set out.





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