

Attracting Investment to Kisumu: Opportunities and Challenges



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Executive Summary

As a large city situated on Lake Victoria, one of the biggest fresh-water lakes in the world, at the crossroads of trade between Kenya and neighboring Uganda and Tanzania, Kisumu has every reason to be a prosperous commercial center.

Yet almost half of the city's population lives below the absolute poverty line. Kisumu's traditional industrial base—exploiting cotton, fish and sugar—is near the end of a slow spiral of decline. Lake-based trade is stagnant. Meanwhile, the city is swelling. Kisumu's city services are strained as its municipal government struggles unsuccessfully to keep up with the additions to its periphery, marked by the daily arrivals of rural migrants to its slums. Furthermore, the city has suffered from decades of political neglect. It is likely that the central government, including both politicians and technocrats, either has not taken Kisumu's issues seriously or has willfully neglected them.

In this context, the Millennium Cities Initiative (MCI) seeks to help promote Kisumu's economic development, aspiring toward the achievement of the Millennium Development Goals (MDGs), largely by attracting foreign direct investment (FDI) that is conducive to the city's development.

FDI-driven development looks for investments that promote economic growth, the sophistication of local human capital, infrastructure development, or basic services provision by virtue of its identity in relation to the local economic environment. Thus, Kisumu and the MCI do not need so-called Angel Investors willing to sacrifice some amount of profit for the cause of development. Instead, they need to find opportunities where the investment will “naturally” lead to the desired effect in the course of pursuing its own success. Sustainability, in the sense that the effect will last far beyond the Initiative's duration, is guaranteed by the investment's profitability.

To this end, a team of graduate students from the Economic and Political Development (EPD) concentration of Columbia University's School of International and Public Affairs (SIPA) assisted the MCI in inaugurating its effort in Kisumu. The EPD workshop's purpose was to look for investment opportunities in the city and surrounding area and to devise a framework for judging the impact and feasibility of foreign investments. What follows herein is a report of the workshop's findings.

Section 1 lays out the rationale for the MCI and the workshop in greater detail. It is followed, in **Section 2**, by a discussion of the team's methodology, describing the direction of research and two trips taken in January and March to gather information in Kenya. In **Section 3** an overview of the city's status is given, including vital statistics and the economic and political context. **Section 4** describes the investment framework the team devised to provide a basis for analyzing the feasibility and development impact of a given investment.

Section 5 gives an in-depth analysis of the nation's sugar sub-sector. It begins by illustrating the threat the industry faces due to an imminent import surge, and then describes a potential alternative market for the nation's sugarcane growers in the production of fuel ethanol. A feasibility study for domestic fuel ethanol production, including demand and cost estimates, is included. Calculations involved in making those estimates are detailed in **Appendix III**.

Section 6 details western Kenya’s groundnut sub-sector. Smallholders grow the vast majority of the nation’s groundnuts in the area surrounding Kisumu, although all value-adding activities in the groundnut sub-sector occur in and around Nairobi. This situation, combined with rising peanut butter demand, points to an obvious opportunity to set up a peanut butter factory in Kisumu. The market for peanut oil is also explored.

Section 7 explores the possibility for promoting aquaculture in western Kenya. One outfit with an aquaculture operation, Dominion Farms, is in the early stages of development and expects its commercial fish farm to be extremely successful. The national government and several academic and civil organizations are also interested in fostering aquaculture as a substitute to lake-based fishing, which is declining with the deterioration of Lake Victoria. The section advocates attracting investors willing to either found a large commercial aquaculture farm or contract with outgrowers.

In **Section 8**, an analysis is provided considering constraints and opportunities in dairy production in western Kenya. There is high demand for both milk and dairy cows in Kisumu and the surrounding area. However, the cost of acquiring suitable cows and the availability of land arise as serious constraints to the successful exploitation of dairy farming.

Section 9 is a description of an investment promotion office (IPO), an essential feature of local capacity to maximize the benefits of FDI, housed within the municipal government. As a single point of contact the IPO would act as a guide for prospective investors, simplifying the process of investing in the city, and a matchmaker for local firms interested in doing business with foreign affiliates.

Section 10 concludes the paper by making recommendations and listing limitations. Following that, **Appendix I** surveys six industries—cotton, solar energy, tourism, rice, water hyacinth, and horticulture—the MCI should investigate further as potential targets for foreign investment. **Appendix II** gives several surveys of industries in which the workshop decided there was no suitable investment opportunity—because an investment was infeasible (as in the case of local furniture), had a low development impact (as in the case of financial services), or both (as in the case of construction and building materials).

As mentioned previously, **Appendix III** gives calculations behind costs and demand estimates for an ethanol blend mandate. Lastly, **Appendix IV** provides a review of basic concepts and some of the theoretical underpinnings of FDI, illustrating the rationale behind the focus on the significance of human capital, linkages and the enabling environment, and the vital role an IPO plays in capturing the benefits of FDI.

The following is a list of the workshop’s recommendations to the MCI, they are explained more fully in Section 10:

- Advocate a government mandate to blend sugarcane-based ethanol with gasoline as a fuel additive. This mandate would guarantee demand of about 50 million liters/year of fuel ethanol, encouraging investors to build distilleries and saving the livelihoods of a huge number of western Kenya’s small farmers.

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- Identify an investor for a peanut butter factory in Kisumu. A peanut butter factory in Kisumu would have natural comparative advantage over its Nairobi-based counterparts. Once basic operations are established, a factory could enhance this advantage by building business relationships with local growers.
 - Identify an investor for a commercial aquaculture farm in the Kisumu region. Commercial aquaculture represents not only an opportunity for a high-value farm activity, it could also increase supply to the local market, driving down prices and feeding a larger share of Kisumu's bulging population.
 - Support the municipality's establishment of an IPO. Kisumu's IPO can take over for the MCI in attracting and encouraging foreign investment in the area, plus serve as a catalyst for local development by linking local firms to foreign affiliates. The MCI should also continue to work with partners to push for the KIA to open an office in Kisumu.

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We also want to thank the municipality of Kisumu, whose contribution played a vital role in our research. Their commitment to the MCI shone through in their support and attention during our field visits. We are also grateful to the various individuals within the Kenyan national government who generously agreed to be interviewed for this project.

We want to recognize the many organizations and individuals that we interviewed in Kenya for their time and energy in providing us with information important to our research. While their names are too numerous to mention here, we are extremely thankful for their kindness and commitment to the development of Kisumu.

Finally, we want to thank Erin Sweeney, student at Harvard's Kennedy School of Government, for her support and friendship and for sharing the research she found while studying the infrastructure of Kisumu for the MCI.

Acronyms and Abbreviations

ACFC	Agro Chemical and Food Corp.
AGOA	African Growth and Opportunity Act (U.S.)
CDM	Clean Development Mechanism
CDS	City Development Strategy (Kisumu)
COMESA	Common Market for Eastern and Southern Africa
EPD	Economic and Political Development Concentration at SIPA
EPZA	Export Processing Zones Authority
FDI	Foreign Direct Investment
FISH	Fisheries Investment for Sustainable Harvest
GOK	Government of Kenya
IPO	Investment Promotion Office
KAT	Kisumu Action Team
KCFC	Kenya Chemical and Food Corp.
KCGA	Kilombero Cane Growers Association
KESREF	Kenya Sugar Research Foundation
KICK	National Irrigation Board
KIWASCO	Kisumu Water and Sewerage Company, Ltd.
KSCL	Kilombero Sugar Company Limited
KSh	Kenya Shillings (KSh 68.42 = US \$1, May 1, 2007 ¹)
LBDA	Lake Basin Development Authority
LDC	Least Developed Country
MCI	Millennium Cities Initiative
MDGs	Millennium Development Goals
MVP	Millennium Villages Project
NGO	Non-Governmental Organization
NIB	National Irrigation Boardc
PV	photovoltaic
SIPA	School of International and Public Affairs, Columbia University
SONY	South Nyanza Sugar Company Ltd.
SUCAM	Sugar Campaign for Change
tch	Tons of cane per hectare
TNC	Transnational Corporation
UNCTAD	United Nations Conference on Trade and Development
UNHABITAT	United Nations Human Settlements Program
USAID	United States Agency for International Development

¹ Oanda.com, The Currency Site. May 7, 2007. <<http://www.oanda.com>>.

Section 1: Millennium Cities Initiative and Rationale for Project

Section 1.1: Millennium Cities Initiative (MCI)

The Millennium Cities Initiative (MCI) is an urban counterpart to the Millennium Villages Project (MVP), a rural development program based at the Earth Institute at Columbia University. The MCI targets six cities in Sub-Saharan Africa located near the Millennium Villages.

The MCI aims to help secondary cities in developing countries to reach the Millennium Development Goals (MDGs), a set of targets in various areas of human development that were agreed upon by world leaders at the 2000 United Nations Summit. These goals are listed below.

Goal	Description
1	Eradicate extreme poverty and hunger
2	Achieve universal primary education
3	Promote gender equality and empower women
4	Reduce child mortality
5	Improve maternal health
6	Combat HIV/AIDS, malaria and other diseases
7	Ensure environmental sustainability
8	Develop a Global Partnership for Development

The MCI is undertaken by the Earth Institute at Columbia University and the Columbia Program on International Investment, and is supported by the United Nations Development Program, along with other international partners. Kisumu, Kenya, declared the first Millennium City, is the focus of this project. Kisumu is located 40km from Sauri, the site of the first Millennium Village.

The year 2007 marks the halfway mark for achievement of the MDGs. The MCI notes, however, that sub-Saharan Africa lags behind other nations in this aspect, and hopes to promote sustained economic growth by promoting FDI and harnessing FDI-associated benefits, such as technology transfer, employment generation, and the increased sophistication of domestic enterprises.

The MCI is structured as a five-year project as follows:

Year	Activity
1	Identify and inform appropriate foreign investors about the Millennium Cities.
2	Promote infrastructure improvements and assist in developing longer-term strategies in critical sectors.
3 - 4	Assist the cities in securing durable investments, completing and disseminating MDG-based City Development Strategies to spur accelerated achievement of the MDGs in these and other urban areas.

At the end of the project, The MCI expects to produce a handbook to be used by other cities to help them develop their own strategies to reach the MDGs.

Section 1.2: Workshop focus

The team from the SIPA was contracted by MCI to begin work on the Initiative's first phase—identifying opportunities for investment in Kisumu.

The main deliverables the MCI requested were:

- Analysis of the business environment in Kisumu
- A framework for analyzing investments
- Recommendations on potential areas (sectors) for investment

Section 2: Methodology

Section 2.1: Literature Review

The EPD workshop team conducted an extensive literature review during the months of November and December. The team reviewed all documents related to development in Kisumu, including development strategies written by the municipality of Kisumu, the government of Kenya, multilateral organizations, NGOs, and others. The team used information gathered during the literature review to write a document which included chapters dealing with characteristics of Kisumu, the Kenyan Economy, concepts useful in the study of FDI, human capital in Kenya and Kisumu, the Kenyan regulatory environment, and FDI case studies.

Section 2.2: Field Visit #1

The literature review prepared the EPD Workshop team for its first 14-day field visit to Kenya from January 7 to January 21, 2007. Preparation for this field visit involved email communication with employees of NGOs, the UN, government officials, and the private sector. The team spent seven days in Nairobi and seven days in Kisumu meeting with a total of eleven business leaders, six government officials, and twelve employees of NGOs and universities. The meetings were generally open ended interviews seeking information on sectors with the most potential in the city of Kisumu as well as an understanding of the political, economic, and social environment of the city. Objectives of the field visit were as follows:

- Meet with government officials and policymakers (on local, regional, and national levels) to assess political climate which supports/hinders investment opportunities in Kisumu.
- Visit with business leaders in primary and secondary industries to determine causes of past failures, current business climate and happenings, and areas for future expansion / investment.
- Meet with existing foreign investors to gauge the ease of doing business in Kenya.
- Consult with academic and professional experts to better understand Kisumu's history, current state, and potential.
- Meet with current partners to establish/strengthen communication.
- Network, so as to increase awareness of MCI and broaden active stakeholder base.
- Establish strong working relationship with MCI-Kisumu Representative, Ashley Hufft.
- Set ground work for upcoming March trip.
- Access local documents and resources.
- Experience and witness, first hand, social and economic factors affecting both citizens' daily lives and business operations.

A mission report was prepared which outlined findings and preliminary observations of the first field visit.

Section 2.3: Sub-Sector Surveys and Investment Evaluation Framework

In preparation for the second field visit, the EPD Workshop team prepared 17 sub-sector surveys on the industries listed below.

Agri-business & livestock

- Aquaculture
- Cattle/dairy
- Cotton
- Fishing
- Groundnuts
- Hyacinth
- Rice
- Sugar and ethanol
- Horticulture

Non-agricultural

- Clean development mechanism
- Construction
- Fertilizer
- Finance
- Furniture
- Water and sewerage
- Solar-energy
- Tourism and hotels

An Investment Evaluation Framework was created, based loosely on The Boston Matrix, as an analytical tool to assess the potential of the various sub-sectors. The Framework, discussed in depth in Section 4, assesses the potential of an investment by looking at its feasibility as well as the developmental impact it would have on the city of Kisumu.

The results of the sub-sector surveys informed the choice of industries focused on during the EPD Workshop's second field visit.

Section 2.4: Field Visit #2

The second field visit occurred from March 10 to March 22, 2007 and focused on researching the sugar/ethanol, groundnut, dairy, construction, and aquaculture sub-sectors. The team conducted 16 private sector interviews, 22 government interviews, and six interviews with NGOs and universities. The research conducted during this visit was critical in determining which sectors had the most potential and, thereby, informing our final recommendations.

Section 2.5: Sub-sector Feasibility Studies

The EPD Workshop team conducted an in-depth analysis of the four sub-sectors which demonstrated the most potential based on the research conducted thus far: sugar/ethanol, dairy, aquaculture, and groundnuts. These feasibility studies formed the basis for the team's final recommendations.

Section 2.6: Group Presentation and Report

The results of the research conducted by the workshop team along with recommendations for MCI were presented at SIPA on April 26, 2007.

Section 3: Kisumu Overview

Section 3.1: Kisumu City Snapshot

The following chart gives an overview of some of Kisumu's defining characteristics:

City Area	Covers an area of approximately 417 Km ² , of which 297 Km ² is dry land and approximately 120 Km ² is under water. The city is the headquarters of Kisumu District and Nyanza Province.
City population:	Approximately 500,000, ² compared to country population of approximately 28.7 million (1999 census).
City population density:	828 per km ² .
City growth rate:	Estimated at 2.8% per year.
Employment:	High levels of skilled and unskilled unemployment. 30% unemployment rate. 52% of the working population engaged in informal activities with monthly wage in the range of KSh 3,000 to KSh 4,000.
Poverty:	48% of the urban population live within the absolute poverty bracket.
Food:	53.4% of the population below the food poverty line in comparison to Nairobi (8.4%), Mombasa (38.6%) and Nakuru (30%).
Education:	Adult literacy rate is 48 %, with 24.6% of urban poor having attained secondary school education. Low enrolment rate and high gender parity between boys and girls. Within Kenya, the city is known as being “the brains of Kenya.”
Water:	10% sewerage coverage. 40% of population has access to piped water. Over 60% of slum residents obtain their water from unsafe sources, resulting in high rates of water- and sanitation-related disease and morbidity.
Waste Management:	20% of people have access to solid waste management services.

Kisumu City Development Strategy (2004-2009), UN HABITAT (unless otherwise noted)

Housing

The city lacks adequate shelter, with approximately 60 percent of the urban population who reside in the peri-urban and informal settlements lacking basic services. There is high

² UN HABITAT, “Managing HIV/AIDS at the Local Level in Africa” (Kisumu, 2006).

congestion, with 150 rooming/housing units per hectare in informal settlements. Approximately 75 percent of peri-urban inhabitants live in temporary and semi-permanent structures.³

Food

The city experiences one of the highest incidences of food poverty, with 53.4 percent of the population below the food poverty line in comparison to Nairobi (8.4 percent), Mombasa (38.6 percent) and Nakuru (30 percent).⁴

Health

The key health challenges that Kisumu faces include high HIV/AIDS infection rates and malaria, and water borne diseases contributing to a high child mortality rate. HIV/AIDS in Nyanza Province is alarming, with a prevalence rate of 15 percent, double the national average.⁵ According to the 2001 results of sentinel surveillance by the Ministry of Health, 35 percent of pregnant women tested positive for HIV in Kisumu.⁶

Energy

Most slum dwellings are without electricity and occupants use paraffin lamps, tin lamps, batteries, and candles for lighting and kerosene or charcoal for cooking.⁷

Climate/Rainfall

At over 1,100m above sea level, the city falls within the humid climate, with an average annual rainfall of 1,245mm. The area experiences long rains between March and June and short rains between October and November. The annual mean minimum and maximum temperatures are 17.3°C and 28.9°C, respectively. The city has a mean humidity of 70 percent.⁸

Land Use

Land use in the hinterland of Kisumu includes small-scale rain-fed mixed farming, large-scale sugar cane farming, fishing, small-scale river irrigation, and settlement infrastructure. “However, agriculture does not provide enough livelihood support due to frequent droughts alternating with severe floods and poorly drained, intractable soils of the flat plains. The result has been rapid rural-urban migration with a consequence of unplanned and uncontrolled urban expansion.”⁹

³ UN HABITAT, “Kisumu City Development Strategy (2004-2009).”

⁴ UN HABITAT, “Kisumu City Development Strategy (2004-2009).”

⁵ UN HABITAT, “Managing HIV/AIDS at the Local Level in Africa” (Kisumu, 2006).

⁶ UN HABITAT, “Kisumu City Development Strategy (2004-2009).”

⁷ E.H. Apoli Mugwang'a, ed., "Working to Restore the Glory of Kisumu" (Tom Mboya Labour College, 1994).

⁸ UN HABITAT, “Kisumu City Development Strategy (2004-2009).”

⁹ Ibid.

Figure 1: Map of Kenya



Source: *Kisumu City Development Strategy (2004-2009)*, UN Habitat

Figure 2: Aerial View of Lake Victoria and its bordering countries



Source: *Google Earth*. <www.googleearth.com>.

Section 3.2: Kisumu Economic Context

Kisumu is the third largest city in Kenya. Its economic significance comes primarily from its location on the shores of the second-largest fresh water lake in the world, Lake Victoria, which connects it to Uganda and Tanzania. In the 1960s and 70s, Kisumu was a thriving economy and large manufacturing hub with well-developed sugar, cotton and fishing industries. However, rapid market liberalization in the 1980s and 90s caused the market to flood with cheap imports with which local companies could not compete.¹⁰ Interviews with local NGOs, government officials and business owners reveal that Kisumu has struggled to adapt to the liberalized economy and remains uncompetitive in most sectors due to high costs of production. Many locals look to the past, at the cotton, sugar and fishing industries, rather than looking toward the future and fostering products in which they have a competitive advantage.

The deregulation of markets, decontrol of prices, and trade liberalization were intended to encourage the growth of the private sector.¹¹ However, the policy shift resulted in the collapse of major industries such as cotton, rice, and other agro-based industries, some say because liberalization happened too quickly.¹² Despite Kisumu's location in the sugar and cotton belt, high costs of production due to inadequate water and electricity supply hinder the ability of these industries to compete internationally.¹³ In addition, Kenyan plants and equipment are outdated, overvalued, and inefficiently used and investment levels are low and declining.¹⁴ While some maintain that there is potential in sugar and cotton, it seems their ability to sustain themselves rests on industry specific protectionist government policies and regional agreements such as AGOA and COMESA.¹⁵ With COMESA's sugar safeguard set to expire in February 2008, the sugar industry is expected to see a major setback.

While the decline of several agricultural industries is blamed on liberalization and cheap imports, the decline of the fishing industry is blamed on pollution, especially from agricultural run-off, over-fishing, and water hyacinth infestation. The dramatic effect of these processes on the lake can be seen in the diminishing number of species in Lake Victoria. While twenty years ago there were 200 species, today there are just four, with one of those four nearly extinct.¹⁶ In accordance with the decreased catch, the number of fish processing factories in Kisumu has decreased from 15 to four, with many relocating across the lake to Uganda or Tanzania, nations which, together, own 94 percent of the lake. While some locals believe that Uganda's advantage of having an

¹⁰ Kimani Ndungu, personal interview, January 2007.

¹¹ Rosemary Atieno, "Agricultural Market Liberalisation, Private Trade and Incomes: Implications for Poverty Reduction in Rural Kenya" (Oxford University, March 2002).

¹² Kimani Ndungu, personal interview, January 2007.

¹³ John Mwaura and Cecilia Kinuthia-Njenga, personal interview, January 2007.

¹⁴ Africa Private Sector Group, "Enhancing the Competitiveness of Kenya's Manufacturing Sector: The Role of the Investment Climate" (Kenya, November 2004).

¹⁵ The Common Market for Eastern and Southern Africa (COMESA) is a preferential trading area with twenty member states stretching from Libya to Zimbabwe.

¹⁶ Ferdinand Wanyonyi, personal interview, January 2007.

international airport will be eliminated with Kisumu's airport expansion plan expected to handle international flights, it is still uncertain if and when that expansion will happen.¹⁷

Local Development Strategy with Respect to FDI

Kisumu created the City Development Strategy (CDS) in 2005, which lays out a development plan for the years 2004-2009. The vision of the CDS as defined by the citizens of Kisumu is to “revamp the identity of Kisumu as the principal transport, communication and commercial hub of the great lakes region, while strengthening the service coverage and delivery capacities.” While the CDS offers an in-depth analysis and action plan for poverty reduction, it lacks an economic development strategy which engages the private sector and attracts investment. Further, there is no mention of foreign investment in the document. For those objectives outlined, there has been little follow up and no one is responsible for measuring progress.^A

Reports on opportunities for investment in Kenya/Kisumu have been created by Technoserve, The Lake Basin Development Authority, UNCTAD, and private consultants. However, like the City Development Strategy, they have lacked follow-up.

According to an interview with a government official, local development strategies are not in harmony with national or regional plans and there is a lack of information sharing among government agencies. It has been said that government agencies are competing rather than collaborating.^B

While the Kisumu Investment Authority, a national government agency responsible for investment promotion has two employees designated to support Kisumu, the city itself does not have a designated investment promotion authority. However, the Kisumu municipality has expressed interest in creating a position to attract and facilitate investment.

^A Wisdom Mwamburi, personal interview, January 2007.

^B Patrick Adolwa, personal interview, January 2007.

Kisumu suffers from soaring unemployment and the highest average urban poverty levels in the country. The majority of the population engages in wage employment in manufacturing and processing plants and there is also a fast growing informal sector in a variety of industries.¹⁸ Within the agricultural sector, large population increases and the subdivision of land among sons are shrinking farm sizes each generation.

Section 3.3: Political Context

Kenya enjoys a stable political climate, having moved from a one-party democracy to an inclusive multi-party system in 1991. While the national government includes Kisumu in two

¹⁷ Netherlands Airport Consultants B.V. and Kenya Airports Authority, “Stakeholders Briefing Kisumu Airport” (June 2006).

¹⁸ UN HABITAT, “Kisumu City Development Strategy (2004-2009).”

important national frameworks, the Poverty Reduction Strategy Paper (PRSP) and Economic Recovery Strategy for Wealth and Employment Creation, many locals feel their needs are neglected by the national government.¹⁹

A variety of political issues hinder economic development efforts in Kisumu. Disharmony between the local and national government has created obstacles to development in the past. Many say that this is because Kisumu is headed by the opposition party. In addition, poor communication among government agencies as well as competition and lack of information-sharing hinder government effectiveness.²⁰ Corruption is endemic at both the local and national level and “there are few people left, even in Kenya, who dispute the fact that the country is one of the most corrupt in the world.”²¹ Others refer to the municipality’s disempowerment caused by the central government’s ability to override local government decisions. Lack of funding is another issue which leaves the Municipal Council feeling powerless to maintain the city’s infrastructure and provide basic services. Just five percent of total national revenue is given to all 175 local authorities combined.²² Despite these issues there is a general sense that local-national government relations are improving and most individuals interviewed expected that the national government would be supportive of development efforts in Kisumu.

Local government has become more participatory and inclusive, aiming to empower communities with the implementation of community-centered planning and management of resources. One example of this is the City Development Strategy (CDS) created by the citizens of Kisumu together with the Kisumu Municipal Council and UNHABITAT to “assemble an array of strategic responses generated through consensus building and highly participatory processes broadly aimed at creating and sustaining Kisumu as a livable and highly viable City.”²³ In addition, the city has created the Kisumu Action Team (KAT), a multi-stakeholder roundtable forum to encourage strategic partnerships for accelerated development.²⁴

Since 2002, the Kenyan government has made huge strides in easing the process for business registration, reducing the number of days it takes to start a business from 90 to 21 days, or sometimes 12 days.²⁵ Although government cooperation is not guaranteed, the process is vastly improved, and one micro-entrepreneur that was interviewed consider it relatively “easy” to open a business as far as credit and business licenses are concerned. Others in the NGO sector and within the government claimed that Kisumu is a free market, and that politics do not hinder private sector development²⁶.

¹⁹ UN HABITAT, “Kisumu City Development Strategy (2004-2009).”

²⁰ Patrick Adolwa, personal interview, January 2007.

²¹ “No End to the Problem,” *The Economist*, November 16, 2006.

²² Peter Ngau, personal interview, January 2007.

²³ UN HABITAT, “Kisumu City Development Strategy (2004-2009).”

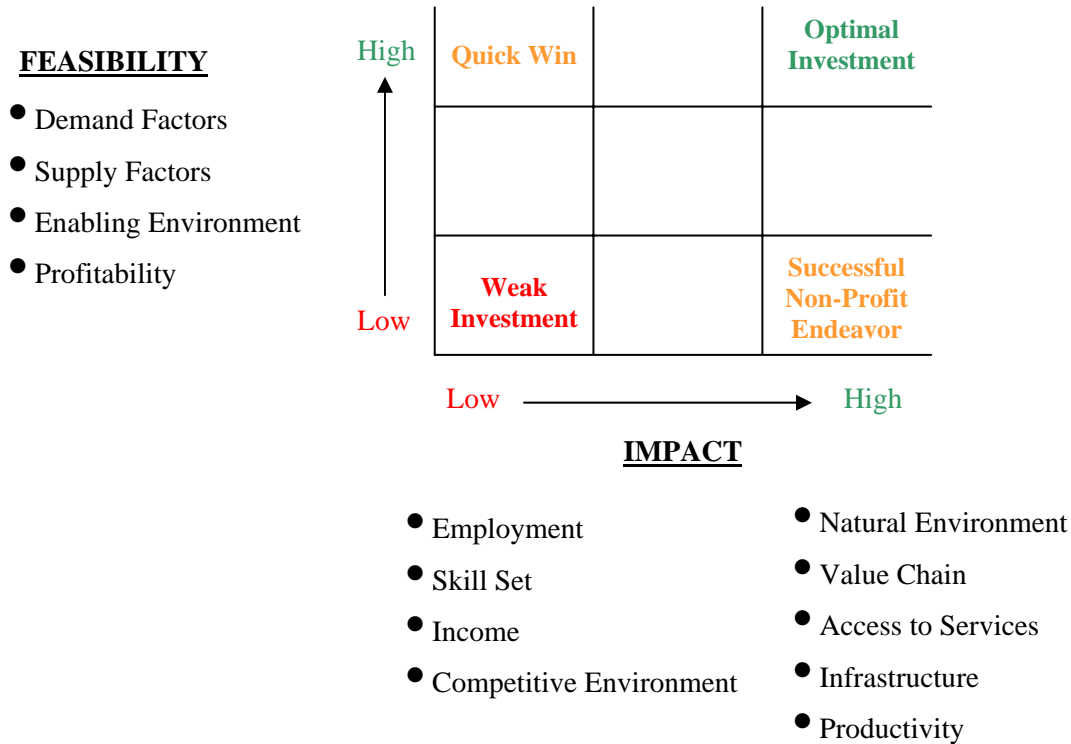
²⁴ UN HABITAT, “Kisumu City Development Strategy (2004-2009).”

²⁵ Wisdom Mwamburi, interview, January 2007.

²⁶ Peter Ngau, personal interview, and Patrick Adolwa, personal interview, January 2007.

Section 4: Framework for Judging Investment Feasibility and Development Impact

Figure 3: Investment Evaluation Framework



The Investment Evaluation Framework is a tool created by the EPD Workshop team to gauge the attractiveness of investment opportunities. The framework, based loosely on the Boston Matrix, relates the potential impact an investment will have to the investment’s feasibility. The result is a matrix that allows the user to compare various investment opportunities. The EPD team used this framework to assess the investment opportunities discussed in this paper.

Optimal Investments are the most desirable, as they have both high feasibility and high developmental impact, while **Quick Wins** are highly feasible with a low impact on the local community. Those investment opportunities which have a high impact with a low feasibility are typically **Successful Non-Profit Endeavors**, which improve various social indicators, however, most often are uncompetitive and rely on donor funding. **Weak Investments** have a minimal developmental impact and a low feasibility.

While the user is not expected to plot a precise point on the matrix, the framework is useful as a visual representation, as well as a checklist of factors to consider, and a guideline for discussion when analyzing sustainable investment opportunities.

The following factors comprise the **Feasibility** component of the framework and ask the following questions of each investment opportunity:

Demand Factors:

- Excess demand – Does current demand for this product exceed supply?
- Demand trend – What does future demand for this product look like?
- Price elasticity of demand – Should the price of this product change, how will demand be affected?

Supply Factors

- Technological requirements – Can the technology required for this operation be found locally and at a reasonable cost?
- Supply of qualified labor – Are there skilled professionals or do employees need to be trained?
- Competitive production costs – Can this investment opportunity compete on cost with other firms in the industry?
- Industry structure – Is the sub-sector considered an oligopoly? Are there many small players?
- Price elasticity of supply – What is the relationship between the change in quantity supplied and the change in the product price? How long will it take the firm to adjust its production levels?
- Access to financing – Is financing readily available?

Enabling Environment (for further discussion on some of these issues, see **Appendix IV**)

- Taxes and tariffs – Will taxes and tariffs affect the competitiveness of the investment opportunity?
- Corruption – Is this industry plagued with high levels of corruption?
- Trade agreements – Are there trade agreements which support or hinder this industry and when are they set to expire?
- Domestic policy – Does domestic policy support the growth of this industry and what will future domestic policy create for this sub-sector?
- Infrastructure – Is there adequate infrastructure to support this investment?

Profitability

-
- Payback period – What is the length of time required to recover the cost of an investment, calculated as Cost of Project/Annual Cash Inflows?
 - Break even analysis – What is the number of units that must be sold in order to produce a profit of zero and recover all associated costs?

The below factors comprise the **Impact** component of the framework and ask the following questions of each investment opportunity:

What is the investment's impact on:

- Employment – How much employment will be generated and among which segments of society?
- Skill set – Will this investment result in an improved local skill set?
- Income – For which segment of society, and for how many people, will incomes increase as a result of this investment?
- Local competitive environment – Does this investment spur competition, innovation and efficiency in the industry?
- Natural environment – Are this firm's operations environmentally damaging?
- Local consumers – Does this investment/product improve the lives of consumers?
- Suppliers – Are the suppliers for this industry benefited by the opening of this firm?
- Value chain – How are other members of the value chain affected by this investment?
- Peripheral service providers – How are the peripheral service providers in this sub-sector affected by this investment?
- Access to services (clean water, energy, etc.) – Does this product/investment improve local access to basic services?
- Productivity – What is this investment's affect on overall productivity?
- Infrastructure – Will this investment improve infrastructure in the region?

Section 5: Sugar Sub-Sector Study

Kenya's sugar industry is a traditional mainstay of the western region's economy. It faces an imminent and potentially mortal threat in the form of an import surge expected to arrive with the fall of a COMESA safeguard agreement on sugar imports, as early as February 2008. In this setting, investment, both foreign and domestic, can play a key role in maintaining the livelihoods of the approximately 200,000 small farmers (and their dependents) who rely on the industry, by quickly opening ethanol distilleries that will provide an alternative market for sugarcane.

Section 5.1 of this chapter gives an in-depth analysis of the domestic sugar industry, including its structure, inefficiencies and the threat it faces. **Section 5.2** details investment opportunities relevant to the situation of the industry. Focusing on fuel ethanol, it includes a description of the country's current ethanol production capacity—producing potable alcohol—followed by the effects of mandating an ethanol/gasoline blend and Kenya's capacity to meet the demand a mandate would entail. It also gives a brief treatment of small-holders' need for furrow irrigation and costs associated with providing it as a service. At the end of the chapter, in **Section 5.3** is an application of the analytical framework, placing fuel ethanol production and irrigation service provision in a matrix plot according to each investment's feasibility and development impact.

Opportunities:

- A. Investments in Parastatal Sugar Mills
 - a. Dependent on debt restructuring and privatization
- B. Ethanol Production Facilities
 - a. Greenfield, stand-alone production
 - b. Augmenting the more competitive mills with ethanol production
 - c. Equity investment in Spectre for fuel ethanol production
- C. Irrigation Service Provider
 - a. Furrow irrigation for smallholders

In brief, failure to act quickly to prevent the likely effects of a sugar import surge will mean the devastation of the western region. Any economic development the MCI hopes to promote in Kisumu and the wider area will necessarily be set back by this event. Well-placed and timely investment, in the form of at least three ethanol distilleries situated throughout the region, can prevent a large part of the economic and social deterioration such widespread, rapid impoverishment would bring.

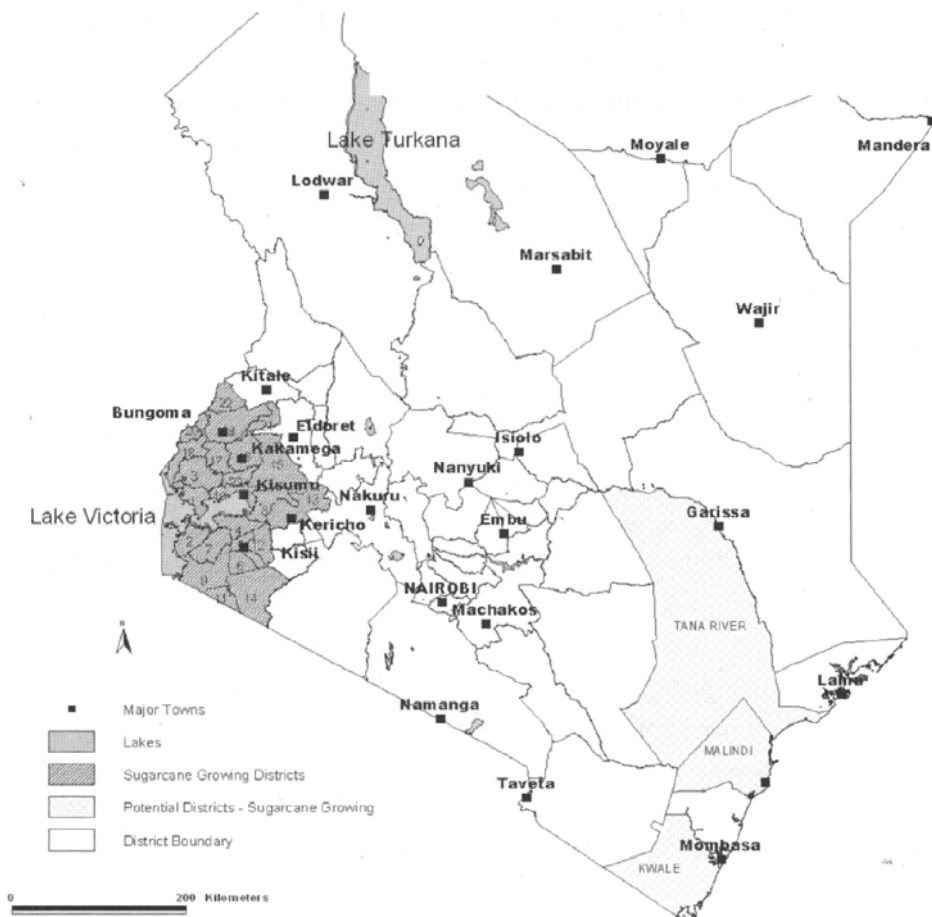
Furthermore, appropriate investments will not only offer a lifeline to struggling smallholders near Kisumu, they will also positively affect Kenya's balance of payments, as fuel imports diminish with the imposition of a gasoline substitute. Moreover, the nascent fuel ethanol industry will position Kenya to become an ethanol exporter to other east African nations and to countries such as China and Japan, where fuel demand is expected to increase dramatically.

Thus, the threat of the import surge is also a rare opportunity for Kenya to rid itself of an extremely uncompetitive element of its national economy, replacing it with a forward-looking industry using modern technology and positioned to prosper from global demand trends. The right investments will be crucial to the success of this transition.

Section 5.1: Overview

Industry experts estimate that the domestic sugar industry directly and indirectly supports 6 million Kenyans in Nyanza and Western Provinces, all who live in a belt around the eastern shore of Lake Victoria with Kisumu at its center. Among these people are about 200,000 smallholders whose farm sizes average less than one Ha. The rest are factory workers, transporters, distributors and their dependents.

Figure 4: Sugar-Growing Areas in Kenya



Source: *Impact of Sugar Import Surges on Kenya*

The Kenyan sugar industry is in a precarious situation. It is horribly uncompetitive, with inefficient mills, poor farming practices and difficult growing conditions. The industry survives for the moment, but only by virtue of its protection from cheap imports under a COMESA safeguard agreement that is scheduled to expire in February 2008. If the safeguard is allowed to fall the majority of the country's sugar mills, accounting for up to half of the industry's annual production, will likely collapse. Government officials say there is a possibility of extending the safeguard but only for two more years at most, to February 2010.²⁷

²⁷ Richard Sindiga, personal interview, March 22, 2007

The safeguard's expiration could eliminate the central income-earning activity of more than 2 million Kenyans in the western region. The effect on Kisumu of such an event is not difficult to predict—a massive increase in the city's already huge slum population and a corresponding strain on the city's spare resources. In order to mitigate these effects, an effort must be made to develop an alternative to sugar as the main sugarcane product, including byproduct exploitation, and bolster the industry's competitive elements through feedstock and process improvement.

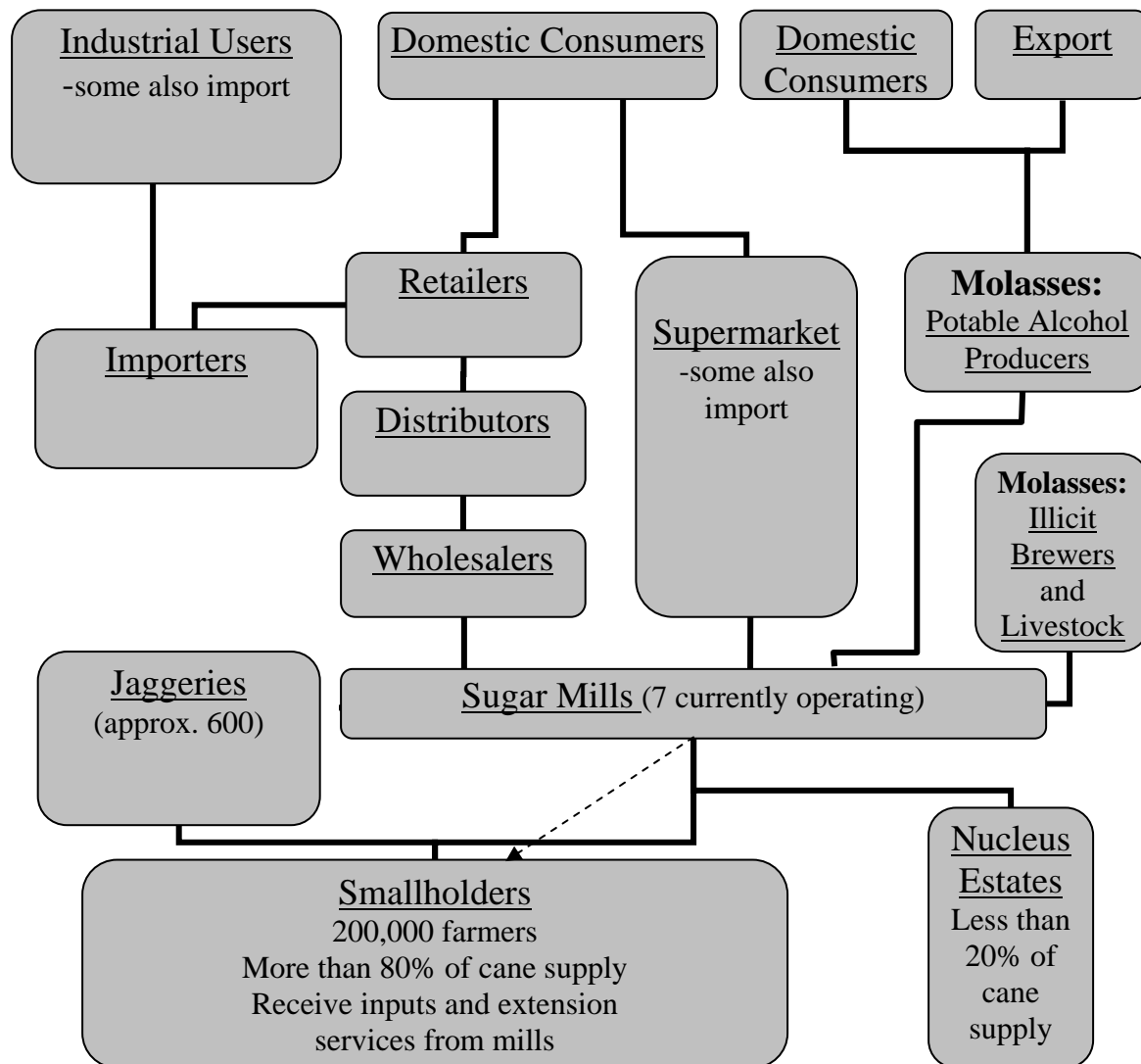
There are opportunities for foreign investment in both of these categories. One might also seek to promote crop diversification, to help farmers hedge against uncertainty in the industry in the run-up to the safeguard's expiration.

The best option for a sugar alternative is fuel ethanol production. This might begin with investments increasing potable alcohol distillation while a mandate is pushed through Parliament for a “gasohol” blend—without which no one will distill fuel ethanol for lack of a market. If a mandate is passed and the facilities built in time (almost certainly requiring a 2-year safeguard extension), the farmers growing sugarcane will be protected from the expected onslaught of cheap imports with a new buyer for their crops. Scant numbers exist for the feasibility of ethanol production in Kenya, but high gas prices, the availability of efficient feedstock (sugarcane is one of the best), and some national capacity for potable ethanol production are positive indicators. Also, some organizations have studied the feasibility of fuel ethanol production in least developed countries, particularly neighboring Tanzania, which allows for extrapolation to Kenya's sugar production and fuel consumption characteristics and a picture of what it would take to meet domestic demand under a blend mandate.

There is also opportunity for an investor to sell furrow irrigation (running water through trenches in fields, as opposed to spray irrigation) services to smallholders, although it will take a few years to collect payments from farmers for the services. Irrigation in the Kenyan sugar belt—where highland conditions and poor seed varieties mean an abnormally long 24-month maturation period and yields as low as 50 tons of cane/Ha (tch)—could push yields up to more than 100 tch (some say 150 tch). This would provide a huge boost to farmer incomes while multiplying feedstock available to ethanol and to those sugar factories that survive the lapse of the COMESA safeguard.

Structure of the Industry

Figure 5: Rough Value Chain of Sugarcane Products in Kenya



Sugarcane is produced by smallholders and at nucleus estates belonging to the sugar mills and is processed at the mills into sugar, which is sold either to supermarkets or to a wholesaler network before being bought by the consumer. There are about 200,000 smallholders providing more than 80 percent of sugarcane grown; the rest is grown on nucleus estates.²⁸ All sugarcane cultivation is in Nyanza and Western provinces, around the eastern shore of Lake Victoria. There are seven sugar mills, with another mill currently under construction and one more lying dormant (see next section, Situation of the Mills).

²⁸ “2006 Sessional Paper on Revitalization of the Sugar Industry” (Ministry of Agriculture, August 2006), p16.

Only mill white and brown sugar is produced in Kenya. All highly refined (confectioners, industrial purpose) sugar is imported by industrial users or by dedicated importers based in Mombasa. Mombasa importers and some supermarkets also import mill white sugar every year. Imports are allowed up to 200,000 metric tons/year, according to the COMESA safeguard agreement set to expire in February 2008; beyond 200,000 metric tons all imports incur a tariff amounting to 100 percent of C.I.F. value or a \$200/ton duty, whichever is greater.²⁹ Some mills also receive relatively small import permits for an amount exported to preferential markets like the EU (the Chemelil mill does this).

Imported sugar is extremely profitable and is allegedly controlled by a handful of influential traders. Thus, it is also political, drawing allegations of association with campaign slush funds, hoarding to fix domestic prices, interference with domestic production levels (the shuttering of Miwani, the sole industrial sugar producer, was blamed on importers), and contention between the Ministry of Finance and the Ministry of Agriculture, which vie for control over the import regime. The two ministries were most recently in the news last February, issuing dueling proclamations regarding the beginning of the import season as thousands of tons of sugar waited off the port of Mombasa.

Adjacent to the formal domestic chain are jaggeries, which are small, largely informal operations producing low-grade sugar. They also serve as an emergency market for sugarcane when mills fail to buy all of farmers' crops. There are estimated to be about 600 jaggeries in the country.

Sugar mills produce C Molasses as a byproduct—the end result of a process by which byproducts are fed back into the sugar pans. The mills sell the molasses to livestock farmers, illicit brewers of potable alcohol and large potable alcohol distillers who use it as feedstock. It was also reported that they export a significant, but unknown amount of molasses every year to Uganda and several of Kenya's other neighbors—the price of molasses in Uganda is three times Kenya's price.³⁰

²⁹ C.I.F. value – Cost, Insurance and Freight value is the cost of the good plus the cost of shipping and maritime insurance. Basically, it's the value of the commodity on the dock in the importing nation.

³⁰ Peter Kegode, personal interview, March 12, 2007

Situation of the Mills

There are seven operating sugar mills in Kenya. They are Mumias Sugar Company Ltd., West Kenya Sugar Company Ltd., SOIN Sugar Company Ltd., Muhoroni Sugar Company Ltd., Nzoia Sugar Company Ltd., Chemelil Sugar Company Ltd., and South Nyanza Sugar Company Ltd. (SONY). Another mill, Miwani, has been shuttered since 2001 while its owners, the GOK and a private company, battle in court over its bankrupted assets. Another industry player occasionally mentioned in the literature, Busia, is a jointly held (private/GOK) estate delivering sugarcane to Mumias. Together the mills produced almost 500,000 metric tons of sugar in 2006, most of which went toward domestic consumption, which was around 700,000 metric tons. The difference was imported under the 200,000 metric ton COMESA quota.

Muhoroni, Nzoia, Chemelil, SOIN and Miwani are state-owned mills. These parastatals face enormous production costs and use obsolete machinery that breaks down frequently, forcing the mills to lie dormant while they await repairs. The mills run operating losses and take little advantage of opportunities to cut costs and increase efficiency, for example by more expansive cogeneration using bagasse, the fibrous byproduct of juice extraction. They also owe huge sums to the GOK and other creditors, primarily for dollar-denominated loans taken out in the 1970s and 1980s (see Investments in Parastatal Sugar Mills).³¹

Mumias, West Kenya and SOIN are private enterprises. SOIN started operating in the second half of 2006, with an operating level of 300 metric tons of cane crushed/day. Another private facility, Kibos, is currently under construction and is planned to begin operating in the 3rd quarter of 2007 with an initial intake of 625 metric tons of cane/day. Although the GOK is the largest shareholder in Mumias (with about 33 percent), the company seems to be run independently of central government dictates. Since its privatization in 2001 and subsequent listing on the Nairobi Stock Exchange, the mill has become the most competitive facility in the Kenya sugar industry. It is also the largest, accounting for 48 percent of Kenya's sugar production in 2006. Mumias has the capacity to take in about 8400 metric tons of sugarcane/day, dwarfing the other mills in the country.

The majority of Kenya's sugar mills survive because the country's domestic sugar price is artificially inflated by the COMESA safeguard. The average retail price for a kilogram of mill white sugar in 2006 was KSh 64. During that time, the average ex-factory³² cost for the industry as a whole was KSh 53.54/kilogram, while the average landed price for mill white imported sugar was KSh 29.05/kilogram.³³ If and when the safeguard falls, the internal sugar price will plummet from its current high price to something far closer to the cost of imports. In a 2004 study World Bank economist Donald Mitchell argued that Kenyan consumers "pay about 50-60 percent more for sugar than if imports were fully liberalized."³⁴ That high internal price is the only thing keeping many of the mills alive. Below is a table breaking down production and ex-factory costs by mill in the 2004-2005 fiscal year, the last year for which we obtained mill-specific data.

³¹ Charles Onchoke and Charity Muya, personal interview, March 21, 2007.

³² Ex-factory cost denotes the price of sugar at the factory door; includes all costs plus profit.

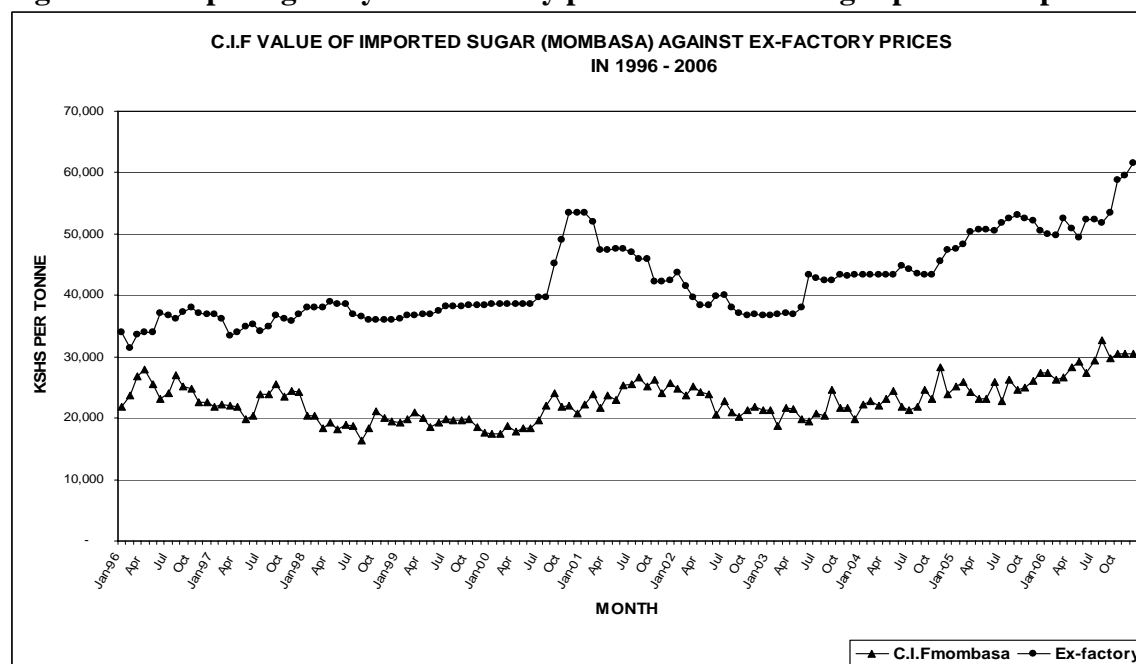
³³ Kenya Sugar Board, *Year Book of Sugar Statistics 2006* (Ministry of Agriculture, unpublished), raw data sheet.

³⁴ Donald Mitchell, "Kenya Sugar Industry Preliminary Findings" (unofficial Powerpoint presentation, October 19, 2004).

Figure 6: Production Costs, Ex-Factory Costs and the average landed price for imported sugar in the July 2004-June 2005 fiscal year:³⁵

Factory ('04-'05)	Production Cost (KSh/metric ton)	Production Cost (\$) Jan'05 XR=78.9/1	Ex-Factory Cost (KSh/metric ton)
Chemelil	KSh 38,335	\$485.87	KSh 46,917
Muhoroni	KSh 41,241	\$522.70	KSh 49,250
Mumias	KSh 24,770	\$313.94	KSh 47,025
Nzoia	KSh 35,867	\$454.59	KSh 46,550
SONY	KSh 34,381	\$435.75	KSh 46,597
West Kenya	--		KSh 47,750
Average in 04-05	Ksh 34,823	\$441.36	KSh 47,348
Average in 2006 ³⁶			KSh 53,540

Figure 7: Comparing Kenyan ex-factory prices to cost-in-freight price of imports:³⁷



Mumias' production cost of \$313.94/metric ton (table above) compares favorably with an average landed price of \$307.26/metric ton for sugar imported through Mombasa (chart above), indicating that Mumias might possibly reduce costs enough to survive in open competition with

³⁵ "Cost of Cane Production," Data supplied by Kenya Sugar Board.

³⁶ Kenya Sugar Board, Year Book of Sugar Statistics 2006 (Ministry of Agriculture, unpublished), p10.

³⁷ Ibid, p28.

importers. Most interviewees agreed that Mumias would survive the elimination of the COMESA safeguard. Some claimed that only Mumias could compete openly with the COMESA producers, while others asserted that all the private mills plus Nzoia would be competitive.

None of the experts interviewed thought Chemelil, Muhoroni and SONY could survive as they currently stand, as indicated by the high production costs those parastatals face (table above). The private mills plus Nzoia accounted for 70 percent of Kenya's sugar production in 2006, while Mumias alone produced 48 percent.³⁸ As a ballpark figure, then, about one third to one half of the domestic sugar industry is gravely threatened by the safeguard's expiration.

Key Constraints

The Kenyan sugar industry is beset with problems, starting at the smallholder level and continuing through the mills to government inaction on reform. Major impediments to the industry's competitiveness include:³⁹

- Small plot sizes prohibit economies of scale at farm level, contributing to high costs of irrigation, input provision and extension services.
- Low sucrose content in Kenyan cane, yielding less sugar by weight of feedstock. This is a function of environmental conditions and seed variety.
- Lengthy cane maturity, up to 24 months compared to 14 months in neighboring countries. This is a function of environmental conditions and seed variety. Maturity period is lower near the coast.
- Poor transport infrastructure, including bad roads and inefficient cane-carrying vehicles.
- Extremely high cost of sugar production relative to neighbors.
- Most mills labor under high debt burdens, largely owed to GOK.
- Inadequate use of efficiency-improving and cost-saving measures, such as cogeneration by burning bagasse (cogeneration is a key cost-saver in most sugar-producing nations).
- Lack of professionalism and accountability among the management of some mills.
- Inadequate policy and reform strategy and a lack of will to implement what reforms have been identified, despite the reprieve granted under the COMESA safeguard.

³⁸ Ibid, p14.

³⁹ Dr. Otieno Odek, Peter Kegode and Shem Ochola, *The Challenges and Way Forward for the Sugar Sub-Sector in Kenya* (Friedrich Ebert Stiftung, 2003), p25.

Section 5.2: Investments

Investments in Parastatal Sugar Mills

Equity investments in the sugar mills would seem to offer immediate opportunities for FDI to contribute to the sector's improvement. Equity infusions would supply needed funds for capital improvements like diffusion technology and cogeneration equipment and help pay arrears to farmers, which might in turn improve feedstock availability by incentivizing increased sugarcane production. Depending on the investors, equity participation might also include the communication of better mill management and sugar production techniques. The mills most in need of funds are the parastatals, but the government must first allow them to open themselves to foreign investment—either through specific share offerings or outright privatization.

Most interviewees felt that privatizing the parastatal mills is essential to making them strong enough to compete in open trade with the COMESA members. However, it seems as if it will not happen early enough to make a difference.

To privatize the mills the Ministry of Finance would first have to restructure or wipe away whatever parastatal debt was under the authority of the GOK. The parastatal mills have accumulated a staggering KSh 26.38 billion (US\$377 million) of debt and interest owed to the GOK as of June 30, 2006 (considering Agro Chemical Co. as part of Chemelil).⁴⁰ Taking in all debts owed by the parastatal mills, including arrears on the Sugar Development Levy (a tax meant to boost the industry) and arrears to farmers, the mills owed more than KSh 50 billion. Under these conditions, no investor would consider investing in Kenya's parastatal mills, even if they were opened to private investment.

Ministry of Finance's Director of Finance Charles Onchoke, in interviews for this study, admitted the necessity of restructuring the debt, but pointed out that the sugar industry is in line behind several other state-owned operations, including telecommunications, insurance, and energy, for privatization. He mentioned moves to float more shares in KenGen, an electricity generator, and further privatize Kenya's telecommunications provider. The sugar mills' debt restructuring will occur when the government moves definitively on privatizing the mills. "I can't say [it will happen] in the next two years, but it is a priority," Mr. Onchoke said.⁴¹

The privatization would not occur as a listing on the Nairobi Stock Exchange, because all the mills are loss-making and a company has to make a profit for three years successively to list on the exchange. Rather, it would probably be a public auction open to "strategic investors."⁴²

The GOK's Privatization Commission, a body dedicated to handling the privatization of state-owned entities, is set to begin operating in May 2007. It would presumably handle the public auction of the mills. The commission will take guidance from the Cabinet and from a parliamentary committee on its priorities, and then implement them. Any pressure to push forward the mills' privatization should probably start at the Cabinet level, with the Ministry of Agriculture and the Ministry of Finance.

⁴⁰ "2006 Sessional Paper on Revitalization of the Sugar Industry" (Ministry of Agriculture, August 2006), p34.

⁴¹ Charles Onchoke, personal interview, March 21, 2007.

⁴² Ibid.

Ethanol Production Facilities

This section is divided into five parts: overview, status, opportunities, effects and constraints regarding fuel ethanol production in western Kenya.

Overview

Ethanol is a colorless, flammable liquid produced by fermenting sugar. The sugar is derived from a wide variety of feedstocks, including sugarcane, sweet sorghum, wheat and corn. Sugarcane has the advantage that, unlike corn and wheat, it does not need processing to derive the sugars used in the fermentation. In the case of ethanol from sugarcane one can use raw cane juice squeezed or diffused from the cane, molasses produced as a byproduct of sugar production, or sugar crystals. Thus a common configuration is to link an ethanol distillery to a sugar mill, limiting raw material transportation costs and energy costs, and allowing producers to shift back and forth between sugar and ethanol as their relative prices fluctuate.⁴³

Ethanol is produced for consumption, for industrial purposes such as solvents, and for fuel. The distinction between ethanol for consumption and for fuel partly concerns the amount of water present in the substance. Potable alcohol is 96.5 percent alcohol, also called hydrous ethanol. Hydrous ethanol can also be used as a complete gasoline substitute in vehicles specially designed for that purpose, but these vehicles are not present in Kenya.

Anhydrous ethanol is 99.5 percent alcohol, with most of the water removed by a chemical absorbent or through the use of a molecular sieve. Anhydrous ethanol is used in the United States, Brazil and other countries as a fuel additive in percentages up to 30 percent ethanol to 70 percent gasoline. Most cars, including almost assuredly those in Kenya, can accommodate up to 10 percent anhydrous ethanol in their fuel, a blend called E10. Anhydrous ethanol, hereafter referred to as fuel ethanol, is less efficient than gasoline, producing only about 66 percent of the energy produced by gasoline combustion.⁴⁴ Thus replacing gasoline with fuel ethanol on a one-to-one basis yields less mileage by volume. However, for a 10 percent mixture the effect on fuel mileage is minimal (about a 3 percent reduction).

Status: Current Ethanol Production and Capacity

Kenya has a history with fuel ethanol production. In 1977, with partial funding from the World Bank, the national government began to construct the Kenya Chemical and Food Corp. (KCFC) on the outskirts of Kisumu. KCFC was to use molasses from the surrounding sugar mills as feedstock in producing fuel ethanol. The plant was also intended to produce a variety of associated products, such as vinegar and baker's yeast. However, in 1981, with 98 percent of the plant complete, the government abandoned construction "for political reasons."⁴⁵ In 1983 it built the Agro Chemical and Food Corp. (ACFC) next to the Muhoroni sugar mill. ACFC produced fuel ethanol for a short time but stopped as world gas prices fell and opposition from oil

⁴³ D. W. Cornland, et al, "Sugarcane Resources for Sustainable Development: A Case Study in Luena", *Zambia* (Stockholm Environment Institute, 2001), p39.

⁴⁴ Energy Information Administration, "Alternatives to Transportation Fuels 1996" (US Department of Energy, December 1997), p40.

⁴⁵ Nelson Gwara, personal interview, March 16, 2007.

importers gathered. ACFC currently produces industrial and potable alcohol. Miwani, the closed sugar plant, also has a 45-year-old distillery reputed to be “in good running condition” despite its age.⁴⁶

The KCFC facility was left dormant until it was auctioned in 1996 to Spectre International, which bought it for about KSh 500 million (about half the construction cost). It completed the plant’s construction and rehabilitation and brought it online in 2004. Spectre produces potable alcohol, mainly for export to Uganda, Tanzania and other neighbors. Less than 20 percent of its product is consumed domestically.

The potable ethanol industry’s major constraint is currently the availability of feedstock. Spectre Procurement Manager Israel Agina said the plant operates 20 days each month (24 hours/day), with 10 days of downtime to accumulate molasses. ACFC has a similar problem—Mr. Agina said it had been down for 15 days at the time of our conversation. Spectre needs 250 metric tons of molasses/day to produce 40,000 liters of potable alcohol each day. To operate at full capacity (around 60,000 liters/day) would require the feedstock from 17,100 Ha under cultivation and a mill that can crush 8,000 tons of cane/day. So Mumias alone could supply Spectre with all its needs, except that much of the molasses produced in Kenya is exported to Uganda. Small, informal distilleries, livestock owners and ACFC also buy molasses.

There is currently no market for fuel ethanol in Kenya because the country lacks a mandate for blending it with gasoline—and it does not seem that a mandate is a government priority. The Kenyan Parliament in December 2006 passed a comprehensive Energy Act that does little more than advise the Ministry of Energy to “promote the development and use of renewable technologies,” including ethanol and biodiesel.⁴⁷ When asked whether the ministry was considering advocating a blend mandate, ministry economists said cost studies needed to be done before any recommendation could be made, and that no studies had been done since the 1980s.⁴⁸

Nevertheless, actors across the industry spoke as if the widespread use of fuel ethanol in Kenya was simply a matter of time, and “the issue is where you’re going to get it from.”⁴⁹ Kibos part-owner Ragbir Chatthe noted that his original plan had been to include an ethanol distillery, but he and his partners had decided instead to limit themselves to sugar production and to await a mandate before beginning to produce ethanol. He said he could augment his factory with a distillery in 12 to 15 months. The Ministry of Finance’s Mr. Onchoke mentioned fuel ethanol production before we had the chance to bring it up, saying he hoped the factories were looking into diverging into that field.

However, if process and product upgrades fail or come too late, as some argue, farmers will most likely stop growing sugarcane and switch to another crop or some other economic activity entirely.

⁴⁶ “2006 Sessional Paper on Revitalization of the Sugar Industry” (Ministry of Agriculture, August 2006), p6.

⁴⁷ *The Energy Act, 2006, Kenya Gazette Supplement No. 96 (Acts No. 12)* (Government of Kenya, January 2007) p416.

⁴⁸ Ng’ang’a Munyu and Joel K. Imitira, personal interview, March 22, 2007.

⁴⁹ Anton Van Tonder, personal interview, March 16, 2007.

Opportunity: Demand and Costs of Producing Fuel Ethanol in Kenya

An investment in fuel ethanol production could take several forms. One possibility is a greenfield operation, with a stand-alone distillery producing ethanol from feedstock drawn from nearby smallholders and, perhaps, the nucleus estates of parastatal mills shuttered in the wake of the import surge. Another form is as an investment in a distillery attached to one of the surviving mills. Kibos has expressed interest in this arrangement. A third arrangement would be an equity investment in Spectre's operation, building fuel ethanol facilities in the concrete skeleton behind its potable alcohol distillery. According to several sources, one can expect a fuel ethanol distillery with capacity to produce 60,000 liters/day to cost about \$15 million.⁵⁰

There is scant information on expected demand and costs associated with fuel ethanol production in Kenya, and available figures are contradictory. However, fuel ethanol has been a popular topic of research in many other developing countries. Based on several of those studies, one can reach the conclusion that Kenya would need to produce close to 50 million liters of fuel ethanol each year to meet the demand an E10 mandate would create. At that level of demand, distilleries have to produce an average of 131,000 liters/day each day of the year. Distilleries do not generally operate year-round without downtime, so three distilleries producing 60,000 liters/day each should suffice to meet domestic demand. Also, under current prices fuel ethanol can be distilled from molasses for about \$0.40/liter, far lower than the current gasoline price of more than \$1/liter.⁵¹

Based on current molasses production levels, Kenya is already very close to having the feedstock to produce 50 million liters of fuel ethanol/year. Furthermore, one could imagine the structure of the sugar industry would be quite different in a post-COMESA safeguard, E10 Kenya, and one can see here that no tremendous increase in sugarcane cultivation or a reduction in oil consumption is required for the project to be realistic. Indeed, post-COMESA it is realistic to assume that many mills will have closed, freeing up sugarcane to be devoted exclusively to ethanol production and making it possible to distill ethanol from cane juice—a less labor-intensive feedstock than molasses.

Effects of Fuel Ethanol Production

There are likely to be several beneficial effects from fuel ethanol production in Kenya. First, smallholders will enjoy renewed demand for their crop even as traditional demand falls away with the collapse of many of the existing sugar mills. Ethanol production does not solve many of the constraints facing smallholders, such as their tiny plots, but it would guarantee a market and perhaps also offer greater returns for sugarcane production.

Second, because Kenya imports all of its oil, producing fuel ethanol domestically offers a possibility for conserving foreign exchange and improving the nation's balance of payments.

Third, with oil prices unlikely to fall in the future and the rapid development of Asian consumer markets, Kenya could position itself strategically to feed growing international demand for fuel ethanol.

⁵⁰ For calculations see Appendix III

⁵¹ Ibid.

Aside from those benefits, fuel ethanol production could offer some advances in human capital development and technology transfer, although most of the technology required to produce fuel ethanol is already present in the Spectre and Agrochemical distilleries. The introduction of state-of-the-art practices, such as those of Brazilian distillers, and the training of a generation of Kenyans in ethanol production would sharpen the nation's competitive edge.

However, fuel ethanol production will probably not offer much in the way of employment gains outside the agricultural sector.⁵²

Constraints to Fuel Ethanol Production

The major constraint to production is the lack of a blend mandate. Without the mandate there is no production, quite simply. Another possible constraint is opposition from the gasoline importing companies, representing both domestic and international interests. It is unclear to what degree this lobby could prevent the passing of a mandate.

The MCI should partner with national politicians from Nyanza province, non-governmental organizations like the Sugar Campaign for Change (SUCAM), and industry actors like Mumias and Kibos to pressure the national government for an E10 mandate.

Irrigation Service Provider

Irrigation installment is the only opportunity for investment that might impact smallholders directly, leading to greater farm yields and higher incomes for farmers.

The average size of smallholder farms is smaller than one Ha, due to a long tradition of subdivision whereby fathers divide their land among their sons each generation. This situation practically rules out economies of scale at the farm level. Furthermore, mills tend to provide inputs and services to farmers (services range from plowing and planting fields to cutting the cane). The farmers are paid for their cane by weight, minus whatever the mills charge for inputs and services. This dependency has evolved to the point where many farmers are "mere spectators" to the farming on their land.⁵³ They pay high prices for poor quality inputs like fertilizer and are unable to shop their cane to other mills for a better buying price.

Average yields in Kenya hover around 70 tch (tons of cane/Ha) according to official statistics,⁵⁴ but researchers at the Kenya Sugar Research Foundation (KESREF) argued that non-irrigated fields (the vast majority in the country) yield 50 tch to 60 tch on average.⁵⁵ That is compared to Tanzania's average yield of 99.2 tch, about 80 tch in Brazil and 65 tch worldwide.⁵⁶

Irrigation has the potential to push yields up to 150 tch, according to researchers at KESREF. Even an increase to 100 tch could bring a sizeable increase to smallholder incomes. Between the

⁵² Spectre, producing about 40,000 liters/day, employs only 180 direct and 120 casual workers. Another 80 would be needed if the plant expanded to also produce fuel ethanol.

⁵³ "2006 Sessional Paper on Revitalization of the Sugar Industry" (Ministry of Agriculture, August 2006), p19.

⁵⁴ Kenya Sugar Board, *Year Book of Sugar Statistics 2005* (Ministry of Agriculture, 2005), p10.

⁵⁵ Dr. Noah Wawire and Stephen Muturi, personal interview, March 19, 2007.

⁵⁶ Dr. Ranier Janssen, et al, "Liquid Biofuels for Transportation in Tanzania" (German Technical Cooperation, August 2005), p68.

two options of sprinkler and furrow irrigation, furrow is easier for farmers to maintain, cheaper and it wastes less water through evaporation and wind drift. Cost estimates range from KSh 50,000/Ha to KSh 200,000/Ha of cultivated land, compared to KSh 200,000/Ha to KSh 300,000/Ha with sprinkler irrigation.

KESREF and other organizations within Kenya know how to set up furrow irrigation; they lack the money to finance a widespread scheme. Farmers cannot pay up front for the service. An investor would have to be willing to provide financing for a return that would take two to three years to realize, with high risk given the speculative nature of the project, but farmers would ideally be able to pay by virtue of the increased incomes they received from their irrigated crops.⁵⁷

Providing furrow irrigation is more of a development investment than a profitable option for an investor, especially considering the cost and risk of lending to individual smallholders.

Section 5.3: Framework Application – Ethanol

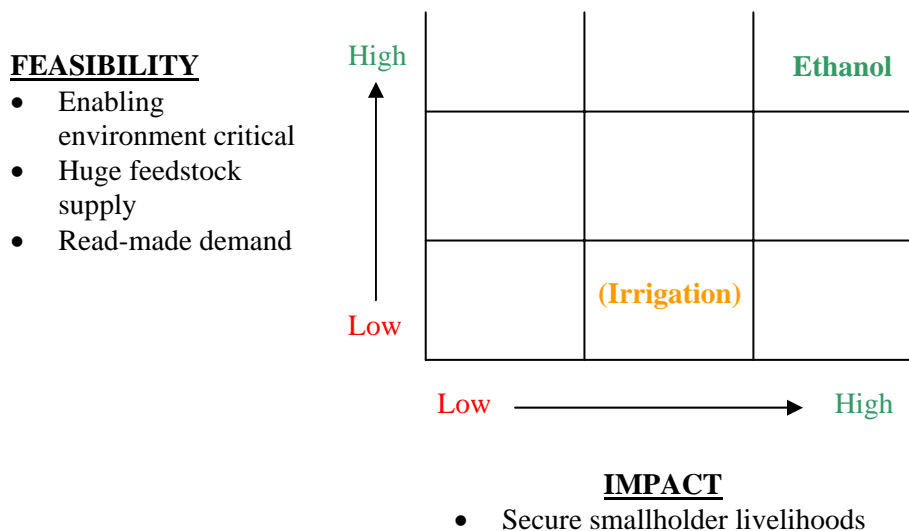
Fuel ethanol production is an optimal investment. The profitability of investment in an ethanol plant is nearly as certain as the likelihood that a market for fuel ethanol will replace the income smallholders would lose from the failure of much of the domestic sugar industry.

Again, investment could take a few forms. One form is an independent facility located near sugarcane farms currently supplying state-owned mills. Another investment could be an equity stake in one of the more competitive (private) mills, intended to fund construction of a fuel ethanol distillery attached to the plant. This is a common configuration in Brazil and it carries certain efficiencies, such as the ability to shift production between ethanol and sugar as prices fluctuate.⁵⁸ Mumias and Kibos are worthy recipients of this form of investment. A third form of investment is an equity stake in the Spectre potable alcohol plant, to finish facilities on an existing (but non-operational) structure designed specifically for fuel ethanol production.

⁵⁷ Dr. Noah Wawire and Stephen Muturi, personal interview, March 19, 2007.

⁵⁸ Cornland, p39.

Figure 8: Framework Application - Ethanol



Feasibility

Demand Factors: 50 million liters/yr. Demand is ready-made if the government mandates an E10 blend.

Supply Factors: 150,000 Ha currently under cultivation, up to half of which can be dedicated to ethanol production when the COMESA safeguard expires. Increased sugarcane production is likely if demand increases.

Enabling Environment: E10 mandate is absolutely critical. Some market players are already interested, but will not invest in fuel ethanol capacity without government assurance.

Profitability: Guaranteed demand will maintain a predictable price, and high gasoline prices give wide room for fuel ethanol production costs to increase while still making it an attractive gasoline substitute.

Impact

Employment: Guarantee smallholder employment, with some job increases for plant employees (likely more than offset by job losses at state-owned plants with COMESA safeguard expiration).

Skill Set: Investment by foreign firm with fuel ethanol production expertise could disseminate best practices in management and production techniques.

Income: Guarantee smallholder incomes, with some plant employee incomes.

Natural Environment: Difficult to determine—research differs on net environmental impact of producing and burning fuel ethanol.

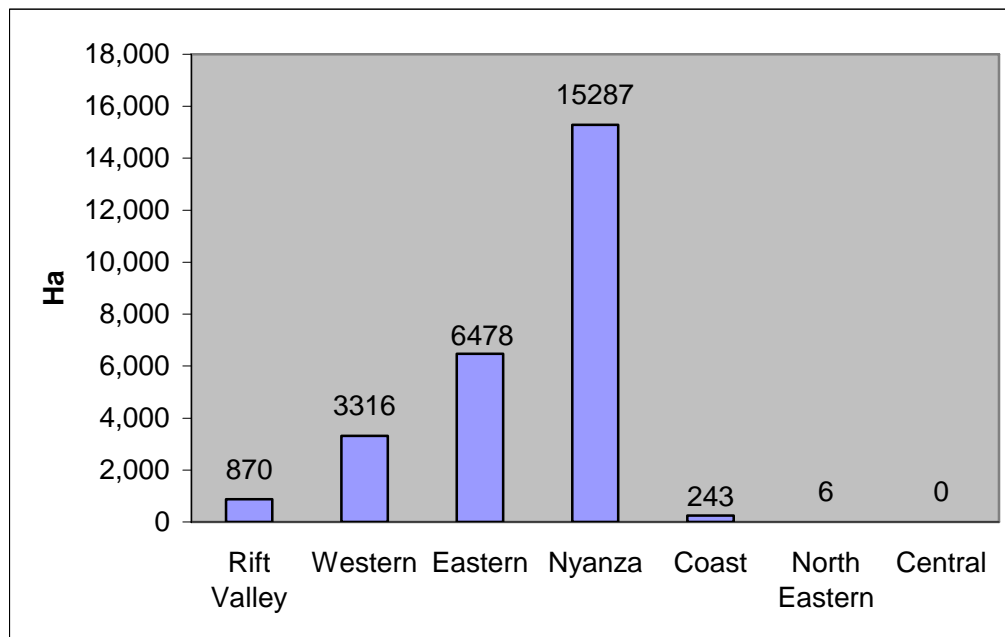
Productivity: Some gains with experienced foreign investor, as with Skill Set.

Section 6: Groundnuts Sub-Sector Study

Section 6.1: Sector Status

Groundnuts (also called peanuts) are one of the most widely grown crops in the greater Kisumu area. In 2005, 15,850 Ha of groundnuts were planted in Nyanza Province, producing 7.2 million kg valued at KSh 444 million.⁵⁹ Nyanza produces the majority of Kenya's groundnuts—in 2003, Nyanza Province represented 58 percent of land planted with groundnuts in Kenya. Neighboring Western Province represented 13 percent.⁶⁰ Groundnuts are grown primarily as a subsistence crop, so use of agricultural inputs (fertilizers, pesticides, etc.) and yields are generally low.

Figure 9: Area under groundnut production by province, Kenya 2003 (Ha)



Source: Kenya Export Processing Zones Authority, *Vegetable Oil Industry in Kenya 2005 (2005)*, p.3

Most groundnuts are sold unprocessed in small quantities by informal vendors. Many of the vendors in Kisumu travel over 100km to the large peanut growing areas, such as South Nyanza or Busia, to obtain their groundnuts, which they sell at the weekly Kibuye Market or the main market off Jomo Kenyatta Highway. Vendors report purchasing peanuts in 90 kg sacks for KSh 45 to KSh 60/kg (depending on the season) and selling for approximately KSh 100/kg. A few vendors process groundnuts at home by roasting and/or grinding them into peanut butter. Groundnuts from the province are also sold in larger quantities to transporters who take them to other parts of the country and sell them to distributors or vendors. Distributors then sell the groundnuts to processors or vendors.⁶¹

⁵⁹ Ministry of Agriculture, Nyanza Province, *2005 Annual Report (2006)*, p31.

⁶⁰ Kenya Export Processing Zones Authority, *Vegetable Oil Industry In Kenya 2005 (2005)*, p3.

⁶¹ Peanut vendors, Kibuye and Kisumu Markets, personal interviews, March 17 – 18, 2007.

A small quantity of groundnuts is processed by formal sector businesses in Nairobi. Groundnuts are generally roasted and then either seasoned and placed into sealed, hygienic bags or ground into peanut butter. These products are sold to high-end supermarkets, such as Nakumatt, or to commercial users, such as boarding schools. It does not appear as though peanut oil is produced or used in Kenya, at least on large scale, as none of the large vegetable oil firms produce it and it cannot be found in markets. However, an executive at Unilever Kenya speculates that one firm, Kenya Orchards Ltd. in Nairobi, may be using peanut oil.⁶²

The peanut butter sector in Kenya is small but growing rapidly—18 percent annually according to an executive of Truefoods Ltd., a peanut butter producer. Truefoods believes that growth in the sector will remain strong in the near to medium term, given that many people in Kenya have growing incomes and are newly discovering peanut butter. The executive estimates that Truefoods sold 73 tons of peanut butter in 2006, representing 20 to 30 percent of sales countrywide. About 35 percent of these sales were to Nakumatt, and a substantial amount were to boarding schools, which purchase in units of 5 kg. In 2006, Truefoods purchased groundnuts for about KSh 65 per kg. Profit margins were about 18 percent. Truefoods has recently invested in an integrated peanut butter producing machine, which has a capacity of 200 kg/hour. The machine cost KSh 1.8 million, and Truefoods expects the investment to be recuperated in three years.⁶³

A trip to Nakumatt supermarket reveals that a 300g container of peanut butter produced in Kenya sells for about KSh 100. Imported brands from South Africa and the U.S. sell for about twice that price. Available varieties include smooth, crunchy, chocolate, and natural. Kenyan firms in the peanut butter sector include Truefoods Ltd., Angel Foods, and Jetlak Foods Ltd.

Section 6.2: Opportunities

Groundnuts represent a unique opportunity in the Kisumu area for value addition and increasing yields. Unlike most other legumes and oil crops, groundnuts are already grown in abundance, as they are a staple crop for smallholders and a cash crop for larger farmers. Groundnuts are relatively drought resistant, and so are appropriate for rain-fed areas. Furthermore, groundnuts are a versatile crop that can be seasoned and packaged, ground into peanut butter, or processed into peanut oil and oilcake.

Kisumu could be a good location for a groundnut processing plant. According to one expert, 30 to 40 percent of provincial groundnuts pass through Kisumu markets on their way to other parts of the country.⁶⁴ As mentioned above, groundnuts are processed in Nairobi before their products are distributed to the rest of the country. A Kisumu plant could capture some of the value added as well as potentially produce and sell at lower costs by eliminating some of the transport expenses. (Based on our interviews, the purchase price of groundnuts is lower in Kisumu than in Nairobi due to lower transport costs.) Additionally, because the market for groundnut products is expanding, a groundnut processing plant based in Kisumu would not necessarily have to take market share from other Kenyan firms.

⁶² Paul Muigai, email interview, March 23, 2007.

⁶³ Manish Phalke, personal interview, March 21, 2007.

⁶⁴ David Munyi, personal interview. March 19, 2007.

Because Kisumu is closer to most groundnut farmers, a Kisumu-based processor would also likely have an easier time working with current producers and/or setting up outgrower schemes. Average groundnut yields in Nyanza Province in 2005 were 477 kg/Ha during the long rain season (March – June) and 405 kg/Ha during the short rain (August – November) season.⁶⁵ Groundnuts, however, have a potential yield of about triple these figures. An effective outgrower scheme could potentially increase groundnut supply for a relatively low cost through provision of proper inputs, which most smallholders can't afford.

Poor product quality or consistency is an issues sometimes faced when sourcing from smallholders. However, this would not be a large concern, at least in regard to peanut butter, as nuts simply need to be sorted by size.⁶⁶

The production of peanut oil could represent a major opportunity in the Kenyan economy. In 2003, Kenya produced about 380,000 tons of vegetable oil, only one-third of its demand. The remainder was imported at a cost of U.S. \$140 million, making edible oil the country's second most important import after petroleum.⁶⁷ The viability of producing peanut oil can be assessed by comparing its production costs to current market prices for vegetable oils. Generic vegetable oil currently sells for around KSh 110 for one liter containers and KSh 80 per liter in bulk. Premium cookings oils, such as corn oil and sunflower oil, sell for around KSh 145 for one liter and KSh 110 per liter in bulk.

In addition to being used for cooking, groundnut oil (like other vegetable oils) can be used in processed foods, cosmetic products, and paints and finishes. The process of oil extraction also produces oilcake as a byproduct, which can be sold as animal feed or fertilizer.

Section 6.3: Constraints

A concern mentioned regarding peanut oil by an interviewee was that Kenyans do not like the taste of peanut oil. If indeed peanut oil may not be initially viable in the consumer market for vegetable oil, it is still likely that peanut oil could compete in commercial and industrial markets, which tend to be price sensitive and open to input substitutes.⁶⁸

An additional concern is poor smallholder productivity due to poor agronomic practices and non-usage of modern inputs. Groundnut pests are also common. These include groundnut rosette and rust.⁶⁹

⁶⁵ Ministry of Agriculture, p31.

⁶⁶ Manish Phalke, personal interview, March 21, 2007.

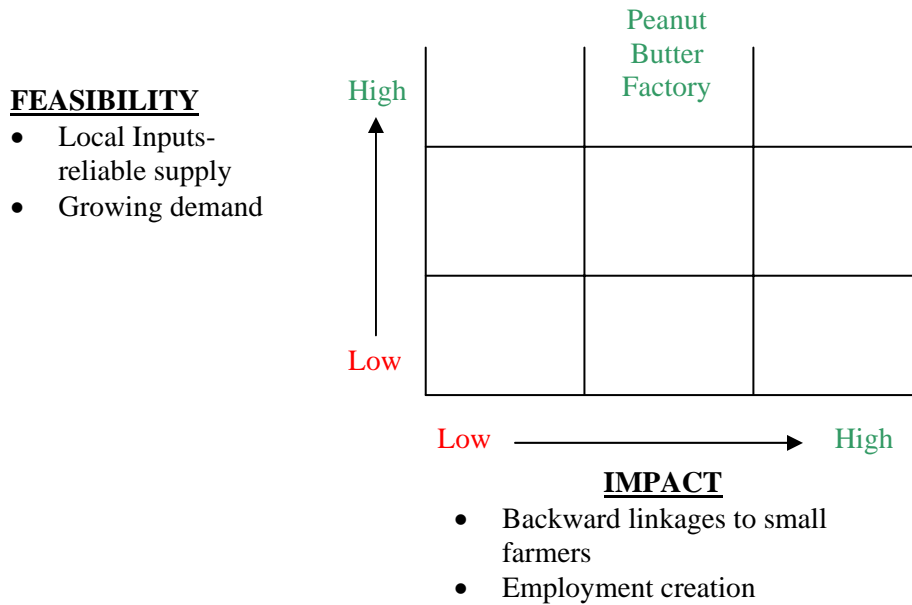
⁶⁷ "Vegetable Oil Industry in Kenya 2005" (Kenya Export Processing Zones Authority, 2005), p1.

⁶⁸ Manish Phalke, personal interview, March 21, 2007.

⁶⁹ Ministry of Agriculture, p31.

Section 6.4: Framework Application – Peanut Butter Factory

Figure 10: Framework Application – Peanut Butter Factory



Feasibility

Demand Factors: Around 300 tons annually in 2006 and growing at 18 percent per year for the near to medium term, according to Truefoods Ltd.

Supply Factors: 15,850 Ha under groundnut cultivation in Nyanza Province in 2005. In 2003, 71 percent of the countries groundnuts were grown in Nyanza and Western Provinces.

Enabling Environment: Inconsistent electricity and water supply in Kisumu.

Profitability: Truefoods currently cites 18% profit margin on peanut butter sales.

Impact

Employment: Factory itself will generate a small number of jobs. Increased demand for groundnuts may also increase demand for farm labor.

Skill Set: Farmer skill set may be improved if factory engages in contract farming and upgrades farming practices.

Income: Increased demand for groundnuts should raise incomes, as would improved farming practices.

Natural Environment: Unlikely to have any meaningful impact.

Productivity: Would be only such firm in Kisumu, though would likely have productivity equal to that of factories in Nairobi.

Section 7: Aquaculture Sub-Sector Study

Kisumu’s fishing industry is in rapid decline. A recent report on the Kenya fish subsector revealed that catch per boat dropped to less than half of 1989 levels—only 80 kg per boat—in 1999. Total volume of fish dropped from 200,000 metric tons in 1994 to 115,000 metric tons in 2002—evidence of the declining fish stocks in the lake.⁷⁰ As explained in the sub-sector study on fishing, the unsustainable nature of Kisumu’s fishing industry threatens the livelihoods of hundreds of thousands of Kenyans who depend on fishing as a source of income as well as food.⁷¹ Aquaculture provides one means for alleviating these socio-economic strains.

Aquaculture has traditionally played a marginal role in Kenya’s economy. Lacking government extension services, private capital, and proper management practices, it has historically been considered an unreliable source of production or income and, as such, used only for subsistence purposes.⁷² While current aquaculture production continues to contribute less than 1 percent of Kenya’s total fish catch, the state of decline of the inland/marine fishing industry has forced the government to reconsider the utility of this industry. In line with numerous independent studies, the Government’s reconsideration of aquaculture has resulted in its strong advocacy of this industry as a means for promoting food security and sustainable economic development.⁷³

Unlike other African countries, Kenya has a long history of aquaculture—dating back to the 1920s when it was introduced to support sport fishing. In the 1960s, international development organizations stressed the utility of aquaculture for increasing local food security. While the government supported aquaculture endeavors under the “Eat More Fish” campaign, a weak economy left it with few resources to provide extension services to farmers seeking training or material support. Requiring capital inputs and skills bases which lake/ocean based, aquaculture was, thus, never fully adopted by the local population for commercial purposes. Today, lack of capital and proper farm management skills continue to hinder aquaculture’s commercial development.

Section 7.1: Sector Status

Over the past decade, aquaculture has consistently produced around 1,000 tons of fish per year and accounted for less than 0.5 percent of total fish production in Kenya each year.⁷⁴ About 95

⁷⁰ Kenya Business Development, “Development of Small-scale clarias fingerling production clusters” (USAID RFP, 2006).

⁷¹ Eirik Jansen, “Rich Fisheries – Poor Fisherfolk: some preliminary observations about the effects of trade and aid in the Lake Victoria fisheries” Socio-economics of the Nile Perch Fisheries Industry (IUCN-The World Conservation Union, 1997).

⁷² Extension services typically include: training of farmers on pond construction, feed use, harvesting, financial management; providing/subsidizing some basic inputs (fingerlings, feed); record keeping; connecting farmers with sources of capital/credit; linking farmers, when possible, with markets.

⁷³ Mentions of aquaculture as an important government initiative include: Government of Kenya’s “2000 Poverty Reduction Strategy Paper” (medium term expenditure framework); Food and Agriculture Organization of the United Nations. “Aquaculture Extension in Sub-Saharan Africa” Fisheries Circular No. 1002. Rome, 2004.”; Ministry of Livestock and Fisheries. “Investment Potential in the Fisheries Sector” Government of Kenya, 2006)

⁷⁴ According to Karen Veverika, director of Fisheries Investments for Sustainable Harvest (FISH) and former partner with the Kenyan Department of Fisheries, these numbers grossly overestimate aquaculture’s current contributions to fish production in Kenya. Veverika said officials of the Department of Fisheries had admitted to

percent of farming is considered to be small-scale, averaging about 1,000 kg/hectare/year. Harvesting occurs on some 7,228 ponds farmed by some 4,921 fish farmers.⁷⁵

According to FAO's National Aquaculture Sector Overview, production in real terms has doubled and is set to grow by 10 times over the coming year. Following this trend, aquaculture production is expected to go from its current 1,500 tons/year to 12,000 tons over the next three years.⁷⁶

While aquaculture has traditionally been practiced for subsistence purposes, recent attention has been given to developing the commercial potential of the industry. Current initiatives by the Department of Fisheries to expand and promote aquaculture include:⁷⁷

- Increasing staff and community training
- Rehabilitation of departmental fish farming demonstration centers/research stations
- Linking farmers to existing rural finance institutions
- Enhanced research on seed and feed production
- Development of quality extension packages for extension workers
- Encouragement of community participation via on-site farm trials and field days
- Rehabilitation of departmental fish farming demonstration/research centers



Sagana Fish Farm

While the extent to which the Government has been successful in achieving these goals could not be assessed, interviews with aquaculture specialists who had worked with the Department of Fisheries and Moi University suggested that the government was sincere in its desire to enhance its aquaculture extension programs.

Section 7.2: Opportunities

The natural potential for aquaculture to become a major source of economic activity in Kenya is not surprising. As explained by the Department of Livestock and Fisheries, "Kenya is endowed with the climatic and geographic conditions favorable for a variety of aquaculture investments." However, as pointed out in the National Paper on Wetland Conservation and Management of January 2001, only 0.14 percent of the country's 1.4 million hectares is being utilized for

poor record keeping of ponds and resorted to estimating production levels by multiplying the number of ponds with expected levels of production per pond. (Source: Karen Veverika, telephone interview, April 16, 2007).

⁷⁵ Pamela Achieng, personal interview, March 16, 2007. According to the Ministry of Livestock and Fisheries, there are 10,400 small ponds throughout the country that are owned by about 7,500 fish farmers—2,187 of them living in the Lake Basin. (Source: Kenya Ministry of Livestock and Fisheries.)

⁷⁶ Food and Agriculture Organization, "Kenya-Aquaculture Production" *Kenya – National Aquaculture Sector Overview*, 2005.

⁷⁷ Nyandat, Beatrice. "Aquaculture management and development in Kenya," March 2004.

aquaculture purposes.⁷⁸ Underutilization of wetland areas is particularly evident in the Lake Basin region where 2,187 farmers work on a mere 661 stocked ponds (35,246 m²)—a small fraction of the 2,597 ponds that exist in the area and cover 383,426 m².⁷⁹

Kenya's varied climate makes it suitable for farming a variety of fish including tilapia, African catfish, common carp, rainbow trout, largemouth bass, red swamp, crayfish, and goldfish. Of these species, tilapia is the most preferred species for cultivation as it does not require sophisticated feeds, can withstand low oxygen levels and water quality, and does best in warm waters which are found in the Lake Basin region.⁸⁰

The Ministry of Livestock and Fisheries has already identified a number of swamps that would be amenable to aquaculture initiatives. Among the spaces considered were:⁸¹

- *Sondu swamp* occurs at the mouth of the Sondu River. Small swamps occur immediately south of Kisumu town and at the mouth of the Mogusi River near Homa Bay. It is a seasonal floodplain on the Kimandi river, a tributary of the Yala river.
- *Yala Swamps* –encompass the Nzoia Delta and the entire lakeshore south to Ugowe Bay, and the entire east to Lake Kanyaboli. It also extends back to Yala river in the south, with a total 38,000/ 52,000 Ha of wetland, which includes Lake Kanyaboli (1500 Ha). It is the site of the Dominion Farms operation.
- *Nyando swamp* is situated at the mouth of Nyando River at Nyakach Bay, extending back onto the Kano Plains. These swamps on the Kano Plains occupy about 10 000 Ha.

Commercial Farms

Self-sufficient Commercial Farm

Dominion Farms represents the first large investor in western Kenya to focus on aquaculture. Operating in Yala Swamp, Dominion Farms offers an example of how private investment might be able to overcome challenges and mitigate risks which currently beset aquaculture development in western Kenya. Additionally, it offers insight into what investment in a large scale aquaculture site might entail.

⁷⁸ Ministry of Livestock and Fisheries.

⁷⁹ Ibid.

⁸⁰ Currently, little is known about the ability to culture Nile perch. Given its predatory nature; however, perch would require more sophisticated feeds and, thus, have higher production costs.

⁸¹ Ministry of Livestock and Fisheries.

Dominion Farms

- 20 acres devoted to aquaculture
- Self-sufficient operation as of 2008
- Expect 20,000 tons tilapia/year
- Profit margin: 40 Kshs /kg
- Expect to export 40 percent of fish
- On-site rice/soy feed production

Currently, Dominion is in the process of establishing an aquaculture scheme covering nearly 20 acres and consisting primarily of 50 circular ponds (31m round x 2 m deep) and 30 green-water tanks for fingerlings (10x30x1m). It is expected that Dominion will produce 20,000 tons of tilapia per year, while producing enough fish manure to fertilize 8,000 acres of 14,000 acres of rice fields. With a profit margin of KSh 40 per kg of tilapia,⁸² Dominion expects that it will be able to recover its initial investment of \$2 million (over 1.5 years) in approximately 5 years.⁸³

Investors seeking to fully manage aquaculture production may prefer to seek a large-scale venture similar to that being pursued by Dominion Farms. According to both locals and Department of Fisheries representatives, opportunity for such a venture exist, given that the demand for fish in the region and fact that much of the Lake Basin wetlands remain unutilized.

Given that little is known about how to farm-raise Nile perch, commercial farming would ideally focus on the production of tilapia, catfish fingerlings, or both (a process known as poly-culture). As the fish of preference within Kenya and increasing demand internationally, tilapia would serve both local and foreign markets. Given its proximity to Europe, Kenya would have a particular advantage over its Asian competitors in exporting fresh tilapia fillets produced at its farms. Unlike tilapia, catfish production would serve only the local market by providing fingerlings to be used as bait by lake fishermen, an opportunity discussed below.

Contract Farming

While a commercial aquaculture farm would do well by injecting additional fish into Kisumu's limping fish industry, it would have a limited developmental impact if it did not enhance the livelihoods of the local community, either by providing food security, employment opportunities, or both. To ensure a positive developmental impact, investors should seriously consider incorporating contract farming into their business models; doing so would help to mitigate the negative impacts of resource extraction previously experienced in the fish export industry. In short, by capturing local small-scale fish farmers, rather than competing with them, a commercial farm supported by contract farmers would enhance both the investor's and community's production capabilities, increasing profit as well as local development.

⁸² Market price of farm raised tilapia in Europe is 110 Ksh/kg. Dominion's production costs are estimated at 70 Ksh/kg of Tilapia. According to Veverika, these costs are higher than average.

⁸³ Enos Were, personal interview, March 20, 2007.

According to Prof. Muchai Muchiri, of Moi University's School of Natural Resource Management, average pond sizes in Nyanza are ¼ to ½ acre (averaging 300 m²) and can produce up to 3-4 tons/Ha in six months.⁸⁴ In the past, production by these farms has been limited by poor management and the unavailability of affordable quality fish feeds and large harvesting nets. As will be discussed below, private capital can have a key role in overcoming these past deficiencies, particularly when it comes to industry inputs. In the area of management, knowledge transfer from the private sector would be highly desirable; however, if this is not possible, current training programs through Moi University, the LBDA, and Department of Fisheries could be sought.

⁸⁴ Muchai Muchiri, telephone interview, April 20, 2007. According to the LBDA, small-scale holders produce ~ 2 tons/Ha/year (Source: Pamela Achieng, personal interview, March 16, 2007).



FISHERIES INVESTMENT FOR SUSTAINABLE HARVEST

Fisheries Investment for Sustainable Harvest (FISH)

FISH is a USAID-funded program (2005-2008) seeking to encourage the commercial development of aquaculture in Uganda. Directed by Karen Veverika, professor at Auburn State University and former research/consultant to Kenya's Department of Fisheries, FISH has emphasized the role of the private sector in transforming Uganda's small-scale holders into commercial actors; increasing daily incomes from \$1 to \$3-\$5. FISH has been successful to this end, in that its activities helped to create 83 (on and off-farm) jobs, supported the production of 11.42 tons of farmed fish, and increased the amount of farmed fish reaching fish processors by 20 tons in a period of 9 months (July 2005 – March 2006).

At the core of FISH's work has been its close collaboration with local companies to encourage their production of necessary industry inputs such as floating fish feeds, nets, aeration systems, and refrigerated transport vehicles. To encourage farmers' use of these products, FISH loans out a portion of these equipment pieces to farmers unable to purchase their own.

Central to FISH's action-plan on how to commercialize aquaculture in Uganda has been its work on fish feed development. Noting that the proper formulations and ingredients exist for making proper fish feeds, FISH is working towards having an investor install an extruder which can produce the necessary floating, as opposed to sinking, fish food pellets. For the time being, the program has secured funding from the Dutch government for its endeavors in feed development.

By the end of its project term, FISH expects to have 1) made the use of floating fish feed commonplace in three districts, 2) ensured that the opportunity to transport live fish to the market is well-known, 3) catalyzed sufficient demand for nets to warrant a commercial net-making company, and 4) improved pond construction and management skills and record keeping across farms.

While the FISH program does not currently operate in Kenya, its work in Uganda speaks to the potential for commercialization of aquaculture in Kenya, according to its director.

Providing Industry Inputs (feeds, fingerlings, nets, landing site development)

Fish Feed

Accounting for up to 60 percent of production costs, the lack of affordable, quality fish feeds is one of the primary constraints for the aquaculture industry around the world, especially in Kenya.

The amount of feed needed per ton of fish exists in approximately a 2:1 ratio.⁸⁵ Veverika expects fish feed demand in Uganda to grow to 1,000 – 1,500 tons in the coming years given the emphasis being given to aquaculture in that country. Given that the lack of demand for aquaculture inputs has been there lack of supply to begin with, the initial introduction of quality floating feed would be likely to catalyze similar demand levels within Kenya as those in Uganda. This demand would be reliant on the feed's availability being made known to farmers and also being affordable.

According to the largest fish farm producer in Uganda, fish feeds would need to be \$250-\$300 per ton in order to be affordable for fish farmers in that country; the situation is likely similar in Kenya.⁸⁶ In the past, feed manufacturers have not produced feeds in Uganda because the cost of production were too high, given the need to import input nutrients.⁸⁷

The opportunity to create fish feeds locally is particularly encouraging because of the fact that a major constituent of targeted feeds is sunflowerseed and/or cottonseed oil cake, a high potential agricultural product for Nyanza province.⁸⁸ Production of feeds from other locally produced oil sources, such as groundnuts, is also possible; however, this would require further research to ensure viability and quality of feed achievable.

Following a feed-makers forum sponsored by FISH in January 2006, South African and Israeli feed companies have researched opportunities for exporting feeds to the Lake Basin region. According to the Managing Director of Aquanuro, a South African-based feed company providing nearly 85 percent of southern Africa's floating fish feed, starting an aqua feeds business in Africa takes more than \$1.3 million.⁸⁹

Fingerlings/hatcheries

The availability of fingerlings, un-matured fish acting as "seedlings" for fish farms or baitfish for long-line fishermen in Lake Victoria, remains low as the commercial distribution of fingerlings has typically been monopolized by inefficient government distribution centers. The availability of these fish, particularly *clarias gariepinus* (catfish), not only supports aquaculture development

⁸⁵ Two kg of feed are needed for every one kg of fish.

⁸⁶ Patrick Blow, of S.O.N Farm (Uganda) quoted in the Proceedings of the Fish Feeds Forums. 19 January 2006. Uganda. (Soft copy of proceedings provided by conference host, FISH.)

⁸⁷ Feeds produced from locally available ingredients in Uganda costs \$148.41/metric ton while those produced from imported nutrients (such as soya) cost \$250.68/metric ton. (Source: Luseesa quoted in the Proceedings of the Fish Feeds Forums, 19 January 2006. (Soft copy of proceedings provided by conference host, FISH.)

⁸⁸ According to Veverika, construction of a fish feed plant would cost about \$2.5 million.

⁸⁹ Van der Linder, Managing Director of Aquanuro, quoted in the Proceedings of the Fish Feeds Forums, 19 January 2006. (Soft copy of proceedings provided by conference host, FISH.)

but also encourages current lake-based fishermen to use legal, environmentally friendly long-lines for fishing rather than illegal gillnets which capture undersized fish in key breeding grounds.

As reported in a USAID request for proposal for the development of clarias fingerling production clusters, “recent survey indicated that fishermen bait between 100 to 1,000 hooks per day, with an overall demand within Kenya between 5,000 and 50,000 catfish fingerlings per day. This equates to an annual demand exceeding 15 million fingerlings (Ngugi, Bowman, Omolo). Assuming an average price of KSh 5-8 per bait fish, catfish fingerlings represent a KSh 97 million industry.”⁹⁰ Considering that polyculture systems combining catfish and tilapia are common, the sale of catfish fingerlings, either as seedlings or baitfish, presents a logical source of income supplementation for an investor interested in a tilapia farm.

Any investor seeking to produce fingerlings as baitfish would be wise to take local competition into consideration; using this simply as a supplemental source of income during the dry season when wild baitfish are less plentiful. Additionally, investors in this area should seek to be as close to the demand market as possible -- focusing on those districts where production has not begun yet and avoiding sales to middlemen who will inflate prices amongst locals.

Fishing equipment & landing-site development

Regardless of whether investors would process and package cultured fish independently or rely on existing processing plants, investors contracting with small-scale farmers would be required to ensure adequate means for collecting and transporting the fish from farms to the processing plant. Investment in properly cooled stations is particularly important for investors hoping to target the largely untapped “fresh fish” markets for tilapia.

Non-consumer goods

Bio-diesel

Working with much larger production levels, fish oils might be used for biodiesel production, an endeavor which Aqua Finca, the biggest tilapia farm in Honduras, began in 2006. Producing 30 tons daily of fresh fillet exports mainly to USA, Aqua Finca Saint Peter Fish opened a brand new fishmeal plant and a biodiesel plant based on tilapia oil. Total investment totaled US\$ 20 million, which included fishmeal, biodiesel, processing, and production, and has allowed all of the vehicles and the machines of the farm to run on bio-diesel.⁹¹ However, given how central fish consumption is to local diets, using fish for fuel production could have a negative development impact.

⁹⁰ Kenya Business Development, “Development of Small-scale clarias fingerling production clusters” (USAID RFP, 2006).

⁹¹ Globefish, “Tilapia Market Report” (February 2007).

Section 7.3: Constraints

Despite the government's renewed emphasis on aquaculture today, the sector continues to suffer the legacy of decades of neglect, particularly in terms of the availability of affordable, quality feeds and fingerlings. As discussed earlier, public-private partnerships, if not independent private ventures, can help remedy many of the industry shortcomings.

Additional industry constraints include limited government extension services, poor record keeping, and a weak fisheries policy. While these constraints impact smallholder farmers most directly, they can be setbacks to investors seeking outgrower schemes that depend upon efficient fish production by smallholders. Additionally, given the environmental impact that any farm can have on its surroundings, special consideration must be given to restrictions on the use of Kenya's wetlands.

Insufficient research and unreliable data

The Department of Fisheries is based out of Sagana Fish Culture Farm, Kirinyaga and Nyeri Districts, Central Province. The largest farm of its kind in eastern Africa, Sagana includes 51 hectares, 25 of which are under water. The farm serves as a center of research for the industry. While the Department of Fisheries has been working closely with USAID's Pond Dynamics/Aquaculture Collaborative Research Support Program since 1996 and Moi University for a number of years, it has only been recently that special attention has been given to researching best practices in Kenya's aquaculture sector—a task complicated by the lack of reliable data on previous farming schemes.

Inadequate extension programs

According to Pamela Achieng, the aquaculture specialist at the LBDA, adequate sources of input exist—the LBDA alone has eight centers for input provision and training, primarily geared towards small farmers.⁹² This view is supported by a study carried out in August 2006 that surveyed 124 fish farmers in 26 districts surrounding Lake Victoria. The study found that 78 percent of farmers had received specialized aquaculture training for at least 1 week. Training was primarily conducted under national/public extension services which were reported to be major sources (81 percent) of technical support and knowledge.⁹³ Despite these efforts, government extension workers are often considered to be less knowledgeable about fish farming than farmers themselves, as they often lack hands-on experience.

Land Availability

Although less than 1 percent of Kenya's land is under aquaculture production, much of this land encompasses ecologically important wetlands. The Lake Basin Development Authority awarded 17,000 acres of wetlands in Yala Swamp to Dominion farms, despite opposition from local conservationists. While interviews with Dominion's aquaculture specialist and officials at the

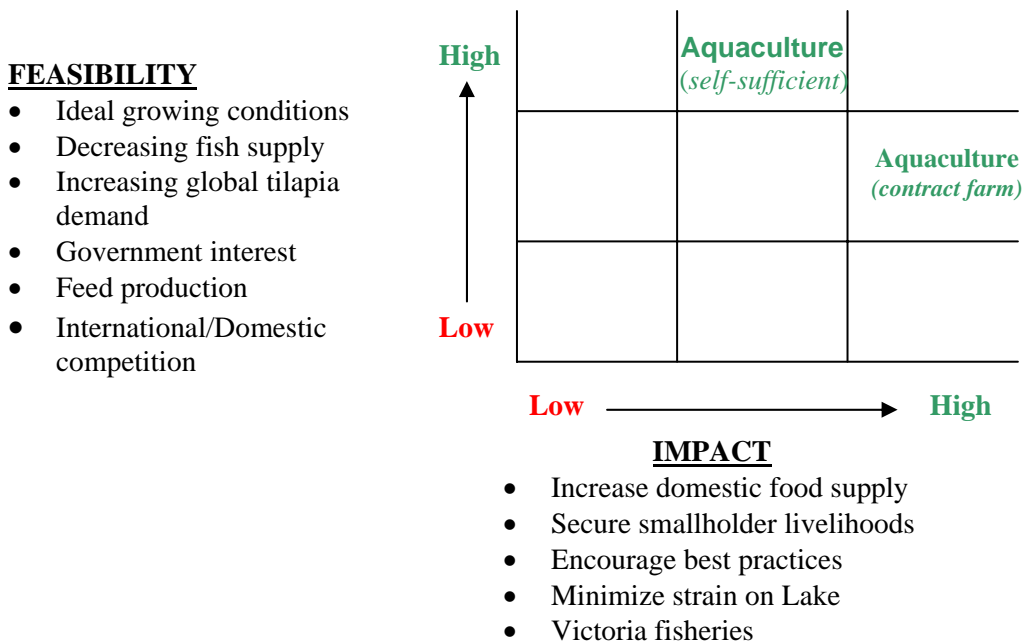
⁹² Pamela Achieng, personal interview, March 16, 2007.

⁹³ Covering 26 districts, findings of these studies represent conditions in Tanzania, Uganda, and Kenya. L. Abubaker, et. al. "Status and impact of rural aquacultural practice on Lake Victoria basin wetlands" *African Journal of Ecology* (August 2006).

LBDA indicate that obtaining land would not be difficult, whether by leasing land from the Government or local smallholders, the degree to which conservation regulations, such as the Nile Basin Treaty, may prevent this would have to be investigated further, as would the willingness of smallholders to lease or sell their property.⁹⁴

Section 7.4: Framework Application – Commercial Aquaculture Farm

Figure 11: Framework Application – Commercial Aquaculture Farm



Feasibility

Demand Factors: Local consumption levels of fish below recommended levels; national consumption of fish increasing with awareness of health benefits; global demand for tilapia increasing.

Supply Factors: Fish supply from Lake Victoria declining at alarming rate; sourcing from other sources besides the lake is critical. Production potential via aquaculture not fully realized; supply from Dominion farms/other large farms (Uganda) potential source of competition. Feed inputs (maize, sunflower seeds, cotton seeds, etc.) available locally.

⁹⁴ Enos Were, personal interview, March 20, 2007. Pamela Achieng, personal interview, March 16, 2007.

Enabling Environment: Government has historically lacked coherent fisheries policy and adequate extension services; however, is attempting to remedy these shortcomings. Government supports several aquaculture promotion initiatives.

Profitability: Varies according to farming approach and inputs used. Profitability is primarily dependent on fish feed costs (up to 60 percent of costs). There is recent focus on producing affordable feeds from locally based products.

Impact

Employment: Small number of jobs created for commercial farm employees. Potential employment creation for small-scale contract farmers and other firms in value chain (nets, cold storage facilities, processing plants etc.).

Skill Set: Investment by foreign firm with aquaculture production expertise could disseminate best practices in management and production techniques. Availability of inputs such as fingerlings and long lines for fishing could also encourage best practices within lake-based fishing industry as well.

Income: Guaranteed smallholder incomes via contract farming. Enhanced small-holder incomes by making industry inputs available and production levels higher.

Local Competitive Environment: Supply from Dominion farms/other large farms (Uganda) potential source of competition; however, markets targeted by these farms are not clear. Contract farmers may have advantage of serving immediate local market; larger commercial farm may serve Central Province, including Nairobi. Local production should minimize fish imports from neighboring countries (e.g. Uganda); however, potential to export to region requires additional study.

Natural Environment: While the amount of unutilized wetlands is extensive, the degree to which conservation efforts regulate the use of these lands requires additional research. Impact on wetlands is also not known.

Productivity: Overall increase in aquaculture production via large commercial farm; some gains among small-scale holders with experienced foreign investor.

Section 8: Dairy Production and Dairy Cow Breeding Sub-Sector Study

Section 8.1: Sector Status

Currently, relatively little formal dairy production occurs in the greater Kisumu area. Most processed milk and other dairy products are produced in central Kenya. In 2006, demand for milk in Kisumu District exceeded production by about 25.6 million liters. Nyanza Province is also reported to experience a large deficit in milk production.⁹⁵

Figure 12: Milk production and demand in Kisumu District (millions of liters), 2005-2006

	Production	Demand	Deficit
2006	14.4	~40	~25.6
2005	14.1	39.9	25.8

Source: Office of Livestock, Kisumu District

Dairy farms in the area appear to be doing well. Mukumu Farm near Kakamega, one of the largest farms in the area, operates on 65 acres with 50 mature milk cows and 40 young cows. The farm follows a semi zero-grazing model, allowing cows to roam and feed on grass (an indigenous variety) for much of the day, while bringing them into confined areas for regular milking and feeding with maize (grown on the farm). The farm sells all of its milk locally and unprocessed (customers boil the milk at home) for KSh 35 per liter, compared to KSh 26 per half-liter for factory-processed milk. The farm sells 250L – 300L of milk per day, and makes a profit of about KSh 25,000 per mature milk cow annually. The manager of the farm believes that he would have no trouble selling more milk if he had additional production capacity. He also believes that his profits would be higher if he were using Friesian cows, which produce about 5,000 liters of milk per year with a low butterfat content, rather than Guernseys, which produce about 3,500 L/year and have a higher butterfat content.⁹⁶ The farm employs 16 people, and much of the work, including milking, is done manually.⁹⁷

The demand for high-quality dairy cows with well-kept records⁹⁸ is also very high, according to all relevant persons interviewed. Such cows are not available in the area, so those interested in purchasing must go to central Kenya. According to those interviewed, such cows can range from KSh 50,000 to KSh 120,000. To purchase large quantities of cows, one might have to buy from South Africa or Europe. According to Mukumu's manager, a large farm in Eldoret had difficulty obtaining the cows it needed from Kenyan sources, and therefore had to look outside the country. Mukumu used to sell dairy cows locally, but has stopped in order to increase its own capacity, and also, according to the manager, because local farmers were unable to take adequate care of the cows, which would die within one year.⁹⁹

⁹⁵ Training and Extension Officer, Nyanza Province, Ministry of Livestock, personal interview, March 19, 2007.

⁹⁶ Butterfat is not profitable in Kenya.

⁹⁷ Brother William Oudshoorin, personal interview, March 20, 2007.

⁹⁸ Records of the milk production of a cow's mother gives a buyer a better sense of what a cow's production will be.

⁹⁹ Brother William Oudshoorin, personal interview, March 20, 2007.

Section 8.2: Opportunities

Because the Kisumu area is a net importer of milk and milk products, opportunity exists for large-scale dairy producers and processors. According to one interviewee, demand for milk is growing, and the red clay soil and rain conditions in the area are good for cattle raising and cattle feed production.¹⁰⁰ Tetrapak, a multi-national food packaging company with expertise in dairy processing and packaging, has expressed interest in partnering with local processing firms. Tetrapak is part of the Business Alliance Against Chronic Hunger, which is already working in Siaya District in Nyanza Province.

Opportunities may also exist in dairy cattle breeding. Demand appears to be high, and high-quality semen used for artificial insemination, which used to be difficult to acquire, is now readily available from businesses in Nairobi, Eldoret, and Kisii.¹⁰¹ However, quantity and consistency of demand may be difficult to gauge.

Section 8.3: Constraints

The primary constraint for dairy production is the availability of high-quality, well-documented dairy cows in Kenya. Though information regarding this low supply has been anecdotal, it has been affirmed by all relevant persons interviewed. Purchasing cattle from outside the country would likely add to costs through transportation and import tariffs. Whether such costs would be prohibitive to starting a dairy farm still needs to be investigated.

Some interviewees expressed concern regarding the availability of land. Others felt that plenty of land was available. The availability of land for a large farm would also have to be investigated before a large investment takes place. Taking Mukumu Farm as a starting point, a dairy farm with 100 cows would require about 72 acres of land.

Outbreaks of Rift Valley Fever (RVF), a disease that infects and kills cattle (as well as other ruminants and humans), have recently occurred in east Africa. Several different types of effective vaccinations against Rift Valley Fever are available for cattle. Additionally, outbreaks of RVF may cause some consumers to substitute away from dairy. However, transmission of RVF can only occur through raw, unprocessed milk.¹⁰²

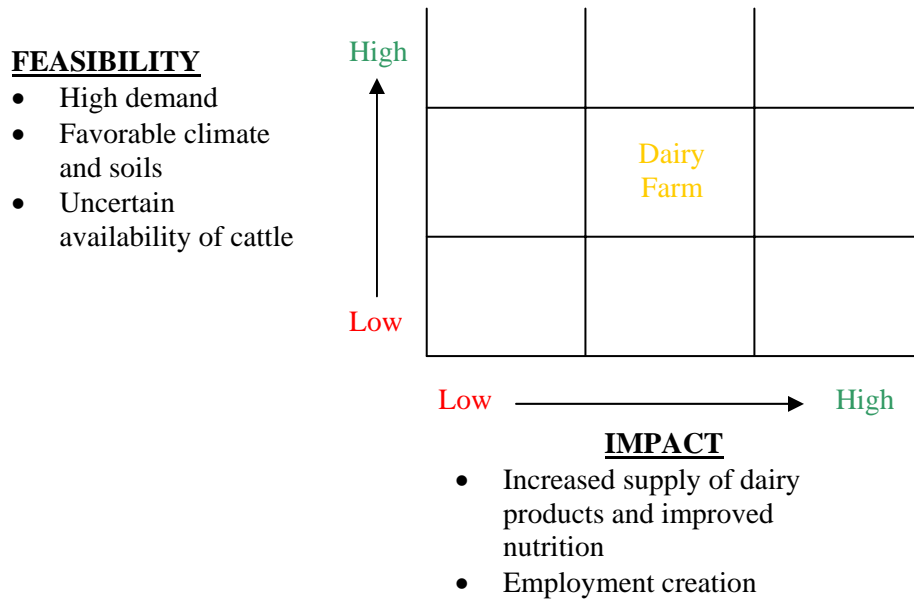
¹⁰⁰ Brother William Oudshoorn, personal interview, March 20, 2007.

¹⁰¹ Training and Extension Officer, Nyanza Province, Ministry of Livestock, personal interview, March 19, 2007.

¹⁰²“New outbreak of fatal Rift Valley fever in the Horn of Africa” (International Livestock Research Institute, January 26, 2007).

Section 8.4: Framework Application – Dairy Farm and Processing Plant

Figure 13: Framework Application – Dairy Farm and Processing Plant



Feasibility

Demand Factors: Deficit of approximately 25.6 million liters of milk in 2006.

Supply Factors: Supply of high quality dairy cows uncertain. Might need to purchase cows from outside of the country, which would raise costs.

Profitability: High demand and profitability of local and national firms are good indicators that this investment would be profitable.

Impact

Employment: Some job creation on the farm and in the plant.

Local Competitive Environment: May provide competition with small dairy producers, but this is unlikely to have a large impact, as local demand is so high.

Natural Environment: Needs further research.

Local Consumers: Potential increased access to high protein dairy products for lower price.

Section 9: Investment Promotion Office

Kisumu faces an uphill battle in attracting investment and making sure it reaps the benefits of what investment it manages to bring in. Overall, FDI inflows to Kenya are on the decline, from \$82 million in 2003 to \$21 million in 2006.¹⁰³ According to the 2006 World Bank's annual Doing Business Report, Kenya's business climate ranks 83 out of 175, a drop from 80 in 2005. While ranking higher than many African nations, Kenya is competing for investment with its increasingly attractive neighbors, Tanzania and Uganda—even Kenyan investors are beginning to look abroad to Uganda and Tanzania as preferred investment sites. Moreover, should an investor choose to put her money in Kenya, Kisumu would have to compete with Nairobi and Mombasa to receive the funds.¹⁰⁴

The Kisumu municipality reports being approached by interested investors in the tourism, hotel, waste recycling, and cotton industries, among others.¹⁰⁵ Local business leaders claim the growing Kisumu population means a growing market for all types of products, pointing to the city's middle class as a key market. The problem, they say, is a lack of market information for would-be investors.¹⁰⁶ Others say that the investment climate is unpredictable¹⁰⁷ and that the lack of a domestic investment policy, as well as an economic plan for Kisumu, hurts the growth of the city.¹⁰⁸

High hopes for attracting investment to Kisumu are pinned on the expectation of the expansion of Kisumu's airport from a domestic to an international airport. While phase one of two phases, the expansion of the runway to accommodate larger planes, is set to begin in May 2007, the implementation of phase two, to allow for international freight flights, has not been confirmed. While the airport's expansion has been promised for many years, national political issues have prevented these plans from being realized in the past. Locals believe the airport will increase cost efficiencies in shipping for businesses and will enable the fishing industry to compete with Uganda and Tanzania. However, some are skeptical of the benefits of the airport, believing the money should have been used to improve the poor roads from Nairobi to Kisumu.¹⁰⁹

Kisumu is the third largest city in Kenya. It is strategically located on Lake Victoria and therefore should have its own investment promotion office (IPO). A key recommendation to the Government of Kenya is that it open a Kisumu branch of the Kenya Investment Authority, especially in light of the MCI's attention, which presents an opportunity. Regardless, the municipality itself should create an IPO drawing on the expertise of the MCI.

The municipality's Investment Promotion Office would be a government authority entrusted with catalyzing the growth and development of Kisumu's economy by identifying and attracting corporate and private investors. The IPO would stimulate the growth of FDI in Kisumu and

¹⁰³ *World Investment Report, 2006*, UNCTAD

¹⁰⁴ Peter Ngau, personal interview, January 2007.

¹⁰⁵ Meeting with Kisumu Municipality, January 2007.

¹⁰⁶ Salima Gilani, personal interview, January 2007.

¹⁰⁷ Kimani Ndungu, personal interview, January 2007.

¹⁰⁸ Patrick Adolwa, personal interview, January 2007.

¹⁰⁹ *Ibid.*

encourage local entrepreneurs to enhance the city's investment potential. The Kisumu IPO would provide information and support to businesses, investors, and entrepreneurs in setting up businesses in Kisumu.

Kisumu's IPO would be responsible for providing investors with extensive information related to the local business environment including: business climate, attractive business sectors, business policy, tax structure, banking and financial structures, major projects, current investment projects, a list of suitable business partners and government incentives. This office would also be responsible for helping to create linkages between foreign and local businesses, perhaps the greatest opportunity for a locality to benefit from FDI. The IPO could accomplish this by creating a database of local businesses that have an interest in providing services and supplies to foreign affiliates and creating joint ventures with foreign investors. Further, this office could also provide a database of foreign investors operating in Kisumu in order to facilitate information sharing.

This office would consist of an individual who would act as the single point of contact for businesses who need to learn about the necessary permits and documentation necessary to start a business in Kisumu. This person would be responsible for facilitating investors in the application process for permits and licenses required for an investment project and providing ongoing support for investment projects once the business is established.

The extensive information the Kisumu IPO would have could be disseminated through a website that explains its objectives, details procedures on how to set up a business in Kisumu, and provides information on the laws and regulations related to doing business in Kisumu. It would also have a section that provides investor support by giving information in the form of frequently asked questions (see below), links to important websites (see below), and contact information for the Kisumu IPO. This website would also provide an overview of Kenya, some economic and demographic information specific to Kisumu and its surrounding areas, along with important facts and figures related to doing business in Kenya.

Another important responsibility of the Kisumu IPO would be to provide attractive rationales for why investors, both foreign and local, should invest in Kisumu. A list of reasons why investors should invest in Kisumu would be very useful, along with some data on economic stability, status of infrastructure, and quality of life within Kisumu. Further, knowledge-sharing in one central space of any investment incentives that may exist in Kisumu, along with trade policy, intellectual property laws, and strength of labor force would be very useful and advisable.

Further, the Kisumu IPO could also register with IPAnet, an internet portal run by the World Bank's Multilateral Investment Guarantee Agency. IPAnet serves as a gateway to investment information resources from the World Bank Group, other multilateral institutions, investment promotion and privatization agencies and sectoral ministries, as well as private sector business information providers worldwide. Users can evaluate potential investment opportunities, analyze the business-enabling environment, and obtain current research on factor costs and infrastructure. In addition, one can contact key government agencies, financing sources and support services through this portal.¹¹⁰

¹¹⁰ Foreign Direct Investment Promotion Center (MIGA, 2007). <<http://www.fdipromotion.com>>.

Frequently asked questions of an Investment Promotion Office

- 1) What is the function of Kisumu's Investment Promotion Office?
- 2) Can I register a business in Kisumu without a local partner?
- 3) Who do I contact if I want to set-up a business in Kisumu?
- 4) What is the size of the economy?
- 5) What is the business environment in Kisumu?
- 6) What are the different business forms in Kisumu?
- 7) Does the Government of Kenya provide any incentives for investors?
- 8) What are the regulations on imports and exports in Kisumu?
- 9) What are the labor laws in Kenya?
- 10) What are the current major projects in Kisumu and the surrounding areas?
- 11) Does Kenya have a free trade zone?
- 12) What are the procedures required for a foreign company to register in Kisumu?
- 13) Can foreign investors own real estate in Kisumu?
- 14) Can foreign companies operate business on their own or must they be partnered with a local partner?
- 15) What are the tax laws in Kenya and in Kisumu?¹¹¹

Links of important websites that should be provided by the IPO

- 1) Ministries and Government Organizations such as the Kenya Investment Authority, Ministry of Commerce, Ministry of Foreign Affairs, Ministry of Interior, Ministry of Education, Kenya Tourism Authority, Ministry of Agriculture, Ministry of Planning.
- 2) Business links such as Kisumu Chamber of Commerce, Kenya Securities Market, Kenya Business Council.
- 3) Banks within Kenya and in the Kisumu region
- 4) Major service industries such as the telecom, gas, electricity, water, navigation and transport, and airline.
- 5) Educational establishments
- 6) Hotels
- 7) Media and Public Relations
- 8) Organizations for hobbies, sports, and leisure¹¹²

¹¹¹ Multilateral Investment Guarantee Agency (2007). <<http://www.fdi.net>>.

¹¹² Ibid.

Section 10: Conclusion and Recommendations

Kisumu is a thwarted giant of a city. It had every reason to be prosperous before the decline of the East African Community and the slow deterioration of its major economic activities. Now it is caught between stagnation and the promise of renewed growth. A few well-placed investments cannot be expected to reverse decades of neglect, but they can make a tremendous difference by maintaining the livelihoods of many of the region's inhabitants, promoting the diversification of the local economy, and increasing the sophistication of local businesses.

With that in mind, we advise that the MCI follow four recommendations: to advocate an E10 mandate, to find investors for a peanut butter factory, to find investors for a commercial aquaculture farm, and to support the establishment of an investment promotion office in the city government.

Recommendations
<u>Advocate:</u>
• E10 Mandate
<u>Identify Investors for:</u>
• Peanut Butter Factory
• Commercial Aquaculture Farm
<u>Support:</u>
• Investment Promotion Office in Kisumu

Section 10.1: Advocate an E10 Mandate

First, the MCI should work with Kenyan partners to pressure the GOK to pass an E10 mandate, forcing gasoline sellers to blend ethanol with gasoline in a 10/90 percent mix, respectively. Diverting production from sugar to ethanol is the only immediate, workable option for saving the livelihoods of a large portion of the 2 million to 3 million individuals who will be affected by the expiration of the COMESA safeguard in western Kenya. The MCI should exert pressure in two forms: by working with local parties and by advocating independently.

On one hand, the Initiative should work with civil society groups in Kisumu, especially the Kisumu-based Sugar Campaign for Change (SUCAM), organized by Michael Arum and Peter Kegode. These two individuals are familiar with many other interested parties and local experts, making a good starting point for the MCI to become acquainted with the constellation of forces around the issue. SUCAM also will probably have an idea of where the MCI could be most useful.

The Initiative should also coordinate with local and national politicians from the region to pressure the Cabinet to consider an E10 mandate. Kisumu is an opposition city and 2007 is an election year—it will be extremely difficult to get key government players, such as the Minister of Energy and the Minister of Agriculture, to pay attention to the issue—but local political buy-in is essential to success.

Furthermore, the MCI should communicate with industry players such as the Mumias and Kibos sugar mills, and the Spectre ethanol plant. Mumias' executive director, Dr. Evans Kidero, has expressed interest in pursuing ethanol production, but as part of an as-yet unexecuted sugar project on the coast. He should be convinced to put Mumias' considerable heft behind ethanol in western Kenya, as well. As mentioned previously, Ragbir Chatthe, part-owner of Kibos, is extremely interested in expanding his facility to incorporate ethanol production. The

management at Spectre is also interested in exploring fuel ethanol and is keen to see a mandate passed. Israel Agina, procurement manager at the plant, is a good point of contact for the MCI, as a Kenyan with strong local knowledge and a deep familiarity with the ethanol industry.

On the other hand, the MCI should advocate independently by sending Dr. Sachs to meet with Cabinet-level national leaders and President Kibaki and Vice-President Moody Awori, if possible, to discuss the threat to the sugar industry and prospects for passing a mandate.

Section 10.2: Identify Investor(s) for a Peanut Butter Factory

Kisumu is ideally placed to take advantage of the growing market for peanut butter in Kenya. Currently, all value-adding activities in the groundnut sub-sector occur in and around Nairobi, relatively far from where the groundnuts are grown. A peanut butter factory in Kisumu would have natural comparative advantage over its Nairobi-based counterparts. Once basic operations are established, a factory could enhance this advantage by building business relationships with local growers.

Other types of groundnut processing should be further investigated, namely roasting and seasoning. It is very likely that this market, like the market for peanut butter, is growing. The market for peanut oil and oilcake should also be examined.

Section 10.3: Identify Investor(s) for a Commercial Aquaculture Farm

While aquaculture has traditionally played a minor role in Kenya's economy, the decline of the fisheries industry in Kisumu makes aquaculture a potentially important substitute for fishing as a source of food and income. Realizing this possibility, the Government of Kenya, in coordination with Moi University and various non-profit and research institutions, has given special attention within recent years to improving aquaculture production within Kenya. By injecting capital and technical expertise, private investment can have a particularly crucial role to play in the commercialization of aquaculture in western Kenya and the development of this industry as a sustainable alternative to the lake-based fishing industry.

Investment opportunities in aquaculture exist given the increasing demand for fish locally and internationally, as well as ideal site conditions in Kenya. Investment opportunities in aquaculture include:

- The creation of a self-sufficient commercial farm (such as the one at Dominion Farms) producing tilapia/catfish for local and international consumption and/or animal feed production;
- A commercial farm contracting with small-scale farmers in a outgrowing scheme.

In considering which of the first two options to promote, the MCI should take account of their variation in feasibility and development impact. The first option is more feasible, promising a higher return and more likely to attract an investor, but it will likely not have much development impact beyond training employees and providing fish to the local market (if it decides to sell locally). The second option has a higher development impact via the income distribution implied

in an outgrower scheme, although it might be more difficult to attract an investor willing to undertake the burden of dealing with many small farmers.

A third option is to attract an investor willing to establish a farm-inputs producer serving small-scale farmers with quality fish feed, traditionally a major constraint to the industry's success.

Section 10.4: Support the foundation of an Investment Promotion Office (IPO) in Kisumu

Kisumu needs an IPO not only to research and attract foreign investment, but also to function as a catalyst for deriving as many of the benefits of FDI as the city can accommodate. As a single point of contact for foreign investors, Kisumu's IPO would be in a position to advise a prospective investor on all local regulatory requirements, simplifying the investment process.

More importantly, the IPO would keep a roster of local businesses interested in providing supplies and services to foreign affiliates, as well as a list of local businesses looking for joint venture partners. Thus the office would also be a matchmaker, serving to establish the backward linkages that lead to technology transfers, workforce and market-access upgrades, and improve the general sophistication of the local economy—making it in turn more attractive to other investors.

This kind of local-capacity building—helping to install an IPO in the municipal government structure—is an essential feature for a city looking to prosper from FDI. It marks the difference between purposeful economic development, on the one hand, and a reliance on the market mechanism, on the other. The latter may work in many situations, but the former will be much quicker if done correctly.

The municipality has expressed interest in setting up this office within its Millennium Secretariat, a special office designed to handle MCI-spurred development. The Initiative, for its part, should support the foundation of the IPO. The city has asked for financial assistance to found the Secretariat—that is another matter. However, the IPO is essential and the MCI should strongly consider providing seed money to found it.

The MCI should also continue in its efforts to have the Kenya Investment Authority open an agency branch in Kisumu.

Section 10.5: Limitations

We acknowledge that this report has several limitations. First, it is not comprehensive. With only about two weeks to spend in Kisumu and fewer than four weeks to spend in Kenya, we knew we would have to limit the scope of our study. This means that we focused on just a few sub-sectors. However, investment opportunities in Kisumu are not limited to those sub-sectors represented in the main body of this report. We present information on sub-sectors we believe also have potential for growth in Appendix I. More work needs to be done to research opportunities in these industries.

Second, we recognize that the framework we have adapted for this project needs to be refined and tested. Late in the project, for example, it was pointed out that we had not included gender or

health aspects as considerations for an investment's development impact. These elements may be of vital importance when looking, for example, at investments that could impact smallholder family income and the incomes of female farmers (such as in sugar and groundnut farming) or at aquaculture and potential links to malaria. Time and application may reveal other such shortcomings, and the framework should be tried and updated accordingly.

Appendix I: Sectors with potential and need further research

- Cotton
- Solar Energy
- Tourism
- Rice
- Horticulture

Cotton

Sector status

In the early 1980s, cotton was the fifth largest foreign exchange earner in Kenya, after coffee, tea, pyrethrum and tourism. National acreage has since declined from a high of 1.5 million hectares to 3,371 hectares currently.

Kenya has a total of 24 ginneries, the majority of which are privatized. A number of the ginneries have taken up roles including signing of cotton delivery contracts with farmers and provision of extension services to the growers. In Nyanza, some provide tractor services to facilitate land preparation in the heavy soil of the region. Such contracts minimize the risks associated with supplying inputs to growers on credit. The arrangement ensures sustained delivery of the raw material to the ginneries.

Acreage yields fall in the range of 310 kg/acre in Western/Nyanza region and 500kg/acre in Lamu at the Coast. Gross margin in Western/Nyanza and Eastern's low potential areas is below zero while in the high potential Coast and Eastern regions, gross margins are close to KSh 3,000 to KSh 4,000 per acre.

Opportunities

Kenya is among a number of African countries benefiting from the African Growth and Opportunity Act (AGOA), which aims to liberalize trade in certain categories of items, including apparel. Countries qualifying for the trade benefits under AGOA may export apparel into the U.S. duty-free, subject to an annual limit, until 2015. To qualify under this specification, countries must source materials from US suppliers or eligible African countries.

The Act also accords preferential treatment to certain countries that are designated as lesser developed countries (LDCs). Kenya falls under this category and enjoys duty-free entry into the US market for clothing cut and made in Kenya, even when the fabric is imported from sources outside the US or outside eligible AGOA African countries. This has helped to make the clothing made in Kenya competitive with similar imports from Asia.

Constraints

While the special categorization for lesser developed countries was extended by three years from September 2004 to September 2007, the final year of this extension will see quotas for apparel shipped under the waiver reduced by half. With current quota utilization rates under this waiver exceeding 50 percent, the reduction in the preference quota will adversely affect less competitive countries.

All fabric and most accessories used in Kenyan production are currently imported, primarily from Asia. For continued duty-free market access to the US, Kenyan apparel factories must source from either US suppliers or from eligible African countries by September 2007.

Trade in the US market requires dealing in high quality products and large volumes. Kenyan textile mills may not be able to produce the wide range of fabric required by the clothing factories, at a competitive price. Importing from other African countries is not feasible, since there is more demand for cotton in factories than there is in being grown.¹¹³

¹¹³ Noel Wandera, "EU urges Government to quit cotton sub-sector," East African Standard, 2003

Solar Energy

Sector Status

Kenya is heavily dependent on imported petroleum products to meet its energy needs. The government has made efforts to reduce the role of petroleum in domestic energy consumption and has achieved some success. Despite these efforts, oil constitutes four fifths of Kenya's total primary energy consumption. There has been an increase in the demand for oil since the country's transportation and industrial sectors have expanded in the last decade. Due to this dependence and the exponential rise in costs of imported petroleum, residents and businesses in Kenya face a prohibitively high cost for energy. This is a key reason for why many foreign investors go to neighboring countries to do business.

Fewer than 2 percent of Kenya's rural households have access to electricity from the grid. Efforts by the state monopoly to improve that figure by expanding the grid have had little effect, in part because the rural population is so sparse. Some rural households have turned to different suppliers with different technology—private companies providing photovoltaic (PV) panel systems. Since 1990, more than 2.5 megawatts of PV electricity have been sold in Kenya, mostly to households among the top 25 percent of rural income earners. The photovoltaic market has grown in stages as technological and commercial innovations have brought it within reach of lower-income users. PV units have gradually become smaller, cheaper, more reliable, and safer sources of power for remote areas, while providing a healthy, environmentally friendly, alternative to kerosene, petroleum and wood.

In addition to the environmental benefits, there are numerous social benefits associated with this energy source such as affordability for the millions of people living without a reliable source of power.¹¹⁴ Further, hire purchase and finance agencies have entered the market, enabling lower-income families to buy systems on credit. The government has largely taken a hands-off approach. That, combined with its liberalization of foreign exchange and import regimes, has allowed private entrepreneurship to flourish.

This “solar explosion” is spreading rapidly in rural areas of southern Kenya as 20,000 or more units are being sold per year in Kenya. The market for solar energy is 100 percent private with 40-50 companies, both domestic and international, working in the industry without the support of aid agencies such as the World Bank. Panels made in Kenya cost half the price of those made in the US due to increasing demand in Kenya and a growing number of producers competing to make and sell PV panels which are affordable to Kenyans both rich and poor.¹¹⁵

Opportunities

The demand for electricity in Kenya is growing by about 6 percent a year. That along with the majority of those living in Kisumu's slums without electricity, there is great demand for more electricity. This demand can be filled with an affordable and reliable source of energy through

¹¹⁴ [Kenya Solar](http://gm.kqed.org/4/14/), Prod. Jim Yager, KQED. <<http://gm.kqed.org/4/14/>>

¹¹⁵ Daniel M. Kammen, “The Commercial Dissemination of Photovoltaic Cell Systems in Kenya” (Energy and Resources Group, June 1999). <<http://jobfunctions.bnet.com/casestudy.aspx?docid=108779>>

the solar PV panel system. Although a lot of growth has occurred in the PV Panel space, there is still room for a lot more growth. The commercial market for solar PV home panel systems has been growing in Kenya for over 10 years. Over 80,000 solar PV Panels have been sold, providing power to over 1 percent of the rural population of roughly 25 million people. The total installed capacity is over two megawatts (MWp), with typical individual systems from 10 - 40 Wp (Wp = peak watts), and costs per system between US\$250 and US\$1,000. By contrast, the national Rural Electrification Program has connected less than 2 percent of the rural households to grid-connected power supply. 99 percent of the rural population of 25 million are still left without coverage so opportunity exists to sell them affordable solar PV Panels. 40-50 companies are already in the market but still they are only able to connect 1 percent of the population that needs and wants to be connected.¹¹⁶

This opportunity within the solar panel industry seems to exist for both micro-enterprises as well as for large businesses. Large businesses can work in producing PV systems that take advantage of economies of scale and micro-enterprises can work with smaller margins but still be profitable.

The benefits of this industry are not only economic, but also environmental and social. With affordable PV panels, people are able to keep their businesses open later and the poor can have their children study into the evening hours¹¹⁷

Constraints

Although the government's hands-off policy is a great benefit as it has prevented any large projects or government tenders to distort the industry, some policy-related hurdles remain. In other countries (India, South Africa) large projects and unsustainable subsidies for photovoltaic equipment have undermined private sector activity, because big players move in and out of the market at will to take advantage of the handouts. In Kenya the market's commercial base has made it more sustainable. Still, a number of policy-related hurdles remain

For one, the costs of materials for production and sale are extremely high with batteries, charge regulators, inverters, and efficient appliances charged duties and value added taxes in excess of 35 percent of their price. A second constraint is that the industry suffers from erratic equipment and installation standards. Dealers undersize or leave out vital components to win contracts, and there is little incentive for proper engineering. Prevalent sales and installation practices undermine consumer confidence in photovoltaic equipment, especially larger systems. Thirdly, the industry suffers a lack of trained technicians and thus system quality remains poor.¹¹⁸ New businesses in this industry must take these constraints into mind when defining their business model.

¹¹⁶ Mark Hankins. "A case study on private provision of photovoltaic systems in Kenya." *Rapid Response*. March 2007. <<http://rru.worldbank.org/Documents/PapersLinks/27.pdf>>.

¹¹⁷ "Access to Electricity program eases poverty: ABB." *World Business Council for Sustainable Development*. March 2007. <<http://www.wbcsd.org/plugins/DocSearch/details.asp?type=DocDet&ObjectId=14048>>.

¹¹⁸ Hankins.

Tourism

Sector Status

While Kenya is still one of the foremost leisure tourist destinations in Africa,¹¹⁹ Kisumu is reported to be just a transit town, an overnight stop on the way to the Masai Mara (2 hours from Kisumu) rather than being a destination itself.¹²⁰ As the business capital of western Kenya, the majority of visitors to Kisumu are business travelers from other areas in Kenya or employees of international NGOs. In addition, many travelers from Nairobi come to Kisumu to visit their relatives, preferring to stay in the city rather than in their rural hometown. The city is considered to be relatively safe for tourists,¹²¹ and is within close proximity to a variety of tourist sites such as Ruma National Park to the south (four hours from Kisumu), Ndere Island (one hour from Kisumu) to the north and Kakamega forest (one and a half hrs from Kisumu) to the East.¹²²

More than 300 visitors arrive to Kisumu daily and tourist growth is evident in the increased number of flights to the city. Previously, there was one daily flight to Kisumu and today there are four.¹²³ In interviews with business owners, NGOs and government officials, tourism was continually cited as one of the top three industries with growth potential in Kisumu. Locals argue that the proximity of Kisumu to national parks and ecotourism destinations, as well as Lake Victoria, make it an excellent tourist location. However, the city's lack of tourist hotels and restaurants, poor roads leading to tourist sites, and the lake's high pollution levels which make it unsuitable for swimming and other lake activities, may make Kisumu undesirable for international leisure tourists.

The government of Kenya has prioritized the western tourism circuit in its current national development strategy,¹²⁴ and the Lake Basin Development Authority is working with a Canadian consultant who has developed a plan for a western Kenya tourism circuit, marketing eco-tourism to American leisure tourists.¹²⁵ UNHABITAT is also working on a tourist plan that involves the creation of a tourist info office and the inclusion of Kisumu in the Kenyan tourist circuit.¹²⁶ However, it is unclear whether these plans have been put into action.

Opportunities

Hotels

A local hotel owner suggested that there is opportunity in the low to mid-range hotel market in Kisumu, geared toward business travelers as well as Kenyans visiting their families nearby in Kenya or in Uganda.¹²⁷ The opportunity in this industry is further supported by a UNHABITAT

¹¹⁹ Sustainable Tourism in Kenya. *United Nations*. February 2007. <<http://www.un.org/esa/agenda21/natlinfo/niaw/kenyanp.htm>>.

¹²⁰ Salima Gilani, personal interview, January 2007.

¹²¹ Wisdom Mwamburi, personal interview, January 2007.

¹²² George Onyango, "An Investment Profiling Of Kisumu City, The First United Nations Millennium City."

¹²³ Wisdom Mwamburi, personal interview, January 2007.

¹²⁴ George Onyango, "An Investment Profiling Of Kisumu City, The First United Nations Millennium City."

¹²⁵ Ferdinand Wanyonyi, personal interview, January 2007.

¹²⁶ Cecelia Kinuthia-Njenga and John Mwaura, personal interview, January 2007.

¹²⁷ Salima Gilani, personal interview, January 2007.

employee who said that “often, you cannot get a hotel room” in Kisumu,¹²⁸ as well as a Technoserve employee who said “there is no decent hotel in Kisumu,”¹²⁹ and a former public official in Kisumu who stated “you cannot get a hotel room on a Friday night in Kisumu.”¹³⁰

Activities and Excursions for Nearby Attractions

Considering Kisumu’s proximity to tourist sites, the full potential of these tourist attractions does not seem to be exploited, potentially due to poor marketing. There appears to be an opportunity to attract business travelers as well as Kenyans visiting family near Kisumu, to local tourist sites through improved marketing efforts. Many hotels, including The Imperial Hotel, the most high-end in Kisumu, do not offer tourism services.¹³¹ Creating excursions related to these tourist attractions and implementing an effective marketing strategy would boost the tourism industry. Further proof of the opportunity for tourist services is evidenced by one hotel industry professional who stated that there is a rainforest one and a half hours from Kisumu but nobody visits there.”¹³²

Cultural Tourism for the Business Traveler in Kisumu City

Kisumu is said to be the cultural home of Kenya, with its most talented and famous artists coming from this region. The city could capitalize on this image and talent to create a cultural tourism industry serving the large amount of Kenyan tourists, NGO employees visiting Kisumu, and international conference attendees, which have become a regular feature in Kisumu.¹³³ The creation of cultural tourism services would fill the current lack of activities for business travelers to enjoy, such as performances and dining options, after a day of work.

Conferencing

The large amount of business travelers arriving to Kisumu and the city’s strategic location at the crossroads of Tanzania, Uganda and Kenya creates an opportunity for Kisumu as a conferencing center.

The Lake Basin Development Authority (LBDA) is in the process of building a 12-story multi-use office, shopping, restaurant and conference center. While the ground floors and basement of the center were built a few years ago, financial problems prevented the project from being completed. The LBDA is looking to partner with investors to complete the project which is estimated to cost between KSh 500m and 600m.¹³⁴

¹²⁸ Cecelia Kinuthia-Njenga and John Mwaura, personal interview, January 2007.

¹²⁹ Steve Otieno and Fred Ogana, personal interview, January 2007.

¹³⁰ Patrick Adolwa, personal interview, January 2007.

¹³¹ Salima Gilani, personal interview, January 2007.

¹³² Ibid..

¹³³ George Onyango, “An Investment Profiling Of Kisumu City, The First United Nations Millennium City.”

¹³⁴ Ferdinand Wanyonyi, personal interview, January 2007.

Constraints

In attracting tourists, Kisumu must compete with other, more established Kenyan sites. In addition, poor road conditions near Kisumu make it difficult to arrive at tourist destinations. (The road to the Masai Mara, one of Kenya's premier tourist destinations, is very poor during periods of heavy rain.¹³⁵) Once at the tourist sites, there is a lack of activities to keep the traveler entertained. While many are attracted to visiting the second largest fresh water lake in the world, the lake's pollution levels make it undesirable to enjoy the lake through water activities.¹³⁶ Lastly, high rates of Malaria are cause for worry among travelers to Kisumu.

¹³⁵ Wisdom Mwamburi, personal interview, January 2007.

¹³⁶ Ferdinand Wanyonyi, personal interview, January 2007.

Rice

Sector Status

Following maize and wheat, rice is considered to be Kenya's most important staple food. Like cotton and sugar, this crop was once considered to be a primary agricultural product of western Kenya; however, following trade liberalization policies, there has been a steep reduction in production due to the uncompetitive nature of the industry with international competitors, primarily from Asia and the Middle East. Combined with weak irrigation schemes, liberalization has left Kenya as a net importer of this essential crop. Today, Kenya spends at least seven billion Kenyan shillings per year due to low domestic production, of which 80 percent of imports come from Pakistan.¹³⁷

According to Kenya's Export Processing Zones Authority 2005 Report, 95 percent of rice grown in Kenya was grown under irrigation paddy schemes managed by the National Irrigation Board while the remaining 5 percent is rain fed. The average unit production for units under irrigation was 5.5 tons/ha for aromatic varieties and 7 tons/ha for the non-aromatic varieties while unit yield for rain fed farms was just below 2 tons/ha. Most milling of this domestic rice is carried out by small-scale, privately owned enterprises although the government owns two large milling stations at the Ahero and Mwea Irrigation Schemes in Nyanza and Central provinces.¹³⁸

Figure 14: Rice – Harvested Area

Production Zone	Estimated harvested area (% of total harvested area)
Mwea Plain(Central)	81.4%
Ahero (Nyanza)	7.1%
West Kenya	7.1%
Bunyala	4.3%

Source: UN Food and Agriculture Organization

In 2003, Nyanza Province was second only to Central Province in rice production—producing 6,855 metric tons of rice that year worth KSh 62,140,000—doubling production levels of 2002.¹³⁹ Nyanza Province's proximity to Lake Victoria and wetlands composition makes it an ideal site for irrigated rice production in Kenya; however, numerous production and policy constraints have prevented the maximization of this potential.

¹³⁷ David Ohito, "Dominion to raise rice production by 100,000 tons" *The Standard Online*, May 6, 2006. <http://www.eastandard.net/archives/cl/hm_news/news.php?articleid=1143952215>

¹³⁸ "Grain Production in Kenya: 2005," (Kenyan Export Processing Zones Authority. 2005), p2. <<http://www.epzakenya.com/UserFiles/File/GrainReport.pdf>>

¹³⁹ Central Province produced over 38,000 metric tons in 2003; however, area under cultivation in Mwea reduced by 1/3 to 10,000 ha in 2005. (Source: Ministry of Agriculture Rice Production Statistics 2002-2003 Chart in "Grain Production in Kenya: 2005" and Ohito.)

Opportunities

Kenya's demand for rice is not being met by its local supply. Within recent years, Kenyan rice production has ranged between 45,000 to 50,000 tons/year while its consumption rate is 250,000 tons/year and growing at an estimated 12 percent.¹⁴⁰ Deficits such as these are not unique to Kenya; rather, they characterize much, if not all of East Africa. Given the history of food insecurity in the region, there is a clear need for increased rice production beyond Kenya.

Kenya has the potential to not only meet its own domestic demand for rice but also supply the region with this important staple as well. According to the EPZA, for example, Kenya has a potential to produce 400,000 ha of rain fed rice and approximately 11,000 Ha of irrigated rice.¹⁴¹ According to the LBDA, the Lake Basin region would be able to produce over 21,000 tons of rice per year if properly invested in.¹⁴²

Realizing the capacity and need for rice production, the LBDA has built a rice mill at Kibos, in Kisumu City, capable of milling and packaging 3.5 tons/hours (24, 000 tons of paddy per year) and storing 17,000 tons in 6 godowns.¹⁴³ In 2005, the LBDA listed the Kibos Rice Mill, considered one of the largest in East and Central Africa, as a joint-venture opportunity in need of partners to run the mill on a commercial basis. As of March 2007, three potential partners have been identified: Uchumi supermarkets, United Millers, and an unidentified American firm. Should the mill be utilized to full capacity, it should support production by 21, 600 farmers – many of whom will be switching over from the faltering sugar industry.¹⁴⁴

In addition to producing rice or investing in irrigation or para-statal mills, such as Kibos, there are also investment opportunities for value-addition in rice production schemes. Specifically, the opportunity to develop animal feeds should be considered as a compliment to rice production for human consumption. In the area of animal and chicken feeds, the LBDA has proposed an investment of KSh 585,000 to help produce three thousand, six thousand, and 12,000 tons of feeds in the first, second, and third years of operation.¹⁴⁵ Rice bran production would especially help with the creation of fish feed which currently is sourced from only one producer in the country.

¹⁴⁰ "Grain Production in Kenya: 2005." (Kenyan Export Processing Zones Authority, 2005), p2.
<<http://www.epzakenya.com/UserFiles/File/GrainReport.pdf>>

¹⁴¹ Ibid.

¹⁴² "Investment Opportunities in the Lake Basin Region (Lake Basin Development Authority, August 2005) p.3.

¹⁴³ Additionally, the mill complex includes facilities for seed cleaning, drying, treatment, packaging. It holds the potential to purify and bottle 4,000 liters/day. (Source: "Investment Opportunities in the Lake Basin Region: August 2005")

¹⁴⁴ Dave Opiyo. "Kenya: Investors Demand Stake in Rice Parastatal's Mill," The Nation. March 22, 2007.

¹⁴⁵ "Potential Projects" (Ministry of Trade and Industry, 2007).
<<http://www.tradeandindustry.go.ke/section.asp?ID.>>

Dominion Farms

Located in Yala Swamp, a flood plain of Yala River, Dominion Farms Limited is embarking on large-scale irrigated rice production that will cover over 5,600 Ha (14,000 acres) of wetlands in Siaya and Bondo districts. It will with paddy sizes of 36 Ha each. The project employs 246

Dominion Farms CEO, Calvin Burgess, states that Dominion expects to produce sufficient rice to reduce Kenya's rice imports by 100,000 tons -- nearly half of current imports. To reach these production levels, large capital investments in irrigation infrastructure and input supplies have been made, with an expected total of KSh 2.2 billion. Specifically, the farm has completed a 25 meter long weir, originally begun by the LBDA in 1998, to help de-silt, divert, and regulate water from the Yala River to irrigation canals.

As a registered seed merchant with the Kenya Plant Health Services, Dominion has also invested heavily in its seed stock – building a rice gene bank of several NERICA (New Rice for Africa) varieties from KARI, LBDA, and Brazil. These seed varieties will be experimented with to find the highest yielding combinations.

At a cost of KSh 28.9 million, Dominion intends to also establish a rice mill capable of processing up to 16 tons per day. The farm's annual production (100,000 tons) will be sold in the local market and help close the gap between domestic production and imported rice which stands at 220,000 tons per year. As a self-sufficient farm, Dominion will use waste water from its aquaculture scheme to fertilize approximately half of its rice paddies. Bi-products will also be used to produce ceiling boards, chicken feed, rice bran (packaged for later production into livestock feed), and charcoal (for use in the drying silos).

While Dominion Farms has a strong corporate social responsibility agenda, touching on employment, health, and education, the presence of this foreign investor has not been unchallenged. Opposition to Dominion has come from conservationists who oppose intervention in the wetlands, political/business elite who view this large actor as competing for power, locals who are untrusting of foreigners, and individuals who see opportunity for self-gain through opposition. While time and example have helped Dominion to solidify some of these formerly contentious relationships, it is likely that a new foreign investor in the area would face similar opposition and skepticism from the local community. According to Calvin Burgess, any investor seeking to begin an operation of this sort must make a long-term commitment to the project and the community even before planting the first seed.



*Pictures: Dominion Group of Companies website < <http://www.domgp.com/farms.html> >
Sources: Dominion Farms Ltd. "Dominion News" (Dominion Farms Ltd., October 2006) 4th Quarter.
Calvin Burgess, personal interview, January 2007.
Ohito.*

Constraints

There are several constraints to efficient and sustainable rice production in Kenya. These include: poor development of irrigation facilities; farm mismanagement; lack of input supply (seeds, affordable fertilizer) and credit to small-holders due to reorganization of the public sectors, and weak research support, amongst other issues.¹⁴⁶

Given that many of these constraints have resulted from stalled government interventions, a private investor would be able to overcome primary challenges such as the lack of modern irrigation schemes. As demonstrated by the Dominion Farm case; however, doing so would require high initial capital investments in addition to annual capital investments would also be needed to supply or produce high yield seeds and fertilizers which are not readily available in the local market.¹⁴⁷

In addition to production constraints, policy constraints also inhibit the development of commercial rice production. Whereas the Lake Basin region is ideal for rice cultivation, conservation of these wetlands is considered essential by locals and environmentalists. Attempts to build large-scale irrigation schemes, for example, are prohibited under the Nile Treaty, signed with Egypt in the 1920s, to ensure protection of the Nile's water sources.

When working with local-small holders, it is difficult to find contiguous pieces of land given the local tradition of subdividing land amongst sons – an issue which Dominion farms is attempting to address through collectivization of plots.¹⁴⁸ Land under irrigation development by the National Irrigation Board (NIB) in Nyando and Kisumu, for example, is formerly owned by the NIB; however, contested by locals -- one example of how the availability of large land plots, with access to irrigation, is not clear.¹⁴⁹

The ability to compete with imported rice is also an important policy consideration for any potential investor. Currently, the majority of Kenya's rice is being imported from Pakistan, Thailand, China, India and Vietnam – market leaders in rice production. While Kenya had a short-term ban on importing Pakistani rice, due to poor quality standards, Kenya has resumed trade with Pakistan – the largest importer of Kenyan tea. In March 2007, delegations from Kenya and

¹⁴⁶ “Kenya Rice Statistics.” [Food and Agriculture Organization of the United Nations](http://www.fao.org/ag/agp/agpc/doc/riceinfo/Africa/KENBODY.HTM#BASIC#BASIC). <<http://www.fao.org/ag/agp/agpc/doc/riceinfo/Africa/KENBODY.HTM#BASIC#BASIC>>

¹⁴⁷ Of 8 major registered grain seed companies in Kenya, non focus on rice seeds. Seedlings would have to be provided through the LBDA or Kenya Agricultural Research Institute (KARI).

¹⁴⁸ Dominion Farms will have three trial farms where land will be collectivized so as to turn subsistence farms into commercially viable farms of at least 100 acres. These larger farms will be contracted to Dominion under 25 year leases. Two bedroom homes will be rebuilt with rice straw, tin roofs, and solar panels (\$3,000 each) in a common area. While Dominion expects this model to take on quickly, locals are less certain as to its viability given ancestral ties to land which prohibit relocation. (Source: Dominion Farms. Journal 51: February 18 – March 2. Provided by the author.)

¹⁴⁹ Ruth Mienzen-Dick et al, “Irrigation Managements and Poverty Dynamics: Case Study of the Nyando Basin in Western Kenya.” <http://www.iwmi.cgiar.org/.../Project_Workshops/Irrigation_Swallow%20et%20al%20Mar%2023%202006>

Pakistan began negotiations on future rice shipments to Kenya – crowding out room for additional market players.¹⁵⁰

Water Hyacinth

Sector Status

The infestation of water hyacinth in Lake Victoria is hurting Kisumu’s fisherman and local economy. Water hyacinth, one of the fastest growing plants known, is an aquatic weed whose tangled web has colonized Lake Victoria. The infestation of water hyacinth changes the lake’s natural resource base, affecting the livelihood of millions of people as it makes it difficult for fisherman to maneuver their boats. While the water hyacinth infestation is a devastating symptom of the serious water quality problems of Lake Victoria,¹⁵¹ the plant’s presence further exacerbates the lake’s environmental problems as it changes the biodiversity of the lake.¹⁵²

Despite the challenges it poses, some have claimed that water hyacinth is “the plant of the future, the golden weed and the answer to deforestation and pollution.¹⁵³” Internationally, some entrepreneurs and NGOs have turned this problem into an opportunity by converting water hyacinth into products such as recycled paper and cardboard, furniture, lampshades, baskets, rope, animal feed, fertilizer, biogas and electricity generation, biomass briquettes for cooking,¹⁵⁴ picture frames, and for purifying sewage effluent (as done in San Diego, California).¹⁵⁵ Water hyacinth can also be used to aid the process of water purification for drinking water, by incorporating clean, healthy plants into water clarifiers to remove small pieces of matter floating in the water.¹⁵⁶

Locally, the company Hyacinth Crafts has partnered with the NGO Kisumu Innovation Center – Kenya (KICK) to market furniture and household accessories, office products, paper, stationary and other gift items which are sold in Nairobi and other major towns in Kenya. The success of this venture led at least two other water hyacinth businesses to spawn off of KICK. Currently, more than 100 people, working in many interdependent small businesses, are involved in the

¹⁵⁰ “Rice export to Kenya re-starts from Saturday” *Associated Press of Pakistan online*. January 13, 2007.

<http://www.app.com.pk/en/index.php?option=com_content&task=view&id=2015&Itemid=2>

¹⁵¹ “Water Hyacinth.” *Thinkquest*. March 2007. <<http://library.thinkquest.org/C0126023/>>.

¹⁵² “Water Hyacinth,” *Thinkquest*.

¹⁵³ “Beach House Fish Pond.” *Journey to Forever*. March 2007 <http://journeytoforever.org/edu_pond.htm>

¹⁵⁴ “Water Hyacinth.” *Practical Action*. April 2007.

<http://practicalaction.org/docs/technical_information_serv.ice/water_hyacinth_control.pdf>

¹⁵⁵ Water Hyacinth Utilization Links. *Action for Natural Medicine*. March 2007.

<<http://www.anamed.net/English%20Home%20Page/anamed%20international/Water%20Hyacinth/Water%20hyacinth%20utilisation%20lin/water%20hyacinth%20utilisation%20lin.html>>., “A Profitable Sentence-Uganda.”

UNDP-Equator Initiative. Television Trust for the Environment. February 2007.

<<http://www.tve.org/ho/doc.cfm?aid=411>>, Wicker Rattan Furniture. February 2007.

<http://www.wickerrattanfurniture.com/roberge_water_hyacinth_khochang_arm_chair_ele_1s.asp>., “Integrated Farming Helps Fight AIDS in Africa.” Integrated Farming and Waste Management. *oneVillage Foundation* April 2007. <<http://green.onevillage.tv/?p=69>, <http://www.tve.org/ho/doc.cfm?aid=411>>, “Water Hyacinth.” *Thinkquest*. March 2007. <<http://library.thinkquest.org/C0126023/>>.

¹⁵⁶ “Water Hyacinth,” *Practical Action*.

various stages of production of water hyacinth products. At a four-day water hyacinth exhibition in April 2000, companies reported sales and orders of more than KSh 300,000.¹⁵⁷

Opportunities

Further research on the costs of water hyacinth conversion into the various products mentioned above is necessary to make a valid assessment of opportunities within this industry. The machinery required for large scale removal of water hyacinth¹⁵⁸ from the lake suggests that business opportunities within this industry would be more appropriate for a medium to large enterprise with capital sufficient to purchase equipment. While the removal may be done by a medium to large enterprise, opportunities exist for micro and small enterprises that purchase the water hyacinth from the hyacinth removal companies to create the products.

The city government should consider engaging in a public private partnership to control water hyacinth and manage waste by adopting San Diego, California's waste purification methods using water hyacinth. The City of San Diego uses water hyacinth to clean the pollutants out of 1,200,000 gallons of waste water a day, including toxic heavy metals. The water hyacinth is then composted and used as a fertilizer. Tests have found that "an acre of water hyacinth could remove 2.4 tons of ammonium sulphate (nitrogen fertilizer) in one hour, and phosphorus just as efficiently."¹⁵⁹

Constraints

Entrepreneurs do not currently have the information to develop businesses around water hyacinth.¹⁶⁰ In addition, expensive machines are required to remove large quantities of water hyacinth from the lake. Removing the plant manually presents a problem for micro-entrepreneurs because it is difficult, labor intensive work with serious health risks associated with the presence of hippopotamuses in the lake. There are also high costs involved in the transportation of the harvested weed as it has high water content.¹⁶¹

Although there is a cheap and, usually, abundant local supply of water hyacinth, the industry does not seem to be flourishing. One reason is the inconsistent availability of raw materials. The water hyacinth moves with wind shifts and there are times when it is hard to obtain, forcing producers to travel far distances to secure it.¹⁶²

¹⁵⁷ "Water Hyacinth," *Thinkquest*.

¹⁵⁸ "Water Hyacinth," *Practical Action*.

¹⁵⁹ "Beach House Fish Pond." *Journey to Forever*.

¹⁶⁰ Salima Gilani, personal interview, January 2007.

¹⁶¹ "Water Hyacinth," *Practical Action*.

¹⁶² "Water Hyacinth," *Thinkquest*.

Horticulture

Sector Status

A number of horticultural goods are produced in and around Kisumu. Bananas, pineapples, chilies, and local vegetables are marketed in other parts of the country in substantial quantities.¹⁶³

Figure 15: Horticultural Production, Nyanza Province, 2005

	Area planted (Ha)	Quantity produced (tons)	Value (million Ksh)
Bananas	22,334	504,336	5,262
Sweet Potato		271,514	2,000
Tomatoes	6,132	120,283	2,569
Onions	1,931	20,439	553
Avocadoes	1,485	21,061	245
Passion fruits	1,109	4,127	190
Sunflower	708	434	7
Soy	241	1,405 bags	5
Chilies	32.5	238.5	17

Source: Ministry of Agriculture, Nyanza Province, 2005 Annual Report (2006).

Approximately 10 percent of **bananas** produced in Nyanza provinces reportedly pass through Kisumu. Small amounts of banana flour are exported to the rest of the country.¹⁶⁴

Passion fruits produced in Siaya District are being exported by East African Growers Ltd., a company in Nairobi.¹⁶⁵

Sunflower has been the source of trials by Unilever and Bidco in recent years because of its potential as a cheap source of oil. Two years ago, Bidco promised to purchase sunflower seeds at a guaranteed price from local farmers, stimulating production. When import prices dropped, however, Bidco did not fulfill the contract. Unilever currently has four Ha under sunflower production in Sauri.¹⁶⁶

Soy is generally produced solely for household consumption. Production on a large scale has been attempted, but demand was lacking.¹⁶⁷

¹⁶³ “2005 Annual Report” (Ministry of Agriculture, Nyanza Province, 2006), p51.

¹⁶⁴ David Munyi, personal interview, March 19, 2007.

¹⁶⁵ “Jumpstarting the Business Alliance Against Chronic Hunger: Pilot Opportunity Assessment for Business Engagement in Siaya District, Kenya.” Draft report prepared for the World Economic Forum. (Technoserve, August 16, 2006).

¹⁶⁶ David Rotich, personal interview, March 15, 2007.

¹⁶⁷ Ibid.

MACE Food Ltd. in Eldoret is currently processing **chilies**, as is Njoro Canning in Rift Valley. Njoro canning, which is a supplier of Unilever, has agreed to purchase chilies from farmers in Sauri.¹⁶⁸

Opportunities and Constraints

Opportunities and Constraints for individual crops must be further investigated. Unilever has expressed interest in sourcing raw (unrefined) sunflower oil, chilies, fennel, and rosemary from the area.¹⁶⁹ Tetrapak has expressed interest in the processing of tomatoes.¹⁷⁰

¹⁶⁸ David Rotich, personal interview, March 15, 2007.

¹⁶⁹ Ibid.

¹⁷⁰ Helen Too, personal interview, March 14, 2007.

Appendix II: Sectors with limited or no potential

- Fishing
- Construction/Cement
- Furniture
- Financial Services
- Water and Sanitation
- Water Hyacinth
- Fertilizer
- Clean Development Mechanism

Fishing

Sector Status

Lake Victoria, the second largest fresh body of water in the world, has historically been at the heart of Kisumu's economy¹⁷¹. By 1997, nine fish processing plants had been set-up in Kisumu to prepare fish fillets for export; however, today this number has been reduced to four as declining fish stocks and bans on the lake's fish in Europe forced plants to close.¹⁷² Though in a state of decline, the industry continues to be prized by locals as a source of wealth, nutrition, and heritage as it supports the livelihoods of a vast portion of the population. An analysis of Kisumu's fishing industry, then, remains central to any analysis of the region's economic vitality and future development prospects.

Fishing is valued in Kenya as being an important economic activity for the country. According to the Ministry of Livestock and Fisheries, the industry as a whole contributed to 5 percent of GDP between 1999 and 2003 and supports the livelihoods of over 500,000 people throughout the country.¹⁷³ It is estimated that in 2004, 37,000, primarily artisanal, fisherman operated 12,280 fishing boats along the shores of Lake Victoria.¹⁷⁴

Though a coastal country, Kenya depends on Lake Victoria for approximately 90-93 percent of its fish exports.¹⁷⁵ In Nyanza Province, nearly 75 percent of all fish caught are exported. The mid-1990s saw the height of fish extraction; however, as seen in the graph below, this figure has since seen a decline due to degradation of the lake's health and overexploitation of the lake's fish resources. In 2003, for example, total fish caught from Lake Victoria by Kenya was 132,561 metric tons – a drop of 67,592 metric tons since 1999.¹⁷⁶

Figure 16: Kenyan Fish Sources (tons)

	1999	2000	2001	2002	2003
Lake Victoria	200,159	192,738	151,804	114,812	132,561
All Freshwater Fish Sources	209,441	197,876	157,810	121,366	139,811
Value (Ksh)	7.4 billion	7.7 billion	7.5 billion	7.2 billion	7.3 billion

Source: Kenya Investment Authority. *Sector Profile Environment and Natural Resources (2004)*

¹⁷¹ Kenya has claim to 6 percent of Lake Victoria's waters. The lake is shared with Uganda (45%) and Tanzania (49%). Catches for each country are: Tanzania (40%), Kenya (35%), Uganda (25%).

¹⁷² By 1997, two fish processing plants were also operating in Southern Nyanza; four in Nairobi.

¹⁷³ Kenya Ministry of Livestock and Fisheries. "Investment Potential in the Fisheries Sector"

<<http://www.livestock.go.ke>>. According to the Kenya Export Processing Zones Authority. "Fishery Industry in Kenya: 2005" report (2005) fishing accounted for only 0.3% of GDP between 1999-2003.

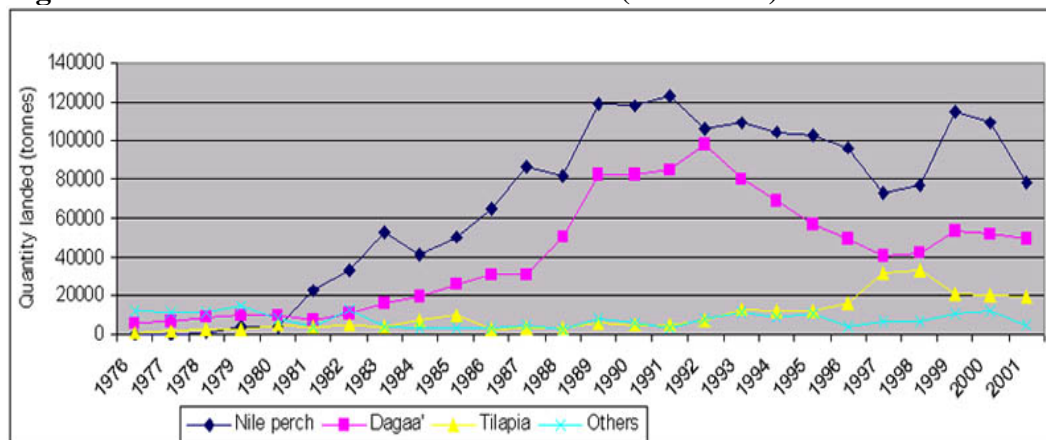
¹⁷⁴ Getabu, A., Njiru, M., Nzungi, P et al. "Are Fisheries Management Measures in Lake Victoria successful? The Case of Nile Perch and Nile Tilapia Fishery" *African Journal of Ecology*, October 2006.

According to the Kenya Ministry of Livestock and Fisheries this number is closer to 30,000 fishermen operating 8,000 vessels.

¹⁷⁵ In 2003, fish from Lake Victoria contributed 94.8percent of Kenya's fish production.

¹⁷⁶ Kenya Export Processing Zones Authority. *Fishing Industry: 2005* p. 8

Figure 17: Lake Victoria Catchment Trends (1978-2001)



Source: Fisheries Department statistics; Othina, 1999 in Abila, Richard. "Fish Trade and Food Security: Are they reconcilable in Lake Victoria" prepared for Report of the Expert Consultation on International Fish Trade and Food Security held in Casablanca, Morocco. 27-30 January 2003. Online: <http://www.fao.org/docrep/006/Y4961E/y4961e0d.htm#bm13>

Nile perch

Introduced to Lake Victoria in the 1960s, the Nile perch represents the most highly sought after fish in the lake as well as the species being impacted most by overexploitation and environmental degradation -- a reality which inspired the award-winning documentary "Darwin's Nightmare." In 2003, Nile perch accounted for 84 percent of Kenya's fish exports.¹⁷⁷ Prior to the 1998/1999 import bans on Kenyan fish in the EU, Europe accounted for 62 percent of all exported Kenyan fish.¹⁷⁸ Given the lifting of the ban, Europe remains the preferred market for perch export given its proximity to Kenya; however, Israel is the lead importer. Other primary importers of Nile perch include: Japan, Australia, Hong Kong, and Singapore.¹⁷⁹

Whereas the Nile perch used to constitute upto 90 percent of Lake Victoria's biomass in the 1980s, it accounted for less than 50 percent in 2005.¹⁸⁰ This reality was reflected in declining catch rates of perch in Kenya from 109,000 tons in 2000 to 57,000 tons in 2004.¹⁸¹ In addition to the declining rates of perch being caught, studies of Kenyan fisheries carried have indicated that average size of perch have also been declining. Studies carried out along 10 Kenyan landing sites between 1998-2000 and 2004-2005 indicated that fewer than 2.0 percent of perch caught were

¹⁷⁷ Kenya Export Processing Zones Authority. *Fishing Industry: 2005* p.10

¹⁷⁸ Bans on East African fish were put in place due to claims of cholera and salmonella contamination from Kenyan fish. Since the ban, the Department of Fisheries has worked to ensure that all exported fish meet stringent EU exporting requirements with regards to handling and packaging of fish.

¹⁷⁹ Israel imported 8,239,690 Kg of perch in 2000 worth over 1.27 billion Kshs. The USA imported only 388,408 Kg of perch from Kenya that same year. (Source: Kenya Export Processing Zones Authority. "Fishing Industry: 2005" p.10)

¹⁸⁰ "Nile perch Market Report" *Fish INFO*network. August 2006. <http://www.eurofish.dk/indexSub.php?id=3276>.

¹⁸¹ Getabu, A., Njiru, M., Nzungi, P et al. "Are Fisheries Management Measures in Lake Victoria Successful? The Case of Nile Perch and Nile Tilapia Fishery" *African Journal of Ecology*, October 2006.

Tanzania also experienced a 7,000 ton decrease of perch catch between 2004 and 2005.

Uganda experienced a 5,000 ton increase during this same period as it has recently invested in its perch industry despite knowledge of decreasing fish stocks and high market prices.

larger than the legally allowable 50 cm.¹⁸² In 2006, escalating supply problems resulted in a 60 percent increase in market prices for whole perch – placing it at \$2.00/kg in the European market.¹⁸³

Given supply constraints and increasing export costs, a number of fish processing plants which relied on perch exports in Kisumu have been forced to close. Those who have not closed have been forced to begin the processing of tilapia or perch bi-products (i.e. oils, skins, intestines etc.) Even with these additional activities, all 6 fish processing plants in Nyanza are working at half capacity – processing 81 tons/day out of a possible 190 tons/day.¹⁸⁴

Figure 18: Fish Processing Plant Capacity

Company	Location	Primary Fish	Capacity (metric tons/day)	Utilized Capacity (metric tons/per day)
East African Seafoods	Kisumu	Nile perch	40	22
AfroMeat Ltd	Kisumu	Nile perch	30	5
Peche Foods	Kisumu	Nile perch	15	7
Fish Processors Ltd	Kisumu	Nile perch	25	7
Capital Fish Ltd	Homabay	Nile perch	50	20
Prinsal Enterp.	Migori	Nile perch	30	20
Total			190	81

Nile tilapia

Following the Nile perch, Nile tilapia represents the second most sought-after fish in Lake Victoria for export.¹⁸⁵ Whereas export demand for tilapia is not as high as that of perch, increasing global demand for this fish have begun to put strains on tilapia stocks as well.

Market demand for native tilapia has increased throughout the world in recent years - particularly in the United States, where a 7 percent increase in tilapia imports was seen in 2006. To date, China has been the primary benefactor of increasing tilapia demands as is the primary exporter

¹⁸² Getabu, A., Njiru, M., Nzungi, P et al. “Are Fisheries Management Measures in Lake Victoria Successful? The Case of Nile Perch and Nile Tilapia Fishery” *African Journal of Ecology*, October 2006.

¹⁸³ “Nile perch Market Report” *Fish INFOnetwork*. August 2006. <<http://www.eurofish.dk/indexSub.php?id=3276>>.

¹⁸⁴ Kenya Export Processing Zones Authority. “Fishing Industry: 2005” p.2

¹⁸⁵ Nile tilapia represent 10 percent of all fish caught from Lake Victoria.

of frozen tilapia to the U.S.¹⁸⁶ Meanwhile, Kenya has continued to focus its exports to the EU and remained, relatively unaffected by China's increased exports; however, as will be discussed later, this may not be the case in the long-term if Chinese exports continue to increase. Unlike perch, tilapia also serves the local and regional market as it is the fish of preference amongst locals. As is discussed in the section on aquaculture, local demand for this fish is also increasing as Rift Fever amongst the country's cattle population has forced the population to seek alternative protein sources. Additionally, increased awareness of the health benefits of consuming fish, a more affordable protein, have also increased demand for fish locally.

Omena/Daggaa

A sardine-like fish, omena/daggaa has not been traditionally exported; however, captured in vast quantities, it is dried and sold in the local market. Once considered the "poor man's meal" consumption of this fish has increased as export of Nile perch and tilapia have also increased and become less available and/or affordable for local consumption. Demand for this small fish is also increasing abroad as awareness of its high protein content becomes more known and opportunities to make fishmeal for animal feeds, from it are realized.

A current USAID project in Suba district has assisted in the commercialization of the omena/daggaa market by building 196 communal racks along 13 beaches.¹⁸⁷ Through the project, 519 woman processors have been able to dry daggaa in greater quantities and at faster rates in preparation for sale to the local market or to Promasidor, a feeds manufacturer and exporter partnering in the project. In August 2006, women processors were able to deliver 31 tons to Promasidor alone thanks to the racks.¹⁸⁸ More recently, the Kenyan government has placed a 4 month ban on the fishing of daggaa and the use of small nets in an effort to allow depleted fish stocks to replenish.¹⁸⁹



Nile perch Nile tilapia perch & tilapia to be processed

¹⁸⁶ "Tilapia Boom in the US" *Fish INFO Network Market Report*.

<<http://www.eurofish.dk/indexSub.php?id=3428>>.

¹⁸⁷ One rack is able to dry 30 Kgs of fish over a two day period. (Source: USAID. "Rack drying technology expands in Suba district" *Kenya Business Development Service Program – Monthly Newsletter*. July/August 2006. <<http://www.kenyabds.com/July%20%20August%202006%20%20Newsletter.pdf>>

¹⁸⁸ USAID. "Rack Drying Technology Expands in Suba District" *Kenya Business Development Service Program – Monthly Newsletter*. July/August 2006. <<http://www.kenyabds.com/July%20%20August%202006%20%20Newsletter.pdf>>

¹⁸⁹ "Kenya: Fish crisis as ban takes heavy toll" *The Nation*. April 14, 2007.

<<http://allafrica.com/stories/200704140148.html>>.

Opportunities

Given the constraints listed above, few opportunities exist for sustainable and profitable investments relying on Lake Victoria's fish stocks. Despite the risk of opening a new fish processing plant, smaller opportunities do exist to support those plants which currently exist. Such ventures would be best suited if complemented with additional fish inputs – an opportunity discussed in further detail in the section on “aquaculture.”

Value-Addition: processing and packaging

Given that world prices for tilapia are likely to stay low, and possibly decline even further given recent trends, Kenya should consider value addition as an important tool for sustaining its fish sector. Because most fish processing plants in Western Kenya export their fish to Nairobi or second countries for repackaging and additional processing, processing and packaging fish in-house would be one way of bring additional value to this sector. In this light, opportunities exist for outside investors to partner with local fish processing plants to assist in the packaging and/or processing of high-quality fish products for Europe -- particularly through the addition of herbs, spices, and seasonings or through canning and preservation methods.

Non-consumer goods

In addition to exporting tilapia for consumption, investment opportunities exist for using fish biproducts for non-consumption purposes. While some fish factories, such as Peche Foods in Kisumu, do a stringent job of ensuring that every part of the fish (with the exception of scales) is separated and sold, it is not clear to what extent other factories avoid wastage in this aspect. Realizing alternative uses for fish parts is especially important considering that only about 30 – 40 percent of a fish consists of edible meat.

In recent years, there has been a move to utilize fish skeletons for the production of fishmeal, a key ingredient for animal feeds. Increasingly, daggaa has also been used for this purpose (see USAID example on previous page). Given the high demand for animal feed production (locally, regionally, and internationally) some Kenyan feed producers have even begun importing fish from neighboring countries for this purpose. While an investment in this area is likely to be profitable; serious consideration must be given to the impact which such investments would have on local food security and illegal fishing practices as such an industry would divert protein sources away from human consumption and encourage the fishing of these small fish with small nets.¹⁹⁰

Ideal investments which may be both profitable and have a neutral effect on food security include leather production and oil extraction. Recently, for example, an Italian investor has expressed interest in using fish skins, from fish processors in Uganda, to make handbags. Similar investors could be attracted o Kisumu as similar supplies exist. Additionally, improved oil extraction methods could support the cosmetics and natural supplements industries.

¹⁹⁰ Abila, Richard and Jansen, Eirik. “From Local to Global Markets: The Fish Exporting and Fishmeal Industries of Lake Victoria – Structure, Strategies, and Socio-economic Impacts in Kenya” *Socio-economics of the Nile Perch Fishery on Lake Victoria*, Report no.2. IUCN, Nairobi. 1997.

Transport and Landing Site Development

Unable to compete with frozen tilapia exports from China, Latin America (particularly Ecuador) has resorted to focusing on its fresh tilapia exports to the United States. While exporting fresh fish has much higher transportation costs, this is one area where Latin American countries will retain an advantage over China due to its proximity. Likewise, focusing on the export of fresh, as opposed to frozen, tilapia to the EU market is one way that Kenya might be able to retain its share of the world tilapia market. To do this; however, additional investment are needed to reduce the amount of post-harvest losses, which currently stand at 30 percent, due to a lack of adequate cooling and ice facilities at landing sites and transport trucks.¹⁹¹

Constraints

The fishing industry in Kisumu faces a number of constraints which demand government attention before new investment can be considered as a sustainable venture in this sector.

Diminishing Resources

Both official reports and informal observations by local fisherman confirm the fact that the number of fish species, quantity of fish being caught, and quality of these fish (size, color, taste) have been diminishing within recent years. A number of factors have contributed to this phenomena which can be generalized into three groups: human exploitation of natural resources, deterioration of Lake Victoria and its environs; natural environmental factors (water hyacinth, floods, erosion, siltation, etc.) A recent study on the Lake Victoria Fisheries Organization provided the following list as a summary of factors contributing to the basin's degradation:¹⁹²

- Eutrophication (excess nutrient loading resulting in high algal populations and blooms which cause taste and odour problems, high water treatment costs, algal toxins, deoxygenation, associated pathogens and alteration in consumer food webs)
- Contamination and toxic effects (heavy metals especially mercury, persistent organochlorines, currently used pesticides)
- BOD (excessive loading of oxygen consuming substances);
- Siltation (excessive turbidity and sedimentation);
- Alteration of physical substratum causing loss of fish habitat;
- Effects of urbanisation and industrialisation of the catchment on the traditional users;

¹⁹¹ Lake Basin Development Authority. "Investment Opportunities in the Lake Basin Region" August 2005. In 2004, USAID's Kenya Business Development Services announced an invitation for bids on the development of ice storage/fish preservation technology for boats; however, it is unclear if this bid was ever met. (Source: Kenya Business Development Service Ref #: A02/005/05.<www.kenyabds.com>).

¹⁹² Bwathondi, P., Ogari, J, and R. Oguto-Ohwayo. "Lake Victoria Fisheries Management Plan" November 2001.< <http://www.inweh.unu.edu/lvfo/fmp.htm>>.

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- Biological pollution and loss of biodiversity (species introductions modifying food webs and causing uncertainty about future resource base, plus disruption of haplochromine species flock);
 - Overexploitation of the fisheries, reducing the stock sizes, thus modifying food webs and causing instability of the ecosystem.

International Competition

Controlling only 6 percent of Lake Victorian waters, Kenya faces stiff competition from its neighbors, Tanzania and Uganda. This is particularly the case given the fact that Kenyan portions of the lake are the more shallow bays, where fish breed before reaching maturity and entering deeper waters in Tanzanian and Ugandan waters.

In recent years, China has emerged as an industry leader in tilapia exports. In only two years, Chinese tilapia exports have doubled to exceed 180,000 tons in 2006 and are expected to reach between 250,000 tons and 300,000 tons in 2007. Total export value reached US\$ 400 million in 2006, which compares to US\$ 160 million in 2004.¹⁹³ The main beneficiaries of China's tilapia exports have been the United States and Mexico which imported 105,000 tons and 33,000 tons each in 2006.¹⁹⁴

While the EU represents only a fraction of China's total tilapia export market, the fact that exports increased by five fold between 2005 (700 tons) and 2006 (3,400) suggests that this market may become increasingly important to China as well. The increase in domestic and international demand for tilapia is pushing China to produce more of this sought-after fish.

While it is expected that world markets would easily absorb additional Chinese exports of tilapia and, thus, support its current market value, little guarantee can be given as to what impact increased Chinese exports to the EU would have on the Kenyan market.¹⁹⁵ Given the example of Mexico, where local tilapia production has become uncompetitive given the flood of Chinese imports, Kenyans would be wise to prepare for a similar predicament by either making tilapia production more efficient (i.e. via aquaculture) or diversifying away from the sector as a whole.

Lack of Coherent Fish Policy

While "the Government has put into place a task force to develop a comprehensive fisheries policy that will guide the sector towards the MDGs and take into account all environmental issues within the Economic Recovery Strategy Paper" such a policy does not exist at the moment – debilitating an already weakened industry.¹⁹⁶

¹⁹³ "China: Leading Light for Tilapia" *Fish INFO Network Market Report*. April 2007.

<<http://www.eurofish.dk/indexSub.php?id=3429>>.

¹⁹⁴ US imports increased by 25,000 tons between 2005 and 2006. Mexico's imports of Chinese imports in 2006 where double that of 2005. Source: "China: leading light for tilapia" *Fish INFO Network Market Report*. <<http://www.eurofish.dk/indexSub.php?id=3429>>

¹⁹⁵ Chinese market values in 2006: frozen whole tilapia (\$1.00/kg), Average frozen fillets/preserved tilapia (\$2.20/kg).

¹⁹⁶ Kenya Investment Authority. "Sector Profile: Environment and Natural Resources" *Economic Survey 2004*.

Construction and Cement

Sector Status

Kisumu's construction sector is characterized by a large supply of contractors struggling over limited demand. Concerning inputs like cement, there seems to be no possibility for shortening the supply chain beyond steps that have already been taken.

There are no architects in Kisumu. There are reportedly eight formal builders competing with a host of informal operators.¹⁹⁷ However, one source said there are 136 contractors in Nyanza province, all who can do business in Kisumu.¹⁹⁸ Another source said the total number of contractors, formal and informal, is large enough to be "uncountable."¹⁹⁹

Current demand seems to be for residential construction rather than for commercial. Within residential construction, realizable demand is for high and medium-end houses. Renovation constitutes the bulk of high-end work.

Informal builders apply significant competitive pressure to formal builders. Skylark Construction, an established outfit, said its profit margin has fallen from 20 percent 10 years ago to between 8 percent and 10 percent today, due to competition from makeshift operations that advertise by word of mouth and pick up daily work crews from the city's legion of unemployed.

Opportunities

There seems to be no opportunity for a foreign investor in conventional construction projects.

The Municipality of Kisumu operates several dilapidated low-income housing communities. These structures are about 40 years old in some cases, sometimes consisting of two-room concrete shacks with large families living in each of them. In one community, more than one hundred of these units shared common bathroom facilities (an open-windowed concrete shed).²⁰⁰

The Municipality's Department of Social Services and Housing is keen to attract an investor willing to build low-income highrises on land currently owned by the city, to replace and expand upon some of the existing low-income housing.

Constraints

However, the return on a low-income highrise construction project would be prohibitively small and an extremely long time in coming. To illustrate, rents on these units are less than KSh 1000/month.

Cement, constituting most structures in the region, is quarried in Mombasa and has to be shipped across the country to Kisumu. Thus building costs are significantly increased by high

¹⁹⁷ Jiten Patel, personal interview, March 17, 2007.

¹⁹⁸ Ben Obiang, personal interview, March 19, 2007.

¹⁹⁹ John Gtau Karuga, personal interview, March 18, 2007.

²⁰⁰ Peter Ogalo, personal interview, March 20, 2007.

transportation costs and there seems to be no way to reduce the associated expense. Skylark makes quite a few of the processed materials it uses, like tiles and bricks, thus capturing some value-added, but has to buy inputs for those materials from outside Kisumu, as do the other builders.

Furniture

Sector Status

The value of the Kenyan furniture market is estimated at US\$50m. It is dominated by imports, which account for about 75 percent of the market. One study estimated that there are only 30 domestic firms operating in the market, with about 2000 employees, but that figure might include only formal businesses located in Nairobi and Mombasa. In the formal market, office furniture made from synthetic materials has the highest demand. Chinese producers are the biggest importers of furniture into the country.²⁰¹

Kisumu is home to a less formal market of highly skilled woodworkers making home furniture of wood and cloth.²⁰² The crowded alleyways behind the Kibuye Market house the workshops of dozens of men laboring for what are most likely informal producers—who reportedly get their wood from the Kakamega Forest, one of the last old-growth forests in eastern Africa. Kenyan producers also get wood from Congo.



Kibuye Market, Kisumu

Opportunities

There is at least one foreign investor making traditional furniture near Mombasa,²⁰³ but it is not known whether any foreigners are involved in the Kisumu market. For that matter, it is unknown

²⁰¹ Enterprise Mauritius, *Market Survey in Kenya*, (January 2007) pp34-40.

²⁰² John Mwaura and Cecelia Kinuthia-Njenga UNHABITAT, personal interview, January 2007.

²⁰³ Funzi Furniture, owned by Mike Calnan. Email attempt was unsuccessful.

whether there is any organization of the local furniture market aside from roadside displays and the furniture section of the Kibuye Market on Sundays.

The stock of local talent and their products' popularity with expatriates in Kenya indicates that there might be some possibility for an efficiency-seeking investment exporting more traditional Kenyan furniture to niche markets in western countries.

Developmentally, a successful investment could improve incomes, enlarge market access, strengthen the value chain by improving access to services, and might even improve productivity by incentivizing improved and increased production.

Constraints

Exporting furniture produced in Kisumu seems to be the only option for a foreign investor. The local market is increasingly dominated by cheap, synthetic imports from Asian nations and expatriates already seem to know where to go to get furniture they want. Given the size of the goods—carrying much higher transportation costs—combined with Kisumu's distance from the port, it is difficult to imagine that an exporter could make a return that would be worth the trouble.

Moreover, if the wood used in the city's industry comes from the Kakamega Forest, an ecological treasure (and one of Kisumu's only nearby tourist attractions), promoting the industry could have an extremely negative environmental impact. Thus, an investment of this character would have low feasibility and a dubious development impact.

Financial Services

Sector Status

There are a slew of international financial institutions in Kenya, such as Barclays Bank, Citibank and Standard Chartered Bank. These banks are market-seeking, serving national demand for credit and savings vehicles.

In Kisumu alone there are reportedly 24 banks, from Barclays to large Kenyan banks and smaller outfits.²⁰⁴ At least three new banks opened last year and have been giving loans to low-income individuals.²⁰⁵ One outfit, Equity Bank, says it works with poor people as a business model, providing savings accounts and loans.²⁰⁶

Opportunities

A Cooperative Bank representative claimed all the banks in the city are profitable and that there is room for more players in Kisumu's financial services market.²⁰⁷ He also emphasized Kenya's position as a potential seat of financial services provision to Uganda (and presumably other neighbors) due to its tradition of customer service and better technology. It seems likely that a bank entering the local market might make a return high enough to justify the move, especially if it was structured in such a way as to provide services to the "unbanked," of which there are legion, at a low cost.

Constraints

However, one must wonder why any bank would move to Kisumu over Nairobi to provide regional services. Without large commercial opportunities, the only attraction is to offer retail services and some commercial lending in the local market. But could any new bank achieve anything that is not already being done by the banks present? It seems unlikely that a new player in the Kisumu financial services market could offer anything except a bit of profit to its owners. Such an investment might have reasonable feasibility, but it would have little if any development impact.

²⁰⁴ Cooperative Bank, personal interview, January 2007.

²⁰⁵ Josphat Wanui Wamathai, Afya Savings and Credit Co-operative, personal interview, January 2007

²⁰⁶ Daniel Githu, Operations Manager, Equity Bank, personal interview, January 2007

²⁰⁷ Cooperative Bank, personal interview, January 2007.

Water and Sewerage Provision

Sector Status

Existing water infrastructure covers about 40 percent of the city, while sanitation coverage is at 23 percent.²⁰⁸ Water production is currently at 19,000 m³/day, compared with a demand of around 60,000 m³/day. Additionally, 68 percent of piped water is unaccounted for, meaning that it is being lost either through leaks or illegal connections. Kisumu's current sewer system is limited to the central business district. Most middle to upper class residents use individual septic tanks and wells for water and sanitation. Further, only about 10 percent of Kisumu residents have access to a flush toilet.²⁰⁹

Kisumu's water and sanitation services are managed by the Kisumu Water and Sewerage Company, Ltd. (KIWASCO), a parastatal company which was created in 2003 to take over water and sewerage services from the Municipality in accordance with the 2002 Water Act. KIWASCO is regulated by the Lake Victoria South Water Services Board, one of seven water boards throughout Kenya. Over the last 4 years, water provision in Kisumu has gone up from 95,000 consumers to 159,000 consumers of piped water, revenue collection has improved from 67 percent to 95 percent, and water production has increased by nearly 6,000 m³/day. In addition, many NGOs, both international and local, are working to provide water and sanitation services, mostly in the informal settlement and slum areas, on a non-commercial basis.²¹⁰

Water production is currently being upgraded by a World Bank project, the Kisumu Water and Sanitation Project, in partnership with AFD (French Development Agency). A 20 million euro loan from AFD has been given for this project.²¹¹

Opportunities and Constraints

Commercial provision of water and sanitation services does not appear to be a viable investment opportunity. Water and sanitation infrastructure is controlled by KIWASCO and substantial investment funds for increasing water production in Kisumu have already been secured.

²⁰⁸ Ombogo, Eng. P. L. *Strategy for Access to Water and Sanitation Services in Informal Settlements, the Kisumu Experience*. Presented at Africities Conference, September 20, 2006, Nairobi, Kenya.

²⁰⁹ Sweeney, Erin. *Infrastructure Development for Kisumu – The First Millennium City*. Draft Report, 2007. p.11-12.

²¹⁰ Ibid..

²¹¹ Embassy of France in Kenya. *Launching of the Kisumu Water and Sanitation Project (KWSSP)*. Press release. May 19, 2006.

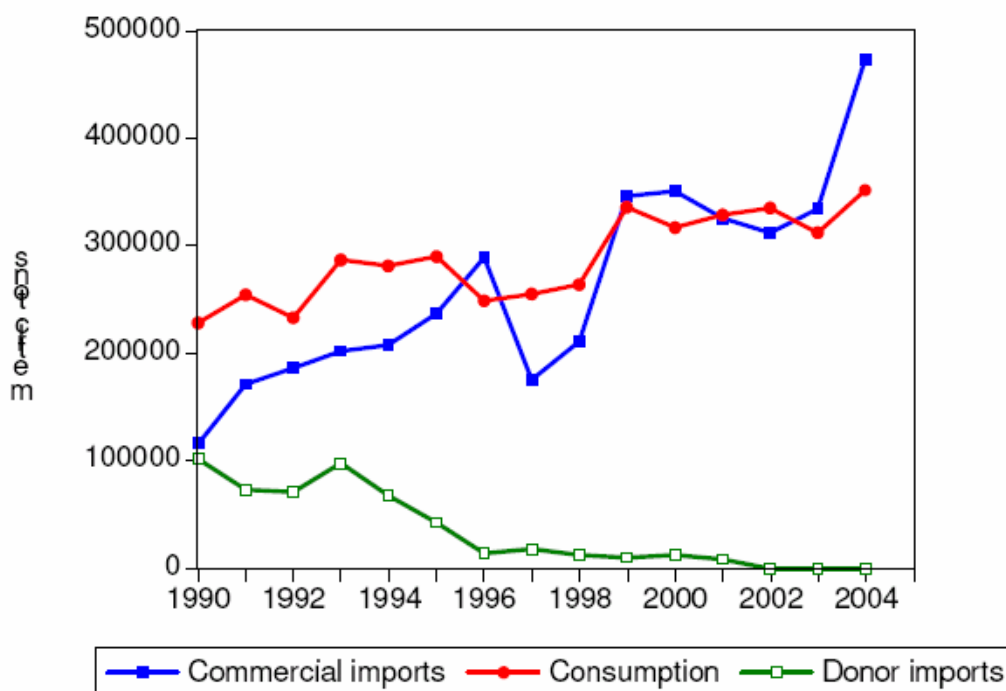
Fertilizer

Sector Status

While agriculture makes up 30 percent of Kenya's Generalized System of Preferences and employs 70 percent of the population, the majority of fertilizers used in farming are imported (95 percent) because Kenya is not endowed with an abundance of mineral resources for fertilizer manufacturing. Given the lack of mineral resources, only two fertilizer factories operate in Kenya, one which does not actually produce fertilizer, but rather imports raw materials and then blends and packages.

With the liberalization of the fertilizer market in 1990, it was expected that the cost of fertilizer would be reduced. In actuality, with the devaluation of the Kenyan shilling and the increase in world fertilizer prices, local prices have increased. Despite this, the demand for fertilizer continues to increase as means for improving efficiency as the agriculture sector continues to grow. Fertilizer use in Kenya has risen from a mean of roughly 180,000 tons per year during the 1980s, to 250,000 tons per year during the early 1990s, to over 325,000 tons in the 1996-2003 periods (figure below). In the most recent year for which data is available, 2004/05, Kenyan farmers consumed 351,776 metric tons of fertilizer.²¹²

Figure 19: Fertilizer Trends in Kenya



Note: *Imports include donor shipments; no donor shipments since 2001.

Source: MoA

²¹² Wanzala, Maria et al. Tegemeo Institute Of Agricultural Policy And Development. *Agricultural Production Incentives: Fertilizer Markets and Insights From Kenya*. Tegemeo Working Paper 3 June 25, 2001 <<http://www.aec.msu.edu/fs2/kenya/wp3.pdf>>.

The main types of fertilizers consumed in Kenya are compound fertilizers that provide both nitrogen and phosphate. Planting fertilizers for grain (DAP, NPK) comprise the majority of the fertilizer consumed in Kenya, while straight nitrogenous fertilizers such as CAN and Urea are used for top-dressing. DAP is used on maize, MAP on wheat, NPK 25:5:5 is used on tea, NPK 17:17:17 and MOP (Muriate of Potash) on coffee, and speciality fertilizers are used on horticultural crops particularly in the flower industry.²¹³

Opportunities

There are a wide range of investment incentives offered by the Kenyan government which apply to the fertilizer industry that could benefit an interested investor. After the elimination of retail price controls, import licensing quotas, and foreign exchange controls, Kenya has witnessed a rapid expansion in private fertilizer distribution, with over 500 wholesalers and 7,000 retailers operating in the country. The mean distance of small farmers to the nearest fertilizer retailer has declined from 8.4kms to 4.1kms between 1997 and 2004. The growth in commercial fertilizer imports (i.e., by private firms) has been especially impressive as donor imports have progressively declined over the years from a high of 48 percent of total imports in the early 1990s before liberalization to zero over the past several years. Commercial fertilizer imports are now roughly 3 times higher than levels achieved during the late 1980s and early 1990s. The figures above demonstrate a strong opportunity for investors to produce fertilizer in Kenya as the industry continues to grow.

Over the 1990s, there were increased incentives to use fertilizer on export-oriented crops because of exchange-rate depreciation during the early 1990s, fertilizer use on maize remains profitable at least in the high- and medium-potential areas of Kenya. About 87 percent of small-scale farmers in the high-potential maize zones of Western Kenya use fertilizer; those that use fertilizer apply roughly 163kgs per hectare on maize, higher than mean levels obtained in South and East Asia. This growth in fertilizer consumption is occurring on smallholder farms – it is not driven by large-scale or estate sector agriculture. Moreover, Kenya's growth in fertilizer consumption is a phenomenon covering both food crops (mainly maize and domestic horticulture) as well as export crops such as tea, sugarcane, and coffee.

Greater exploration of the opportunities for using water hyacinth to make fertilizer is recommended. Costs associated with this process would need to be determined to understand the potential of this sector. Further, the Kisumu region has an abundance of limestone from which fertilizer could be made. Further attention also needs to be given to this idea. Finally, Kisumu is in the sugarbelt and bagasse is a byproduct of sugar production. Fertilizer can be made from bagasses but again further research and studies are needed on this potential market.

Constraints

Some constraints to further developing the fertilizer industry in Kenya include the following: 1) Profit margins for fertilizer traders being relatively low; importers' mark-up margins are in the

²¹³ Wanzala, Maria et al. Tegemeo Institute Of Agricultural Policy And Development. *Agricultural Production Incentives: Fertilizer Markets and Insights From Kenya* Tegemeo Working Paper 3 June 25, 2001 <<http://www.aec.msu.edu/fs2/kenya/wp3.pdf>>.

range of 5 percent to 6 percent, 2) High costs are incurred in domestic distribution, 3) The relatively low mark-up margins at each stage of the fertilizer supply chain is consistent with the observation that there appear to be strong competition at each stage, especially wholesaling and retailing, 4) There is also great price risk incurred by these fertilizer traders, 5) Relatively high maize prices in Kenya due to import tariffs have promoted fertilizer use but if the import tariffs are to be removed or maize prices drop drastically than fertilizer use would proportionally go down as it would become unaffordable for most farmers to use.²¹⁴

²¹⁴ Wanzala, Maria et al. Tegemeo Institute Of Agricultural Policy And Development. *Agricultural Production Incentives: Fertilizer Markets and Insights From Kenya* Tegemeo Working Paper 3 June 25, 2001 <<http://www.aec.msu.edu/fs2/kenya/wp3.pdf>>.

Clean Development Mechanism

Sector Status

The Clean Development Mechanism (CDM) is an arrangement under the Kyoto Protocol allowing industrialized countries with a greenhouse gas reduction commitment to invest in emission reducing projects in developing countries as an alternative to what is generally considered more costly emission reductions in their own countries. The purpose of the CDM was defined under Article 12 of the Kyoto Protocol in 1997. Apart from helping Annex 1 countries comply with their emission reduction commitments, it must assist developing countries in achieving sustainable development, while also contributing to stabilization of greenhouse gas concentrations in the atmosphere. Through this arrangement, developing countries can sell projects to investors in developed countries.²¹⁵

Research on the Clean Development Mechanism in Kenya found one pilot project being conducted by the World Agroforestry Centre. The project in the highlands of western Kenya serves as a testing ground for assessing how the CDM can be implemented to benefit smallholder farmers, reduce poverty, improve food security and sequester carbon²¹⁶.

A CDM pilot project by the Pembina Institute in Kenya found that the only opportunities that can provide the Certified Emissions Reductions needed in the time frame required by the Kyoto Protocol are those of medium- and small-scale size that can be implemented quickly as energy efficiency, small-scale renewable energy and waste processing.²¹⁷

Opportunities

With many living in Kisumu's slums without electricity, there may exist an opportunity for small scale projects to provide power to these households while receiving the benefits of the CDM.

Further, there may be some opportunities in soil carbon sequestration in Kenya as part global attempts to mitigate greenhouse gas emissions and the possibility that the development of greenhouse gas mitigation projects will offer local ancillary benefits such as improvements in agricultural practices and land-use management which than could increase agricultural productivity and sequester soil carbon. During the first five-year commitment period of the Kyoto Protocol, only afforestation and reforestation projects were eligible for crediting under the CDM, but soil carbon sequestration and broader sink activities have become eligible at present. However, very few cost estimates of soil carbon sequestration strategies exist, and available data are not readily comparable. It is uncertain how large amounts of carbon could be sequestered, and it is unclear how well site-specific studies represent wider areas. It is concluded that there presently is a need to launch long-term (10 years) field experiments and demonstration and pilot

²¹⁵ CICERO. Center for International Climate and Environmental Research, Oslo. April 2007.

<http://www.cicero.uio.no/publications/detail.asp?publication_id=110&lang=no>.

²¹⁶ WorldAgroforestry Centre. "Testing the Clean Development Mechanism in Western Kenya." *Agroforestry in Action*. 2003. <http://www.worldagroforestrycentre.org/ar2003/downloads/AIA_CDM.pdf>.

²¹⁷ Peters, Roger. "Strengthening the Clean Development Mechanism." *The Pembina Institute*.

<http://www.pembina.org/pdf/publications/Str_CDM_RP_Nov05.pdf>.

projects for soil carbon sequestration in Africa. It will be important to monitor all environmental effects and carbon 'costs' as well as estimate all economic benefits and costs of such projects.²¹⁸

Yet another opportunity surrounding CDM could be with cogeneration of sugar mills. Cogeneration from bagasse (sugarcane waste) is a process that involves the use of fibrous sugarcane waste to cogenerate heat and electricity at high efficiency in sugar mills. With more than 1.35 billion tonnes of sugar cane produced globally, there is abundant opportunity for the wider use of bagasse-based cogeneration in sugarcane producing countries. The global potential, estimated at 135 TWh/yr in absolute terms, is very high, despite being small in comparison to global electricity production. Experience from Reunion, Mauritius, India, Brazil and Cuba confirm the practical potential for cogeneration in Kenya.

Due to statutory requirements and other limitations on the sale of electricity, sugar factories in Kenya have been unable to exploit all the energy in the bagasse. The excess bagasse has been treated as waste and usually incinerated. Sugar factories have produced process steam and power, mainly as a by-product of the disposal process.

The present Kenyan government has committed itself to the rehabilitation of the sugar industry. Power generation through cogeneration is seen as opening up new avenues for revenue creation. Accordingly the ministry of energy recently permitted sugar companies to generate power for sale to the grid and to the public in general. Further, various fiscal incentives for investments in regular and non-conventional renewable energy projects have also been suggested for inclusion in the national energy policy document. Moreover the local utility is looking at strengthening the transmission grid, which will allow the sugar companies to feed in their power.

For cogeneration plants, the investment costs ranges from US\$1.4 million/MW at the lower pressures, through US\$1.8 million/MW mid-range to US\$3.1 million/MW at the top end. This compares with US\$1.1 million/MW for heavy fuel plants, US\$2.25 million/MW for geothermal and US\$2.5 million/kW for hydro power plants. Thermal power plants have significant fuel costs that are passed directly to the consumers under current tariffs. Of the total capital costs of putting up sugar factories, approximately 60 percent is attributable to the cost of the cogeneration power plant. Given that a number of the factories are planning capacity expansions, with most in need of a large degree of reinvestment to replace obsolete plant, cogeneration provides an ideal platform for the upgrade.²¹⁹

Constraints

Pembina's work with small project developers in India and Kenya has demonstrated that small projects still have to bear significant transaction costs (such as those associated with registration fees and validating and verifying projects) that often do not make it worthwhile to use the CDM.

²¹⁸ Ringius, Lasse. Soil Carbon Sequestration and the CDM: Opportunities and Challenges for Africa, Climatic Change, Springer Netherlands, Volume 54, Number 4 / September, 2002.

²¹⁹ Potential for Electricity Generation From Bagasse in Kenya. *ESI Africa*. Issue 4 / 2004. May 2007. <http://www.esi-africa.com/archive/esi_4_2004/38_1.php>.

Further, Kenya needs to develop strategies, which would promote sustainable development, without contributing to increased emission of Greenhouse Gas.

In addition, the CDM is complicated and many NGOs have limited awareness and training in working with the CDM along with understanding how it can be used to support local projects.²²⁰ More training needs to be instituted in Kenya.

Any efforts to develop cogeneration in Kenya will have to begin with a look at the performance of the sugar industry and electricity sector as a whole. In a situation where all the sugar factories are largely owned by the government, it will be essential to develop policies that facilitate the accelerated development of these sectors through the involvement of the private sector.

Another issue for the CDM is the lack of a market for carbon credits beyond 2012. Since there is no value for carbon credits beyond the Kyoto commitment up to 2012, many CDM projects will not reap the benefits of their project's investment.²²¹

²²⁰ Peters, Roger. "Strengthening the Clean Development Mechanism." *The Pembina Institute*. <http://www.pembina.org/pdf/publications/Str_CDM_RP_Nov05.pdf>.

²²¹ Ibid..

Appendix III: Demand and Costs of Fuel Ethanol in Kenya

Expected Demand

We have derived an estimate of Kenya's fuel ethanol demand under an E10 mandate, using figures from an estimate of demand in Tanzania. Tanzania's E10 requirement, if the country had a mandate, was judged to be 20.9 million liters in 2005, 21.9 million liters in 2006, and 23 million liters in 2007.²²²

Because available figures for oil consumption in Kenya and Tanzania are for 2004, we will assume that Tanzania's E10 demand followed the trend indicated above and was thus about 20 million liters in 2004. Tanzania consumed 23,000 barrels of oil/day in 2004, while Kenya consumed 55,000 barrels/day in 2004.²²³ Tanzania consumes 2,698,820 liters of oil/day, totaling 985.1 million liters/year. Kenya consumes 6,453,700 liters of oil/day, totaling 2,355.6 million liters/year.²²⁴

Figure 20: Oil consumption and Projected E10 Demand, Tanzania and Kenya, 2004

	Tanzania	Kenya
2004 Oil Cons. (bbl/day)	23,000	55,000
2004 Oil Cons. (liters/day)	2,698,820	6,453,700
2004 Oil Cons (liters/year)	985.1 million	2,355.6 million
E10 Demand (liters/year)	20 million	47.826 million

Assuming that Tanzania's E10 requirement was 20 million liters in 2004, then Kenya's E10 requirement in 2004 would have been about 47.826 million liters. Thus Kenya would need one fuel ethanol plant producing 131,000 liters/day, operating every day of the year.

Tanzania is a good comparison because it is a close neighbor and likewise a net sugar importer. However, about half of Tanzania's GDP is in agriculture, whereas Kenya is overwhelmingly services-based.²²⁵ Thus one might question to what degree their respective oil consumption is comparable. Does one use more diesel than the other? What about heavy fuel oil use in industrial plants—how much bigger is Kenya's manufacturing sector?

Meeting Demand

²²² Dr. Ranier Janssen, et al, "Liquid Biofuels for Transportation in Tanzania" (German Technical Cooperation, August 2005), p68.

²²³ Tanzania and Kenya, Economy. *CIA World Factbook*. <<https://www.cia.gov/cia/publications/factbook/>>.

²²⁴ There are 117.34 liters in a barrel.

²²⁵ Tanzania and Kenya, Economy. *CIA World Factbook*. <<https://www.cia.gov/cia/publications/factbook/>>.

In 2006 Kenyan mills produced 170,938 metric tons of molasses, up from 168,975 tons in 2005 and 163,989 tons in 2004.²²⁶ Assuming that 360 kg of molasses produces 100 liters of fuel ethanol, using all the molasses produced in Kenya in 2004 would yield 45,552,500 liters of ethanol—nearly the total demand in 2004 under an E10 mandate.

Kenya has the capacity, or is very close to it, to produce the amount of fuel ethanol it would need to supply to its domestic market under a 10 percent blend mandate. One could imagine the structure of the sugar industry would be quite different in a post-COMESA safeguard, E10 Kenya, but at least one can see here that no tremendous increase in sugarcane cultivation or a reduction in oil consumption is required for the project to be realistic. Indeed, post-COMESA it is realistic to assume that many mills will have closed, freeing up sugarcane to be devoted exclusively to ethanol production and making it possible to distill ethanol from cane juice—a less labor-intensive feedstock than molasses.

Initial Investment Cost

A Spectre representative said a new plant with the capacity to produce 60,000 liters/day would cost around KSh 1 billion (\$15 million).²²⁷ This is close to estimates from a Dutch study, which proposed an investment cost of 10 to 15 million euros to add a distillery with an 80,000 liter/day capacity to an existing sugar mill.²²⁸

Production Costs

It is estimated that producing 100 liters of fuel ethanol requires 1,270 kg of sugarcane or 360 kg of molasses.²²⁹ The abovementioned Dutch study argues the average price of producing fuel ethanol in a least developed country (LDC) is 0.42 euros (\$0.562)/liter.²³⁰ Using average Kenyan prices for molasses (KSh 1800/ton of molasses²³¹) and sugar (KSh 53,540/ton²³²) in a cost structure provided in the study, yields prices of \$0.40/liter for fuel ethanol derived from molasses, and \$1.592/liter for fuel ethanol derived from sugar crystals. The molasses price for ethanol, compared to the observed Kenyan gasoline price of around one

	DSD Study (LDC avg)	Kenyan Estimate
Ethanol from Molasses	\$0.562	\$0.40
Ethanol from Sugar	\$0.977	\$1.592
Ethanol from Juice	\$0.562	?
Avg. Price	\$0.562	

²²⁶ Kenya Sugar Board, *Year Book of Sugar Statistics 2006* (Ministry of Agriculture, unpublished); and Kenya Sugar Board, *Year Book of Sugar Statistics 2005* (Ministry of Agriculture, 2006), p16.

²²⁷ Nelson Gwara, Spectre International, personal interview, March 2007.

²²⁸ Dutch Sustainable Development Group, “Feasibility study on an effective and sustainable bio-ethanol production program by Least Developed Countries as alternative to cane export.” (2nd Edition, June 2005), p24.

²²⁹ *Ibid*, p14. This ratio varies dramatically between studies. An ECLAC study entitled “Biofuels Potential in Guyana” used a ratio of 385 kg of molasses to 100 liters of fuel ethanol. Other studies mention ratios as high as 500kg/100liters.

²³⁰ *Ibid*, p27.

²³¹ Anton Van Tonder, personal interview, March 2007.

²³² Kenya Sugar Board, *Year Book of Sugar Statistics 2006* (Ministry of Agriculture, unpublished), p10.

dollar/liter, is quite feasible, while the price for ethanol made from processed sugar is prohibitive.

One could expect the price of molasses in Kenya to rise considerably with increased demand from fuel ethanol production, but there is plenty of room for an increase before the cost becomes prohibitive. At the time of research, a liter of gasoline was selling in Nairobi for about KSh 75, or a little more than one dollar. Without an estimate of the value of cane juice it is difficult to estimate how much it will cost to produce ethanol directly from the juice—which is unfortunate; producing from cane juice is the best option for an industry that is less focused on producing sugar than fuel ethanol.

Appendix IV: FDI and Development Impact

The following is a review of some useful distinctions and concepts in thinking about FDI and the potential that foreign transnational corporations (TNCs) can contribute to economic development in poor countries.

Basic Distinctions

FDI can take a few forms but all entail a large (the rule of thumb: greater than 10 percent) equity stake in a local operation by a firm from another country. The country in which the investment is made is called the host country. It receives inward FDI from outside its territory. The TNC's country of origin is called the home country. Among the most common forms of FDI are:

- **Greenfield** – in which a TNC opens a previously untapped market with an entirely new operation, called a foreign affiliate. Greenfield investments are the vast majority of FDI inflows to developing countries. The TNC often takes a majority stake (though many countries restrict the percentage of ownership by foreign companies) and usually exercises direct control over the affiliate's operations.
- **Mergers & Acquisitions** – in which a TNC enters a market by acquiring a firm that is already present (whether local or the foreign affiliate of another TNC). M&As tend to offer less in terms of local economic development than greenfield investments because M&As don't necessarily entail an increase in productive capital, employment, infrastructure, etc.—it is simply a transfer of ownership. They constitute the vast majority of FDI inflows to developed countries, and they carry a host of political issues surrounding foreign ownership, as the recent cases of Dubai Ports World's acquisition of British port operator P&O and CNOOC's bid for U.S. oil concern Unocal illustrate.

In terms of a TNC's motivation in opening an operation, there are three overall types of FDI:²³³

- **Resource-seeking FDI** – in which TNCs seek to extract resources, almost always for export. It tends to offer little long-term development benefit, on its own, and can even harm the national economy if it promotes inflation (Dutch Disease). This type of FDI ranges from oil and gas to fishing.
- **Market-seeking FDI** – in which TNCs seek to expand into the local market (e.g. Wal-Mart opening a store in Beijing). It has the potential to benefit consumers by offering better products at lower prices and can sharpen competition, spurring local businesses to improve their operations. However, it can also crowd out local business. Furthermore, TNCs seeking markets tend not to export even as they repatriate profits, hurting the host economy's balance of payments.
- **Efficiency-seeking FDI** – in which TNCs seek operational efficiencies (low wages, etc.). Largely manufacturing, efficiency-seeking FDI is the punching bag of corporate social

²³³ Peter Nunnenkamp and Julius Spatz, "FDI and economic growth in developing countries: how relevant are host country and industry characteristics?" *Transnational Corporations* (Vol. 13, No. 3) pp57-8.

responsibility campaigns but is also the most promising of the three types of FDI for growth, skills and technology transfers and the overall competitiveness of the host economy. Firms seeking operational efficiencies tend to import their best technology, hire locals (with lower wage demands), and source from local suppliers (which is arguably where the real benefit lies, see below). They also tend to export, so they contribute less, if at all, to balance-of-payments deterioration

Another way to look at FDI is in terms of what the TNC offers the host country. For a host country's comparative advantage, a TNC's contribution can be divided into three types of upgrades:²³⁴

- **Asset upgrade** – in which TNCs provide competitive assets not previously present or widely available, then disseminate them by employing local labor and developing linkages with local firms. It presumes a certain level of sophistication among local firms in order for linkages to be successful.
- **Market upgrade** – in which TNCs improve local firms' access to competitive export markets and improve demand conditions for local goods and/or services (the Israeli flash-frozen fish company could be an example of this, albeit a disastrous one).
- **Employee upgrade** – in which TNCs train the local workforce and disseminate technical and managerial skills. It presumes local human capital, or skilled labor, is already developed to the point at which workers can successfully apply training (see below), and local firms are sophisticated enough so that they can adopt more efficient production and managerial techniques.

Linkages—the bread and butter of FDI-driven economic development

Linkages between foreign affiliates and local businesses are perhaps the best way for host economies to reap the potential benefits of FDI. Backward linkages, in which local firms act as suppliers to foreign affiliates, are most appropriate to this study. Benefits to local firms are in increased output, greater sophistication from skills and knowledge transfer, and perhaps introduction to larger markets. The host economy stands to gain from increased economic activity, higher employment and more sophisticated local firms that provide better products and, in turn, attract more investment.²³⁵

Ideally, one can envision a TNC opening a foreign operation in a developing country and establishing business relations with local input and service providers. The local firms not only grow from increased demand but also become more competitive through the necessity of meeting the foreign affiliate's requirements (which will usually be higher than prevailing local standards in terms of consistency and quality). Eventually local businesses can expand their scope of activity beyond the foreign affiliate, finding their own way in the global market. Where local firms are far removed from the standards of internationally competitive business, linkages can be particularly useful for improving their capabilities.

²³⁴ UNCTAD, *World Investment Report 2002*.

²³⁵ UNCTAD, *World Investment Report 2001*.

In turn, the fact that a country has developed firms capable of meeting the supply demands of TNCs should attract more FDI from companies looking to increase efficiency or tap the emerging market of better-employed consumers.

However, it is immediately apparent that the availability of local suppliers capable of doing business with foreign affiliates is one of the biggest constraints to the establishment and success of linkages in developing countries. A government seeking to link local businesses to foreign affiliates of TNCs would thus do well to promote the capabilities of local firms. Many TNCs also have their own programs for improving the capabilities of local suppliers. Whether a TNC intends to form linkages and its interest in actively improving the capabilities of local suppliers should be criteria for judging an investment's usefulness to a locality's economic development goals.

Government policy intending to promote linkages should address at least these two issues:

- the need to provide information about local firms to foreign affiliates, and
- the need to improve the capabilities of local firms to work do business with foreign affiliates.

For the first issue, governments can provide information and match-making services to TNCs to make them aware of local firms.

Thus, an investment promotion office should have an exhaustive list of local firms and understand their capabilities and constraints, and their suitability to provide supplies and services to TNCs. Beyond subordinate relationships, a promotion office should also have a list of local firms interested in joint ventures with TNCs.

Regarding the need to improve local firm capabilities, governments can provide fiscal (tax-based) or financial (grants) incentives to TNCs for choosing to form linkages with local businesses. Governments can also promote suppliers' associations and can improve technical assistance and access to finance for local businesses, among other measures. One thing many governments often cannot do is impose a range of performance requirements, including local content requirements, which World Trade Organization rules expressly forbid unless requirements are linked to incentives and participation is voluntary.

UNCTAD's *World Investment Report 2001*, which thoroughly treats this topic, emphasizes that linkage-promotion programs should take place within a well-defined local development strategy, including a specific plan to build production capacity.

UNCTAD's recent "Investment Policy Review: Kenya" (2005) lauds Kenya's relatively high level of human capital while lamenting that Kenyan business management practices are "stuck in a time warp." The report suggests the national government should "promote the diffusion of World Class Manufacturing (WCM)" as a quick first step in making the nation's manufacturing sector more competitive and capable of forming linkages. WCM is a set of production principles, based on Japanese management techniques, designed to improve productivity by redesigning operations and cutting waste.

The Significance of National Characteristics

Aside from the readiness of local firms to do business with foreign affiliates and a TNC's motivation for entering a host country, some research has shown that domestic characteristics play a significant role in attracting and maximizing the benefits of FDI.²³⁶ Results from two studies argue that a nation's level of human capital,²³⁷ its degree of openness to trade and the steadiness of its institutions²³⁸ bear directly on its ability to reap benefits from inward FDI.

First, the level of human capital, or skilled labor, in a country determines the degree to which skills and technology used by foreign affiliates can be absorbed in the domestic labor force. Smart workers pick up new organizational and production methods more quickly, and can learn how to use and reproduce advanced technology at a faster pace than workers with little education.

This only makes sense, but the significance of, and need to continually invest in, human capital might be easily overlooked, especially when a host country weighs the costs and benefits of a given investment. Robert Reich, former US Labor Secretary under President Clinton, famously argued in 1990 that a TNC's country of origin was completely insignificant—what matters is what the investment means for the sophistication of the nation's workforce.²³⁹ He argued that US lawmakers would defeat their own goals of economic growth by punishing Japanese firms like Toyota, in whose plants US workers receive training in production and management techniques more sophisticated and productive than those in many US plants, in retribution for Japan's refusal to allow imports of US-made automobiles.

Thus, an investment's prospects for capitalizing on and improving the locality's human capital should be another criterion for deciding its usefulness for the city's economic development.

Secondly, countries with sound public institutions do a better job of attracting FDI and ensuring fair competition and equal treatment once foreign affiliates are established. At the same time, a country that is open to trade tends to attract FDI that offers greater benefits in terms of its purpose for being there, as well as allowing foreign affiliates to become integrated into complex, integrated international production systems that bring more advanced technology to the host country.²⁴⁰ Those foreign affiliates then transfer that technology through linkages with domestic firms.

²³⁶ "Domestic characteristics" are not intended to signify a nation's so-called economic determinants, such as factor costs, proximity to markets and resource availability, which are paramount considerations for any foreign investment decision.

²³⁷ Eduardo Boernshtein et al, "How does foreign direct investment affect economic growth?", *Journal of International Economics* (Vol. 45, 1995), p4.

²³⁸ Peter Nunnenkamp and Julius Spatz, "FDI and economic growth in developing countries: how relevant are host country and industry characteristics?" *Transnational Corporations* (Vol. 13, No. 3) p81.

²³⁹ Reich, Robert, "Who is us?", *Harvard Business Review*, 1990, pp53-64.

²⁴⁰ Theodore Moran, et al. Does Foreign Direct Investment Promote Development? (Center for Global Development, 2005) p15.

Positive FDI Case Study: Kilombero Sugar Company Limited (KSCL)

The production of sugar for regional and international markets has expanded rapidly in southeastern Tanzania's Morogoro Region over the past decade. This may be attributed to the Kilombero Sugar Company Limited (KSCL), a subsidiary of the South Africa-based Illovo Group of companies, who purchased the region's large state-owned sugar processing plant and made considerable investments in its rehabilitation. The company's rapid expansion boosted local demand for raw sugar cane and provided thousands of independent cane growers with new opportunities to expand their sales and personal incomes.

Although these new opportunities have benefited the many Morogoro sugar out growers that KSCL works with in Tanzania, they lack the necessary capital, technology, and training to take advantage of the improving market still holds many cane growers back from substantial financial gains. Low capitalization hinders the rehabilitation of older farms and the purchase of tools, fertilizers, and high-quality seed cane. Inadequate loading services prevent farmers from harvesting and delivering their cane when its sugar content peaks. Poor cane husbandry methods significantly reduce average yields per hectare, and feeder roads and drainage systems, which decayed during the 1970s and 1980s, pose additional obstacles to effective transportation and land use.

Due to the above reasons, most independent farmers across the region split their production between growing staple grains and vegetables and cultivating sugar to generate cash earnings, and most farmers earn significantly less than Tanzania's per capita income.

One of the noteworthy aspects of the Kilombero Sugar Company Limited are the various development projects the company has embarked on in partnership with various stakeholders. For example, in 2004, KSCL in partnership with the African Development Foundation provided two groups of Morogoro smallholders, the Kilombero Cane Growers Association (KCGA) and the Ruembe Outgrowers Association funding to increase the quantity and quality of their output by:

- Financing revolving loan funds to support improved land-preparation methods and the introduction of more appropriate fertilizers and herbicides;
- Providing the associations with monies to purchase cane loaders and other vehicles to help them transport raw cane from smallholder fields to the Kilombero processing plant;
- Supporting the training cost of association staff in business management and financial accounting practices; and
- Supporting the training cost of smallholder members in sugar cane husbandry and HIV/AIDS prevention.

The goal of both projects was to assist the associations in raising their members' average incomes by helping members produce more raw cane and deliver their cane to local processing facilities when it reached its peak quality and value. This project led to the farmers incomes

increasing significantly over five years. KCGA currently has 1,600 members, and ROA serves nearly 1,000 members.²⁴¹

Another program the KSCL developed to improve rural livelihoods in Tanzania was the Kilombero Business Linkages Program. The program works with nearly 6,000 sugar cane out-growers in rural Tanzania to transform subsistence farming into a commercially viable undertaking. It began as a partnership program with the International Finance Corporation. The program was designed to economically link the Kilombero Sugar Company Ltd, the largest sugar manufacturer in Tanzania, with local small scale subsistence farmers, or out-growers. It did this by improving sugar cane farming and developing small businesses, which then provide support services to the larger company. The program offered technical, agricultural and business training to the farmers and farmer groups; established three Savings and Credit Cooperatives to foster the growth of a credit culture within the Kilombero community; strengthened smaller companies supporting farmers or providing services to the sugar mill; and established the Kilombero Community Trust to continue the program for many years to come. The trust also established the 1200 hectare Kilombero Community Trust Farm to provide sustainable, ongoing revenue streams for community development activities. This program more than doubled the incomes of its farmers over a three year period with a relatively small amount of funding, leveraging the resources of donors and banks. The result was a dramatic transformation for the farming and business community in Kilombero.²⁴²

Yet another partnership the Kilombero Sugar Company limited has formed is with the ABB Group and the Kilombero Community Trust. 6 percent of the population in Tanzania has access to electricity. 80 percent of the population lives in rural areas and depends on a collection of wood fuel for energy supply. Socio-economic studies among rural households and especially rural enterprises show a willingness to pay for access to electricity, if only reasonably reliable and 24hour services were available. Recent estimates indicate that poor households once electrified, would initially consume about 30-200 watts during 5 hours per day, corresponding to 55–360 kWh per year.

Kilombero Sugar Company currently generates its own electricity. TANESCO and KSC also have an agreement to buy/sell power from KSCL. Areas around Kilombero estate have yet to have access to electricity. Preliminary ABB-Kilombero study indicated that rural households spend about \$15-32 per month, essentially for charcoal, kerosene and dry batteries.

This project is to set up a local entity owned by the rural community to administer and manage rural electrification in two potential villages (Myage and Msolwa) around the Kilombero estate. KSCL will sell power to a rural electricity entity and maintain power supply, while ABB will provide the initial installation of connections and upgrade of connections. Kilombero Community Trust will provide capacity building/training.

²⁴¹ "Sweeter Earnings for Cane Growers." *African Development Foundation*. April 2007. <<http://www.adf.gov/enews0505roa.htm>>.

²⁴² "Social Development Through Outgrower Schemes: The Private Sector Kilombero Business Linkage Program." *Partners for Africa*. March 2007. <<http://www.partners4africa.org/docs/S2-9-PfA-Tanzania-Tomlinson-Illovo.pdf>>.

The purpose of this partnership is to improved access to electricity and basic services around Kilombero estate (comprising smallholders of sugar cane and tour operators, etc.) It is to work towards poverty reduction through access to energy allowing for opportunities to develop private sector and create jobs.²⁴³

Finally, a recent partnership between KSC and the United States Trade and Development Agency led to a grant in the amount of \$299,780 (approximately 401 million Tanzanian shillings) from the U.S. Trade and Development Agency, which will be used to allow Kilombero Sugar Company to explore using waste as a source of power. The power produced will support both the plant's own production process and contribute to the national power grid. In fact, through this agreement, Kilombero Sugar will begin to produce ethanol for export. The goal of this grant is to address the problem of waste disposal, enhance production, and increase the power supply of Tanzania.²⁴⁴

²⁴³ UNDP. "Growing Sustainable Business: Rural Electrification Project." March 2007. <<http://www.undp.org/partners/business/gsb/projects/tanzania-ruralelectrification.doc>>.

²⁴⁴ "Signing Ceremony for USTDA Grant to Kilombero Sugar Company." *US Embassy, Dar es Salaam, Tanzania*. April 2007. <http://tanzania.usembassy.gov/sp_02152008.html>.

References

Abila, Richard and Eirik Jansen. "From Local to Global Markets: the fish exporting and fishmeal industries of Lake Victoria – structure, strategies, and socio-economic impacts in Kenya." Socio-economics of the Nile Perch Fishery on Lake Victoria, Report no.2. Nairobi: IUCN, 1997.

Abubaker,L., Akol, A. and Mwanja, Wilson et. al. "Status and impact of rural aquacultural practice on Lake Victoria basin wetlands." African Journal of Ecology (August 2006).

Actionaid International Kenya. "Impact of Sugar Import Surges on Kenya." September 2006.

Africa Private Sector Group. "Enhancing the Competitiveness of Kenya's Manufacturing Sector: The Role of the Investment Climate." Kenya, 2004.

African Development Foundation. <<http://www.adf.gov/enews0505roa.htm>>.

Allafrica Newsmedia. "Kenya: Fish crisis as ban takes heavy toll." The Nation April 14, 2007. <<http://allafrica.com/stories/200704140148.html>>

Aquaculture Collaborative Research Support Program. <<http://pdacrsp.oregonstate.edu/>>.

Associated Press. "Rice export to Kenya re-starts from Saturday." Associated Press of Pakistan online (January 13, 2007). <http://www.app.com.pk/en/index.php?option=com_content&task=view&id=2015&Itemid=2>.

Atieno, Rosemary. "Agricultural Market Liberalisation, Private Trade and Incomes: Implications for Poverty Reduction in Rural Kenya." Paper submitted for presentation at the conference on Understanding Poverty and Growth in Sub-Saharan Africa, at the Centre for the Study of African Economies, Oxford University. Oxford, March 18-19 2002.

Balirwa, John. "Econological, environmental and socio-economic aspects of the Lake Victoria's introduced Nile perch fishery in relation to the native fisheries and the species culture potential: lessons to learn." African Journal of Ecology December 2006.

Boernshtein, Eduardo et al. "How does foreign direct investment affect economic growth?" Journal of International Economics 45 (1995).

Bokea, Crispin and Moses Ikiara. "The Macroeconomy of the export fishing industry in Lake Victoria (Kenya)." Socioeconomics of the Lake Victoria Fisheries series. April 2000.

Bwathondi, P., Ogutu-Ohwayo, R., and Ogari, J. "Lake Victoria Fisheries Management Plan." Prepared for the Lake Victoria Fisheries Organization. November 2001.

CICERO, Center for International Climate and Environmental Research, Oslo. <http://www.cicero.uio.no/publications/detail.asp?publication_id=110&lang=no>.

Cornland, D.W., Johnson F.X., Tamba, F., Chidumayo, E.N., Morales, M, Kalumiana O., and Mtonga-Chidumayo, S.B. Sugarcane resources for sustainable development: A case study in Luena, Zambia. Stockholm: Stockholm Environment Institute, 2001.

Dominion Farms Ltd. Dominion News. October 2006.

Ecotourism Society of Kenya. <<http://www.ecotourismkenya.org/downloads/issue2.pdf>>.

Engle, Carole and Ivano Neira. "Tilapia Farm Business Management and Economics: a training manual." Aquaculture Fisheries Center, University of Arkansas at Pine Bluff. December 2005.

Enterprise Mauritius. Market Survey in Kenya. January 2007.

ESI Africa. <http://www.esi-africa.com/archive/esi_4_2004/38_1.php>.

Export Processing Zones Authority, Kenya. "Fishing Industry: 2005." <www.epzakenya.com/UserFiles/File/Fishkenya.pdf>.

Export Processing Zones Authority, Kenya. "Grain Production in Kenya: 2005." <<http://www.epzakenya.com/UserFiles/File/GrainReport.pdf>>.

Export Processing Zones Authority, Kenya. <<http://www.epzakenya.com>>.

Export Promotion Council, Kenya. <<http://www.epckeny.org>>.

FDI.net. <<http://www.fdi.net>>.

First Lake Victoria Fisheries Organization and FAO Regional Technical Workshop on Fishing Effort and Capacity on Lake Victoria. Food and Agriculture Organization of the United Nations. December 12-14, 2005.

Fish INFO Network Market Report. "China: Leading Light for Tilapia." <<http://www.eurofish.dk/indexSub.php?id=3429>>.

Fisheries Investment for Sustainable Harvest. Quarterly Report. March 2006.

Food and Agriculture Organization of the United Nations, Fisheries Department. <<http://www.fao.org/fi/>>.

Food and Agriculture Organization of the United Nations. "Aquaculture Extension in Sub-Saharan Africa." Fisheries Circular No. 1002, 2004.

Food and Agriculture Organization of the United Nations. "Kenya Rice Statistics." <<http://www.fao.org/ag/agp/agpc/doc/riceinfo/Africa/KENBODY.HTM#BASIC#BASIC>>.

Food and Agriculture Organization of the United Nations. "Kenya-Aquaculture Production." <http://www.fao.org/figis/servlet/static?dom=countrysector&xml=naso_kenya.xml>.

Food and Agriculture Organization of the United Nations. “National Aquaculture Sector Overview: Kenya.” <www.fao.org/figis/servlet/static?dom-countrysector&xml=naso_kenya.xml>.

Food and Agriculture Organization of the United Nations. <<http://www.fao.org>>.

Food and Agriculture Organization of the United Nations. “Fishery Country Profile: Kenya.” <<http://www.fao.org/fi/fcp/em/KEN/profile.htm>>.

Foreign Direct Promotion Center. <<http://www.Fdipromotion.com>>.

Forum for Organic Resource Management and Agricultural Technologies Kenya. <<http://www.formatkenya.org/ormbook/Chapters/chapter14.htm>>.

Getabu, A., Njiru, M., Nzungi, P et al.. “Are Fisheries Management Measures in Lake Victoria Successful? The Case of Nile Perch and Nile Tilapia Fishery.” African Journal of Ecology October 2006.

Gichuri, W, Omondi, J. and Veverika, K. “A Partial Economic Analysis for Nile Tilapia and Sharptoothed Catfish Polyculture in Central Kenya.” Aquaculture Research 32, 2001.

Gippsland Aquaculture Industry Network. “GROWfish.” <<http://www.growfish.com.au/>>.

Government of Kenya, Department of Fisheries. “Want to Start Fish Farming?” <<http://www.livestock.go.ke>>.

Government of Kenya, NEPAD, and FAO. Support to NEPAD-CAAD Implementation. National Medium Term Investment Program. Volume I of IV. Ref: TCP/KEN/2908. December 2004.

Government of Kenya. 2000 Poverty Reduction Strategy Paper.

Government of Kenya. Kenya Sugar Board. Kenya Sugar Industry: Strategy 2004-2009.

Government of Kenya. Kenya Sugar Board. Year Book of Sugar Statistics 2006. (Unpublished.)

Government of Kenya. Kenya Sugar Board. Year Book of Sugar Statistics 2005.

Government of Kenya. Lake Basin Development Authority. Investment Opportunities in the Lake Basin Region. August 2005.

Government of Kenya. Ministry of Agriculture. 2006 Sessional Paper on Revitalization of the Sugar Industry. August 2006.

Government of Kenya. The Energy Act, 2006. January 2007.

Halwart, Matthias and Moehl, John, ed. A Synthesis of the Formulated Animal and Aquafeed Industries in Sub-Saharan Africa. Rome: Food and Agriculture Organization of the United Nations, 2005.

Institute for Agriculture and Trade Policy. <<http://www.iatp.org/>>.

International Rice Commission. <<http://www.fao.org/ag/irc/>>.

IslamOnline.net. <<http://www.islamonline.net/english/science/2003/09/article03.shtml>>.

Jansen, Eirik. “Rich Fisheries – Poor Fisherfolk: Some Preliminary Observations About the Effects of Trade and Aid in the Lake Victoria Fisheries.” Socio-economics of the Nile Perch Fishery on Lake Victoria. IUCN-The World Conservation Union. 1996.

Janssen, Dr. Ranier, et al. “Liquid Biofuels for Transportation in Tanzania.” German Technical Cooperation. August 2005.

Journey to Forever. <http://journeytoforever.org/edu_pond.html>.

Kenya Business Development Services Program. “Aquaculture activities commence in Western Kenya.” Kenya BDS Monthly Newsletter November/December 2006. p.1. <www.kenyabds.com>.

Kenya Business Development Services Program. “Catfish Fingerling Sales Commence at Mbita Point” Kenya BDS Monthly Newsletter July/August 2006: 2. <<http://www.kenyabds.com>>.

Kenya Business Development Services Program. “Invitation for bids: Development of Small-scale Clarias Fingerling Production Clusters.” Ref # AO2/011/06. <www.kenyabds.com>.

Kenya Business Development Services Program. “Invitation for Bids: Development of Ice Storage/Fish Preservation Technology for Boats.” Ref # AO2/005/05. <www.kenyabds.com>.

Kenya Business Development Services Program. “Moi University Completes fingerling market survey.” Kenya BDS Monthly Newsletter January/February 2007: 3. <<http://www.kenyabds.com>>.

Kenya Business Development Services Program. “Program to Develop Leather Industry for Nile Perch Launched with ESALIA.” Kenya BDS Monthly Newsletter September/October 2006. <www.kenyabds.com>.

Kenya Business Development Services Program. “Rack-drying technology expands in Suba district.” Kenya BDS Monthly Newsletter July/August 2006: 2. <<http://www.kenyabds.com>>.

Kenya Business Development Services Program. “Seining wild baitfish and implications for the small-scale fish farmer.” Kenya BDS Monthly Newsletter January/February 2007: 3. <<http://www.kenyabds.com>>.

Kenya Business Development Services Program. <<http://www.kenyabds.com/>>.

Kenya Investment Authority. <<http://www.investmentkenya.com>>.

Kenya Ministry of Livestock and Fisheries. “Aquaculture Extension and Development.” <<http://www.livestock.go.ke>>.

Kenya Ministry of Livestock and Fisheries. “Investment Potential in the Fisheries Sector.”
<http://www.livestock.go.ke/index.php?option=com_content&task=view&id=142&Itemid=79>.

Kenya Ministry of Livestock and Fisheries. “Sagana Fish Culture Farm.”
<<http://www.livestock.go.ke>>.

Kenya Ministry of Livestock and Fisheries. <<http://www.livestock.go.ke>>.

Kenya Ministry of Trade and Industry. <<http://www.tradeandindustry.go.ke/>>.

Kenya Sugar Research Foundation, et al. “An Assessment of Industrial Research and Development Needs of the Kenyan Sugar Industry.” December 2006.

Kisumu Millennium City. <<http://www.kisumumillenniumcity.org/>>.

KQED, Public Broadcasting for Northern California. <<http://gm.kqed.org/4/14/>>.

Lake Basin Development Authority. <<http://www.regional-dev.go.ke/lbda/board.htm>>.

Lake Victoria Region Local Authorities Co-operation. <<http://www.lvrlac.net/>>.

Mienzen-Dick, Ruth, Leah Onyango, and Brent Swallow. “Irrigation Managements and Poverty Dynamics: Case Study of the Nyando Basin in Western Kenya.”
<http://www.iwmi.cgiar.org/.../Project_Workshops/Irrigation_Swallow%20et%20al%20Mar%2023%202006>.

Ministry of Tourism and Wildlife, Kenya. <<http://www.tourism.go.ke/>>.

Ministry of Trade and Industry. “Potential Projects.”
<<http://www.tradeandindustry.go.ke/section.asp?ID>>.

Mitchell, Donald. “Kenya Sugar Industry Preliminary Findings.” (Unofficial Powerpoint Presentation, October 19, 2004).

Moi University, School of Natural Resource Management.
<<http://www.mu.ac.ke/academic/schools/nrm/>>.

Moran, Theodore, et al. Does Foreign Direct Investment Promote Development? Center for Global Development. 2005.

Mugwang'a, E.H. Apoli., ed. Working to Restore the Glory of Kisumu. Kisumu: Tom Mboya Labour College, 1994.

Net Impact. <<http://www.netimpact.org>>.

Netherlands Airport Consultants B.V. and Kenya Airports Authority. “Stakeholders Briefing Kisumu Airport.” June 2006.

Ngugi, Charles and Veverika, Karen. Aquaculture training for Kenyan Fisheries Officers and University Students. Comp. K.McElwee, K.Lewis, M.Nidiffer, and P.Buitrago(eds). Corvallis, Oregon: Oregon State University, 2002.

Nile Basin Initiative. <<http://www.nilebasin.org/>>.

“Nile Perch Market Report.” EuroFish INFOnetwork. August 2006.

“No End to the Problem.” The Economist. November 16, 2006.

Nunnenkamp, Peter and Julius Spatz. “FDI and economic growth in developing countries: how relevant are host country and industry characteristics?” Transnational Corporations. 13 No. 3.

Nyandat, Beatrice. "Aquaculture Management and Development in Kenya." Report of the FAO-Worldfish Center Workshop on Small-scale Aquaculture in Sub-Saharan Africa: Revisiting the Aquaculture Target Group Paradigm. March 2004.

Odek, Dr. Otieno, Peter Kegode and Shem Ochola. “The Challenges and Way Forward for the Sugar Sub-Sector in Kenya,” Friedrich Ebert Stiftung. 2003.

Odhiambo, Walter and Fred Miencha. “The Kenya-EU Trade Regime: Implication of the ACP-EU Economic Partnership Agreement (EPA) on Fisheries in Kenya.” Kenya Institute for Public Policy Research and Analysis. KEPLOTRADE Research Paper No 2/2004. December 2003.

Ohito, David. “Dominion to raise rice production by 100,000 tons.” The Standard Online May 6, 2006. <http://www.eastandard.net/archives/cl/hm_news/news.php?articleid=1143952215>

oneVillage Foundation. <<http://green.onevillage.tv/?p=69>>.

Opiyo, Dave. “Kenya: Investors Demand Stake in Rice Parastatal’s Mill.” The Nation March 22, 2007. <<http://allafrica.com/stories/200703210985.html>>.

Othina, A., Njiru, N., Nzungi, et al. “Are fisheries management, measures in Lake Victoria successful? The case of Nile perch and Nile tilapia fishery.” African Journal of Ecology. <<http://www.blackwell-synergy.com/doi/abs/10.1111/j.0141-6707.2006.00712.x>>.

Partners for Africa, Social Development through Outgrower Schemes: The Private Sector Kilombero Business Linkage Program. <<http://www.partners4africa.org/docs/S2-9-PfA-Tanzania-Tomlinson-Illovo.pdf>>.

Practical Action.

<http://practicalaction.org/docs/technical_information_service/water_hyacinth_control.pdf>.

Proceedings of the Fish Feeds Forums. Fisheries Investment for Sustainable Harvest. January 19, 2006.

Rattan Wicker Furniture. <http://www.wicker-rattanfurniture.com/roberge_water_hyacinth_khochang_arm_chair_ele_1s.asp>.

Reich, Robert. “Who is us?” Harvard Business Review (1990).

Ringius, Lasse. “Soil Carbon Sequestration and the CDM: Opportunities and Challenges for Africa.” Climatic Change 54 No.4 (2002).

Strombom, Dan and Stewart Tweed. “Business Planning for Aquaculture – Is It Feasible?” Northeast Regional Aquaculture Center. University of Massachusetts, Dartmouth. <http://aquanic.org/publicat/usda_rac/efs/nrac/nrac150.pdf>.

Sustainable Village. <<https://www.thesustainablevillage.com/sr2003/archive/2003/pre-conf/stanley.html>>.

The Daily Nation. <<http://www.nationmedia.com/dailynation/>>.

The Eastern Standard. <<http://www.eastandard.net/>>.

The Pembina Institute. <http://www.pembina.org/pdf/publications/Str_CDM_RP_Nov05.pdf>.

ThinkQuest. “Water Hyacinth.” <<http://library.thinkquest.org/C0126023/>>.

“Tilapia Market Report.” Globefish. February 2007.

Tourism Trust Fund. http://www.ttfkenya.org/?q=list_of_projects.

Uganda FISH Project. <http://www.ag.auburn.edu/fish/international/uganda/>.

UN HABITAT. “Managing HIV/AIDS at the Local Level in Africa.” <http://www.unhabitat.org/downloads/docs/4058_85367_Kisumu.pdf>.

UN HABITAT. Kisumu City Development Strategy (2004-2009).

Understanding Poverty and Growth in Sub-Saharan Africa, at the Centre for the Study of African Economies, Oxford University. Oxford, March 18-19, 2002.

United Nations Development Programme - The Equator Initiative. <<http://www.tve.org/ho/doc.cfm?aid=411>>.

United Nations Development Programme. <<http://www.undp.org/partners/business/gsb/projects/tanzania-ruralelectrification.doc>>.

United Nations Food and Agriculture Organization. “Fishery Country Profile:Kenya” Online: <www.fao.org/fi/fcp/em/KEN/profile>.

United Nations Industrial Development Organization. <<http://www.unido.org/>>.

United Nations. <<http://www.un.org/esa/agenda21/natlinfo/niau/kenyanp.htm>>.

United Nations. Food and Agriculture Organization. Contract Farming: Partnerships for Growth.

United Nations. UNCTAD, World Investment Report 2001.

United Nations. UNCTAD. World Investment Report 2002.

United Nations. UNCTAD. World Investment Report, 2006.

United States Embassy, Dar Es Salaam, Tanzania.

<http://tanzania.usembassy.gov/sp_02152008.html>.

United States. Energy Information Administration. Alternatives to Transportation Fuels 1996. December 1997. <<http://www.eere.energy.gov/afdc/progs/ddown.cgi?afdc/FAQ/5/0/0>>.

USAID-Kenya. <<http://www.usaid.gov/ke/>>.

USDA-Economic Research Service. <<http://www.ers.usda.gov/>>.

Value Chain Based Matching Grant Fund. <<http://www.matching-grant.or.ke/>>.

Wanzala, Maria et al. “Agricultural Production Incentives: Fertilizer Markets and Insights From Kenya.” Tegemeo Working Paper 3 June 25, 2001. <<http://www.aec.msu.edu/fs2/kenya/wp3.pdf>>.

Widescope Tours and Travel. <<http://www.widescopetours.com/safaris/conferences.htm>>.

World Agroforestry Centre.

<www.worldagroforestrycentre.org/ar2003/downloads/AIA_CDM.pdf>.

World Bank Group. Doing Business Report: Benchmarking Business Regulation. 2006.

World Bank. “Knowledge Services for Financial and Private Sector Development, Brought to you by Rapid Response.” <<http://rru.worldbank.org/Documents/PapersLinks/27.pdf>>.

World Business Council for Sustainable Development.

<<http://www.wbcsd.org/plugins/DocSearch/details.asp?type=DocDet&ObjectId=14048>>.

World Trade Organization. Trade Policy Review: East African Community. Report by the Secretariat. Ref: WT/TPR/S/171. September 20, 2006.

Worldfish Center. “Community-based fish culture in seasonal floodplains” Worldfish Center Quarterly 29 No. 1 & 2. (January – June 2006). <<http://www.worldfishcenter.org.>>

WorldFish Center. <<http://www.worldfishcenter.org/>>

List of Interviews

Pamela Achieng, Aquaculture Specialist, Lake Basin Development Authority, March 2007.

Patrick Adolwa, Director of City Planning, Nairobi City Council and former head of City Planning in Kisumu, January 2007.

Otieno Aluoka, Dutch Embassy, January 2007.

George Anyango, Head, CPCD & National MDG Secretariat, Ministry of Planning & Dev., January 2007.

Michael Arum, SUCAM, March 2007.

Barclays Bank Representative, January 2007.

Nardos Berkele-Thomas, UNDP, Nairobi, January 2007.

Calvin Burgess, CEO, Dominion Farms Ltd., January 2007.

Arnolda Chao, Kenya Association of Manufacturers (KAM) , March 2007.

Ragbir Chatthe, Kibos Sugar Co., March 2007.

Cooperative Bank

Prof. Bill Daniels, Associate Professor, Department of Fisheries & Allied Aquacultures, Auburn University (Alabama, USA).

Dunga Fishing Village, January 2007.

Prof. Bill Daniels, Department of Fisheries & Allied Aquacultures, Auburn University (Alabama, USA). Phone interview, April 16, 2007.

Hanief Gilani, Operations Manager, Sunblest Bread Factory, January 2007.

Murani Gilani, Peche Foods, January 2007.

Salima Gilani, Imperial Hotel, January 2007.

Daniel Githu, Operations Manager, Equity Bank, January 2007.

Government of Kenya, Ministry of Livestock and Fisheries, Director of Training and Extension, March 2007.

Nelson Gwara, Spectre International, March 2007.

Heikki Haili, Deputy Head of Mission, Embassy of Finland, Nairobi, January 2007.

Joel K. Imitira, Economist, Ministry of Energy, March 2007.

Peter Kegode, Technoserve, March 2007.

Kibera Market, Various small merchants, March 2007.

Wycliff Kibisu, Mumias Sugar, March 2007.

Susan Kikwae, Managing Director, Kenya Investment Authority and Board Member of COMESA, January 2007.

Cecilia Kinuthia-Njenga, Human Settlements Officer, Urban Environment Section, UNHABITAT, January 2007.

James Kobe, Assistant Housing Officer, Kisumu Municipality Department of Housing and Social Services, March 2007.

Kisumu Town Council Members, various present at joint meeting, January 2007.

David Matule, Manager, Planning, Research, and Budgeting, Kenya Airport Authority, March 2007.

Laban Mburu, Kenya Investment Authority, March 2007.

Prof. Muchai Muchiri, Department of Fisheries and Aquatic Sciences, Moi University (Eldoret, Kenya). Phone interview, April 19, 2007.

Paul Muigai, Unilever, March 2007.

Ng'ang'a Munyu, Deputy Chief Economist, Ministry of Energy, March 2007.

Patrick Mutuo, Millenium Villages Project, MDG Center, Kisumu, January 2007.

Stephen Muturi, Kenya Sugar Research Foundation, March 2007.

Charity Muya, Restructuring Expert, Ministry of Finance, March 2007.

Wisdom Mwamburi, Kisumu Town Clerk, January 2007.

John Mwaura, UN HABITAT, January 2007.

Nellie Mwawaka, Kenya Investment Authority, March 2007.

Kimani Ndungu, Policy and Regulation Researcher, Institute of Economic Affairs, January 2007.

David Ngarama, Ministry of Trade and Industry, March 2007.

Professor Peter Ngau, Department of Urban Planning, University of Nairobi, January 2007.

Patricia Njeru, Kenya Sugar Board, March 2007.

Simon Njeru, Manager, Uchumi Market Branch, March 2007.

Ben Obiang, Kisumu Chamber of Commerce, March 2007.

Isa Odiambo, Non-Ruminants and Bee-Keeping, GOK Ministry of Livestock and Fisheries, March 2007.

Thomas Odhiambo, Small business owner, January 2007.

William Odhiambo, Business Advisor (Technoserve Consultant), MDG Center, Kisumu, January 2007.

Peter Ogalo, Deputy Director, Kisumu Municipality Department of Housing and Social Services, March 2007.

Fred Ogana, Kenya Country Director, Technoserve, January 2007.

Phillip Olo, Agriculture Specialist, Lake Basin Development Authority, March 2007.

Caleb Omondo, Assistant to the Director, GOK Ministry of Agriculture, Nyanza Province, March 2007.

Charles Onchoke, Director of Finance, Ministry of Finance, March 2007.

Charles Otieno, Estates Officer, Kisumu Municipality Department of Housing and Social Services, March 2007.

Israel Agina Otieno, Procurement Manager, Spectre International, March 2007.

Steven Otieno, Technoserve, January 2007.

Brother William Oudshoorin, Manager, Mukumu Farm, March 2007.

Jiten Patel, Director, Skylark Construction, March 2007.

Manish Phalke, Production Manager, Truefoods Ltd., March 2007.

David Rotich, Enterprise Development, MDG Center- Kisumu, March 2007.

Sumil Shah, Owner, United Millers, March 2007.

Richard Sindiga, Deputy Chief Economist, Ministry of Trade and Industry, March 2007.

Erin Sweeney, Graduate Student/Infrastructure Researcher, Harvard University, January 2007, February 2007 and April 2007.

Moses Titi, Area Sales Manager (Nyanza Province), Unilever, January 2007.

Helen Too, Tetrapak, March 2007.

Anton Van Tonder, Plant Manager, Spectre International, March 2007.

Karen Veverika, Director, Fisheries Investment for Sustainable Harvest (Uganda). Phone Interview April 16, 2007.

Josphat Wanui Wamathai, Afya Savings and Credit Co-operative, January 2007.

Ferdinand Wanyonyi, Managing Director, Lake Basin Development Authority, January 2007.

Barbara Waterston, Company Director, Dominion Farms, January 2007.

Ruth Waweru, Livestock Specialist, Lake Basin Development Authority, March 2007.

Dr. Noah Wawire, Kenya Sugar Research Foundation, March 2007.

Grahame Welch, Country Director, Dominion Farms, January 2007.

Enos Were, Aquaculture Specialist, Dominion Farms, March 2007.

Nalan Yuksel, Agriculture Specialist, MDG Center, Nairobi, January 2007.