


Spring 2011

Rural Futures: How Can Agricultural Development Lead to a High Quality of Life?

Jessie Ebersole
SIT Study Abroad

Follow this and additional works at: https://digitalcollections.sit.edu/isp_collection

 Part of the [Agriculture Commons](#), [Natural Resources Management and Policy Commons](#), and the [Sustainability Commons](#)

Recommended Citation

Ebersole, Jessie, "Rural Futures: How Can Agricultural Development Lead to a High Quality of Life?" (2011). *Independent Study Project (ISP) Collection*. 1021.
https://digitalcollections.sit.edu/isp_collection/1021

This Unpublished Paper is brought to you for free and open access by the SIT Study Abroad at SIT Digital Collections. It has been accepted for inclusion in Independent Study Project (ISP) Collection by an authorized administrator of SIT Digital Collections. For more information, please contact digitalcollections@sit.edu.

Rural Futures:

How can agricultural development lead to a high quality of life?

Jessie Ebersole

Practicum Final Paper

School for International Training: Uganda Development Studies

Spring 2011

Academic Director: Charlotte Karungi Mafumbo

Project Advisor: Muyinda Abdu Maliki

6-5-11

Acknowledgments:

Thank you to my academic director Charlotte Mafumbo for her advice, guidance, flexibility, and unceasing willingness to go out of her way to support her students. I am also filled with gratitude for all the staff at VEDCO who made this research possible by opening their office and the field to my inquiries. They provided me with advice, transport, Luganda-English translation and even lunch. In particular I would like to thank my academic advisor, Muyinda Abdu Maliki, and the rest of the Mukono field office staff: Crespo Mubbalya, William Lubwama and Juliet Nakayita.

Abstract:

Study Objectives:

Uganda, with its wealth of arable land and water resources, has unrealized agricultural development potential. How food is produced and distributed will impact United Nations Millennium Development Goal targets, including the eradication of extreme hunger, reductions in child mortality, and improvements in maternal health and environmental sustainability, yet advances towards the MDG's have been limited. This study explores how Uganda's agricultural sector can be developed in a way that improves the quality of life of smallholder farmers in Katente and Namuyenje parishes in Mukono district, Uganda. Ugandan agricultural production is starved of new sources of knowledge and technology, it is undercapitalized, and farm work is increasingly left to an ageing population as youth migrate to Kampala. This study attempts to answer the question: how can agricultural development lead to a high quality of life? To this end the researcher assessed farmer access to sustainable agriculture techniques and marketing strategies, and farmer quality of life in Mukono.

Research Methodology:

The researcher's work was supported by VEDCO, a Ugandan NGO that supports sustainable agricultural livelihoods. Both qualitative and quantitative methods of inquiry were used. The researcher observed farms, farming practices, and the living situations of interviewees. The researcher interviewed 29 members of farmer producers groups in Katente and Namuyenje parishes. One interview questionnaire was used for all interviews: it covered basic household demographic information, knowledge of agricultural techniques and challenges, knowledge of marketing strategies, and quality of life indicators. Both qualitative and quantitative measures were used: for example farmers were asked to self-assess their quality of life, and also estimate their average yearly income.

Findings and Discussion:

The average farmer in Katente and Namuyenje parish is 46 years old, owns 6.25 acres of land, earns UGX 2 million each year, supports seven children, and has had seven years of formal education. All farmers had at least some knowledge of how to prevent soil loss and increase soil fertility, although most lacked a diversity of methods. Pest and disease management was the weakest area of sustainable agricultural knowledge. Drought was the greatest agricultural risk faced by farmers, and most farmers had no technology or knowledge for even partial drought management. Since VEDCO began working in the area farmers have formed producer groups and engaged in collective marketing, but many still face challenges, particularly high input costs for poultry care and low prices for egg sales. Quality of life in the two parishes is fair, based on farmer income, access to health and education services and farmers' own self-assessment. 84% of farmers have experienced positive income change since they began working with VEDCO. In the future, more sustainable agricultural knowledge transfers are needed in the parishes, along with further farmer training in business and recordkeeping. Technology transfers, including irrigation systems and food processing and storage centers would also improve quality of life.

Table of Contents

Introduction.....	5
Background on Ugandan Agriculture.....	7
Statement of Objectives.....	11
Justification for Study.....	11
Justification for measuring access to sustainable agriculture techniques.....	11
Justification for measuring access to marketing strategies.....	13
Justification for measuring quality of life.....	14
Methodology.....	15
Methodology challenges.....	16
Background on VEDCO.....	17
Mission and Objectives.....	17
Organizational Structure.....	17
Funding Sources.....	18
Findings and Discussion.....	18
Demographic information.....	18
Access to knowledge of sustainable agricultural techniques.....	20
Agricultural risks and risk management.....	24
Access to marketing strategies.....	26
Marketing challenges.....	26
Impact of VEDCO.....	28
Quality of life.....	31
Conclusions.....	34
Recommendations.....	35
Agricultural Recommendations.....	35
Marketing Recommendations.....	36
Appendix A: Informed Consent Form.....	41
Appendix B: Research Form 1: Demographic Information.....	42
Appendix C: Research Form 2: Study Information.....	43

Introduction

Ugandan agriculture is filled with development potential. Uganda enjoys a wealth of arable land and water resources, and its huge labor force is over 80% rural.¹ Rural areas are heavily populated, but when sustainable agricultural production methods are practiced, high densities of people can be assets instead of liabilities. The concentrated labor force is useful when it comes to tilling the land, digging terraces, harvesting rainwater, controlling weeds and pests, building soil structure and feeding animals.² Higher numbers of people increase information and labor sharing, benefiting agricultural productivity. Higher levels of agricultural production might improve household incomes and food security. Yet the development potential of Uganda's agricultural system remains largely unrealized.

In 2000 the United Nations adopted eight Millennium Development Goals, forging a global partnership to reduce poverty by 2015. Many of these goals are closely linked to the state of agricultural systems. How food is produced and distributed will impact MDG targets including the eradication of extreme hunger, reductions in child mortality, and improvements in maternal health and environmental sustainability. The current Ugandan agricultural system, along with that of much of the globe, does not serve these goals, and advances towards the MDG's have been limited. The United Nations' 2010 MDG report stated that, "Overall progress in reducing the prevalence of (worldwide) hunger has not been sufficient to reduce the number of undernourished people." There has been no significant change in how food is grown and who is

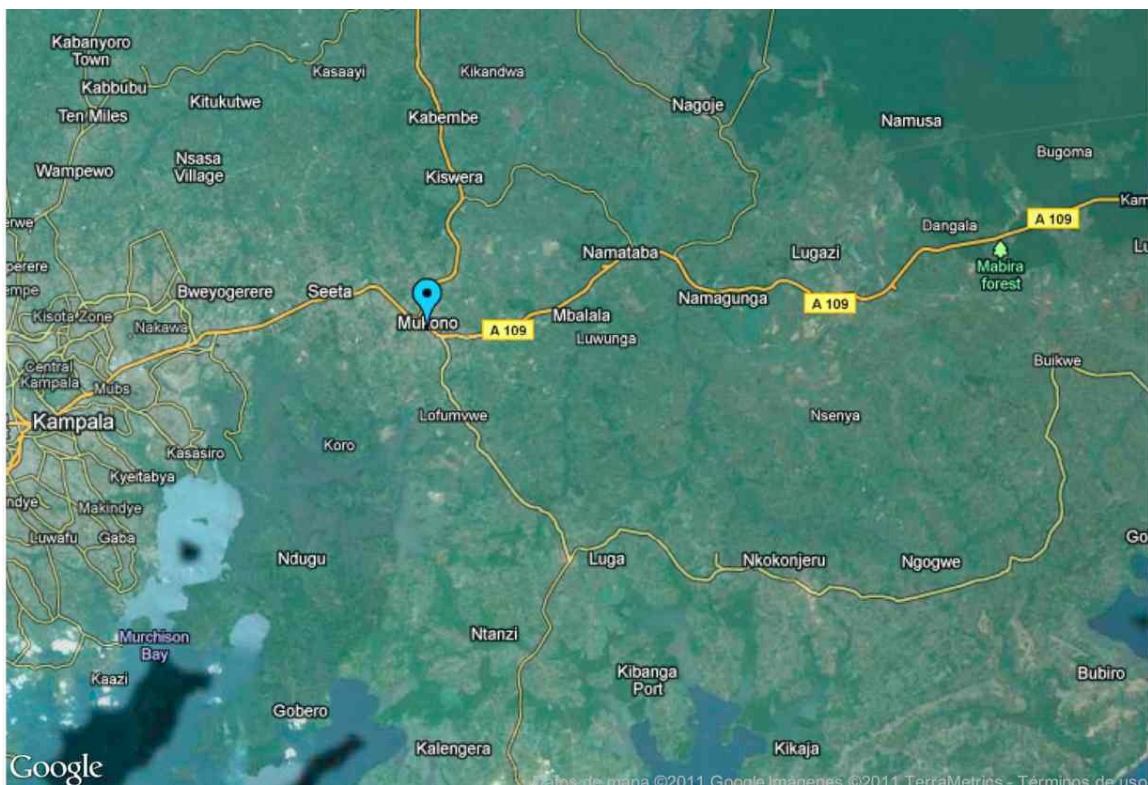
¹ Kenneth Bateesa. "Entrepreneurship Development in Uganda." Lecture. Makerere University. 11-3-11.

² Lim Li Ching. "Sustainable Agriculture Pushing Back the Desert." Institute of Science and Society. Web. <http://www.i-sis.org.uk/desertification.php> accessed on 26 April 2010.

receiving its health benefits. In Uganda, agricultural productivity of major crops has actually declined by 60 percent in the last ten years.³

The study explored this connection between the state of agricultural systems and human well-being. I wanted to study how Uganda’s agricultural sector can be developed in a way that improves quality of life of smallholder farmers. I focused specifically on Mukono district in central Uganda in order for my research to achieve sufficient depth. (See Image 1, below).

Image 1: Map of Mukono Area, Uganda



Background on Ugandan Agriculture

³ Mwambutsya Ndebesa. “Demonstrations Relevant in Improving Food Security.” Daily Monitor, 24 April 2011.

To understand the direction Ugandan agriculture might take, it is helpful to examine its past trajectory. In the post-colonial era, Uganda has followed the agricultural pattern of many African nations. It has continued to export commodity crops such as cotton, coffee and tea. This production strategy has prevented the development of indigenous value-added enterprises that would encourage more specialized and profitable agricultural products.⁴ Lack of product diversification has left farmers vulnerable to fluctuations in world market prices for commodities. Agricultural production strategies have contributed to environmental degradation, harming soil fertility. Commercial farming methods are causing the erosion of fertile soils into Lake Kyoga and the Nile River. The Mbale municipality of Bugisu has measured 59.7 mg of dissolved solids per liter of water.⁵ Most water is too contaminated to drink without treatment, which has spillover effects for human health and security.

The contribution of agriculture to Gross Domestic Product in Uganda has been shrinking: from 45.7% of GDP in 1995-96 to 41.5% in 1999-2000.⁶ Total cultivated land in Uganda began to decline in 2008.⁷ Today 90% of all vegetables consumed in Uganda are bought from Kenya.⁸ These indicators do not signal a more diversified economy, but rather the exacerbation of various challenges to agricultural production.

Ugandan agricultural production is starved of new sources of knowledge and technology, it is undercapitalized, and farm work is increasingly left to an ageing population as youth migrate

⁴ Amadou Makhtar Diop. "Yes, Africa can feed itself – through a sustainable agriculture revolution." Rodale Institute. 09 Aug. 2007. Web. 24 Apr. 2010.
<http://newfarm.rodaleinstitute.org/international/features/2007/0807/biodiverseafrica/diop.shtml>

⁵ Stephen G. Bunker. *Peasants against the State: the Politics of Market Control in Bugisu, Uganda, 1900-1983*. Chicago: University of Chicago, 1991.

⁶ Gerald Tenywa. "Uganda: Nation Facing Food Crisis." New Vision. 19 March 2011.

⁷ Gerald Tenywa. "Uganda: Nation Facing Food Crisis." New Vision. 19 March 2011.

⁸ Ronald Kalyango. "Kabale introduces greenhouse farming." New Vision. 9 February 2011.

to Kampala. Agricultural labor has traditionally been used as punishment for prisoners and delinquent schoolchildren, therefore it is perceived by youth as an undesirable profession.⁹ Youth are also lured to urban areas by better water and electrical services. However, after they leave the agricultural sector most young people do not substantively contribute to the productivity of other Ugandan industries. Instead they “chase deals” looking for quick money selling land or cars, or they join the overloaded ranks of *boda-boda*¹⁰ drivers. (See Image 2, below). Still others abandon productive work for alcohol consumption and drug abuse.¹¹

Image 2: Boda-boda stage, Kampla, Uganda

⁹ “Make agriculture an attractive enterprise to the youth.” Daily Monitor. 29 September 2010.

¹⁰ *Boda-boda*: a motorcyle taxi.

¹¹ Gerald Tenywa. “Uganda: Nation Facing Food Crisis.” New Vision. 19 March 2011.



Those people who remain farming fail to access profitable hotel and grocery store markets because they lack the capacity to pick, clean and package vegetables.¹² Many also lack the knowledge capital required to attain high productivity in agriculture. The report of the Ugandan Agricultural Sector Investment Plan for 2009 to 2014 discovered that research stations have failed to transfer knowledge of high-yielding agricultural practices to farmers. Smallholder farm bean yields are 356 kg/ha, but research station yields reach 800 kg/ha. Smallholder banana yields average 1,872 kg/ha, while research stations achieve 4,500 kg/ha. This transfer problem highlights the large unrealized potential smallholders have to produce food for home consumption and remain with a surplus to export.

Even when farmers have some agricultural knowledge, they still struggle to purchase technology that would improve risk management and boost yields. Chemicals used to protect

¹² Ronald Kalyango. "Kabale introduces greenhouse farming." New Vision. 9 February 2011.

crops from pests and diseases constitute a sizeable expense.¹³ Irrigation can ensure food security in the case of drought, but less than 1% of ordinary Ugandan farmers, and 5% of commercial farmers irrigate their land, due to the cost of irrigation systems and lack of technical knowledge.¹⁴ Climate change has exacerbated the problem of drought in Uganda. Last year some parts of Teso and Karamoja experienced famine when the March-May rainy season failed to occur at all.¹⁵

Even when there is no drought, people are unable to grow or access sufficiently nutritious food. According to the Uganda Demographic and Health Survey Report of 2007, 20.4% of children in Uganda below 5 years of age suffer from vitamin A deficiency (VAD), 73% suffer from Iron Deficiency Anemia (IDA) and 60% suffer from various Iodine Deficiency Disorders (IDD). One out of every five women of reproductive age suffers from vitamin A deficiency and 41% suffer from iron deficiency anemia. These micronutrient deficiencies have negative development implications: they contribute to impaired immunity and cognitive function, growth failure and increased morbidity and mortality.¹⁶ In its current state, Ugandan agriculture fails to offer many people food security, attractive jobs, or lasting environmental resources.

Statement of Objectives:

This study attempts to answer the question: How can agricultural development lead to a high quality of life? To this end the researcher had the following objectives.

¹³ Stella Naigino. "My family had written me off as a useless chap." New Vision. 21 February 2011.

¹⁴ Joshua Kato. "Irrigation: The missing link to hunger solutions." 26th January, 2010.

¹⁵ Joshua Kato. "Irrigation: The missing link to hunger solutions." 26th January, 2010.

¹⁶ B:T. Kiremire, et. al. "Effects of vegetable drying techniques on nutrient content: a case study of South-Western Uganda." *African Journal of Food, Agriculture, Nutrition and Development* 10.5 (2010): 2587+. *Academic OneFile*. Web. 29 Mar. 2011.

http://find.galegroup.com.ezproxy.middlebury.edu/gtx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T002&prodId=AONE&docId=A233125124&source=gale&srcprod=AONE&userGroupName=vol_m58c&version=1.0

- To research farmer access to sustainable agriculture techniques and marketing strategies in Mukono, Uganda, and ways access might be improved.
- To assess quality of life in Mukono through both quantitative and qualitative measures, including average yearly income estimates, access to health care and education and farmers' own assessments of their quality of life).
- To make recommendations for how quality of life in Mukono might be improved

Justification for Study

This study focuses on the connection between three development indicators: access to sustainable agriculture, access to marketing strategies and rural quality of life.

Justification for measuring access to sustainable agriculture techniques

It is clear that the current agricultural system needs reform. But why select access to *sustainable* agriculture techniques as a quality of life indicator? For Uganda, investment in the United States' energy and input-intensive agricultural model is both environmentally costly and economically unfeasible. The estimated sum of all environmental and health costs connected to recommended levels of pesticide use in the United States is around \$12 billion each year, with an additional \$45 billion in costs associated with soil erosion.¹⁷

Productivity increases cannot be achieved by simply increasing the quantity of land that is under cultivation: the best land is already in use. Sustainable agriculture cultivates existing

¹⁷ D. Pimentel, P. Hepperly, J. Hanson, D. Douds, and R. Seidel. "Environmental, energetic and economic comparisons of organic and conventional farming systems." *BioScience* 55: 573-582.

farmland more intensively, but in a way that can be maintained over time. Sustainable production methods can “deliver increases in food production at relatively low cost,” and they also have the advantage of “low external input technology, environmental conservation, and input/output efficiency.”¹⁸ The Rodale Institute asserts that in developing countries, food production could be doubled or tripled through the use of organic methods by intensifying biological activity through increasing diversification.¹⁹ To diversify entails growing more vegetables and fruits, which are the main sources of important micronutrients that many rural Ugandans lack.²⁰ Another advantage is that many vegetable varieties grow quickly, resulting in rapid investment turnaround for capital-needy farmers. Agricultural risks are also spread across a range of farm enterprises.

In Uganda, Gilbert Bukenya’s one acre, irrigated vegetable farm earns him sh4 million every three months,²¹ and Alex Odyek can earn around sh10,000 a day, even in the dry season, by growing vegetables on small raised beds with efficient irrigation systems.²² (*See Image 3, below*). These two men provide evidence that small-scale diversified vegetable farms in Uganda have the potential to be highly profitable if farmers have knowledge of sustainable techniques.

¹⁸ Amadou Makhtar Diop. “Yes, Africa can feed itself – through a sustainable agriculture revolution.” Rodale Institute. 09 Aug. 2007. Web. 24 Apr. 2010.
<http://newfarm.rodaleinstitute.org/international/features/2007/0807/biodiverseafrica/diop.shtml>

¹⁹ Amadou Makhtar Diop. “Yes, Africa can feed itself – through a sustainable agriculture revolution.” Rodale Institute. 09 Aug. 2007. Web. 24 Apr. 2010.
<http://newfarm.rodaleinstitute.org/international/features/2007/0807/biodiverseafrica/diop.shtml>

²⁰ B.T. Kiremire, et al. "Effects of vegetable drying techniques on nutrient content: a case study of South-Western Uganda." *African Journal of Food, Agriculture, Nutrition and Development* 10.5 (2010): 2587+. *Academic OneFile*. Web. 29 Mar. 2011.
http://find.galegroup.com.ezproxy.middlebury.edu/gtx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T002&prodId=AONE&docId=A233125124&source=gale&srcprod=AONE&userGroupName=vol_m58c&version=1.0

²¹ Joshua Kato. “Irrigation: The missing link to hunger solutions.” 26th January, 2010.

²² Titus Kakembo. “Odyek earns sh10,00 daily from kitchen gardening.” *New Vision*. 21 February 2011.

Image 3: Irrigated raised-bed vegetable farming



Justification for measuring access to marketing strategies

However, knowledge of sustainable agriculture techniques is not enough: farmers also need access to marketing strategies in order to promote their products and obtain fair prices. This is the reason that access to marketing strategies has been selected as the second development indicator. There is a ready market for vegetables in Kampala and the Middle East. Given the right marketing knowledge, Wakiso, Mukono and Luweero residents could all successfully target year round vegetable production to customers in these places.²³

Justification for measuring quality of life

The relevance of access to sustainable agriculture techniques and marketing strategies to a population must be assessed against another development indicator. This study has decided to use quality of life instead of a strictly economic metric. This poses an assessment challenge:

²³ Joshua Kato. "Irrigation: The missing link to hunger solutions." 26th January, 2010.

quality of life is a value-based standard with many potential components. However, recent literature has criticized more traditional economic measures of development for overlooking some important aspects of human welfare.

Traditionally poverty has been defined as a state of low income: a person is poor if he is living on less than USD 2 a day, and is in extreme poverty if he subsists on less than USD 1. While wealth is often a good indicator of other measures of quality of life, such as access to food, health care, education, gainful employment, family and leisure time, Amartya Sen demonstrates there is not always a correlation. In his book *Development As Freedom*, Sen calls for a broader view of poverty as “capability deprivation” and development as “a process of expanding the real freedoms that people enjoy.”²⁴ Sen points out that income and wealth are “admirable general-purpose means for having more freedom to lead the kind of lives we have reason to value,”²⁵ yet they are not ends unto themselves, and other factors influence quality of life.

As a result, this study will attempt to examine quality of life through a range of variables, including access to quality education and health services, leisure time, participant self-assessment of quality of life, and average annual income.

Methodology

I used both quantitative and qualitative measures. The quantitative questions allowed me to make easy comparisons across the whole sample group, while the qualitative questions

²⁴ Amartya Sen. *Development as Freedom*. New York: Knopf, 1999. Print. Introduction, Chapter 4.

²⁵ Sen, Amartya. *Development as Freedom*. New York: Knopf, 1999. Print. p. 14.

provided farmers with the space to share their individual perspectives and give more nuanced answers.

My field research was based upon two distinct methods of qualitative and quantitative inquiry: observation and individual interviews.

I observed farms, farming practices and the living situations of interviewees. This method was valuable because I witnessed firsthand the agricultural techniques farmers described to me, and all the information I received in farmer interviews was further reinforced. I was able to make my own assessments for indicators such as plant and animal health, soil erosion potential and housing quality.

I interviewed 29 people in two parishes that are close to Mukono town in Mukono district, Uganda. The subjects in both Katente Parish and Namuyenje Parish were members of farmer producer groups and had some relationship with VEDCO. By focusing on two parishes I made sure that my area of data collection was narrow enough to draw meaningful conclusions, but also broad enough to permit some cross-parish comparisons.

My interviews were guided by two consistently used research questionnaires. (*See Appendices A, B, and C: Informed Consent Form, and Research Questions Forms 1 and 2*). This allowed me to obtain a diversity of responses on each topic. However, I also remained flexible, diverging from the questionnaire if a subject's response opened up a new field of inquiry.

The interview questionnaire I used as a guide covered basic household demographic information, knowledge of agricultural techniques and challenges, knowledge of marketing strategies and challenges, and quality of life indicators.

Both qualitative and quantitative questions were used. For example, to measure quality of life farmers were asked to estimate their average yearly household income and to indicate whether or not they paid for private education and health care or used the free, but lower-quality, government services. These quantitative measures were supplemented by asking farmers to pick one of five words that best described their quality of life, and then explain the reasons for their choice.

Methodology Challenges

My access to the field depended on the incredible generosity of VEDCO, who as an organization was invaluable in arranging farmer introductions, transport to hard to access areas, and Luganda-English translations. It is important to recognize the research perspective that comes with such support. Since VEDCO staff served as my translators, farmers, as beneficiaries of VEDCO's work, may have been reluctant to criticize VEDCO's programs.

I tried to allay this possibility as much as possible by explaining verbally and in my written consent form that farmers could feel free to say whatever they wished without consequence, and that they could refuse to answer any question. I also tried to phrase questions in ways that would give farmers room to criticize their current agricultural system without directly critiquing VEDCO.

For the most part I believe these measures to have been successful. There were farmers who freely voiced critiques of VEDCO's interventions, for example noting no change in their income or claiming no knowledge from VEDCO of marketing strategies.

I have provided background information on VEDCO hereafter so that its organizational role and influence in Mukono might be better comprehended.

Background on VEDCO:

Mission and Objectives

Volunteer Efforts for Development Concerns (VEDCO) is a Non-Governmental Organization indigenous to Uganda whose mission is to improve the quality of life of small and medium holder farmers. It was established in 1986 in Luwero in response to the challenges of poverty that resulted from the social and economic disruptions caused by the military conflicts in the region from 1980-1986. Today VEDCO continues to work to improve farmer income, agricultural productivity and food security.

Organizational Structure

A seven-member board of directors guides VEDCO. Members are professionals in various fields and offer both strategic direction and technical guidance. VEDCO has a head office in Kampala, the capital city, along with regional offices in Kamuli, Kikoma Wobulenzi and Mukono. An executive director runs VEDCO, and receives support from managers, regional team leaders, project coordinators, program officers, assistant program officers and support staff.

Funding Sources

VEDCO receives both financial and technical assistance for their programs from a variety of partners. These include the Netherlands Organization for International Development (NOVIB), Iowa State University, HIVOS, the Maendeleo Agricultural Technology Transfer Fund-Farm Africa, the European Development Fund, Plan International Uganda, Concern Worldwide and Norwegian Friends of Uganda. VEDCO is currently partnering with HarvestPlus for one of their principal programs: a plan to introduce Vitamin A rich orange-fleshed sweet

potatoes into local farms and markets. The McKnight Foundation is providing support for two other main VEDCO initiatives: the introduction of amaranth, a high protein grade, and a poultry project targeting specifically women farmers. VEDCO works with farmers in the research area of this study, and supported the researchers' efforts to assess access to sustainable agricultural knowledge, marketing strategies and quality of life.

Findings and Discussion:

Demographic Information

The research area was Katente and Namuyenje parishes in Mukono subcounty. All the farmers interviewed members of two producer groups that VEDCO works with. 29 farmers were interviewed, 5 men and 24 women. The greater number of women is a reflection of the focus of VEDCO donors on female empowerment. 19 farmers are from Katente and 10 from Namuyenje. 26 subjects have spouses who also farm, and 3 are widows. Farmer ages range from 24 to 74. The average farmer age is 46.

The farmers interviewed have worked with VEDCO for different amounts of time: from as few as two years to as long as 10. The median number of years the relationship has existed is 5. Farmers spend an average of 6 hours a day doing farm work, 6 days a week. Sunday is typically a day for church and rest. The farmers have a wide range of years of formal education, from no schooling to having completed the equivalent of high school in the United States. No farmers interviewed have attended or completed university, and the average number of years of education is 7. On average farmers are responsible for the care of seven children, usually a mix of biological children, the children of relatives, and grandchildren.

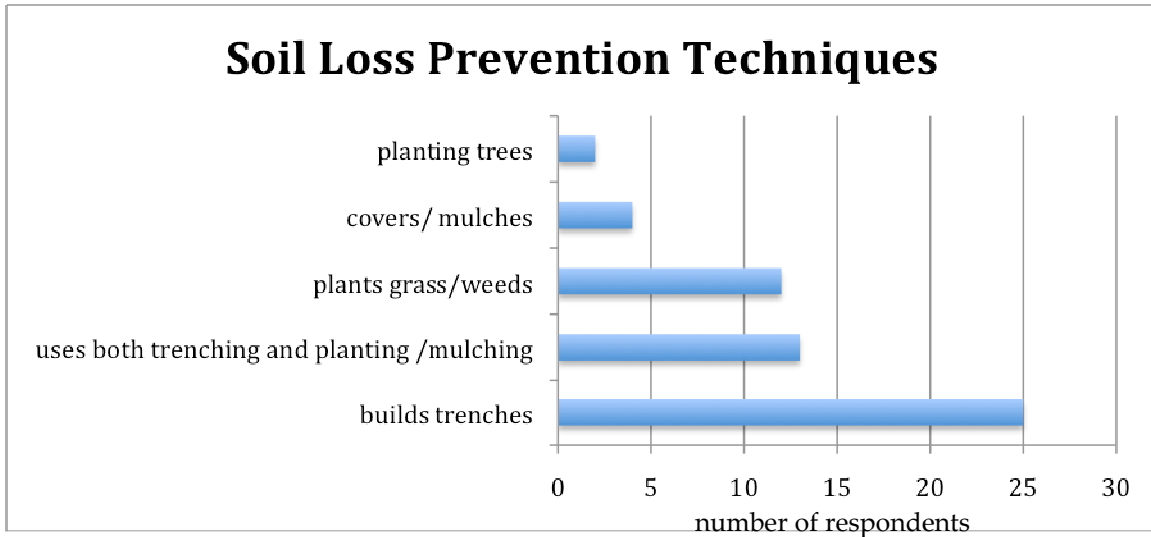
Land ownership varies greatly amongst the farmer population. One farmer owned only the land around her house, while another had 50 acres. Average land ownership is 6.25 acres. 17% of farmers also rent land, and another 14% use additional land that they do not own without charge. The average amount of land under cultivation is 3.8 acres. The average amount of land used to keep animals is 2.4 acres. Many farmers whose principal enterprise is a poultry operation keep their birds contained in houses and do not consider the space used for poultry to be significant.

Access to knowledge of sustainable agricultural techniques:

Knowledge of sustainable agricultural techniques was strong in some areas of farming and weak in others. All farmers had at least some knowledge of how to prevent soil loss and increase soil fertility.

Digging trenches to collect rainwater soil runoff was by far the most common soil loss prevention practice, employed by all but one farmer. 50% of farmers used trenching in conjunction with another method of soil preservation, such as planting trees, planting grasses, or mulching. (See Figure 1, below). While these results are positive, much more knowledge could be transferred about the benefits of intercropping avocado or banana trees with beans and sweet potatoes, and of planting grasses between crops. These planting-based methods of soil loss prevention have advantages over trenching alone. Additional plant roots do not just hold soil in place: cover crops that are tilled into the soil while still green can improve nitrogen content, providing a cheap natural fertilizer. Greater crop diversity often also aids in disease resistance. Farmer yields would likely improve through increased knowledge transfer about soil loss prevention.

Figure 1: Soil Loss Prevention Techniques



Similarly, all farmers have at least one method to increase soil fertility, but the majority of farmers are limited to the use of animal manures. 29% of farmers use a system of compost pits, which allows for some fertilizer diversity: both weeds and manure are added to the heaps. (See Figure 2, below). Most farmers gave VEDCO credit for their knowledge of the use of animal manure or the compost pit system, seeing it as a way to increase yields without taking on the external input costs of chemical fertilizers. Although results in this area are highly positive, more knowledge could still be transferred about how plant compost could complement the use of animal manures, and about how certain crops, like beans, can be planted to add nutrients to the soil. No farmers mentioned crop rotation as a soil fertility technique.

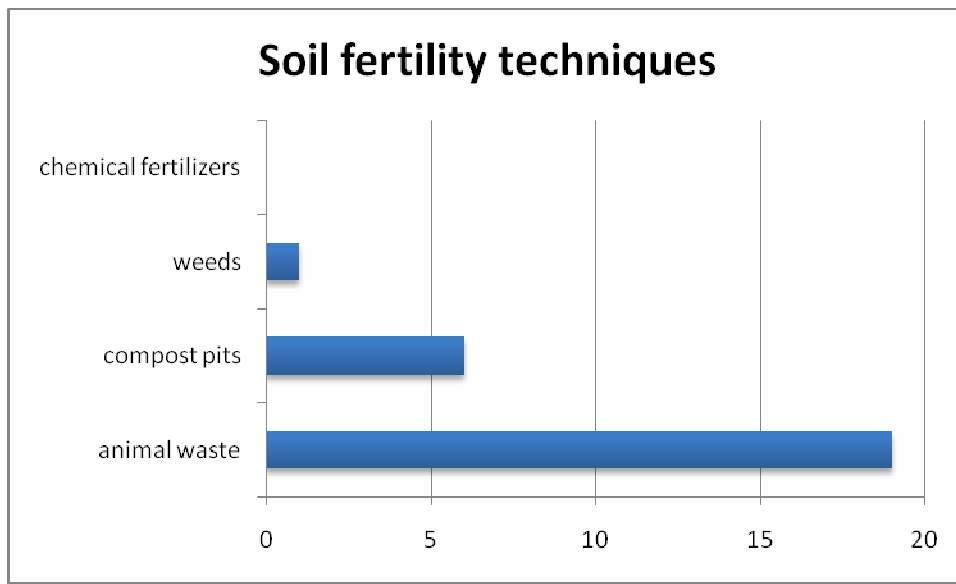
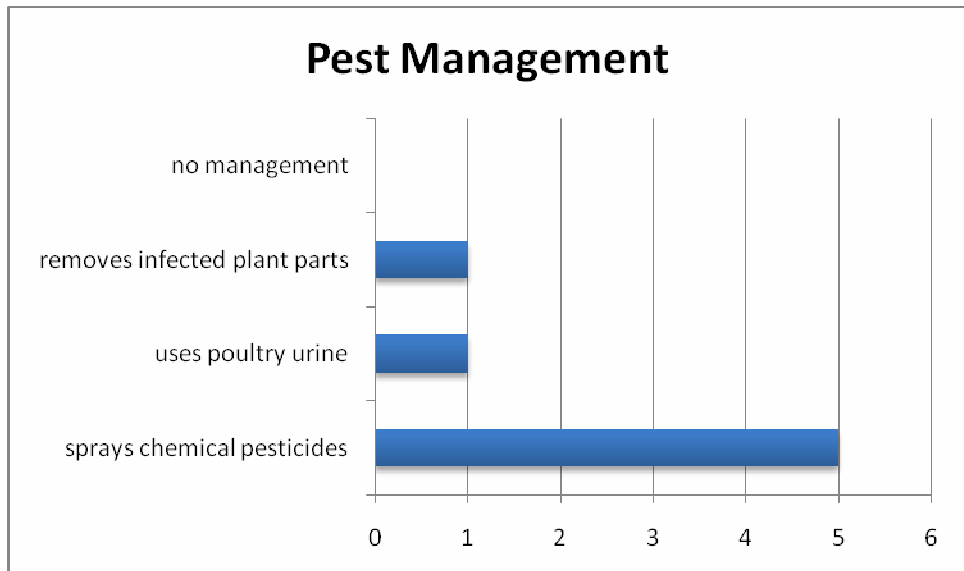


Figure 2: Soil Fertility Techniques

number of respondents

By far the weakest area of sustainable agricultural knowledge amongst farmers was pest and disease management. For 62% of farmers, the main method of pest control is to purchase chemical insecticides, a practice that can lead to financial, environmental and health burdens. Only 19% of farmers make insecticides themselves from natural ingredients such as ash, red pepper and animal urine. Another 23% of farmers cannot afford to purchase pesticides and do not use homemade sprays. (See Figure 3, below). Pest management is a potential area of knowledge transfer. However, this knowledge transfer would also have to be accompanied with research to determine the most effective methods of pest control that use low cost sustainably produced ingredients.

Figure 3: Pest Management



number of respondents

In regards to weed control, 31% of farmers use chemical herbicides, which also is not a sustainable environmental strategy in the long term, even if farmers may safely bear the financial burden. The other 69% of farmers cannot or will not purchase herbicides, instead weeding manually.

Manual weeding has its costs and benefits. Weeding manually is not necessarily a bad strategy if labor is directed to a small amount of land that is managed intensively for high yields and profits. However, the average age of farmers is 46. When they were asked about how they would like their farm to be in the next ten years, many farmers worried about the need for continued physical labor with their advancing age. It is also not clear that any farmers recognized the value of a few well-managed (and manageable), high-yielding acres. All farmers said that they hoped to expand their farm in some way in the next ten years: more chickens, more cows, more land under cultivation. Farmers do benefit from economies of scale when they buy more chicks. However, increased cultivation tends to imply increased labor, or decreased yields as land is managed less intensively. Most farmers are not aware that it is possible to maintain a highly productive low acreage farm.

Farmers could also receive simple tools, like the scufflehoe, that would make the manageable amount of weeding required on a low acreage farm much more efficient. In the

photo below, instead of bending down and pulling out every weed by hand, farmers simply run this tool along the ground, uprooting small weeds as they walk. (*See Image 4, below*). The cost of this simple labor-saving device is worth looking into. Individual farmers or producer groups might bear a share of the price with VEDCO or other donors in order to increase their sense of ownership, and guarantee their investment in its use.

Image 4: Scuffle hoe



Agricultural Risks and Risk Management

Farmers in Katente and Namuyenje identified five main agricultural risks that they face: drought, animal sickness, heavy rain and wild animals. (*See Figure 4, below*). Out of all these risks, drought affected the most farmers (81%). Of the farmers who identified drought as a problem, only two have access to a small wetland area that they could use for irrigation during the beginning of the dry season. Both of these farmers stated that their wetlands are not sufficient to last through entire drought periods. A few farmers try to mitigate the effects of drought by timing their planting based on historical patterns, covering their soil, or planting fast growing trees to attract more rain. While positive, these measures are insufficient protection against crop loss from drought, and 71% of farmers take no steps to manage drought risk. (*See Figure 5,*

below). Several farmers saw a link between irrigation systems and increased food security during times of drought, but noted that they lacked the capital to purchase irrigation for their farm.

Figure 4: Agricultural Risks

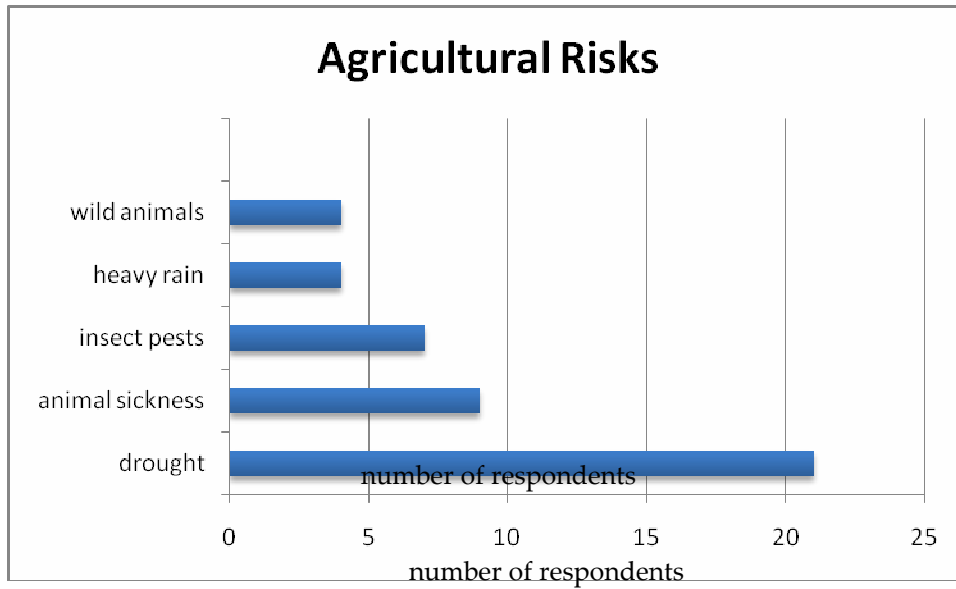
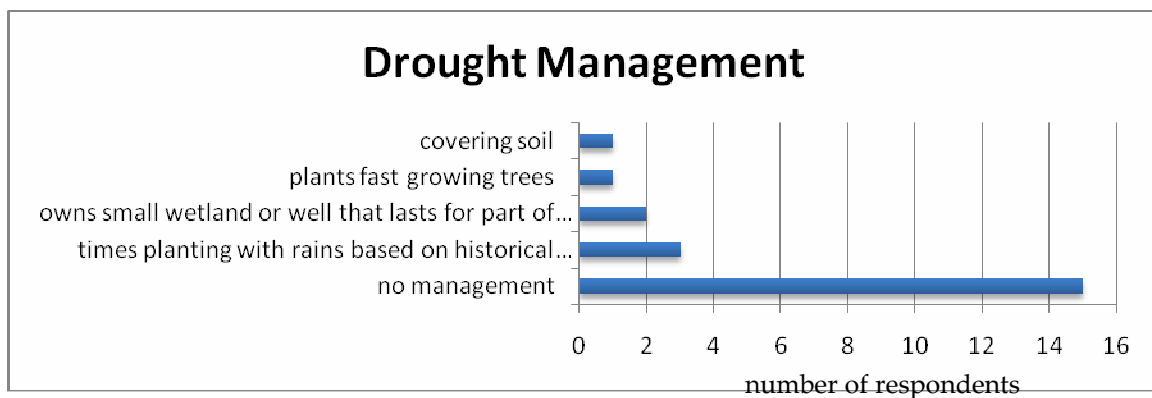


Figure 5: Drought Management



majority of farmers complained of any other

agricultural risk. Animal sickness and insect pests were the next highest risks, identified as issues

by 35% and 27% of farmers respectively. While still agricultural challenges, farmers seemed

Less
than
a

better able to defend themselves against risks. All farmers purchase medicines and vaccinations for their animals, and either spray or manually remove diseased plant parts.

Heavy rain and wild animals were also identified as agricultural risks by 15% of farmers. No farmers had ways of managing the risk posed by rains. Half of the farmers who faced damages from wild animals used dogs as a deterrent; the other half had no management strategy.

Access to Marketing Strategies

No matter how productive and environmentally sound a farm is, or how well it a farmer can manage agricultural risks, the farmer's livelihood will not be self-sustaining itself unless it is also financially stable. Knowledge of marketing strategies is essential. Farmers must have successful ways to find buyers and transport crops.

Farmers were asked what marketing strategies they had learned from VEDCO. 75% mentioned collective marketing, 30% said how to find buyers and 10% added recordkeeping. 20% of farmers surveyed were unable to identify any marketing strategy that they learned from VEDCO.

Marketing Challenges

The marketing issue most commonly identified by farmers was that they received low prices for their products, especially for eggs. (*See Figure 6, below*). Similarly, the second most common issue was that high input costs, particularly for chicken feed, led to low profits. Some farmers were able to offer reasons for the low market prices. One suggested that having too many suppliers of eggs drives the prices down. Another farmer noted that because he lacks long-term storage facilities he faces pressure to sell crops like corn before they spoil, which reduces

his power to negotiate better prices. Several farmers pointed to the middlemen: because they often lack vehicles to transport goods to markets they depend on traders who come to their farms, and these traders do not always offer fair prices for their goods. Most farmers did not suggest an explanation for the low prices they faced.

Not all farmers identified issues with marketing their products. 20% of farmers said they faced no marketing challenges, and some farmers considered selling their products to traders from their homes to be a time and labor-saving strategy.

Figure 6: Marketing Challenges



actively seek buyers and fair prices, and in educating producer groups about the increased bargaining power that comes with collective marketing. The majority of farmers have undoubtedly benefited from these efforts; however, the complaints made by some farmers of a

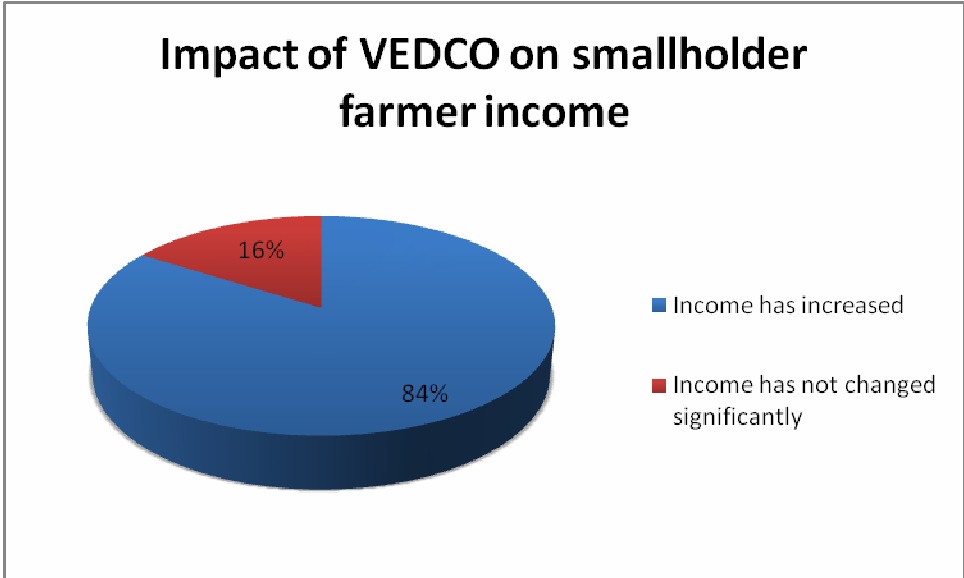
lack of markets suggests that there are some inconsistencies which could be remedied through additional trainings and check-ins.

More than an issue with marketing strategies, the complaints of low prices, high input costs for poultry feeds, and too many suppliers of eggs suggest deeper problems with the poultry project that need to be addressed.

Impact of VEDCO

It seems that VEDCO’s involvement has so far been a net benefit to Namuyenje and Katente parishes. 84% of farmers stated that their income has improved since they began working with VEDCO, although not all were able to quantify this assertion. (See Figure 7, below). Although they were asked to estimate an amount that their income had changed by, those who could quantify the improvement in their livelihoods insisted on doing so in different ways, making comparative data analysis difficult.

Figure 7: Impact of VEDCO on smallholder farmer income



Four farmers said that through VEDCO they had achieved food self-sufficiency: they produce everything they eat, creating a lot of savings. Another woman said that before VEDCO she had not been able to afford school fees for all of her children, but now she could. One farmer said that it was difficult for her to estimate by how much her average yearly income had changed, but that before VEDCO she never had UGX 100,000 in her pocket at any one time and now she has over UGX 1 million in personal savings. Another farmer estimated that her income had improved by 2 million since her work with VEDCO. Others were only able to make monthly comparisons. One farmer's income has increased from UGX 100,000 to 300,000 per month, another from UGX 20,000 to 60,000 monthly. Several farmers were not able to quantify what their incomes were before VEDCO, only that their income was "small," and had improved, to either UGX 10,000 to 15,000 a day (2 farmers) or UGX 40,000 a day (1 farmer). For one farmer, the most noticeable improvement in her income since VEDCO was that she had been able to save the money to buy a new house with better materials. *(See Images 5 and 6).*

Image 5: Janet Jjuko's old house, at the beginning of her work with VEDCO



Image 6: Janet Jjuko's new house, after working with VEDCO



Quality of Life

Four quality of life indicators were used in the study: average yearly income, use of private or public health and education services, and farmer self-assessment of life quality.

It was difficult for many farmers to estimate their average yearly income. Most do not keep detailed records of earnings and expenses, and all farmers experience fluctuations on earnings based on seasonal farming opportunities, weather events and other agricultural disturbances.

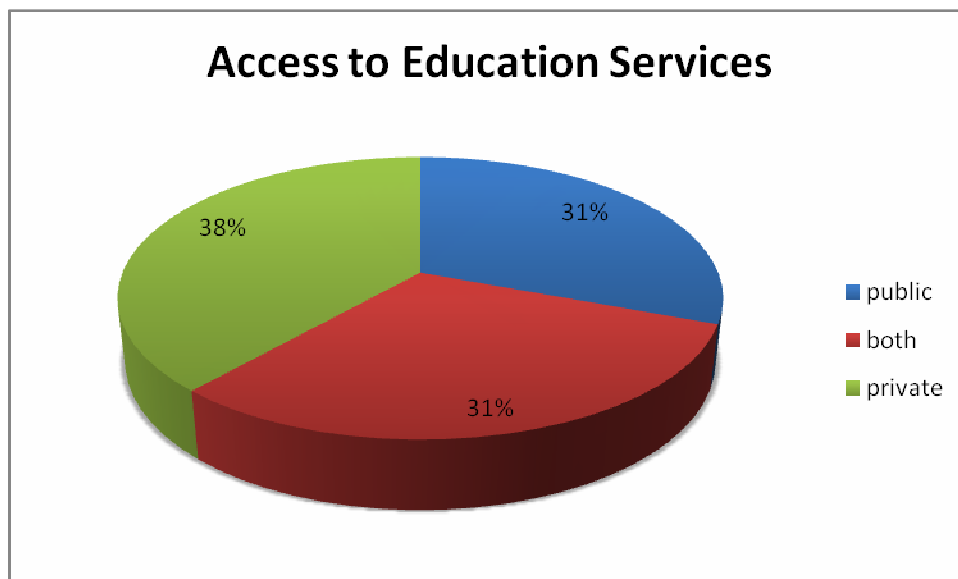
As a result, not all farmers would supply a figure. Of those who were able to estimate their earnings, average farmer yearly income is UGX 2 million. Median income is UGX 1,000,000.

Due to the estimated nature of these numbers, and the inability of some farmers to provide a response, average yearly income data is a useful but insufficient measure of household poverty.

Two other questions provided a more complete picture of what standards of living households could afford. Farmers were asked if they sent their children to private or public schools and if they used private or public medical care. In Uganda the private health care and education systems are considered superior to the government versions: therefore, anyone who can afford to chooses the private options for reasons of “quality” and “value”.

The education results were nearly evenly divided: eight respondents send all their children to public schools, ten send all their children to private schools, and eight send some of their children to private and some to public depending on the child’s potential and what they can afford. (See Figure 8, below).

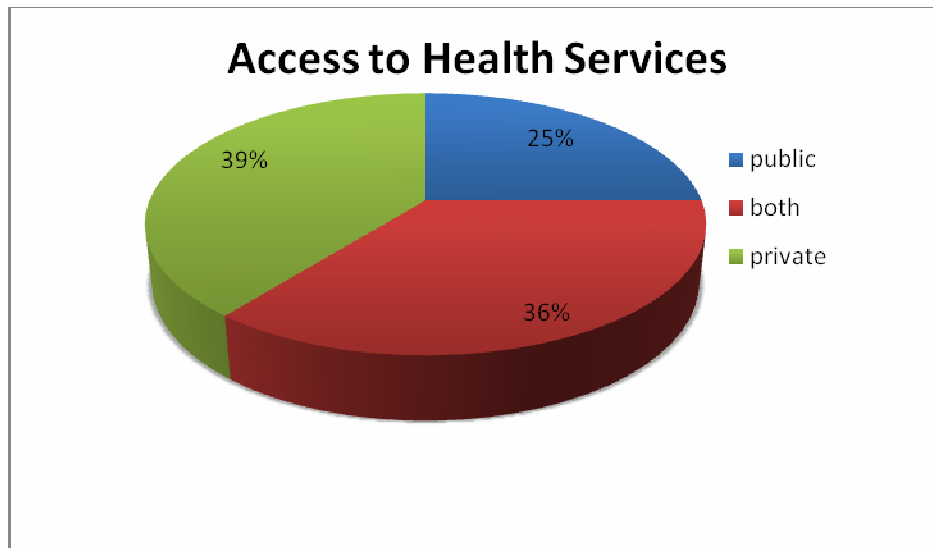
Figure 8: Access to Education Services



When it comes to medical care eleven respondents always use private, seven always go to public facilities, and ten use both public and private depending on the seriousness of the case.

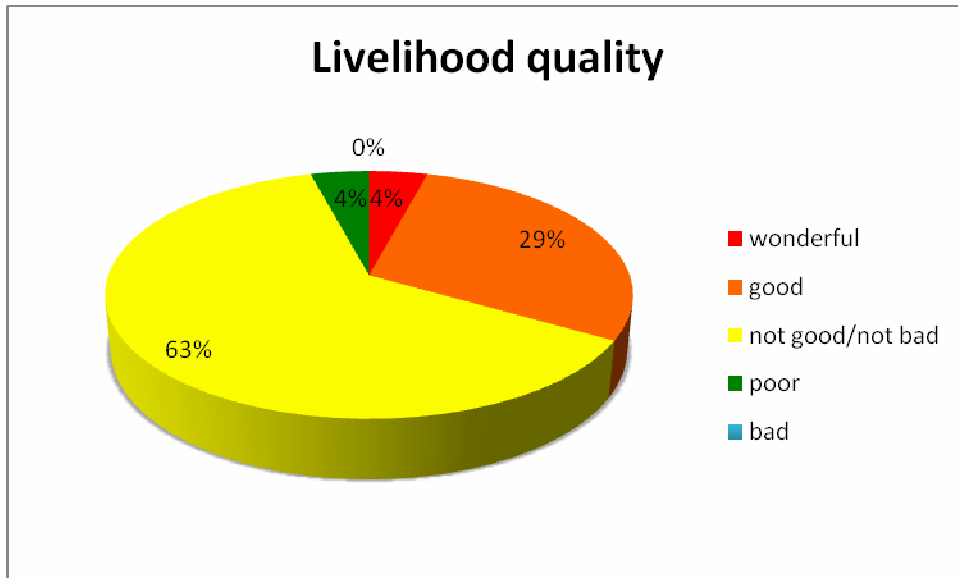
(See Figure 9, below).

Figure 9: Access to Health Services



When they were asked to assess their own quality of life, 52% of respondents put themselves squarely in the middle at “fair.” *(See Figure 10, below).* Most in this category added that things could be better, but that they were able to grow or buy most of the things that they needed. Other possible answers were wonderful, good, poor, and bad. Only one respondent classified her income as worse than “fair”, at “poor.” The reason this elderly widow gave was that she was aging and had a low income. Only one respondent considered her life “wonderful,” a married woman in her late 20s who is earning UGX 1 million and whose husband also brings in money. The remaining 24% of respondents classified their lives as good.

Figure 10: Livelihood quality



When asked why they considered their quality of life “good”, some gave similar answers to those who had put themselves in the “fair” category: the crops and income they earn through farming permit them to eat well and buy what they need. One woman stated that her quality of life is good because VEDCO’s involvement has helped her to have a more successful business. Another woman told how she used to have to ask her husband for money when she wanted to eat beef. Now, with the introduction of VEDCO’s poultry and sweet potato projects, she says, “I am proud because I am earning.” If she wants to eat beef, she takes the money she has earned and she goes and buys it.

Conclusions:

Quality of life for the majority of Katente and Namuyenje residents is fair, measured by their own self-assessment, income levels and access to health and education services. Most farmers have some knowledge of sustainable agriculture techniques and marketing strategies, and VEDCO’s knowledge transfers and poultry and orange sweet potato projects have undoubtedly benefited the majority of farmers. More can still be done to increase farmers’

knowledge of sustainable agriculture techniques and marketing strategies. There is a need for more technology transfers: irrigation systems, scufflehoes, and food storage and processing centers would all save labor and increase profits. When asked what had hindered her quality of life in the past, one farmer, Rose Kiwanuka, responded: “Ignorance. The only limit was knowledge.” Although there are many obstacles VEDCO and farmers will face as they continue their work, I remain hopeful about the future as long as agricultural and marketing knowledge continues to spread.

Recommendations:

It is important to recognize that the following recommendations are made after only five weeks of research in Mukono district. I likely do not perfectly comprehend all the challenges faced by farmers, or all the resources they possess to their advantage. I also am surely not aware of all the obstacles that stand in the way of implementing my recommendations. All the same, after my five weeks of research here I do have some ideas for ways VEDCO might continue to improve the quality of life of Mukono smallholders.

I have divided my recommendations into agricultural and marketing recommendations.

Agricultural Recommendations:

Increase farmer knowledge of sustainable agriculture methods and technologies

- Conduct more trainings and workshops that transfer knowledge of diverse soil fertility techniques and soil loss prevention techniques.

- Research pest management techniques (or consult with research stations in Uganda run by NARO or NAADS) in order to pinpoint effective, environmentally sustainable and inexpensive methods of pest control that can be transferred to farmers.
- Look into potential sources of funding for irrigation systems. Drought is the risk identified by the most farmers in Katente and Namuyenje. The presence of irrigation systems would minimize crop loss, increase food security, and improve the ability of farmers to grow year round, providing them with a more continuous income stream.
- Examine and address the flaws of the poultry project. Feed and medicine costs are high and prices are low. Is there a way for farmers to grow their own feeds? Could collective bargaining mechanisms be strengthened? Is more diversification into other enterprises needed?
- Promote the idea that low acreage, high yield vegetable farming can be extremely profitable, and that simply expanding existing operations is not always a way to improved livelihoods. Assist farmers in attaining the sustainable agriculture knowledge and technology (like irrigation systems) that would allow them to design this kind of farming enterprise.

Marketing Recommendations

- Continue to train farmers in bookkeeping and recordkeeping. Encourage farmers to view their occupation as a business enterprise and to constantly assess the profitability of their methods.

- Research possible sources of funding for the construction of grain and corn storage centers collectively owned and operated by the Katente and Namuyenje producer groups. By eliminating fear of spoilage and pressure to sell immediately, farmers could bargain for better prices or sell in times of scarcity.
- Research possible source of funding for the construction of processing centers that would allow producer groups to engage in the production of more value-added products. Possibilities include but are not limited to: cassava flour, sweet potato flour, pancakes and other breads and cookies. These products could likely be sold at higher prices than in their unprocessed forms.

Bibliography:

Primary Sources

- Bateesa, Kenneth. "Entrepreneurship Development in Uganda." Lecture. Makerere University. 11-3-11.
- Buyondo, Charles. 52. Interview. Katente. Luganda to English translation by Crespo Mubbalya. 20-4-11.
- Gava, Dezy. 35. Interview. Katente. Luganda to English translation by Crespo Mubbalya. 1-4-11.
- Gombi, Henry. 44. Interview. Katente. Luganda to English translation by William Lubwama. 12-4-11.
- Huve, Peter Alphonse. 69. Interview. Namuyenje. Luganda to English translation by Crespo Mubbalya. 14-4-11.
- Jjuko, Janet . 52. Interview. Katente. Luganda to English translation by Crespo Mubbalya. 1-4-11.
- Kafero, Bena. 53. Interview. Namuyenje. Luganda to English translation by Crespo Mubbalya. 14-4-11.
- Kaizuka, Edith . 45. Interview. Katente. Luganda to English translation by Crespo Mubbalya. 1-4-11.
- Kakoba, Edith Sanyu. 74. Interview. Namuyenje. Luganda to English translation by Crespo Mubbalya. 18-4-11.
- Kalya, Agnes. 39. Interview. Katente. Luganda to English translation by Crespo Mubbalya. 20-4-11.
- Kanyike, Proscovia. 61. Interview. Namuyenje. Luganda to English translation by Crespo Mubbalya. 18-4-11.
- Kigonge, Dodovico. 58. Interview. Katente. Luganda to English translation by William Lubwama. 12-4-11.
- Kiwanuka, Rose. 52. Interview. Katente. Luganda to English translation by William Lubwama. 12-4-11.
- Luyombia, Barbara. 24. Interview. Katente. Luganda to English translation by Crespo Mubbalya. 20-4-11.
- Mawanda, Christine. 40. Interview. Namuyenje. Luganda to English translation by Crespo Mubbalya. 14-4-11.
- Mukasa, Rosie. 40. Interview. Namuyenje. Luganda to English translation by Crespo Mubbalya. 14-4-11.

- Mutumba, Sarah. 56. Interview. Katente. Luganda to English translation by Crespo Mubbalya. 1-4-11.
- Naigino, Joel. 65. Interview. Katente. Luganda to English translation by William Lubwama. 12-4-11.
- Nakabugo, Margaret . 39. Interview. Katente. Luganda to English translation by Crespo Mubbalya. 1-4-11.
- Nakamati, Joyce. 42. Interview. Namuyenje. Luganda to English translation by Crespo Mubbalya. 18-4-11.
- Naluwama, Justine. 37. Interview. Katente. Luganda to English translation by Crespo Mubbalya. 20-4-11.
- Namudoo, Rose. 33. Interview. Namuyenje. Luganda to English translation by Crespo Mubbalya. 18-4-11.
- Nanga, Rebecca. 51. Interview. Namuyenje. Luganda to English translation by Crespo Mubbalya. 18-4-11.
- Sendejje, Agness. 40. Interview. Katente. Luganda to English translation by William Lubwama. 12-4-11.
- Ssechinguse, Nalongo. 39. Interview. Katente. Luganda to English translation by Crespo Mubbalya. 20-4-11.
- Ssekiramba, Sarah. 48. Interview. Namuyenje. Luganda to English translation by Crespo Mubbalya. 14-4-11.
- Ssesanga, Harriet . 30. Interview. Katente. Luganda to English translation by Crespo Mubbalya. 1-4-11.
- Sulaimani, Kadda . 36. Interview. Katente. Luganda to English translation by Crespo Mubbalya.
- Teo, Sekinizuu . 52. Interview. Katente. Luganda to English translation by Crespo Mubbalya. 1-4-11.
- Tweheyo, Enid. 28. Interview. Katente. Luganda to English translation by William Lubwama. 12-4-11.

Secondary Sources:

- Bunker, Stephen G. *Peasants against the State: the Politics of Market Control in Bugisu, Uganda, 1900-1983*. Chicago: University of Chicago, 1991.
- Diop, Amadou Makhtar. "Yes, Africa can feed itself – through a sustainable agriculture revolution." Rodale Institute. 09 Aug. 2007. Web. 24 Apr. 2010.

<http://newfarm.rodaleinstitute.org/international/features/2007/0807/biodiverseafrica/diop.shtml>

Kakembo, Titus. "Odyek earns sh10,00 daily from kitchen gardening." *New Vision*. 21 February 2011.

Kalyango, Ronald. "Kabale introduces greenhouse farming." *New Vision*. 9 February 2011.

Kato, Joshua. "Irrigation: The missing link to hunger solutions." 26th January, 2010.

Kiremire, B.T., et al. "Effects of vegetable drying techniques on nutrient content: a case study of South-Western Uganda." *African Journal of Food, Agriculture, Nutrition and Development* 10.5 (2010): 2587+. *Academic OneFile*. Web. 29 Mar. 2011.

http://find.galegroup.com.ezproxy.middlebury.edu/gtx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T002&prodId=AONE&docId=A233125124&source=gale&srcprod=AONE&userGroupName=vol_m58c&version=1.0

Li Ching, Lim. "Sustainable Agriculture Pushing Back the Desert." Institute of Science and Society. Web. <http://www.i-sis.org.uk/desertification.php> accessed 26 April 2010.

"Make agriculture an attractive enterprise to the youth." *Daily Monitor*. 29 September 2010.

Pimentel, D., P. Hepperly, J. Hanson, D. Douds, and R. Seidel. "Environmental, energetic and economic comparisons of organic and conventional farming systems." *BioScience* 55: 573-582.

Naigino, Stella. "My family had written me off as a useless chap." *New Vision*. 21 February 2011.

Ndebesa, Mwambutsya. "Demonstrations Relevant in Improving Food Security." *Daily Monitor*. 24 April 2011.

Sen, Amartya. *Development as Freedom*. New York: Knopf, 1999. Print.

Tenywa, Gerald. "Uganda: Nation Facing Food Crisis." *New Vision*. 19 March 2011.

United Nations Millennium Development Goals report. September 2010.

Appendix A: Informed Consent Form

RESEARCH PARTICIPATION CONSENT FORM

My name is Jessica Ebersole. I am a student at the School for International Training in Development Studies. I want to study the relationship between access to sustainable agriculture techniques, access to marketing strategies and quality of life.

You have been asked to participate in the study because you are a youth or farmer in Mukono/Buikwe district. Participation is entirely voluntary; you may withdraw from the study at any time without consequences. You may also refuse to answer any question without explaining why you don't want to answer. Participation should require about half an hour of your time.

Any information that you choose to give will be treated with confidentiality.

Information will be used for academic purposes only. Results of this study will be summarized in a bachelor's thesis project and may be presented at a conference or in a manuscript for publication.

There are no known major risks or benefits to your participation in the study.

Feel free to ask any questions, about the study at any time. **You may contact the main researcher, Jessica Ebersole at 0781866650 or the investigator's faculty advisor Charlotte Mafumbo 0779518549 if you have any questions or concerns about this study or your rights as a study participant.**

Your signature indicates that you have read and understand the information provided above, that you willingly agree to participate, that you may withdraw your consent at any time and discontinue participation without penalty, that you will receive a copy of this form, and that you are not waiving any legal claims. Thank-you!

Signature

Date

Appendix C: Research Form 2: Study Information

I would like to research the connection between access to sustainable agriculture techniques and marketing strategies and improved quality of life.

Agricultural Risk Management:

1). What are the greatest agricultural risks you face?

2). Do you do anything to manage these risks? Yes No

If yes, please describe what methods you use and how often.

3). What do you want your farm to look like in ten years?

Market Access:

1). What are the biggest challenges you face when you try to sell your products? How do you address these challenges?

2). Do you make any value-added products? Are there any challenges you face that are specific to production and sale of value-added products?

Farmer Relationship with VEDCO:

1). How long have you been working with VEDCO?

2). Has your income changed since you began working with VEDCO? Yes No

Please estimate how it has changed.

4). What agricultural techniques have you learned from VEDCO?

5). What marketing strategies have you learned from VEDCO?

Livelihood Quality:

1). How would you describe your quality of life? Wonderful, good, fair, poor or bad. Please give a reason for your choice.

2). In the future, do you hope to continue farming, or do you want a different job?

3). How would you like to be in a few years? What has prevented you from what you think would be the best quality of life?

Farmer Pride:

1). How many times have you participated in an agricultural/food trade fair?

2). What did you exhibit? Did you exhibit as a group or as a single farmer?

3). Which other activities (agricultural) have you participated in? e.g. NAADs show, district celebrations etc.