

HIV/AIDS AND ARTISANAL FISHERIES NEXUS:
A CASE STUDY OF LAKE VICTORIA KENYA

by

Sheila A. Omom

A Thesis submitted to the Faculty of Graduate Studies of
The University of Manitoba
in partial fulfilment of the requirements of the degree of

Master of Natural Resources Management

Natural Resource Institute

University of Manitoba

Winnipeg, Manitoba

Copyright © 2009 by Sheila A. Omom

THE UNIVERSITY OF MANITOBA
FACULTY OF GRADUATE STUDIES

COPYRIGHT PERMISSION

HIV/AIDS AND ARTISANAL FISHERIES NEXUS:
A CASE STUDY OF LAKE VICTORIA KENYA

by

Sheila A. Omom

A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University of
Manitoba in partial fulfillment of the requirement of the degree

Of

Master of Natural Resources Management

Copyright © 2009 by Sheila A. Omom

Permission has been granted to the University of Manitoba Libraries to lend a copy of this thesis/practicum, to Library and Archives Canada (LAC) to lend a copy of this thesis/practicum, and to LAC's agent (UMI/ProQuest) to microfilm, sell copies and to publish an abstract of this thesis/practicum.

This reproduction or copy of this thesis has been made available by authority of the copyright owner solely for the purpose of private study and research, and may only be reproduced and copied as permitted by copyright laws or with express written authorization from the copyright owner.

Abstract

Since the emergence of HIV/AIDS on the shores of Lake Victoria Kenya in 1985, HIV/AIDS-related illness and mortality has remained highest among fishing communities in this region compared to the rest of the population. The primary purpose of this thesis was to understand the HIV/AIDS and artisanal fishery nexus.

Using a qualitative approach, perceptions of fishers from two local artisanal fishing communities, Kaswanga and Kolunga on Rusinga Island – Lake Victoria, Kenya were collected. The qualitative approach followed Participatory Rural Appraisal (PRA) and the techniques used included; literature review of government and research documents, participant observation, transect walks, semi-structured interviews and focus group discussions. A total sample of 50 respondents from both fishing communities were selected for this study. The respondents were artisanal fishers (fish crews and boat owners), fish processors, village/clan elders, and members of the community (village men and women) and village/clan elders.

The research findings clearly showed that the type of fishery played a role in increasing the fishing communities' vulnerability to HIV/AIDS in that the ban placed on Omena fishing, mainly affecting the Kolunga fishing community, further aggravated their existing poverty situation and made them more susceptible and vulnerable to HIV/AIDS. In addition, the Omena fishing ban in Kolunga resulted in the seasonal migration of fishers and fish processors, which increased their susceptibility and vulnerability to HIV/AIDS. Seasonal migration was not common to Kolunga fishers and fish processors as prior to this ban since they had access to fish all year round. Also, the returns obtained from the fishery played a role in determining the communities' vulnerability. The study found that the Kaswanga fishing community was slightly less vulnerable to HIV/AIDS compared to Kolunga, due to the fact that Kaswanga had access to

the two export fish species (Nile Perch and Tilapia) which translated to substantial returns and somewhat better livelihoods.

As Kaswanga and Kolunga fishing communities were engaging in positive coping strategies to reduce their vulnerability to HIV/AIDS, it was noted that the HIV/AIDS illness and mortality was also pushing them to engage in coping strategies that were ultimately self-defeating and that actually increased their vulnerability. According to the study, it is also clear that learning played a big role in most of the coping strategies adopted. This was explained using two channels of learning; social (community and peer-to-peer) and individual channels of learning. Social learning involved fishers and fish processors and other community members sharing their knowledge and experiences with one another, on ways of dealing with the implications of HIV/AIDS as peers and as a community. Individual learning involved the ability of individual fishers, fish processors, household members and other members of community to obtain knowledge on different coping strategies through their interactions with other members of the community.

The results underscores that emerging issues such as sex-for-fish, sex-for-customer, and tilapia-aphrodisiac phenomenon all contributing to fishing communities' susceptibility and vulnerability to HIV/AIDS.

To alleviate the HIV/AIDS problem in the artisanal fishery sector, this study calls for an holistic approach grounded in prevention, treatment and mitigation strategies that requires full participation of all the artisanal fishery stakeholders, fishing communities, the private sector (middlemen and fish processing factories) and the government.

DEDICATION

To my most dedicated father and mother, Mr and Mrs Omom, and my siblings Dave, Ken and Imelda, I have come this far thanks to your support, encouragement, dedication and love. I owe everything to you.

To my dearest friends, Doreen Mutungi, Kwekwe Kivutha and Lois Ward, thank you for your emotional support and encouragement throughout my masters program.

ACKNOWLEDGEMENTS

I am indebted to all those who through their efforts helped in the success of this thesis. I recognize the fact that God through His own wisdom and guidance made it possible for me to complete my studies successfully.

Thanks to all the residents of Kaswanga and Kolunga who welcomed me into their communities and to everyone who shared time and information for the development of this work. Indeed, without their participation and generosity, the development of this thesis document would have been impossible. My sincere gratitude also goes to the Kenya Ministry of Fisheries, the Kenya Fisheries Research Institute (KEFRI) and the United Nations Environmental Program (UNEP), for helping me gain access to government and statistical data on HIV/AIDS and the fishery sector of Kenya.

I also wish to express my profound gratitude to my advisor, Dr. John Sinclair, for his immeasurable contribution. Thank you for your guidance, attention and inspiration. Without your constructive criticism, this work would not have been possible. I also acknowledge Dr. John Sinclair and Dr. Harry Spaling of Kings University for obtaining funding for my field work. I further acknowledge the invaluable efforts and dedication of my research committee members Dr. Harry Spaling, Dr. Jim Gardner and Dr. Fikret Berkes towards the success of the thesis.

I would have wished to mention the names of all those who contributed to this work but for lack of space; I say thank you and God bless you all.

Table of Contents

Abstract.....	iii
Dedication and Acknowledgement.....	v
List of Figures.....	ix
List of Tables.....	x
Glossary of Terms.....	xi
Chapter 1 - Introduction	
1.1 Context of the Research.....	2
1.2 Kenya's Lake Victoria fishery	3
1.3 HIV/AIDS in Lake Victoria, Kenya.....	6
1.4 Research purpose and objectives.....	8
1.5 Research plan and methodology.....	9
1.6 Contribution to knowledge	9
1.7 Limitations and strengths to the study.....	10
1.8 Organization of thesis.....	11
Chapter 2 - Artisanal fishery practices, management and HIV/AIDS in Lake Victoria, Kenya	
2.1 Artisanal fishers and fishery in Lake Victoria	13
2.2 Fishery management in Lake Victoria.....	15
2.3 Lake Victoria fishery institutions.....	18
2.4 The impact of HIV/AIDS on artisanal fishing and fishery management.....	21
2.5 Social learning and complex resource management issues.....	25
2.6 Summary.....	28

Chapter 3 - Research Approach

3.1 Introduction	30
3.2 Qualitative research approach.....	32
3.3 Participatory approaches.....	33
3.4 Case study as a research strategy.....	34
3.5 Case study site.. ..	35
3.6 Sample selection.....	37
3.7 Research methods.....	40
3.8 Data analysis and verification.....	45
3.9 Ethics approval.....	46

Chapter 4 - Study communities

4.1 Study communities in context.....	48
4.2 The artisanal fishery in Kaswanga and Kolunga.....	53
4.3 Summary.....	63

Chapter 5 - HIV/AIDS and the artisanal fishery in Kaswanga and Kolunga

5.1 Introduction.....	65
5.2 Impact of HIV/AIDS on fishery activities and management efforts in Kaswanga and Kolunga.....	65
5.3 Why fishing communities are more susceptible and vulnerable to HIV/AIDS compared to other occupational groups.....	76
5.4 Coping strategies.....	95
5.5 Learning dynamics and coping strategies.....	100
5.6 Summary.....	103

Chapter 6 - Conclusions

6.1 Introduction.....	105
6.2 Conclusions.....	105
6.2.1 <i>Comparing the HIV/AIDS implications in Kaswanga and Kolunga to other regions in Africa</i>	106
6.2.2. <i>Coping strategies adopted in Kaswanga and Kolunga</i>	108
6.2.3 <i>Learning dynamics and coping strategies</i>	109
6.2.4 <i>Policy interventions and recommendations for fishery management</i>	110
6.3 Future research.....	113
6.4 Concluding thoughts.....	114
References.....	115
Appendix A.....	133

List of Figures

Figure 1. Map of Lake Victoria.....	3
Figure 2. Percentage fish production by fishery area 2007.....	4
Figure 3. A comparison of the Provincial HIV/AIDS prevalence surveillance from ANC and from survey for demographic health.....	7
Figure 4. A simplified schema of the potential impacts of HIV/AIDS on the fishery sector.....	23
Figure 5. Map of Lake Victoria, Kenya showing Rusinga Island.....	36
Figure 6. Map of Rusinga Island showing Kaswanga and Kolunga.....	49
Figure 7. Fish distribution chain in Kaswanga fishing village.....	51
Figure 8. Fish distribution chain in Kolunga fishing village.....	52
Figure 9. The impact of HIV/AIDS on Kaswanga and Kolunga fishing communities at the household, community and sector level.....	66
Figure10. Relationship of factors that contribute to the susceptibility of the two fishing communities' to HIV/AIDS.....	78

List of Tables

Table 1. Sample size and respondents in Kaswanga and Kolunga villages.....39

Table 2. Impacts of HIV/AIDS, coping strategies and channels of learning.....102

Glossary of Terms

BM:	Beach Management
BMU:	Beach Management Unit
FAO:	Food Agriculture Organization
HIV/AIDS:	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
KMFRI:	Kenya Marine and Fisheries Research Institute
KMF:	Kenya Ministry of Fisheries
LVEMP:	Lake Victoria Environmental Management Program
LVFO:	Lake Victoria Fishery Organization
NASCOP:	National AIDS and STI Control Programme
UNAIDS:	Joint United Nations Programme on HIV/AIDS
UNEP:	United Nations Environmental Programme

CHAPTER 1

Photos by Sheila Omom



Top: Kaswanga fishers
Bottom: Fish processor from Kaswanga village

Chapter 1: Introduction

1.1 Context of the Research

According to Verheijen and Minde (2007), the magnitude of the HIV/AIDS pandemic in Africa is linked to the inability of part of the population to maintain a sustainable livelihood. Hence, in the past decade it has become evident that HIV/AIDS-related illness and mortality in Africa are at the highest in fishing communities when compared to the rest of the population (Kissling et al. 2005; Gordon 2005). Allison and Seeley (2004) assert that fisheries management has been stifled in countries where many fishers and fisheries managers (including community leaders) have become ill or died of HIV/AIDS. Studies that have been done on the HIV/AIDS and fishery nexus have reported three major impacts of HIV/AIDS on artisanal fishing activities and fisheries management: over-harvesting of fishery resources; decreased availability of labour and management capacity due to sickness and death; and loss of traditional or indigenous knowledge and skills related to sustainable fisheries management practices (Allison & Seeley 2004; Ternstrom 2005; FAO 2005b; Torell et al. 2006). Allison and Seeley (2004), highlight that the high HIV/AIDS rate in fishing communities undermines the long-term perspective needed for sustainable fisheries management.

In reference to the case studies of Kaswanga and Kolunga fishing communities in Lake Victoria, this study takes on a special significance, because the first cases of HIV/AIDS were recorded in the early 1985 around Lake Victoria, the bordering fishing communities and regions in the countries of Uganda (Rakai District), Tanzania (Mwanza and Bukoba provinces) and Kenya (Nyanza province) (Pickering et al. 1997; Barnett & Whiteside 2002).

1.2 Kenya's Lake Victoria Fishery

Lake Victoria is the largest freshwater lake in Africa and the second largest lake in the world, covering 68,000 km² (Awang'e & Ong'ang'a 2006). The lake is shared by Kenya (6%), Uganda (45%) and Tanzania (49%) (Awang'e & Ong'ang'a 2006) (See figure 1).

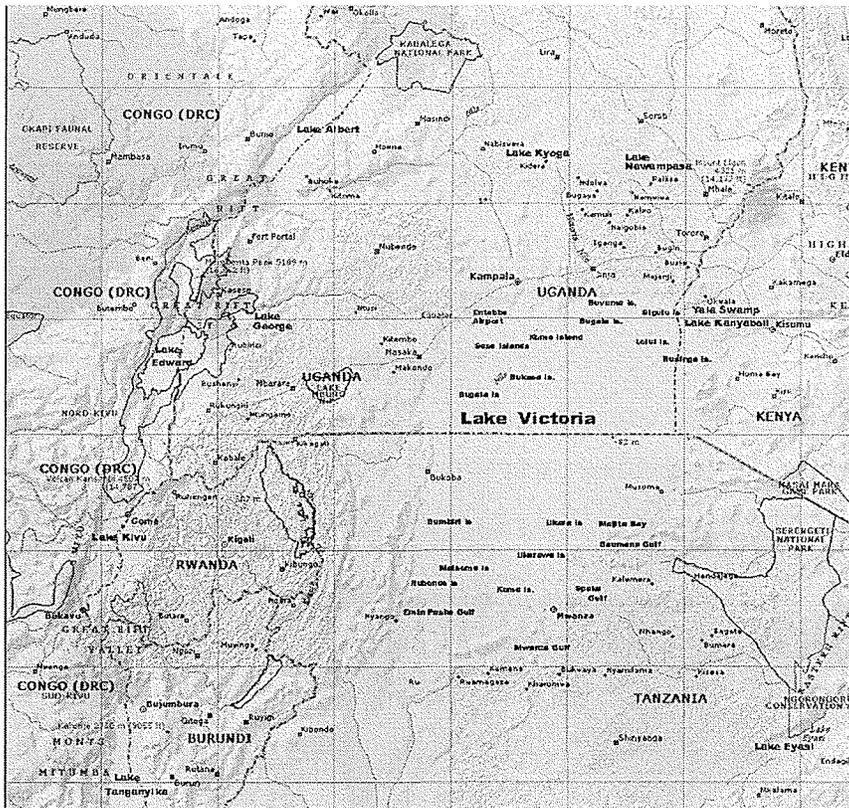


Figure 1 Map of Lake Victoria <http://www.african-cichlid.com/Lake%20VictoriaMap.jpg>

It has a maximum depth of 84m, 3,500km of shoreline, a water retention time of 140 years and a catchment area of 193,000km², which extends into Rwanda and Burundi (Awang'e & Ong'ang'a 2006). The Lake Victoria Basin, mostly made of the Western and Nyanza Provinces, covers only 8.4% of Kenya's territory, but contains more than 40% of the total population (Awang'e & Ong'ang'a 2006). Two major disasters that the lake faces are the introductions of Nile Perch (*Lates niloticus*) and water hyacinth (*Eichhornia crassipes*).

The demographic profile of Lake Victoria is characterized by a rapidly expanding population. In 1962 and 1969, the population in Nyanza province stood at 1 million and 2.1 million, respectively. By 1993 the population was estimated at 4.5 million, indicating a growth rate above the average national rate (Oucho 1993). From the 1970's until 2006, Lake Victoria has produced more than 90% of the total national fish harvest. However, in 2007, Lake Victoria's nominal fish harvest in 2007 was below 90% of the national total, although it still produced the bulk of the catch, with 86.6% of the total fish production (Figure 2) (Kenya Ministry of Fisheries Development Unpublished).

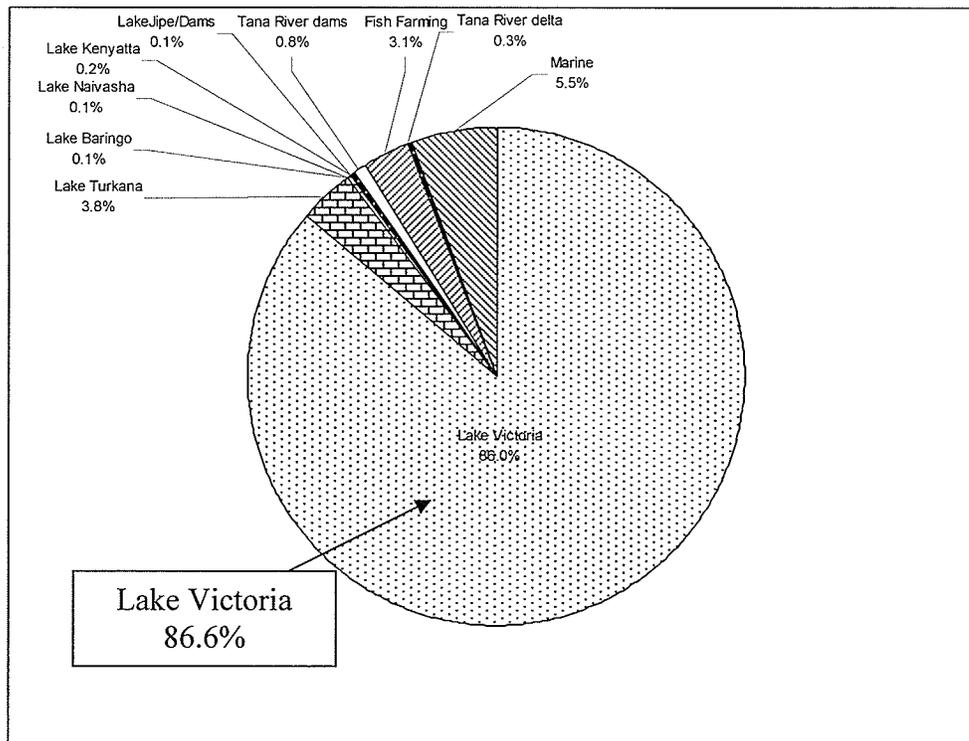


Figure 2: Percentage fish production by fishery area 2007 (Kenya Ministry of Fisheries Development Unpublished)

According to Witte et al., Lake Victoria has supported more than 28 genera of endemic fish species, which comprised about 350 species (1992). The Cichlids were a dominant group of species, accounting for about 300 *Haplochromis* species and two *Tilapiine* species (Greenwood

1974; Witte et al.1992; Graham 1929). However, in the past three years Omena (*Rastrineobola argentea*) and Nile Perch have been the dominant catches. In 2007, the species catch composition was as follows: Omena (*Rastrineobola argentea*) 42.2%, Nile Perch 39.7%, Tilapia (*Oreochromis niloticus*) 8.6%, and Cichlids (*Haplochromis*) (4.9%) (Kenya Ministry of Fisheries Development Unpublished). The bulk of the fish landings from Lake Victoria occurred in Suba district (43.3%) followed by Bondo (16.4%), Migori (11.7%), Rachuonyo (9.9%), Busia (8.8), Kisumu (7.8%), Nyando (1.7%) and Homa Bay (0.4%) (Kenya Ministry of Fisheries Development Unpublished).

According to the Kenya Fisheries Frame Survey 2008 report, there has been a significant increase in the number of Lake Victoria artisanal fishers, from 38,431 in 2000 to 44,263 in 2006 (Frame Survey National Working Group Kenya Unpublished). The survey found that the total number of fishing crafts increased from 11,515 in 2000 to 14,257 in 2008. The report further notes that there has been a continued use of destructive gear, such as beach seines and monofilament gillnets (Frame Survey National Working Group Kenya Unpublished).

Although the fishery is a major source of food and livelihood for the fishing communities (Awang'e & Ong'ang'a 2006), income distribution from the fishery is increasingly skewed in favour of the owner of fish processing and animal feed factories, and against the fishers and factory employees (Abila 2003). With the population growing at an exponential rate, the multiple activities in the lake basin have increasingly led to exploitation of the fishery and degradation of the lake's ecosystem (Odada et al. 2004).

With increasing populations, riparian communities around Lake Victoria have been vulnerable to diseases and other risks due to a lack of medical facilities and poverty. Most of the hospitals or dispensaries available at the landing beaches lack medical facilities and qualified

doctors. Consequently, malaria and water-borne diseases such as cholera, and typhoid have been reported as the most frequent diseases affecting the fishing communities (Shipton 2007). Poor health status of the fishers has resulted in poor production of fish and increased poverty among rural fishing communities (Shipton 2007). Aside from water borne diseases, Lake Victoria has also been badly hit by HIV/AIDS, which has led to a reduced life expectancy of artisanal fishers and resulted in a high adult mortality rate.

1.3 HIV/AIDS in Lake Victoria, Kenya

The first cases of HIV/AIDS in Africa were identified in 1982 among fishermen at the Kasensero landing site on the shores of Lake Victoria in Rakai District in Uganda (Jefferis et al. 2007). It was called the “*slim*” disease because it was a mysterious disease that made people thin before dying (Jefferis et al. 2007). During the period 1981-1985, Uganda was in the midst of a civil war and political turmoil that caused a shattered economy and stagnation (Jefferis et al. 2007). There was abuse of human rights, violence, military intimidation and refugee situation that facilitated the spread of HIV/AIDS through unprotected sexual intercourse. This period 1982-1985 was also characterised by denial about the HIV/AIDS epidemic (Jefferis et al. 2007). The situation at that time provided a favourable environment for the spread of the HIV infection.

The first cases of HIV/AIDS in Kenya were reported in 1985 in Lake Victoria Nyanza province among the Luo fishing communities (Pickering et al. 1997; Barnett & Whiteside 2002). The Luo named the disease “*chira*”, which they believed was a curse on those who did not obey the Luo custom and beliefs. In addition to the civil war in Uganda, the major trans-highways shared by the three countries, and the seasonal mobility of Lake Victoria fishing communities have also acted as hubs for the spread of the disease. Kuhanen (2009), explain that the Kisumu-Uganda-Tanzania trans-highways and trading centres developed dense local and regional sexual

networks which enabled HIV to spread quickly among the “risk groups” and local people of the busiest trading towns and villages.

Since the emergence of HIV/AIDS at the shores of Lake Victoria in 1985, the HIV/AIDS-related illness and mortality remains highest among Lake Victoria artisanal fishers compared to the rest of the population (Pickering et al. 1997; Pitcher & Hart 1995; Gordon 2006). This trend underpins the global literature reporting higher HIV/AIDS rates among fishing communities (Kissling et al. 2005; Gordon 2005).

In their 2005 HIV/AIDS study, Kissling et al. found that the prevalence rate for fishers was 30.5% in Kenya, 4.5 times higher than in the general population. The 2005 National AIDS and STI Control Programme (NASCOP) Provincial survey on HIV/AIDS reported Nyanza¹ Province with the highest HIV/AIDS prevalence rate in Kenya (Figure 3).

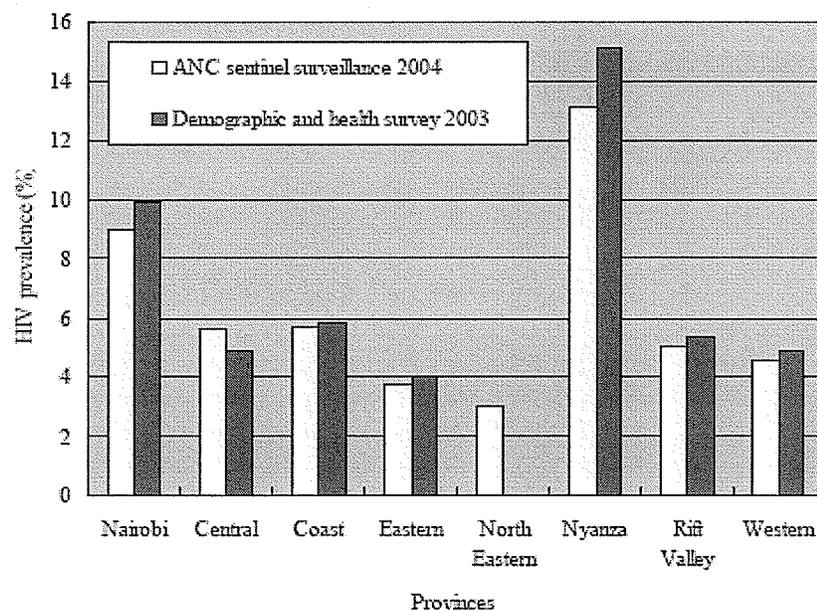


Figure 3: A comparison of the provincial HIV prevalence from ANC surveillance and from a demographic health survey. (NASCOP)/Ministry of Health 2005)

¹ Lake Victoria is located in Nyanza province

Recently, the Lake Victoria Fishery Organization (LVFO) reported high HIV/AIDS infection rates in Lake Victoria ranging from 10% to 40% higher than the national average of 6% to 7% (LVFO 2008). Studies show that numerous factors can be attributed to the vulnerability of fishing communities to HIV/AIDS, including geographical, social and political marginalization; high levels of mobility; poor access to health care services; prevalence of other life threatening diseases; daily cash income; and cultural practices such as wife inheritance (FAO 2005c). HIV/AIDS in Lake Victoria is not only a health problem, but also a development problem manifesting itself through escalating under-development and poverty, intensified socio-economic imbalances, and deepened impacts on resource management and natural resources (Hemrich & Topouliz 2000).

1.4 Research purpose and objectives

Since the emergence of HIV/AIDS at the shores of Lake Victoria Kenya in 1985, the HIV/AIDS-related illness and mortality remains highest among the fishing communities compared to the rest of the population. The primary purpose of this thesis was to understand the HIV/AIDS and artisanal fishery nexus. The following objectives guided the research:

1. To establish if HIV/AIDS is having a similar impact on the artisanal fishery in Kenya as has been documented for fisheries in other regions of Africa;
2. To determine which coping strategies the fishing communities may have adopted in an attempt to adjust to HIV/AIDS;
3. To explore whether social learning played a role in any coping strategies adopted;
4. To consider policy implications for artisanal fishery practices and management.

1.5 Research plan and methodology

This research study was largely grounded in social constructivism using a qualitative research approach and a case study strategy. A qualitative approach was derived from participatory rural appraisal (PRA) and the techniques used included a review of secondary sources (government and research documents), participant observation, transect walks, semi-structured interviews, and focus group discussions.

Data collection was conducted from June 2008-October 2008. The research timeline was subdivided into three phases: (1) a one-month immersion in July 2008 to help me gain some insight about the impact of HIV/AIDS on artisanal fishery practices and management, paving the way for my research; (2) a four-month period from August to November 2008 to carry out a case study that used techniques such as participant observation, a series of focus group discussions and semi-structured interviews with groups such as artisanal fishers, fish processors, clan/village elders, and other villagers; and (3) the subsequent period from December to August 2009 to compile, analyze and synthesize the data. The methods are detailed in Chapter 3.

1.6 Contribution to knowledge

The importance of artisanal fishery resources to the livelihood of fishing communities in Lake Victoria and the economy of Kenya cannot be understated. The findings of this research will bridge the existing gap in empirical studies regarding the impact of HIV/AIDS on the use and management of artisanal fishery resources in Kenya, and the implication of the fisheries management policies on fishing communities' livelihoods and the fisheries sustainability.

The results of this study will be a great tool for policy makers when integrating and embedding HIV/AIDS in the artisanal fishery sector in the creation and design of artisanal

fishery policies as outlined in Chapter 6. The participatory research tools used in this study helped to build the fishing communities' knowledge on issues concerning HIV/AIDS and fishery practices, and also gave them an opportunity to think of possible solutions of identified problems. In considering social learning, this study provides an understanding of the dynamic of social learning in relation to the coping strategies adopted by the fishing communities affected by HIV/AIDS.

1.7 Limitations and Strengths of the study

Since the stigma associated with HIV/AIDS is still present in the region, some respondents were reluctant to discuss HIV/AIDS, especially in their personal lines. In order to deal with this limitation, I was very sensitive to the respondents discomfort with some questions especially regarding how a person living with AIDS or the death of a person from HIV/AIDS affected the community's fishing practices and fishery management efforts. The literature review helped me become aware of the emerging challenges of dealing with HIV/AIDS research.

Given that most of the respondents did not understand English, I carried out most of the research in Luo, which is also my native language. Initially, I did not expect this to be a challenge but indeed it was, since I had lived away from home for many years and had lost some of my Luo language skills. In order to get on track with the Luo language and adjust to the Luo culture, I stayed in Karabondi village with my grandmother for two weeks, which proved quite beneficial. While at the village, I translated most of the interview questions into Luo. This was very challenging and time consuming, but at the end it did pay off. By carrying out most of the research in Luo, the respondents felt at ease and were very warm and friendly to me. For the time spent in the field, I lived in Kaswanga village, spoke Luo and engaged in most of the household chores, communal activities such as fetching water from the lake, carrying firewood, helping in

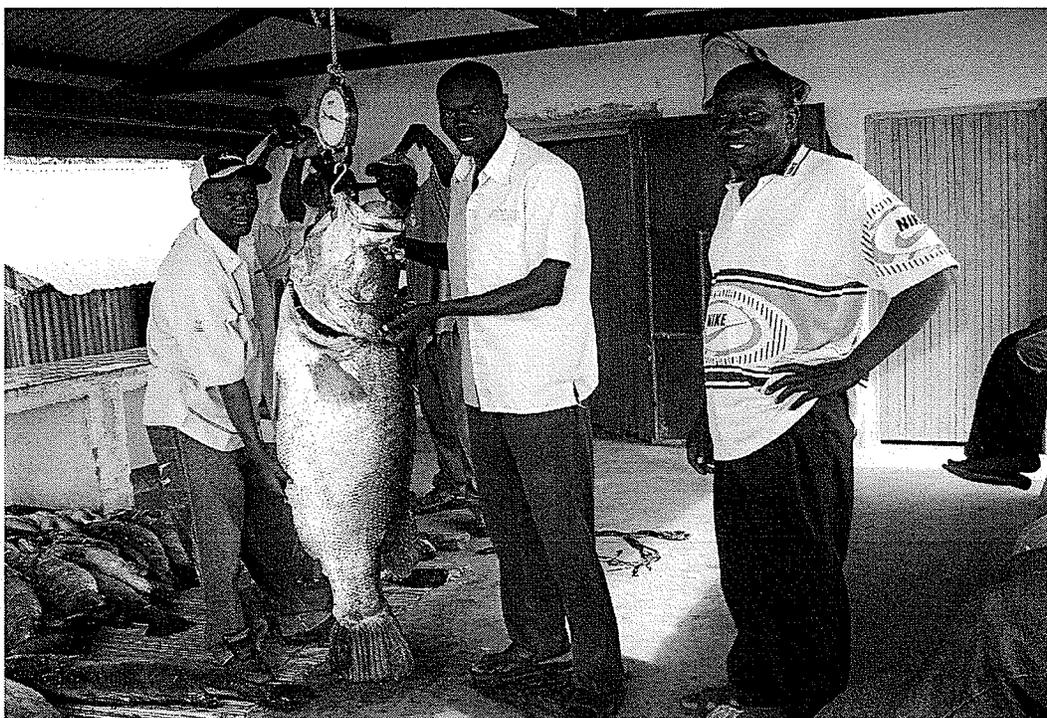
processing fish, and going on short day fishing trips. I also attended communal events such as weddings, funerals, and regular community meetings.

1.8 Organization of the thesis

After introducing the major components of the research in Chapter 1, Chapter 2 explores the artisanal fishery system of Lake Victoria in Kenya, outlines conservation and management efforts taking place for the fishery, and finally provides the HIV/AIDS scenario of Lake Victoria artisanal fishers. Chapter 3 presents a brief overview of the research approach, expanding on the details of the research problem, the field research plan, and the methodology applied to gather and verify data. A description of strengths and limitations faced during the field work study is also included. Chapter 4 provides a detailed description of the two study communities. Chapter 5 presents findings on the; impacts of HIV/AIDS on the artisanal fishery practices and management efforts, susceptibility and vulnerability of fishing communities' to HIV/AIDS, coping strategies adopted to cope with the HIV/AIDS implications and the dynamics of learning. Lastly Chapter 6 ties the findings of the study together, with the aim of drawing conclusions for each of the study's research objectives, and exploring on some policy implications and providing recommendations for future research.

CHAPTER 2

Photos by Sheila Omom



Top: Landing site
Bottom: BMU centre Kaswanga village

Chapter 2: The artisanal fishery practices, management and HIV/AIDS in Lake Victoria

Kenya

2.1 The artisanal fishers and fishery on Lake Victoria

The terms artisanal fishers' and 'artisanal fishery' are difficult to define explicitly, as they tend to be defined depending on the circumstances in different countries (FAO 2005a).

McGoodwin (1990) refers to artisanal fishers as "fisher-artisan whose art is the skill, experience and intuition they apply to their fishing effort", while others emphasize the long standing socio-cultural dimensions of this group (Demuynck 1994). McConney and Charles (2008), argue that there is no one model of a small-scale marine fishery, but rather they can be seen as fisheries possessing many of the following characteristics: fishers operate close to shore and are dependent on local resources; fishers use vessels that are relatively small and individually-owned; the fishery constitutes an integral part of the coastal communities where fishers live; there is a greater reliance on labour than on capital in the fishery, with relatively low capital costs per fishery job and fuel usage per unit of catch; and the participants do not identify themselves as being part of an offshore or industrial fishery.

The term 'artisanal fishers' covers a wide variety of groups which can be distinguished by characteristics such as gear type, type of fishery, professional category, sources of income, migratory status, gender, culture and nationality (Hart & Reynolds 2002). Berkes et al. (2001) underscore that artisanal fishers typically use traditional fishing gear such as small nets, traps, lines, spears and hand collection methods. Although biodiversity of the catch is often highest in these fisheries - partly because of the low selectivity of gear used - there tends to be few discards as everything caught is utilized (Berkes et al. 2001).

In general, artisanal fisheries are traditional fisheries involving fishing households using relatively limited amounts of capital and fishing vessels (if any), and making short fishing trips close to shore. The catch is mainly used for local consumption. Hart and Reynolds (2002) argue that artisanal fishers have their roots in traditional fishing communities that for generations have been dependent on aquatic resources for livelihood and food security purposes. According to Nomura (2007), the traditional knowledge, informal rules and customs, self-organizing and self-reliance of artisanal fishing communities, when combined with development support, offer opportunities for fishery restoration and management.

McConney and Charles (2002) underline that the idea of “small-scale or artisanal” is relative to the location being considered, and it is not unusual to find that what is considered a small-scale or artisanal fishery in one country would be classed as a large-scale fishery in another. Geheb and Binns (1997) stress that the vast majority of fish caught from Lake Victoria are by artisanal/small-scale fishermen, who form the back-bone of a highly labour-intensive and generally low technology artisanal fishing industry. Not only do these fishers harvest fish for subsistence use, but also for commercial gains. Some artisan fishermen work alone, but usually they are organized in small crews. They are usually confined to a short range of operation from their beaches (Jansen 1973). The length of the fishing season varies with weather conditions along the lake, as rough weather curtails the number of days on which fishing is possible (Oucho 1993). As a result of declining fish stocks in the lake, some artisanal fishers now engage in other economic activities, such as subsistence farming. They grow cassava, sweet potatoes, sisal, maize and raise domestic animals such as goat, cattle and poultry to supplement low fishing incomes (Oucho 1993).

Fish processors and fish mongers are also part of the artisanal fishery system. Fish processing and trading is mainly dominated by women. Some of the fish processing methods employed include smoking, sun-drying, salting and frying. The Nile Perch export boom and a high unemployment rate in most parts of Kenya has led to a rapid growth of people moving from non-fishing areas to fishing areas in search of jobs, causing population growth of fishers, fish processors and fish traders in Lake Victoria. Fish traders often sell fresh fish, smoked fish, dried fish and fried fish at the local market; some of the species they sell include Omena and Tilapia, and more rarely Nile Perch, Mud Fish (*Neochanna Galaxilidae*) and Lung Fish (*Profopterus Annectens*).

Despite the critical role artisanal fisheries play in contributing to food security, poverty alleviation and rural development, this sector has been systematically neglected by the Kenya Fisheries Act over the years in favour of the commercial fishery (Cowx et al. 2003; Awang'e & Ong'ang'a 2006; Njiru et al. 2007). A lack of understanding of the dynamic and diverse nature of the artisanal fishery has contributed to its neglect. Appropriate policies and management systems that address the diverse characteristics of artisanal fishers and the challenges they face are not in place (Cowx et al. 2003). Some of these challenges include declining fish catch, lack of government support, lack of improved fishing boats, gear and marketing channels, poor physical infrastructure, and most of all HIV/AIDS.

2.2. Fishery management in Lake Victoria

During the pre-colonial period, the clan elder was the leader of a landing site and provided advice about seasonality, controlling over-fishing/exploitation of fishery resources by restricting fishing activities during farming seasons, local social structures were used to enforce these rules or impose sanctions when needed. Fishing was closely integrated into the culture and traditions

of the fishing community. Mutunga (2002) asserts that the fishing communities, under the authority of the clan institution, played a central role in the control and management of the fisheries' resources. These resources were not simply a source of livelihood but a way of life. Sustainable utilization was a collective responsibility among fishing community member

Since the colonial and post-colonial era, however, fisheries resource management has primarily been based on the top-down, centralized approach (Lwenya & Abila 2003). Fishing communities' input on natural resource management decisions has been overlooked. Recommendations from fisheries biologists have primarily been the major inputs and have formed the basis for policy formulation, legislation and resource management guidelines (Lwenya & Abila 2003).

Fisheries resources are now state-owned. Though there is a tendency to overlook it, state-ownership now tops the problems of the Lake Victoria fishery in Kenya and permeates virtually all facets of the fishery industry. Like mining and forestry, the lake's fish stocks are nationalized resources: the rights of ownership to these resources are in the hands of the government (Mutunga 2002). Since the government owns the fisheries, exclusive resource-based management approach to fishery policies dominates at all the levels of decision-making, including planning and the implementation of conservation strategies to control exploitation of fish stock. Irrespective of the critical role they play in artisanal fisheries, the communities themselves are alienated from the implementation of the official policies.

Owino (1999) argues that co-management policies and participatory strategies practiced and successful elsewhere in Africa have not been successful in the Kenya's Lake Victoria. This explains the sense of apathy among fishing communities, who are largely excluded from their own natural resources. In Tanzania, the government has set up BMUs (Beach Management

Units) empowered to take on management functions at a local level. Similarly in Uganda, there is interest in devolving powers to Landing Management Committees. In Kenya, the Lake Victoria Fisheries Authority has introduced Beach Management Units in most landing beaches to control the exploitation of fisheries resources. Despite this move, there has been no measurable progress in either decentralizing or devolving power to the lakeside (fishing) communities (Regional Workshop 2005).

According to Mutunga (2002), central management has built up an atmosphere of distrust leading to fishing communities' non-cooperation with the Lake Victoria fisheries departments, and lack of support on fisheries conservation and management initiatives. Furthermore, over-fishing and the use of illegal fishing gear are only in part a reflection of the failure of centralized management strategies. Currently, the management of Lake Victoria fisheries is based on the 1989 Fisheries Act and its revised 1991 version, whose focus is on the restriction of mesh sizes, fishing methods or technology, and closed seasons and areas for some species and/or fishing technology (Laws of Kenya 1991). The Fisheries Act (CAP 378 - 380) outlines rules and regulations for the management of Lake Victoria Fisheries (Laws of Kenya 1991).

Since the collapse of traditional management system and the start of the centralized management system, the majority of lakeside fishermen have lost control of their means of production. Marketing is now also out of their hands, as large refrigerated trucks owned by fish processing factories and middlemen have taken control. Mutunga (2002) argues that as a result of the alienation, fishing communities no longer feel responsible towards the lake. Their previously responsible attitudes and practices have been undermined by watching government fisheries officials collude with unscrupulous fishermen to plunder the fisheries resources.

The central management of the Lake Victoria fisheries represents a grave threat to the sustainability of the resource. It will only be with the involvement and support of the fishing communities that sustainability of the fishery becomes an achievable objective.

2.3 Lake Victoria fishery institutions

Scholars tend to define institution as a set of rules or norms that govern the behaviour of individuals in the system (Charles 2001). In general terms institutions can be defined as an organizational arrangement of some sort by which people interact, pursue society's goals and manage themselves, such as a Department of Fishery, or a co-operative of fishers. Lake Victoria is characterized by six distinct institutions: Lake Victoria Environmental Management Program, Lake Victoria Fishery Organization, Friends of Lake Victoria (Osienala) Environmental Restoration Program, Beach Management Unit, Lake Victoria Fisher Association and Fisherman's Cooperative Societies.

Lake Victoria Environmental Management Program (LVEMP)

LVEMP is one of the largest environmental conservation programs in Lake Victoria (LVFO 2008). The program was initiated in response to the imminent ecological collapse of the lake resulting from a number of adverse effects on the water quality and fishery biodiversity (LVFO 2008). With its research, capacity building, environmental management and development components, the program is being implemented by several national ministries and organizations in Kenya, Uganda and Tanzania (LVFO 2008).

Lake Victoria Fishery Organization (LVFO)

The establishment of LVFO was achieved through the funding of the LVEMP, courtesy of Kenya, Uganda, Tanzania, the FAO, European Union, World Bank and the United Nations Development Programme/Global Environmental Facility (UNDP-GEF) (LVFO 2008). The LVFO

is a regional organization under the East African Community responsible for coordinating and managing the fisheries resources of Lake Victoria. Its formation was facilitated by the Committee for Inland Fisheries of Africa (CIFA), with the three partner states - Tanzania, Kenya and Uganda – signing the convention in 1994 (LVFO 2008). The objective of the organization is to foster cooperation among the partner states by harmonizing national measures and developing and adopting conservation and management measures for the sustainable utilization of aquatic resources of Lake Victoria for maximum socio-economic benefits (LVFO 2008).

Friends of Lake Victoria (OSIENALA) Environmental Restoration Program

This program was registered in Kenya in 1992 to fight the environmental degradation of Lake Victoria and its environs (OSIENALA undated). Since its inception, OSIENALA has carried out projects such as the implementation of the UNDP-GEF support for the Lake Kanyaboli rehabilitation program and the Sondu Miriu/Nyando wetland conservation project (Osienala undated). It also conducts numerous local and regional training and workshops on the conservation of lake's fishery resources. Through these efforts OSIENALA has created a number of valuable publications concerning the conservation of Lake Victoria and has lobbied for participation in the regional Lake Victoria Environmental Management Program (LVEMP) (OSIENALA 2009). In Kenya, OSIENALA remains a grassroots institution concerned with community-based environmental conservation activities around Lake Victoria (OSIENALA undated). A lot of OSIENALA's work has been associated with socio-economic issues and biodiversity loss in Lake Victoria, without necessarily linking the two (OSIENALA undated).

Beach Management Units (BMU)

The concept of BMU was introduced in 2000, with an aim to encourage local communities to take part in the management of the fisheries resources (Abila et al.2005). According to Nunan and

Scullion (2004), the term BMU has been adopted throughout Kenya, Uganda and Tanzania for community-based fishery management institution. The BMU functions as the umbrella organization of the beaches and the fishing communities (Owino 1999). All people working on the beaches are subjected to BMU. The BMUs, each of which comprises 5-9 persons, exist at most or all of the 297 designated beach landing sites along the Kenyan side of Lake Victoria (Owino 1999). BMUs bring together everyone involved in the fishery - including boat owners, boat crews, traders, processors, boat builders and repairers, net repairers - to work with government and other stakeholders in managing fishery resources and improving the livelihoods of community members (LVFO 2008). The functions of BMU include resolving conflict, establishing beach hygiene and sanitation facilities, and the establishment and maintenance of beach infrastructure (Owino 1999).

However, fishing communities are convinced that the BMU is yet another government introduction which will interfere with the normal traditions widely accepted at the beaches (Regional Workshop 2005). They feel the BMUs have been introduced in order to take the roles of beach leaderships or to interfere with cooperative societies or local authorities. In some cases they are seen as spies of the government. The reason for this perception is that the communities were never consulted during the design and development phase of the policy (Regional Workshop 2005; Pers. Com. with Fishers from Rusinga Island).

The Fishermen Co-operative Societies

The registration of fishermen's co-operative societies by the Kenyan Government started in the late 1960s (Owino 1999). They were initiated by the Government in order to assist the fishermen in marketing and saving and offered 'soft' loans" (loans with extended grace period). To become a member of the co-operative society one must either be a fisherman who sells his fish to the co-operative or own gear or a boat (Geheb 1996). The co-operative society's income

comes from a ten per cent commission they charge members for selling their fish (Owino 1999). Initially most co-operatives performed well, but in the past decades the majorities of the co-operatives have collapsed or are on the verge of collapsing. Corruption, poor management, disputes between local and non-local members, and government intervention are some reasons for these collapses (Owino 1999; Geheb 1996).

Lake Victoria Fisher Association

This association has just been registered by the Kenya Government since 2002 (Awang'e and Ong'ang'a 2006). Its main objective is to form a strong partnership of the Lake Victoria local fishers with other institutions (or on their own) in decision making, planning, implementation and evaluation process of fishery policy, management and conservation (Owino 1999).

Furthermore, the association aims at effectively lobbying and advocating on behalf of fishers for positive change, especially in respect to conservation and sustainable use of the lake's fishery resources (Geheb 1996). The formation of this organization is seen by the locals as a means of averting both the environmental and economic crises now facing the fishing communities in Lake Victoria (Owino 1999).

2.5 The impact of HIV/AIDS on artisanal fishing practices and management

Little has been published in the academic literature regarding the nexus between AIDS and fishery management (Allison & Seeley 2004; Torell et al. 2006). However, studies show that fishing communities are often among the highest-risk groups in comparison to other occupational groups in countries with high overall rates of HIV/AIDS (Pickering et al. 1997; Bain 1998; Huang 2002; Simon-Meyer 2002; Allison & Seeley 2004; Kissling et al. 2005). Sambrook-Bishop & Tanzarn (2003) found that the risk of artisanal fishing communities experiencing high HIV prevalence rates is due to both the characteristics of the community and the livelihood

lifestyles associated with fishing. Some of these characteristics include near neglect by government and service sectors, a high degree of mobility of artisanal fishers and their lack of social cohesion (Sambrook-Bishop & Tanzarn 2003).

There is very little empirical evidence on the linkages between the impacts of HIV/AIDS pandemic and the use and management of natural resources. According to ABCG (2002) the use and management of natural resources can impact the HIV/AIDS pandemic (ABCG 2002). By summarizing the existing literature on the connections between HIV/AIDS and natural resource management, it can be established that HIV/AIDS has three direct impacts on fisheries and fishery management (ABCG 2002; Drimie 2002; Simon-Meyer 2002; Bishop-Sambrook 2004; Torell et al. 2006). These direct impacts are at an accelerated rate of extraction of fishery resources due to increased dependence on the resources, decreased availability of labour and management capacity due to sickness and death and a loss of traditional/indigenous knowledge and skills (ABCG 2002; Drimie 2002; Simon-Meyer 2002; Bishop-Sambrook 2004; Torell et al. 2006). Allison and Seeley (2004) assert that HIV/AIDS has serious negative impacts on the fishery at several levels (Figure 4).

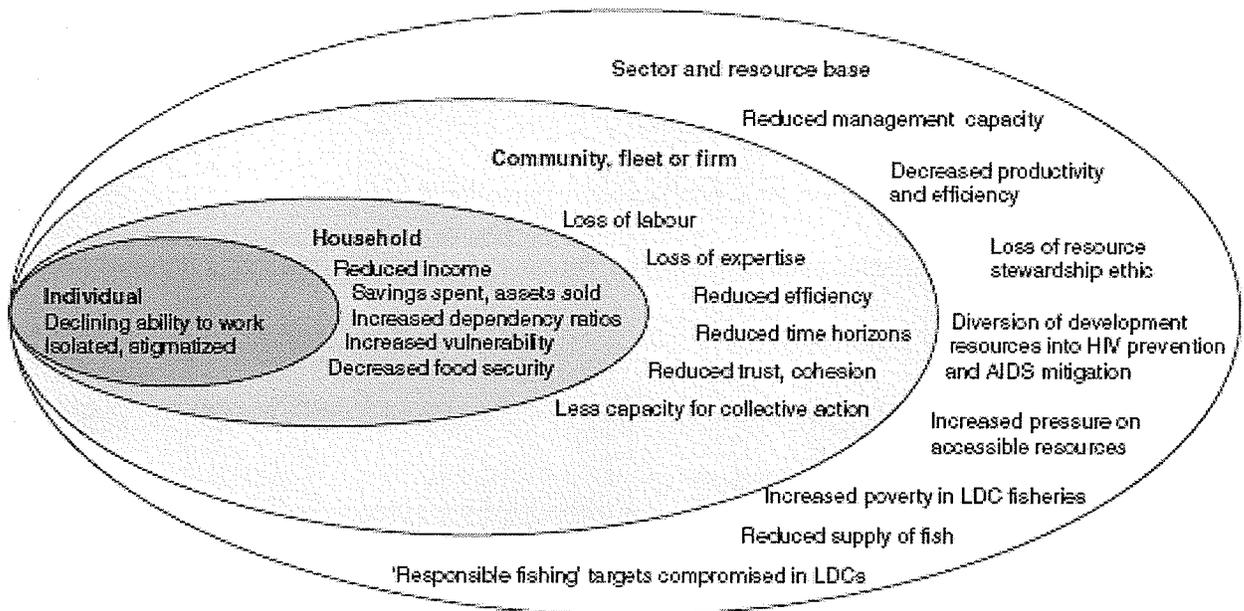


Figure 4: A simplified schema of the potential impacts of HIV/AIDS on the fishery sector at different levels. Darker shaded areas represent known and documented impacts, while lighter or un-shaded areas represent more speculative concerns. (Allison and Seeley 2004)

Accelerated rate of extraction of fishery resources

HIV/AIDS can lead to an accelerated rate of resource extraction when people turn to fishery resources as a means to replace household income lost after an income-earning family member dies from an AIDS-related illness or is too sick to work (Tobey et al. 2005). HIV/AIDS can create coping strategies and demands on affected communities that threaten to deplete fishery resources and negatively affect biological diversity (ABCG 2002). Studies conducted in Uganda and Tanzania reported an accelerated depletion of fish stocks and mismanagement of the Lake Victoria's ecosystem as a result of HIV/AIDS (Sambrook-Bishop & Tanzam 2003; Tobey et al. 2005). According to the Uganda study, use of small-mesh nets for both marine and freshwater fishing was common among households in the HIV/AIDS affected villages as they

tried to make a living from declining fish stocks. This led to over-harvesting of small fish (Tobey et al. 2005).

Decreased availability of labour and management capacity

The negative impact that AIDS can have on natural resources stems from an increase in mortality and the consequent reduction in labour capacity (Bishop-Sambrook 2004). Because HIV/AIDS primarily affects adults between the ages of 25 and 45 years, loss of adult labour and the capacity for heavy labour often leads to changes in affected households' use of land and water resources and fishing practices (Haddad & Gillespie 2001; Drimie 2002; Bishop-Sambrook 2004). A study conducted in Zambia found evidence that AIDS disrupted agricultural production, since those with HIV/AIDS could not dedicate as much time to field labour as compared to household members who were healthy (Baylies 2002). Sambrook-Bishop & Tanzarn (2003) found that sick fishermen preferred shallow-water fishing instead of sailing to deep waters and they also reduced night-time fishing activities. Women switched to sun-drying fish because although it had a lower market value than salted or smoked fish, it was less labour intensive. The same study (2003) also found that fishing boats and gear were sold to raise money to cover burial costs, and widows who inherited boats and equipment, often 'bought in' male fishing expertise by co-habiting with young fishermen. Shifting labour roles in fishing communities as a result of HIV/AIDS was described in a Uganda study (Seeley et al. 2003). Based on the study findings, in fishing communities where there was increasing ill-health as a result of HIV/AIDS, some men were taking over traditionally female activities such as fish processing since they were less labour-intensive (Seeley et al. 2003). Tobey et al. (2005) also found in his study in Tanzania that households affected by HIV/AIDS were forced to diversify their activities in order to earn more income (Tobey et al. 2005).

Loss of traditional knowledge and skills

HIV/AIDS has been documented to be eroding the skills and knowledge acquired as people die in their prime before passing on knowledge and expertise to the next generation (FAO 2002). Loss of traditional knowledge and skills on sustainable fishery management practices, traditionally passed on between generations, can cause fishery resources degradation and a decline in productivity (Johannes et al. 2000). As death rates in fishing communities increase, the knowledge that comes from long experience in the fishery is also lost, along with the traditional ways of managing the fishery. Fishing may become increasingly dominated by young men with low long-term interest in sustaining the fishery and high interest in maximizing short-term earnings (Sambrook-Bishop & Tanzarn 2003). Similarly, skills and knowledge are lost from government fishery management institutions, universities and advisory agencies as people contract AIDS-related illnesses.

2.5 Social learning and complex resource management issues.

Röling and Wagemakers (1998) describe social learning as “a framework for thinking about the knowledge processes that underlie societal adaptation and innovation” and refer to it as a society-wide process (i.e. not limited to scientists, experts, or intellectuals) in which social actors learn to adapt through a discourse. They also stress that “meaningful interaction and communication between individuals is central to social learning” (Röling & Wagemakers 1998). In essence, the concept of ‘social learning’ refers to learning processes among a group of people who all seek to address shared problems and take action collectively (King 2000). The concept of social learning therefore extends experiential learning into collective learning (Maarleveld & Dangbegnon 2002). For the purposes of this research, social learning will be viewed as learning that occurs when people engage one another, sharing diverse perspectives and experiences to

develop a common framework of understanding and basis for joint action to deal with socio-environmental uncertainties and complexity. In their definition of social learning, some scholars highlight the importance of dialogue between groups and reflection over time (Maarleveld & Dangbegnon 1999, and Ison 2003).

Wondolleck and Yaffee (2000) state that a key step in collaborative initiatives is “committing to a process of mutual learning in which participants agree that they individually do not have all the answers.” Daniel and Walker (1999) describe ‘mutual learning’ as a process for exchanging perspectives between natural resource users and managers. Social learning acknowledges that interest groups bring different knowledge to the learning process, including knowledge in the form of values, capacities, perspectives, methods and historical experiences. According to Daniels and Walker (1999), such knowledge and experience, effectively shared, are critical assets in solving natural resource management-related problems (Maarleveld & Dangbegnon 1999).

Another important dimension of social learning therefore is knowledge sharing, which emphasizes the diversity and complementary nature of different social groups’ knowledge (Röling & Jiggins 1998). It comes as no surprise that knowledge of resource and ecosystem dynamics and associated management practices exists among people of communities that, on a daily basis and over long periods of time, interact for their benefit and livelihood with ecosystems (Berkes et al. 2000, Fabricius & Koch 2004). However, such communities’ ability to share their traditional knowledge on resource management may be constrained by nature’s uncertainty and change. An example of this would be the loss of fishery traditional knowledge as a result of HIV/AIDS (Lee 1993; Röling & Wagemakers 1998). Folke et al. (2003) point out that social learning is essential for building up the experience needed to cope with complexity and

uncertainty of natural resource management that HIV/AIDS brings as a result of loss of traditional knowledge on fisheries management practices. Tompkins and Adger (2004) highlight that community-based resource management that stems from social collective action enhances adaptive capacity in two ways: by building networks that are important for coping with extreme events and by retaining the resilience of the underpinning resources and ecological systems. Pahl-Wostl et al. (2007) points out that, social learning increases adaptive capacity and leads to sustained processes of attitudinal and behavioral change by individuals in social environments through interaction and deliberation. One of the lessons learned from a case study in Nepal was that a social learning approach that facilitates collective learning and collaborative action among the different resource users has a great potential to deal with different ecological uncertainties and complex ecological problems (Wollenberg et al. 2001).

Social learning facilitates joint problem solving by fostering perceptions of interdependence, trust, and mutual appreciation (Buck et al. 2001). It demonstrates that people can benefit from working together toward agreed-upon goals, and generate confidence in further efforts at collaboration. There is communication and a relationship-building aspect of social learning that results in sharing of knowledge and enhanced capacity for action (Buck et al. 2001). A Zimbabwe case study on forest community-based conservation found a growing acceptance of the need for community participation in forest management and that collaborative approaches based on an adaptive social learning process made this possible (Wollenberg et al. 2001).

ILO (undated) stresses that HIV/AIDS is threatening future generations by breaking down traditional systems of social learning that pass skills and knowledge from generation to generation. For the purpose of this study, I set to explore further the dynamic of social learning

in relation to fishing activities and management that exists within the fishing communities affected by HIV/AIDS.

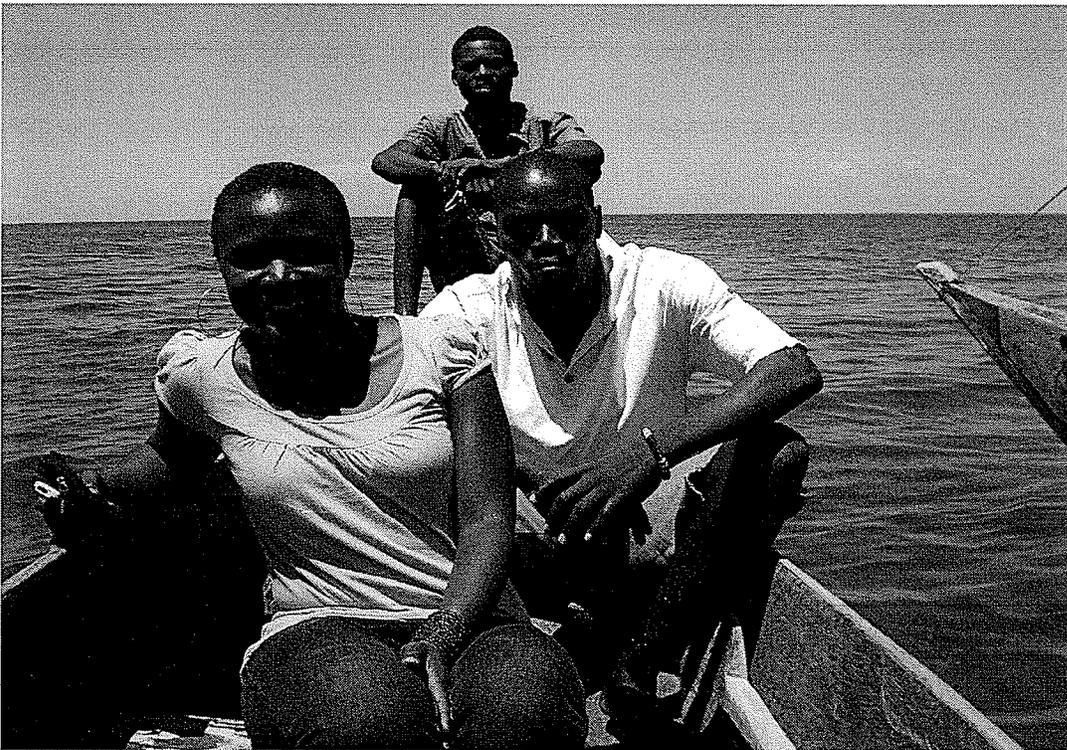
2.6 Summary

Artisanal fishers play a large role in the Kenyan fishery but face many challenges. Some of these challenges include declining fish catches, a lack of government support; a lack of improved fishing boats, gear and marketing channels, poor physical infrastructure, and, most of all, HIV/AIDS. Drawing from the literature, fishing communities are often among the highest-risk in comparison to other occupational groups in countries with high overall HIV/AIDS prevalence. In most developing countries, HIV/AIDS is having a serious impact on the fisheries sector by impacting the ability of fishing communities to carry out fishing activities. Studies show that some of the key negative impacts of HIV/AIDS on artisanal fishing activities include the over-harvesting of fish stocks, the declining availability of labour and management capacity, and the loss of traditional fishing knowledge and skills. Adjusting to these changes brought fourth by HIV/AIDS requires understanding on the dynamic of social learning and coping strategies.

CHAPTER 3



Photos by Sheila Omom



Top: Community meeting Kolunga village
Bottom: On a fishing expedition with Kolunga fishers

Chapter 3: Research Approach

3.1 Introduction

Silverman (2000), states that the key objective of research methodology, “is to define how one will go about studying a phenomenon.” This chapter explains the research paradigm, approach and strategy used to facilitate the research process.

Reality varies from person to person and place to place, which means that we perceive our surroundings in different ways and according to our own experiences and beliefs. According to Schwandt (2000), this is the ontological motivation of the participatory approach. Reality is based on local and specific representations of the perceptions of what reality is. Thus, it draws its base from constructivism, a school of thought that argues that human knowledge is not passive but active, and that human beings do not discover knowledge but construct it. It is the human mind that processes impressions, and we invent concepts, models, and schemes to make sense of our experience and test it. The following is a quote from Cooper (1993) distinguishing constructivism from behaviourism and cognitivism.

“The constructivist...sees reality as determined by the experiences of the knower. The move from behaviourism through to constructivism represents a shift in emphasis away from an external view to an internal view. To the behaviourist, the internal processing is of no interest; to the cognitivist, the internal processing is only of importance to the extent to which reality is understood. In contrast, the constructivist views the mind as a builder of symbols- the tools used to represent the knower's reality. External phenomena are meaningless except, as the mind perceives them.... Constructivism views reality as personally constructed, and state that personal experiences determine reality, not the other way round”. (Cooper 1993)

Schwandt (2002) asserts that constructivism lays claim to historical and socio-cultural dimensions of reality, saying that there is no trans-cultural and trans-historical reality but that reality is based on shared things such as understandings, practices and

language. Schwandt (2000) goes even further, noting that society affects our perceptions and ideas. We translate our perceptions and ideas within a structure or framework that already exists within us because we belong to a pre-existing social group. All ideas are designed to fit into what we know as normal or valued by the society around us. This is the social constructivist's view.

Consequently, it can be explained that fishing communities in Lake Victoria have created meaning through their interactions with each other and with the environment they live in and that meaningful learning occurs when they are engaged in various fishing and fish processing activities (Palincsar 1997). As in other sub-sectors of agriculture, such as forestry and farming/crop-production, fishery research is embracing a new paradigm of social constructivism (Rolling 1998). Wilson (undated) argues that understanding the knowledge base of fishery management depends on the understanding of the social construction of nature. Therefore when studying the fishery of Lake Victoria, it is not enough to learn of the changes in the lake's ecology or the issue of fishery management without the knowledge of local community and their participation as makers of their social realities. For centuries the fishing communities have known how to manage and conserve their fishery resources. Hence in order to understand the nexus of HIV/AIDS and artisanal fishery practices and management in Lake Victoria, this research study was driven by the social constructivism paradigm using qualitative research borrowing on participatory tools from Chambers' (1994) Participatory Rural Appraisal (PRA) and using a case study strategy.

3.2 Qualitative research approach

Qualitative research explores the complexities of everyday life in order to gain a deeper insight into the processes shaping the social world and realities. It is also a means of understanding people, enabling researchers to engage in-depth with the lives and experiences of others. In this study, I sought to understand artisanal fishing communities' perceptions about issues pertaining to fishery resources and management practices. Such an approach makes sense given the assertion by Johnson et al. (2000) that qualitative research approaches are concerned with how the world is viewed, experienced and constructed by social actors.

Qualitative approaches view the social world as dynamic and changing, always being constructed through the intersection of cultural, economic, social and political processes. The emphasis when using qualitative methodologies is to understand, reflect on and interpret the understandings and shared meanings of people's everyday social worlds and realities. The approach seeks subjective understanding of social reality rather than statistical description or generalized predictions (Limb & Dwyer, 2001). Through this qualitative approach, I was able to reveal the artisanal fishing communities' understandings of their own situations, problems and priorities.

Limb and Dwyer (2001) found that a qualitative research approach provides access to motives, aspirations, class and power relationships that account for how places, people and events are made and equally represented. The qualitative research process has variously been described as iterative, emergent, simultaneous and flexible. Repstad (1993) likewise indicates that a feature characterizing much of qualitative research is the flexibility of methods. Repstad (1993) asserts that the qualitative approach also provides

an understanding of the social processes that are involved in shaping health-related behaviour and outcomes. This aspect of the qualitative approach will help me understand how HIV/AIDS has shaped artisanal fishing activity and management practice in the study area.

The main drawbacks to the qualitative approach are that it tends to be subjective, difficult to replicate and not good for generalization and prediction (Patton 1990; McCracken 1988). Through the qualitative approach, the interviewer is the instrument in the qualitative research. Therefore, the quality of research and the subsequent output of the work is very much dependant on the in-depth experience, knowledge and skills of the researcher (Patton 1990).

I dealt with the reliability drawbacks of the qualitative approach by employing the triangulation method, which encompasses the use of multiple research methods of data collection (Creswell 2003). I combined different qualitative methods of data collection including interviews (in-depth and semi-structured), focus group discussions and participant observation. Patton (1990) notes that qualitative methods consist of three kinds of data collection techniques: in-depth, open ended interviews; direct observations; and documents.

3.3 Participatory approaches

Participatory rural appraisal is defined as a family of approaches and methods which enable rural people to analyze their own life and conditions and choose their own means of how to make improvements (Chambers 1994). PRA may also be seen as a method for research where the people investigated are the ones who actually are the analysts (Holland & Blackburn, 1998). The conviction in PRA as described by Holland

and Blackburn (1998), is that local people have the knowledge and ability to be the subjects of their own development and that those who facilitate PRAs must pay particular attention to the way they behave when interacting with local people. To soften the line between the researcher and the research participants is one of the main objectives of PRA (Chambers 1994; Wills 2007).

Some of the PRA tools commonly used are semi-structured interviews, focus group discussions, participant observations, transect walks, diagramming and visualizations, ranking and scoring exercises, oral histories, ethno-biographies and seasonal calendars (Chambers 1994). In this study, I was completely aware of the importance of including participants and making the research meaningful, and was able to empower participants at all times. To achieve real participation, I borrowed from participatory approach PRA tools such as semi-structured interviews, focus group discussions, participant observation and transect walks.

3.4 Case study as a research strategy

There are several different research strategies and each provides a different way of collecting and analyzing empirical evidence following its own logic. In order to achieve the purpose and objectives of this research study, a case study strategy was employed. According to Yin “the case study as a research strategy comprises an all-encompassing method-covering the logic of design, data collection techniques, and specific approaches to data analysis (2003)”.

Yin expresses that “the distinctive need for case studies arises out of the desire to understand social phenomena” (2003), specifically defining this approach as pertaining to “an empirical inquiry that investigates a contemporary phenomenon within its real-life

context, especially when the boundaries between phenomenon and context are not clearly evident” (2003). A case study is the best choice strategy when ‘how’ and ‘why’ questions are asked about a contemporary real life event, over which the researcher has little control (Yin 2003). Since this study does not require control of behavior events and the aim is to collect and analyze data from a contemporary event, and compare it to existing concepts and ideas, a case study strategy is therefore the best choice.

3.5 Case study sites

This research was conducted in two fishing villages, Kaswanga and Kolunga on Rusinga Island (Figure 5). Rusinga Island was selected as the site for this study on the basis of the following: fishing in the area is mainly carried out by artisanal fishers; it is characterized by a number of beaches and landing sites; it has a high HIV/AIDS prevalence rate; there is lack of research considering links between fishery management and HIV/AIDS in the area; and, in terms of culture, traditions and values, there is homogeneity within the fishing communities. The selection of the study site was also primarily based on the fact that I am originally from Lake Victoria, Kenya and share the same language, culture and traditions.

The selection of the two fishing villages on Rusinga Island for detailed study was based on the following criteria: close proximity of the fishing villages to a landing site and a beach; high villagers’ involvement in artisanal fishing; the presence of fishing activities and traditional fishery management practices (such as ritual prohibitions on fishing in certain areas, taboos relating to fish in general or on specific fish species, gear restrictions etc); and the presence of villagers affected by HIV/AIDS.

Rusinga Island (0°35'–0°44' South; 34°11'–34°22' East; altitude 1,100 m) is 42 km² in area and is the second largest island in Lake Victoria (GoK 2001). Due to its close proximity to the mainland a 200m long causeway was constructed in 1983 to link the island with Mbita Township, the major trading and the administrative centre of the district (GoK 2001).

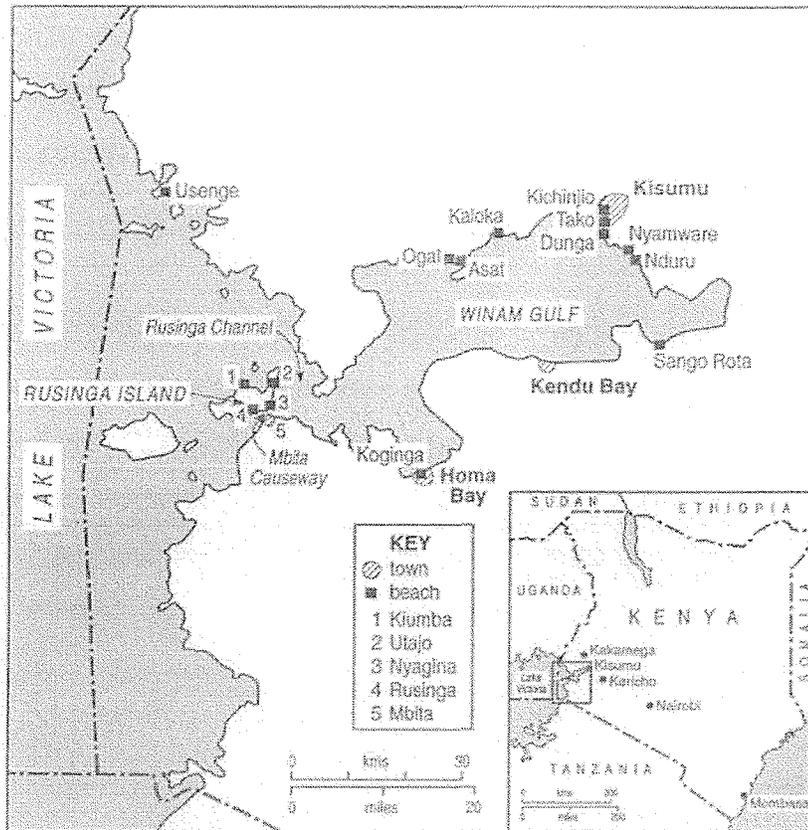


Figure 5: Map of Lake Victoria, Kenya showing Rusinga Island.

(Geheb K. & Binns T. 1997).

The majority of the inhabitants are people of Luo ethnic background. The main economic activities of the area are fishing, subsistence farming and making crafts. The area is characterized by a number of beaches and landing sites. The artisanal fishing community in the Island is comprised mainly of four livelihood groups; boat owners, fish

crews, fish traders/fish mongers and fish processors. Boat owners are predominantly men who are relatively resource rich and earn regular cash income. Fish crews are mainly young men who hire themselves out as fishing crew in return for a daily wage. Fish traders and fish mongers are predominantly men, though some are women, who buy and sell fish, either as agents for a fish company or as operators of small businesses transporting the fish - often by bicycle - to the market town. Fish processors are usually women who buy and process fish through smoking, salting or sun-drying within the community.

The terrain is extensively deforested and generally rocky and hilly with limited vegetation cover. There are a number of seasonal rivers which contain water only during the rainy season and the lake provides the main water source for the population. Two rainy seasons are typical for the area. The 'long rains' occur between March and June and the 'short rains' between October and November, but these seasons are unreliable with some years characterized by prolonged dry periods.

People living in Rusinga face a multitude of problems. The island has suffered enormous environmental degradation, soil erosion and extended drought conditions in recent years, leaving little productive land and few opportunities to make money other than through fishing. The high rate of HIV/AIDS (30%) on the island has been a major impediment to socio-economic development (GoK 2001).

3.6 Sample selection

Sampling techniques provide a range of methods to reduce the amount of data that is necessary to collect, by considering only data from a sub-group rather than all cases or elements (Wilson 2007). Purposive sampling, also known as judgmental sampling, has

been identified by Kitchin and Tate as the most subjective sampling method (2000). The term snowballing, according to Flowerdue and Martin, describes using one contact to help you recruit another contact, which in turn can put you in touch with someone else (2005). In this method, the initial contact may be a friend, neighbour, or someone from a social group, or formal organization.

Before conducting my field work, I met with the Mbita District Commissioner and both Kaswanga and Kolunga's chief and assistant chief, to brief them on my research. The Kaswanga and Kolunga's chiefs and assistant chiefs introduced me to their community members. During my meeting with the community members, I introduced my research objectives and plans for carrying out the field work. I explained that their participation was voluntary and that I would not be able to financially reward them for their contributions. I assured them that I was going to maintain confidentiality throughout the process, including my final written report. I also informed them that I would be living in their community during my entire field work and hosted by one of their own community members, Mr. Ezekiel Tito. In addition, I explained to them that I would commence my field work by carrying out participant observation to orient myself with the communities' way of life. Throughout the observation phase, I spent time with them at the beach, landing sites, in their villages, at the village market, kiosks and also attended their community and BMU meetings.

After two weeks of participant observation in both communities, through random purposive sampling I was able to come up with a long list of potential research participants, fishers, fish processors and clan elders based on my selection criteria, which included their knowledge on the topic and their involvement in fishing and/or fish

processing activities in their communities. With reference to my selection criteria, I checked with Mr. Tito (my main contact and host family) on my long participants' list for Kaswanga village and with reference to the selection criteria, he helped me to finalizing my research participant list. In Kolunga village, the Assistant Chief introduced me to Harry Thuku, a local fisher, who helped me with the shortening the long list of participants I had developed with the aid of my selection criteria. I chose Ezekiel Tito and Harry Thuku to help me with the process since they were respected members of the community, were involved in artisanal fishing and had both lived in their communities all their lives. At the end of the selection process I chose a sample of 50 respondents from both fishing villages in Rusinga Island. The selection criteria were based on the involvement in artisanal fishing practices and management and familiarity with the implication of HIV/AIDS (Table 1). The respondents were artisanal fishers (fish crews and boat owners), fish processors, village/clan elders, and members of the community (village men and women) and village/clan elders. The breakdown of the sample size is illustrated in the table below.

Table 1: Sample size and respondents in Kaswanga and Kolunga village.

<i>Village</i>	<i>Fishers</i>	<i>Fish Processors</i>	<i>Clan Elders</i>	<i>Members of community (Village men and women)</i>	<i>Total</i>
<i>Kaswanga</i>	5	5	3	12	25
<i>Kolunga</i>	5	5	3	12	25
<i>Total</i>	10	10	6	24	50

I chose a small number of respondents in order to adequately meet all the research objectives within the research timeframe. Most of the research methods were carried out in the villages, at the landing sites and on the beaches. Since I speak the same language as the respondents, I carried out most of the research methods in Luo, and later translated the research findings in English for the final thesis report. My ability to conduct the research in Luo allowed for free and open dialogue between the respondents and myself.

Though it seemed difficult at first given that I was a foreigner to the villagers, I was able to establish a good rapport with the respondents. Most villagers demanded to know who I was and my mission there. They told me that in the past, they had encountered people who identified themselves with various non-government organizations, promising development which was never delivered. After disclosing my identity as a student and making the villagers know that I was there to learn from them regarding their views and perceptions on the connection between HIV/AIDS, fishing and management practices, they gained confidence and trust and hence their views were forthcoming.

3.7 Research methods

a) Secondary Sources Review

According to Flowerdew and Martin (2005), secondary data means information that has already been collected by someone else which is available. The secondary sources for this study included existing literature on HIV/AIDS and fishing communities in Africa and other developing countries. I also sought data from text books, pamphlets, newsletters, leaflets magazines, articles, journals, internet sources and other published and unpublished books available in Kenya. I gathered more data from research materials, government reports, and project reports obtained from the KMF, UNEP and KMFRI

libraries. The objective of the secondary sources review was to build an understanding of the present fishery situation and review official government records to gain insight into fishery trends. To better understand the case study site, and learn about the fishing communities of Rusinga Island, I used secondary sources such as government data showing the population statistics, HIV/AIDS figures and the different fishing and fish processing methods carried out in the area. Data gathered through the various secondary sources also helped back up and supplement the research findings.

b) Participant Observation

According to Leedy and Ormrod (2005) observation in qualitative research is deliberately unstructured. Through participant observation and assistance from Ezekiel Tito and Harry Thuku, I was able to select the two fishing villages and my research participants.

Staying at home of a villager and spending my entire field work period with the two fishing communities were valuable means to understand the fishing communities' ways of living, their social relations and the problems they face. This process helped me build strong, trusting relationships with the villagers. During my time in the field, I interacted with the villagers and attended many social events, such as village meetings. I socialized with the villagers in their villages, at the landing sites, and at the markets. At the end of the field work I found myself becoming fully immersed in both communities.

Visual observations and photography of the communities' fishing methods, as well as other livelihood activities such as fish processing were also carried out as part of the immersion process. This helped me gain valuable insights into the daily activities of the respondents and their processes for managing the fishery. The observation phase also

involved accompanying the fishers on their daily fishing trips, so as to have an approximate idea of their fishing process. I also accompanied women to the landing sites to observe how they negotiate for the catches and the role they play in the artisanal fishery. I engaged in participant observation for the entire period I was in the field.

I kept a daily journal of observations and reflections as backup and to track the progress of the study. In my journal I jotted down the random conversations I had with other fishers, fish processors, and regular members of community (those who were once involved in fishing and fish processing but are not anymore), this summed up twelve community members in each village. Given the busy schedule of the fishing communities and their limited time to engage in dialogue, participant observation was a very important tool for the collection of data and even for the validation of results obtained.

c) Semi-structured interviews (SSI)

Pretty et al. (1995) define SSI as “guided conversation in which only the topics are predetermined and new questions or insights arise as a result of the discussion and visualized analysis.” In SSI, the context, participants, the way the interview is conducted and when it takes place is important as the questions themselves (Pretty et al. 1995).

Pretty et al. (1995) argue that to conduct SSI, the researcher needs to be a self-critic and aware of biases, open, and a good listener and observer. For an effective SSI, Pretty et al. (1995) point out the need for adequate previous preparation, use of an interview guide or checklist, use of different resources such as visual aid to encourage participation and dialog, consideration of participants’ values and culture when formulating questions and judging responses, verifying results through triangulation and recording responses and observations. I adopted the above mentioned techniques when conducting the SSIs.

In this study, I used SSIs to generate data and information, on how the fishery management has changed over the years; to establish key factors causing these changes including HIV/AIDS, to determine coping strategies the fishing community has adopted to adjust to the HIV/AIDS problem; and to explore on how the community learned to adjust their fishery practices and management in the face of HIV/AIDS. All respondents were asked the same questions in order to maintain uniformity and ability to compare responses of each respondent at the end of the study. I used open-ended questions in order to probe further on the research topic. Questions were confined to the issues relating to my research objectives.

I conducted a total of twenty six interviews, thirteen interviews in each fishing village. The interview sessions involved artisanal fishers, fish processors, and village elders. A check-list with open-ended questions was prepared to focus on issues to be explored. The open-ended questions were framed with the aim of soliciting deeper information which would otherwise be difficult to obtain. The choice of using a semi-structured interview format made it possible to ask further questions based upon the respondents' responses.

d) Focus group discussions

Discussion among local people and discussions with a particular group of stakeholders with the researcher as a facilitator are considered important methods to employ during data collection process (Pretty et al. 1995). Focus group discussions were useful, given the diverse resource users within the fishing communities who are either involved directly or indirectly in the artisanal fishery practices and management. A number of guided questions were used and during the discussion group members

spontaneously talked about the topic, under my facilitation and assisted by BMU chairmen. The method was chosen because of its effectiveness in obtaining in-depth information on concepts, perceptions and ideas of a group. All input from the discussions were transcribed in a notebook at a later time. The results were used as a basis for validation of claims made by the respondents concerning HIV/AIDS and artisanal fishery practices and management.

Focus group discussions were used in this research with an objective to generate data and information on the dynamics of learning in relation to HIV/AIDS coping strategies, and to develop recommendations and identify policy implications that aim to control the impact of HIV/AIDS within the fishing communities. The discussions were conducted between October 21st - November 7th with both Kaswanga and Kolunga fishing communities/beaches. Six focus group discussions were held, with three in Kaswanga and three in Kolunga. Each focus group discussion was conducted separately. In both study sites, there was a focus group discussion for fishermen, another for fish processors and a third with members of the community. This made it easy for a more open and free dialogue during the discussions. There were only five participants in each of the six focus groups. The small number of participants made it easy to facilitate the discussions and allowed a comfortable flow of information. This was a pool of villagers who had been previously interviewed and those who had not been interviewed. Each focus group lasted one hour. The focus group discussions were held in the villages and at the BMU centre.

Finally, using the focus group discussions, I managed to create an atmosphere of co-learning, where the fishing communities were able to clarify their thoughts through

discussions with each other and myself. The focus group discussions were inclusive to all participants, and all were encouraged to participate and take a leading role.

3.8 Data analysis and verification

Data analysis constituted a very important and interesting phase in this research since it drew me closer to making my final observations and conclusions. I executed my data analysis manually. All responses from participant observation, semi-structured interviews and focus group discussions were sorted out based on the two fishing villages and on the different groups of respondents (fishers, fish processors and clan elders). After sorting out all the response notes into their respective groups, I developed a special summary sheet which had codified themes based on my research objectives. Data was added into various categories of the codified themes according to similarities and differences in the responses. This was to help me easily analyze the final observations, interpret as appropriate and draw respective conclusions. I marked every objective that I had dealt with to ensure that none were left out or repeated. The data was then presented in quotes, tables and figures in Chapter 5 to give a clearer picture and understanding of the data gathered. To avoid any personal bias, I had my thesis advisor and advisory committee review the final thesis document.

Data verification was meant to increase data quality, facilitate coherence, check completeness of data, ascertain consistency and institute accuracy. Throughout the field work I employed the use of the triangulation method, which encompasses the use of multiple methods of data collection. I combined different qualitative methods of data collection including semi-structured interviews, focus group discussions and participant

observations. I also used the member-checking method to analyze and verify the data collected from the interviews, focus group discussions and community meetings.

While in the field, I presented the main findings of the study during final community meetings that took place in both villages, with the respondents and other village members present to further verify the data. In order to involve all community members, I conducted the presentations in their language. Later on, I will provide the communities with a primary report of the research outcomes (in their preferred form of presentation) which will be in Luo and English. This will be done once the final research report has been reviewed and approved by my advisor and committee members.

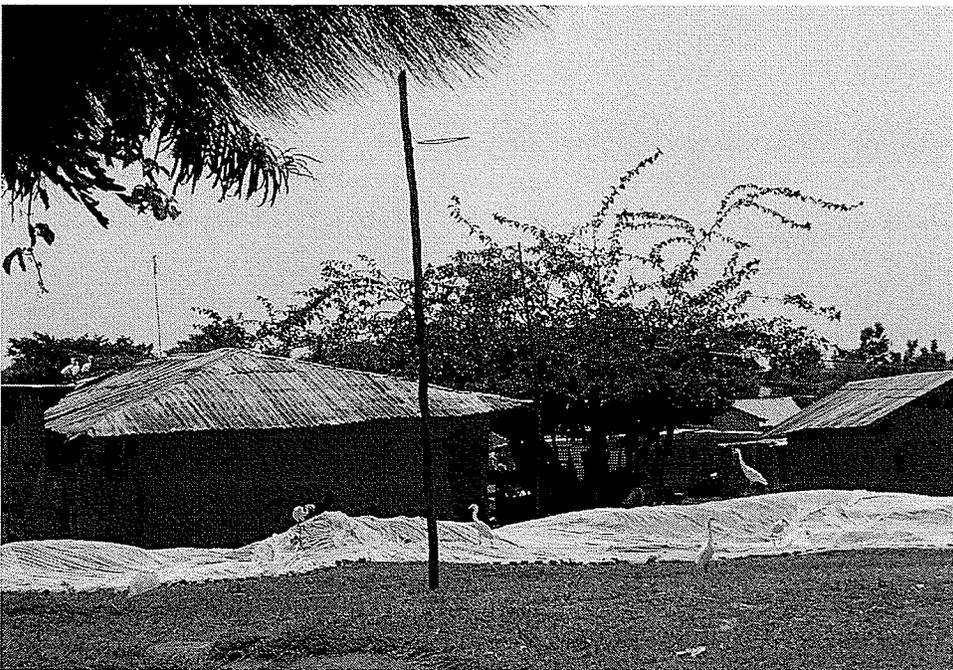
3.9 Ethics Approval

The Policy #1406 (University of Manitoba Policy and Procedures S. 1400, Policy 1406), states that the Research Ethics Board must approve any research under the auspices of the University of Manitoba that involves human subjects. Following this policy, steps were taken to ensure the ethical nature of the research and, in particular, to assure the confidentiality of all persons involved in the research.

CHAPTER 4



Photos by Sheila Omom



Top: Fish processors/traders negotiating fish with fishers on the fish catch
Bottom: Sun-drying Omena in Kolunga village

Chapter 4 – The case study communities

4.1 Study communities in context

Rusinga Island is situated in Mbita Division, Suba District, South Nyanza Province southwest of Kisumu, the biggest city in Western Kenya. Rusinga Island is linked to Mbita Point on the mainland by a causeway. Based on the 2007 Kenya AIDS indicator survey, Nyanza province has the highest HIV/AIDS prevalence rate of 15.3%, more than double the national prevalence rate² (NAS COP 2007). Kaswanga and Kolunga fishing villages are located in Rusinga Island (Figure 6). The 2007 population projections reported 2,183 and 3,001 inhabitants in Kaswanga and Kolunga fishing villages respectively (Pers Comm. Govt Official). The same population projection based on gender reported 1,030 males and 1,153 females in Kaswanga village and 1,403 males and 1,598 females in Kolunga village (Pers Comm. Govt Official). The high demand for fish and high prices from the export market has attracted many young men and women to migrate to the landing beaches to engage in artisanal fishing, fish processing and fish trading.

Prior to the introduction of Nile Perch and commercialization of the lake, fishers in both Kaswanga and Kolunga sold their catch directly to local fish processors, fish traders and to local villagers. Today, the high demand for Nile Perch in the export market has created intense competition for the species, a high influx of fishers and introduced sophisticated gear to boost the catch. Also to further increase the catch, most fishers have now turned to deep sea fishing and over-fishing. The commercialization of the lake has also brought in middlemen, who have captured the fishing market and now dictate the fish price. Fishers have no bargaining power and must accept the set price. During rainy

² Based on the Kenya AIDS indicator survey 2007 study, national prevalence rate was 7.4%.

As illustrated in Figure 7, the fish supply chain in Kaswanga has fishermen supplying their prime catch (Nile Perch and Tilapia)³ to middlemen or fish factory agents, who then sell the fish to processing plants, which later export the fish and fish products to export markets in European Union countries, Israel, the Middle East and other African countries. Abila and Jansen (1997) and SEDAWOG (1999) revealed that there is high degree of vertical and horizontal integration in this industry. Vertical integration arises from a fish processing factory owning or controlling other enterprises related to fish supply, including acquisition, transporting fish, product distribution and export marketing. Horizontal integration arises from fish processing factories owning or controlling other factories operating at the same level, i.e. different 'branches' of the same factories. Horizontal integration now extends beyond Kenya's borders as some factories in Kenya own similar factories in Uganda and Tanzania.

In Kaswanga, once the fishers have sold off their prime catch to middlemen/factory agents, they then sell the left-over fish (Nile Perch, Tilapia and other native fish species) to fish mongers and fish processors with the highest bids first. Some fish processors and fish mongers will then sell the fish to processors and traders who were not able to buy the fish directly from the fishers due to their low bids. Next on the fish supply chain, fish traders will then sell their fish to the national and local markets in Mbita, Homabay, Kisumu, Nairobi and Mombasa. As for fish processors, they would first process the fish and later sell them to villagers at the local village market. Fried Nile Perch skeletons and fried, smoked, and sun-dried Tilapia are the dominant processed fish products in the local

³ Fishers consider Nile Perch and Tilapia their prime catch since they are able to fetch a lot of money from them compared to other native fish species

village market. Both the supply and demand of these products are to a large extent driven by the nearly total absence of cold storage facilities.

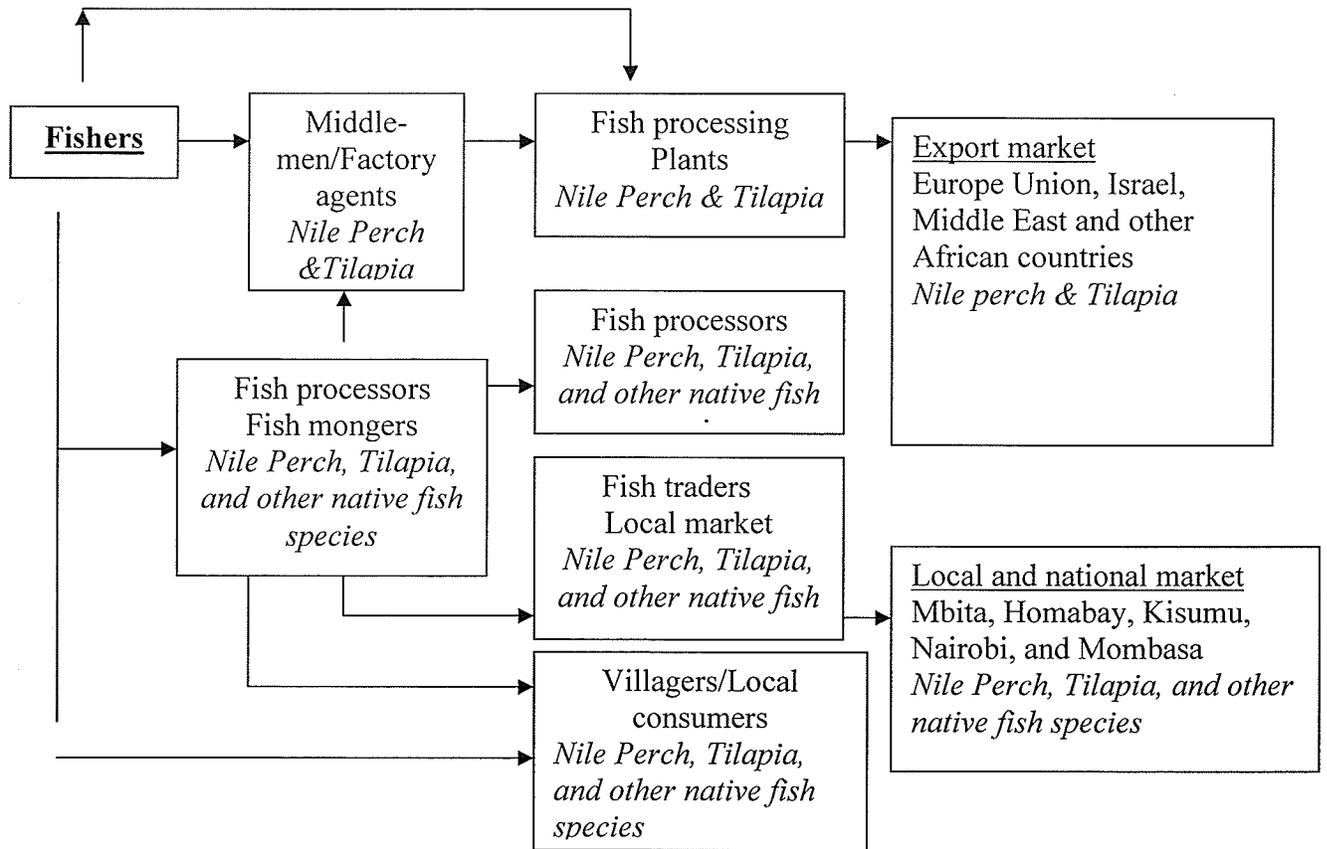


Figure 7: Fish distribution chain in Kaswanga fishing village (n=12)

As Figure 8 shows, the fish supply chain is quite different in Kolunga, since they only fish Omena. Fishers will first sell Omena to fish processors and fish traders with the highest bid. Fish processors and fish traders then sell Omena to those fish processors and fish traders who were not able to buy directly from fishers. Once they have bought Omena, processors immediately sun-dry the fish near the beach and then take it in bulk to the nearest wholesale markets or sell it at the local village market. Some fish traders will buy the fish from the fishers and sell it to animal feed factories, which process the Omena to animal feed and later sell it to the animal feed market.

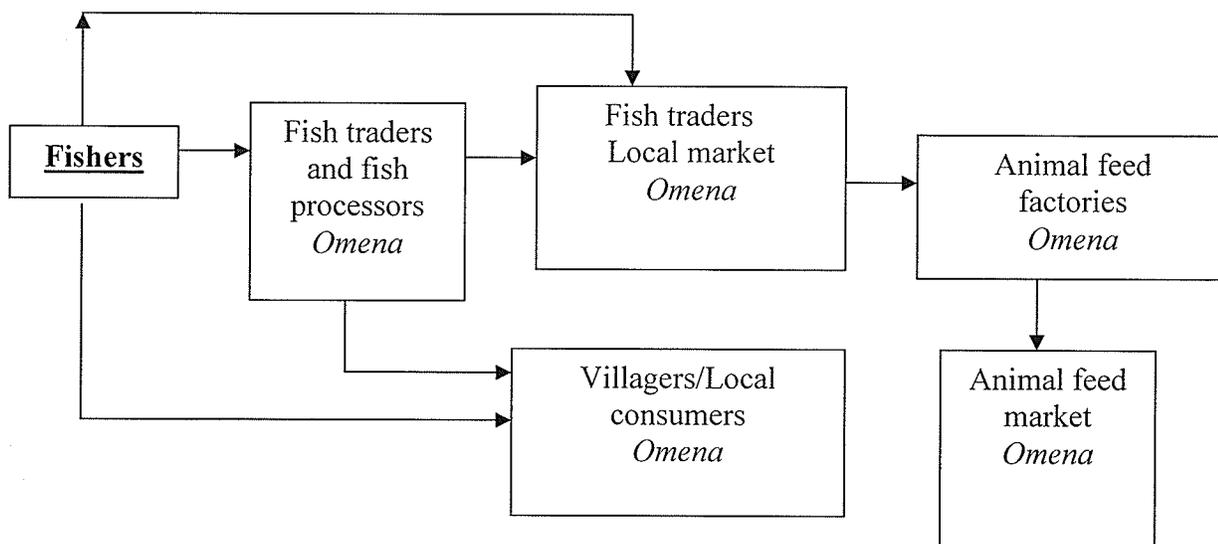


Figure 8: Fish distribution chain in Kolunga fishing village (n=12)

The catch effort has increased with a consequent increase in the number of fishing boats and an increase in the efficiency of fishing gear. According to the 2008 Kenya Fisheries Frame Survey report, Suba District had the highest number of fishers and landing sites, standing at 14,341 and 101 respectively⁴ (Frame Survey National Working Group Kenya 2008). In terms of facilities in Suba District, the report indicates only one working cold storage, 32 all-weather roads, 42 health clinics, 73 HIV/AIDS Volunteer Counselling and Testing centres and 46 HIV/AIDS Anti-Retroviral Centres available in 2008. The total number of fishing craft reported in 2008 in Suba District was 4,486. The common fishing gear dominant in most beaches were, sesse pointed at both ends, gill nets >5", small seines (mosquito seines) and long line hooks (Frame Survey National Working Group Kenya 2008).

⁴ Report on the Lake Victoria (Kenya) fisheries frame survey 2008: Survey coordinated by Lake Victoria Fisheries organization (LFVO) secretariat together with Regional Working Group (RWG) on Frame Surveys at regional level and by National Working Group (NWG) at national level.

4.2 The artisanal fishery in Kaswanga and Kolunga

Kaswanga Fishing Village

Nile Perch and Tilapia are the two common species in Kaswanga's part of the lake; this is because the waters are very deep, making it favourable breeding ground for the two species (Personal Observation). Occasionally, native fish species such as Mud Fish, Cat Fish, and Lung Fish are found in this part of the lake. Fishers and fish processors noted that there has been a continuous, drastic decline of these native species following the introduction of Nile Perch in their lake. In this community, fishing is a daily subsistence activity and is carried out at all hours of the day, although at dawn one cannot fail to notice a fleet of canoes swarming to the beach after over-night fishing.

Most of the fishers and fish processors are natives of Kaswanga community. In this fishing village, division of labour is based on gender, in that fishing, boat building, and net-mending activities are mainly carried out by men whereas fish processing and trading are dominated by women (Personal Observation). Fishing in Kaswanga beach is skilled and fishers mainly use simple low-quality gear, such as simple wooden dug-out canoes, beach seine fishing nets, trawl nets, long line hooks, gill nets, baits and wooden paddles (Personal Observation). Most fishing trips consists of three to four crew members per boat, where one person steers the canoe, while the others repeatedly throw cast nets, which sink to the bottom to entrap the fish (Personal Observation). Fishing activity is also for commercial purpose. Fishers sell their Nile Perch catch to the middlemen/agents from fish processing factories and Omena, Tilapia and other traditional fish species are sold to fish processors and fish traders (Personal Observation). Fish from Kaswanga is

often exported to Kisumu, Nairobi and Mombasa and to foreign countries in Europe and the Middle East.

Fishers fetch more money from fishing Nile Perch and Tilapia because they are high-demand fish exports. On a good day in one boat, a crew could catch 100kg of fish. The average price for Nile Perch caught in Kaswanga is 140 shillings per kilo, but the prices usually vary depending on the catch and demand for the catch. Fishers also noted that the price also depends on whether the fish is “*alive*” (fresh fish with reddish gills) or “*dead*” (fish with greyish gills). Fish that they consider alive are sold to the middlemen or traders willing to pay higher prices, while the dead fish are sold at discounted prices between 10-40 shilling per kilo to fish processors, fish mongers and villagers (Personal Observation). All Nile Perch and Tilapia over 1 kilo are recorded by the BMU once they land at the beach. In addition, a fee of 5 shillings per kilo of Nile Perch and Tilapia is deducted per boat for beach management activities. Fishers claimed that they were being exploited by middlemen who would only buy the Nile Perch for 140 shillings per kilo, while the processing plants would pay them 280 shilling per kilo. They also reported that the middlemen only paid for a full kilo and not for part-kilos, yet the processing factories would pay them for every kilo, including part-kilos.

During the off-season, men supplement their daily income by operating taxi (*boda boda*) or motorcycle (*apiko*) businesses, while women are involved in small businesses selling vegetables and fruits, selling cooked food along the beach, or brewing and selling local/traditional beer. In the rainy season both men and women also practice small-scale farming, growing maize, sweet potatoes, bananas and millet.

Fishing seasons depend on the rainfall patterns with the highest catches obtained during the rainy seasons between March and May and between August and September. Fishers in Kaswanga village refer to the rainy season as the “high season.” The high season attracts migrants (fishers, fish processors, and fish mongers) from surrounding villages as well as urban areas. In addition, during the rainy seasons, there is a substantial increase in the catches but a relative reduction in the number of traders, due to the poor conditions of access routes. In these seasons, fishers who are able to connect with traders are often forced to accept a low price for the fish because there is a high supply of fish and low demand from traders/middlemen. Fishers find themselves unable to influence the price decisions. Also, because of poor infrastructure in terms of transportation and fish preservation /storage facilities in the area, most of the fish caught during rainy season often goes bad, which causes a substantial income loss for both fishers and fish processors.

The dry seasons are the low seasons and they normally occur immediately before and after the rainy seasons: early March, late May, early October and late February. During the low season, most migrants and locals (fishers, fish processors and fish mongers) move to other more lucrative beaches in search of a better catch. The weather pattern in Kaswanga has become very unpredictable attributing to longer low season, and shorter high season with very little rains.

Fish processors/mongers either sell the fish when fresh or process the fish through sun-drying or deep frying before selling. Smoking of fish is the most popular preservation method in Kaswanga. Smoking of fish is done in traditional mud-walled ovens/kilns. Inside the kiln, the fish are spread out in up to three layers on iron rails stacked on top of

each other. Fish processors prefer to use wet firewood, as it produces more smoke and burns at a lower speed, making it easier for the fish to fully cook. The sun-drying method is the second most common method and is used with fish species such as Tilapia, Mud Fish, Cat Fish, and Lung Fish. Frying is also carried out in open-fired frying pans, although most fish processors consider it very expensive because it requires cooking oil.

According to Mbita HIV/AIDS report, from 2002 to 2008, Kaswanga had thirteen reported HIV death cases (Pers Comm. Mbita Clinic Health official 2009). According to the BMU statistics, only four members have been reported to have died of HIV related illnesses between 2007 and 2008 (Pers. Comm. Willis Miyengo 2009).

Kolunga Fishing Village

The topography of Kolunga fishing village is mostly flat. Omena/dagaa⁵ is the dominant species in Kolunga because it is situated in the shallow part of the lake which is favourable for breeding of Omena. According to KMFRI, fishing of Omena is carried out in areas less than 6m deep (Pers. Comm. with KMFRI Research Officer, 2008). Also the land area in Kolunga fishing village is open and wide, making it easier for Omena drying. The fishing gear used are small seines (mosquito seines), pressure lamps, and simple wooden boats. Light is necessary in areas with deeper waters during dark nights for visibility and also to attract Omena to the source of light, making it easier to fish.

Fishers and fish processors noted that there has been a drastic decline in Omena catches from about 600 to 1,000 kilos per day since 1990. Fishers explain that this decline is mainly caused by over-fishing, brought about by the increased number of fishers and boats in the lake. When it comes to fishers' income, boat owners often employ crews who have no boats, with 30% of the daily catch divided among the crew

⁵ A small sardine like fish

and 70% going to the boat owner. Fishers usually sell their prime catch to the middlemen and the surplus to fish processors/fish mongers and villagers who immediately sun-dry the fish near the beaches and later take it in bulk to Mbita town centre.

Fishing is skilled and is carried out using cheap, low-quality gear. With the fishing mainly dominated by men, the women are mostly involved in processing and trading Omena. Fish processors face adversity during cold and rainy season, since Omena requires sunlight to dry faster. Fresh Omena do not sell, and so by any means they must have the Omena dry in order to make money. The rainy seasons between March and May and between August and September are considered the high seasons. However, during these seasons fish losses are high, as there is often not enough sun for effective and quick drying of the Omena. As a result of the long drying period, the fish acquires an intolerable pungent taste, contributing to very low sales and an increasing poverty level among the fish processors/fish mongers. Similar to Kaswanga, the weather pattern in Kolunga has become very unpredictable attributing to longer low season, and shorter high season with very little rains.

The government has placed a ban on Omena fishing from April 1st to August 31st to prevent interference in fish breeding areas; Kolunga community has been gravely affected by the ban. Fishers and fish processors assert that the ban has increased poverty and the food insecurity situation in the area, driving most of them to succumb to sex-for-fish and sex-for-customer deals for survival.

Kolunga fishing village is mainly populated with migrants (fishers, fish processors and fish mongers). The community is highly over-populated and has a growing fishing slum, with most houses in poor quality. The majority of women are single women.

Kageno, which means “A place called hope” is an NGO which first started in Kolunga Village in 2003. According to the Kageno-Kolunga regional coordinator, the Center’s big success has been setting up income-generating projects and promoting empowerment programs that target infected and affected women, providing education and care to AIDS orphans, and starting mini-clinic for the locals. However, my respondents showed some divided perception on Kageno within their village. Some believed that the NGO had done a lot to improve the community members’ livelihoods by offering social services such as micro-loaning projects, a community school, a mini-clinic and by providing income-generating projects for women affected and infected with HIV/AIDS. Other community members argued that most of the programs offered by Kageno only targeted HIV/AIDS infected women, which has further contributed to the stigmatization of those infected with HIV/AIDS in their village.

According to Mbita HIV/AIDS report, from 2002 to 2008, Kolunga had twenty seven reported HIV death cases (Pers Comm. Mbita Clinic Health official 2009).

According to the BMU statistics, six members have been reported to have died of HIV related illnesses between 2007 and 2008 (Pers Comm. Harry Thuku 2009).

Kaswanga and Kolunga fisheries institutions

The communities have both formal and informal fishers’ organizations. Formal structures are usually government administrative structures. The Ministry of Fisheries is a government institution charged with enforcing fisheries regulations.

At the district level, these include the District Commissioner (D.C.), the District Officer, (D.O.) the District Fisheries Officer (D.F.O), Agricultural Officers, Forestry Officers and the judiciary. At the local level, there are the Village Chiefs, Assistant

Chiefs and Councilors. The Chief and Assistant Chief are very much involved with the fishing community. They provide security, enforce government laws, solve conflicts that the Beach Management Unit Committee cannot solve and create awareness of various issues of national importance.

Informal organizations include the BMU, fishers' groups and the Council of Elders. Other informal groups at the beach are women's groups, and the fishermen's cooperative society. The BMU is an informal organization based within the fisher community. It is headed by a Beach Chairman and comprises representatives of the fishing community who are elected every two years. The Ministry of Fisheries Department works together with the BMUs from all the landing sites in an attempt to solve any fisheries related problems. Despite this, the BMUs are not a legalized institution under Kenyan Law. The BMU Committee's task is to manage fishers' activities at beaches. It registers fishers on the beach, solves fisheries-related conflicts, and enforces fishing community by-laws and some fisheries regulations.

In both villages, the most dominant cooperative is the BMU, which involves all the players - fishers, fish processors and traders. This cooperative type is managed by the Beach Management Unit Committee. In the past, money raised from the BMUs has been used to purchase a weighing scale, build a *banda* (BMU centre), build toilets, and purchase some communal legal fishing gear. The fishers, fish processors and fish traders also have their own cooperatives, to which they make a monthly contribution. Monies collected in all the cooperatives are often used to meet the most basic needs for the groups and they have merry-go-round every month where a member gets a large sum of

money. Through these cooperatives, fishers, fish processors and fish traders are able to loan money and pay it back later at a reasonable rate of interest.

The dynamics of learning in both Kolunga and Kaswanga villages

Learning in Kaswanga and Kolunga culture has existed for many generations and evolved with time. Learning consists of transmitting and acquiring knowledge on life, traditions, societal beliefs and practices of the Luo group. Before modernization, the Luos created time and space for learning. Community members took learning seriously and elders played a critical role in passing on their knowledge and experience to the younger generation. Elders were entrusted with this role, for they were considered more experienced in life and they were highly respected for having accumulated so much knowledge. The transmission of knowledge took place during all times the young ones were with the elders.

Most of the learning focused on the Luo traditions/customs and their relationship with the lake. Community members viewed the lake as a sacred body that fed them and that had to be treated with so much love for it to reciprocate by provision of food to the communities. When there was a low catch, they believed it was because they were disrespecting some of the fishing traditions that had been set by the ancestors. Learning created cohesive social ties among community members and also ties between community members and the native fish species.

Young women learned different methods of processing fish and how to use each method through older fish processors. On the other hand, young men learned the fishing rules and regulations and a variety of effective fishing methods. They were taught how to use wind direction patterns to locate the areas that would provide a high catch, and how

to use the stars⁶ and the position of the moon to determine the direction most fish are moving. They were also taught on how to use their knowledge on fish breeding patterns and fish habits to determine the best gear to use. Young ones were keen when learning, since they were later expected to apply these lessons in their daily lives. Once the young women and men reached the appropriate age (15 years old) for fishing and fish processing, they would put into practice what they had learned. By the age of 18, they were considered efficient in their roles. As part of the tradition, when they got older, they were expected to transmit back the same knowledge to the next generation.

Presently, the way of learning has changed in many ways. Community members no longer create time and space for learning. Learning is not taking place with elders, as it did in the past. Instead, people are learning because they need to (by necessity) and are learning in order to live or just get by. Community members have become too busy to transmit and acquire knowledge, because of the many responsibilities that have accompanied the harsh economic situations. Community members are so occupied in trying to make ends meet that they are not making the time or effort to create an environment for learning. HIV/AIDS has also changed the dynamics of learning. As a result of HIV/AIDS, elders have been forced to take on the role of caregivers in elder-led households, and thus they have no time to transmit knowledge. With the high HIV/AIDS deaths taking place, many adults and elders have died prematurely, before transmitting the knowledge. HIV/AIDS has also created increased responsibilities among elders, and with so many families led by the elderly, the care-giving and financial burden placed on elders has made it impossible for them to create the time and space to transmit knowledge. Fish processors have also not been able to make time to pass on their

⁶ The number and type of stars

knowledge to young fish processors, since they have also often had to take the role of looking after sick members in the family as a result of HIV/AIDS.

Other than HIV/AIDS, the migration of fishers and fish processors during low season is also interfering with the dynamic of learning, since fishers and fish processors are often gone for long duration during low season and the young are often left behind. The migration of newcomers to the fishing communities has also interfered with the learning process by causing pressure and competition over fishery resources. In light of this competition, fishers and fish processors have little time to spend passing on their knowledge to their young.

Channels of learning (past and present)

In the past, the main channel for learning was the clan-based/communal way of learning. The clan elders transmitted the knowledge of different aspects of life and the younger generation acquired the learning.

Community members also transmitted and acquired knowledge through each other (peer-to-peer). This happened during their daily interactions in livelihood activities. This form of learning is still a common way of learning, although it is not as extensive as it was in the past. Through peer-to-peer learning, fishermen transmit and acquire knowledge while on fishing trips, and fish processors transmit and acquire knowledge while waiting for the fishermen to land, at the landing site or at times when they are processing fish in the village. Also, today with community members not creating time and space for learning in a communal setting as happened in the past, community members are finding themselves learning on their own through observing and imitating what others are doing.

4.3 Summary

Kaswanga and Kolunga fishing villages are two very poor and remote fishing villages irrespective of the fact that a high tonnage of Nile Perch and Omena is caught by them each year. These two fishing villages have poor access roads, poor communication infrastructure and have no refrigeration facilities in their beaches or close by in the surrounding areas. Social services such as health care facilities, schools and government administrative centers are miles away and thus not easily accessible by the communities. Poverty rates are quite alarming and so is the HIV prevalence rate, which is much higher among these fishing communities when compared to other non-fishing communities.

The management of Lake Victoria artisanal fisheries has gone through a significant transition, moving from being a traditionally-based system during the pre-colonial period to a system of central government control during the post-colonial period. This transition has led to tremendous changes in fishery and its ecological dynamic. The introduction of Nile Perch, a high demand for fish, the growth of fish export market, population growth in the lake region, an increase in the number of fishers and gear, and a rapid decline of fish stock are just some changes that have taken place.

The poverty and HIV/AIDS situation, and the change in the dynamic of the fishery resource in Kaswanga and Kolunga, definitely calls for the need to address both the management of fisheries and sustainability of fishing communities' livelihoods.

CHAPTER 5



Photos by Sheila Omom



Top: Fish processor/trader in Kaswanga village
Bottom: Fishers and fish processors/traders at the landing site

Chapter 5 – HIV/AIDS and the artisanal fishery in Kaswanga and Kolunga

5.1 Introduction

This chapter seeks to give the communities of Kaswanga and Kolunga a voice by sharing their perceptions on the; impacts of HIV/AIDS on the artisanal fishery practices and management efforts, susceptibility and vulnerability of fishing communities' to HIV/AIDS, coping strategies adopted to cope with the HIV/AIDS implications and the dynamics of learning. This was done by presenting as much of their own words (from interviews and focus group discussions) as possible, in line with the objectives that the research seeks to address.

5.2 Impact of HIV/AIDS on fishing activities and management efforts in Kaswanga and Kolunga (N=50)

It was realized in the course of the interviews and focus group discussions that respondents from both communities had an understanding of the impacts HIV/AIDS was having on their fishing practices/activities and fishery management. Drawing on the findings from the respondents, Allison and Seeley's (2004) model (Figure 4 on page 23) was applied to organize the impacts noted by respondents of HIV/AIDS on Kaswanga and Kolunga fishing practices and management efforts. Figure 9 below is grounded in the data to outline the identified impacts HIV/AIDS has on the fishing communities at the household, community and sector level. Based on the findings it is evident that the implications of HIV/AIDS drive the fishing communities to engage in activities that threaten the sustainability of their livelihoods and fisheries. The data constitutes findings from participant observation, SSIs and focus group discussion responses from both fishing villages.

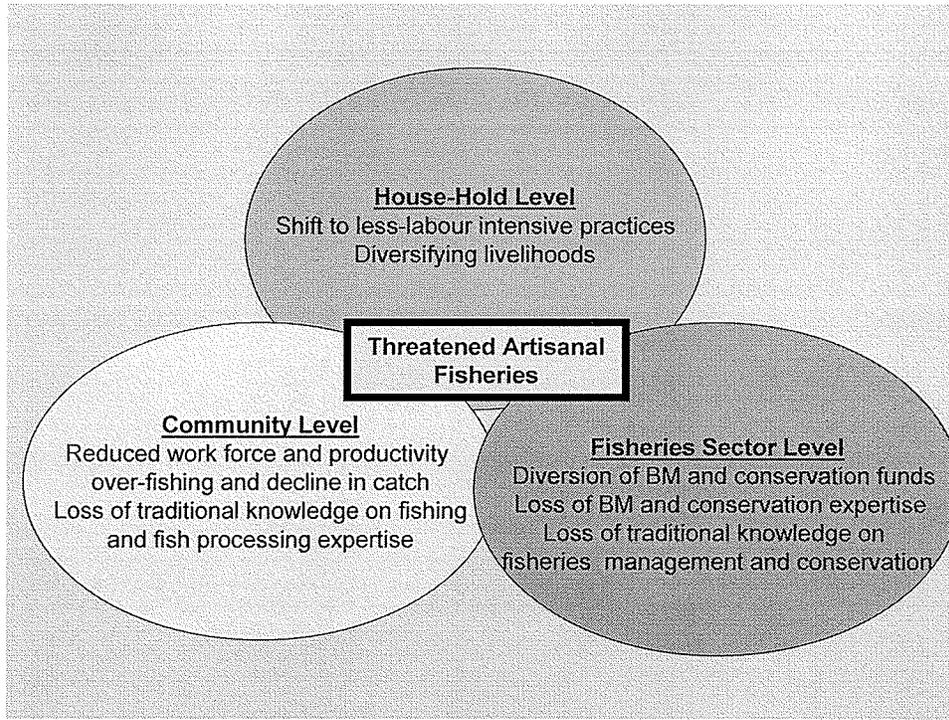


Figure 9: The impact of HIV/AIDS on Kaswanga and Kolunga fishing communities at the household, community and fisheries sector level.

1. The impact of HIV/AIDS at a household level

a) Shift to less-labour intensive fishing and fish processing methods

With the drastic decline in catch levels, fishers from both communities have been forced to lengthen their fishing trips by carrying out ‘deep sea fishing’⁷, to further boost their catch. However, quite a number of sick fishers in the communities have been forced to shift to shallow fishing because it is less-labour intensive, regardless of the low catch associated with it. As one fisher pointed out:

“After fishermen get sick and weak from the big disease, fishermen stop going deep sea fishing because it is very tiring and because it involves very tough and cold conditions, so they choose to fish on close waters (shallow fishing) because it is done during the day and is less tough.” (Interview response from a fisher in Kolunga village KOL1)

⁷ Deep sea fishing is mostly carried out over-night, it’s very labour intensive and dangerous because of the use of small boats, and big waves and strong winds at night

Another fisher also recounted that:

“Because the population of people and fishermen in our beach communities has increased, there is now competition for fish in the lake. Most fishermen are using very complicated (advanced) methods of fishing and fishing in the deep sea. But for some fishermen who are getting sick from the big disease, they are choosing to only fish on close waters even though that is where fish reproduces. Because a good number of fishermen are doing this, the catch is very low this is because they interfere with the environment that the fish need to reproduce.” (Interview response from a fisher in Kaswanga village KAS3)

Bishop-Sambrook and Tanzarn (2004) identify this phenomenon, noting that the choice of sick fishers to fish on shallow waters, results in greater environmental deterioration and depletion of fish stocks since close-shore waters are critical habitat to sea grass, corals, and mangroves and serve as nurseries for juvenile fish.

Based on focus group discussions with fish processors in both communities, it was evident that despite earning them less money when compared to smoking or frying methods, sick fish processors and those taking care of sick members in the family were switching to sun-drying processing method since it is less-labour intensive (Focus Group Discussions, 2008). As one fisher processor noted:

“The big disease affects us a lot. Because many members of our families are getting sick from the big disease, we are now using fish processing methods that require so much time so that we look after the sick ones in the family. Women who are sick from the big disease are changing to using easy methods of processing fish like sun drying and not smoking or frying because they require a lot of time at the hard job of looking for firewood.” (Interview response from a fish processor in Kaswanga village KAS02)

These shifting labour roles in fishing communities as a result of HIV/AIDS were also described in Sambrook-Bishop and Tanzarn (2003) and Seeley et al. (2003) from studies in Uganda. Based on the study findings, some men in fishing communities where there was increasing ill-health as a result of HIV/AIDS were also taking over traditionally

female activities such as fish processing, since they were less labour-intensive (Seeley et al. 2003; Focus Group Discussions 2008).

b) Diversifying livelihoods

During focus group discussions respondents from both Kaswanga and Kolunga maintained that households that are affected by HIV/AIDS are forced to diversify their activities in order to make up for the lost income of those that are sick. One fisher captured this:

“After the death of two of my family members to the big disease, I am now doing many jobs on top of fishing and selling fish so that I can provide my family with food and school fees for my children, I am now burning wood, selling firewood mending fishing nets, and fetching water for people here in Kolunga .” (Focus group discussion response from a fisher in Kolunga village)

Fish processors also underlined that once their husbands get sick they resort to engaging in multiple livelihoods such as collecting and selling firewood, fishing (closer to the shores), selling vegetables and *mitumba* (second hand clothes), selling cooked food at the landing sites, and working in the bars at the beaches. Similar studies in Tanzania also found that households affected by HIV/AIDS were forced to diversify their activities in order to earn more income (Tobey et al., 2005).

During the focus group discussions, several fish processors expressed the frustration they face when sick fishers switch to fish processing and fish trading business, creating an intense competition for fish catch (Focus Group Discussion, 2008). They went further to explain that the intense competition over the fish catch, made them initiate, or more frequently feel compelled, to engage in the sex-for-fish deals with the fishermen in order to access fish (Focus Group Discussion, 2008).

2. The impact of HIV/AIDS at a community level

a) *Over-fishing and decline in fish catch (multiple fishing trips)*

Fishers in Kaswanga and Kolunga often fish in crews (consisting of 4 or 5 members), most of these crews have been fishing together for more than five or even 10 years. However, as some of the crew members are now dying of HIV/AIDS, before they can get replacements, remaining fishers are now forced to increase their fishing efforts and hours to make up for the lost workforce/labour.

“After losing 2 of our best crews to HIV/AIDS in 2007, we have now been forced to increase the number of hours we spend fishing, before we would fish for only 6 hours per day, now we are fishing for more than 15 hours per day to increase our chances of getting good catch, it is so tough” (Focus group discussion excerpt from a fisher in Kolunga village)

During focus group discussion in Kaswanga one fisher pointed out that:

“We fish together as a team. Between 1998 and 2000 I remember in my boat we lost two of our strong crews, it took so much time before we found hard working strong people to replace them, and so I remember at that time we started going on two long trips and one short trip per day so that we can get a good catch with less crew....” (Focus group discussion excerpt from a fisher in Kaswanga village)

According to the focus group discussions with clan elders, the increased intensity in fishing activity is now attributing to the rapid decline in fish catch (Focus Group Discussion, 2008).

Also, fishers coming from HIV/AIDS affected families are now making multiple fishing trips (intensive fishing) in order to make up for the lost income. As one fisher narrated:

“Fishermen who are from villages where most of the fishermen are now sick and weak, because of the big disease they now make more than the normal two fishing trips. And so early in the day they will cast so many nets on close waters, and in the evening they will go for overnight fishing. Because so many of us fishermen are doing this, so much fishing is now going on and I think this is making there to be

low catch in the lake, but we have to do this so that we can provide food at home.”
(Interview response from a fisher in Kaswanga village KAS2)

This finding is supported by ABCG (2002), who found that HIV/AIDS morbidity and mortality changes in natural resource acquisition strategies may involve unsustainable harvesting practices. Torell et al. (2006), in their field study in Tanzania found that, the use of small mesh nets for both marine and fresh water fishing was common among village households affected by HIV/AIDS, as they tried to make a living from declining fish catch.

b) Loss of traditional knowledge on fishing and fish processing expertise

For generations the Luo fishing communities have valued their traditional knowledge, which has been transmitted orally through culturally shared practices such as fishing, fish processing and farming (Focus Group Discussions, 2008). According to the responses from focus group discussions, the sharing of information on fishing and fish processing is an activity that has always taken place (Focus Group Discussions, 2008). Often encompassing fishing and fish processing methods, fish habits and behaviours, best fishing spots, fishing equipments, regulations, fish markets, preservation methods and hygiene, the shared information has always been considered to be essential (Focus Group Discussions, 2008). Community elders considered these traditional knowledge elements essential for long-term sustainability of their lake (Interviews, 2008) and over time, fisher and fish processor experts have been expected to pass on this information to the young/new fishers and fish processors.

However, from the interview responses offered in both villages, it is evident that today HIV/AIDS has interfered to a certain degree with this form of shared

learning/knowledge transfer, given that some of the experts have died/or are dying of HIV/AIDS. This in turn is resulting in a loss of fishing expertise and disrupted knowledge transfer.

“For many past generations, women fish processors learnt of ways to process fish. They acquired this learning from elder fish processors. Also the fishermen learnt on the different effective fishing methods, fishing grounds, learnt on different winds patterns and stars, and how to use that knowledge to direct them on spots with the best catch, direction most fish were moving to, best spots for different fish species. There was time for learning and the community members made time to acquire knowledge and for those who were in a position to transmit knowledge they did so freely.

Presently the mode of learning has changed. This can be accounted by factors such as harsh economic conditions, extreme poverty and hunger issues as a result of loss of rains (land becoming infertile and increased dependence on fishing and fish processing, hence forcing the community members to become more and more involved in engaging in commercial activities to meet the household basic demands. As a result of the over-engagement in commercial activities, community members have failed to create time and environment for learning/knowledge sharing. HIV/AIDS has partly contributed to this change since many community members are getting sick and some dying and creating extra responsibilities on the remaining family members, and leaving them no time for learning.” (Focus group discussion excerpt from Kaswanga fishers, fish processors and clan elders)

During a focus group discussion in Kaswanga, one fisher noted:

“I remember my one of my crew members who died two years ago, Otieno, Otieno had a great talent of spotting the best fishing grounds. We always came back from fishing trip with our boat full of fish, because he always directed us on the best spots to go to. Unfortunately after Otieno’s death, our crew has not even been able to make it back from a fishing trip with half the boat full of fish, we miss his talent.” (Focus group discussion excerpt from a fisher in Kaswanga village)

Allison and Seeley (2004) noted that “as death rates in fishing communities as a result of HIV/AIDS increase, knowledge that comes from long experience in the fishery is also lost along with the commitment to the notions of a fishing community and culture”. Stressing the aforementioned point, ABCG (2001) and DAI (2003), underline

that, following the death of the experts, those inexperienced fishers and fish processors who are left are more likely to employ unsustainable harvesting practices owing to a lack of conservation/management knowledge.

c) Reduced work force and productivity

HIV/AIDS has decreased the workforce in fishing, given that fishers are getting sick from opportunistic⁸ infections and are not able to carry out fishing activities. Based on the findings, this leads to a gradual decline in fish catches. As one fisher recounted:

“Because we are fishermen we work together as a team, for example in one boat there will be four crews who will go on a fishing trip together. But when one falls sick because of the big disease at times he will then pull out from his crews, leaving only three crews. If the crews left are strong enough they will then go on a fishing trip just the three of them, Because there will be one person less to carry out certain jobs in the lake, now there will be less catch, compared to when all the four crews were working.” (Interview response from a fisher in Kaswanga village KAS3)

3. Impact of HIV/AIDS at a fisheries sector level (Fishery resource and management)

a) Diversion of beach management and conservation funds

The BMU created a by-law mandating members to pay an annual membership fee of 100 Kenya shillings, an annual vessel registration fee of 200 Kenya shillings, a daily landing fee of five Kenya shillings per kg and a truck loading fee of 50 Kenya shillings (Focus Group Discussion, 2008). The objective of this by-law is to channel the funds collected on beach management and conservation efforts. However, this has been challenged with today's high HIV/AIDS rate (Focus Group Discussion, 2008). The funds are now channeled to assist BMU members to meet medical, funeral and education costs for HIV/AIDS orphans (Focus Group Discussion, 2008). For this reason, very minimal funds are left for beach management and conservation efforts. Consequently, this creates

⁸ Illnesses that are made possible by the weakening of the immune system (e.g. as a result of HIV)

competition for scarce financial resources between HIV/AIDS demands and beach management activities. Corroborating this finding, Oglethorpe and Gelman (2004), also reported that many conservation organizations have to cover the costs of medical expenses, sick leave, terminal benefits, funeral costs and additional training for new staff, thereby reducing the budget available for conservation work.

b) Loss of beach management and conservation expertise

Kaswanga and Kolunga BMU statistics reported four and six HIV related deaths of BMU members between 2007 and 2008. Since HIV/AIDS hit communities, many adults and elders who were very involved in management and conservation efforts have become ill and some have died of the disease (Focus Group Discussion, 2008). Consequently, this has brought about the loss of qualified, capable, and productive people who would today be involved in undertaking management and conservation measures within the beach (Focus Group Discussion, 2008). As one fisher from Kaswanga sadly narrated:

“HIV/AIDS has affected the management of the lake because our BMU leaders have become sick from the disease and have not been able to carry out their duties, and because for them to become BMU leaders, they have gone through tough and expensive training so when they get sick and are not able to pass on the skills to community members before their death, the community loses on very important beach management experiences (skills) that is important for long-life (sustainability) of the beach.”

“Again after the death of BMU leaders, the community is forced to carry out elections, but because training of new staff is important before they become effective it takes such a long time for proper beach management to take place, also because the training is organized by LVFM (Lake Victoria Fishery Management organization) and only done after every four years so it actually takes time for a new chosen beach manager to cause good management to take place. During this period of not having effective BMU leaders ensuring beach management takes place fishermen get out of control and use bad gears and misuse the lake without thinking of the long-life (sustainability).” (Interview response from a fisher in Kaswanga village KASI)

Based on the focus group discussion responses from both communities, the coping mechanism for the loss of beach management and conservation expertise has been the deployment of Beach Management Unit members, who in most cases are very inexperienced. This is a sound short-term strategy which is, however, not sustainable in the long term. They do not fully replace the skills and knowledge base that has been lost.

In their study area in Tanzania, Torell et al. found that 13 people (seven women and six men) engaged in environmental management activities had died from AIDS-related illness during the last five years (2006). Drawing on this finding, they went further to explain that when staff members pass away, organizations lose institutional experience and memory. Hence, the loss of park rangers, extension officers, senior officials and other conservation personnel can have detrimental impacts on coastal biodiversity conservation (Torell et al. 2006).

Allison and Seeley (Undated) argue that from a fishery management perspective, a key implication of high rates of HIV/AIDS in fishing communities may be the loss of the long term view that is a prerequisite for any system of management that requires cooperation or leadership from fisher-folk. They (Undated) go on to explain that there may not be a reduction in fishing effort as new entrants will replace those who leave the fishery through illness, but the high turnover could lead to reduced productivity (less skilled fishers) or increased use of effective but destructive fishing techniques.

c) *Loss of traditional knowledge on management and conservation*

Traditional knowledge on the customary practices for management and conservation of fishery resources, historically passed across generations, is also being lost due to the HIV/AIDS crisis. Communities are losing the traditional knowledge that was based on sustainable fishing practices and controlled the exploitation of the fishery resources (Focus Group Discussion, 2008). As one fisher from Kaswanga pointed out:

“Some of the elder fishermen are also leaving us because of HIV/AIDS and not sharing (passing on) their fishing experiences (good ways of fishing, how to fish without destroying the reproducing fish areas, and ways to maintain long-life for the lake) to younger fishermen. Also in some families where the parents have both died and the grandparents are now looking after the orphans, these grandparents are left with so much responsibility that they now don't have time to share their fishing experiences with the young fishermen. This is why the younger generation (young fishers) are now fishing based on what they see and what brings a lot of money and not what is good for the long-life of the lake.”
(Interview response from a fisher in Kaswanga village KAS5)

Oglethorpe and Gelman (2004) highlight in their report that since the middle (adult) generation is most active in land and natural resource management, when they die before they have passed on the knowledge to the younger generation, their traditional knowledge on sustainability and natural resource management is often lost. Also, Allison and Seeley (Undated) explain that as fishing experts die, the knowledge that comes from long experience in the fishery will be lost. Fisheries may become increasingly dominated by young people with little long-term interest in sustaining the fishery and every interest in maximizing short-term earnings.

5.3 Why fishing communities are more susceptible and vulnerable to HIV/AIDS compared to other groups (N=50)

Barnett and Whiteside (2000) present a comprehensive reflection “susceptibility and “vulnerability” concepts:

“Susceptibility is the term used to describe the individual, group and general social predisposition to infection. This concept may be operationalized at any level, from an entire “society” or country, down to a household. Thus individuals, societies and nations are more or less susceptible to infection, and the speed and extent of HIV spread will be determined by the susceptibility.”

“Vulnerability describes those features of a social or economic entity making it more or less likely that excess morbidity and mortality associated with disease will have adverse impacts upon that unit. Thus families, communities and societies will be more or less vulnerable to the impact of increase mortality and morbidity.”

Bishop Sambrook and Tanzarn (2003) argue that there are three defining characteristics of fishing communities which make them cauldrons for HIV infection: first, their near neglect by government and the service sector; second, the high degree of mobility by the fisher-folk: and third, their lack of social cohesion. They (2003) also underline that, not only does the livelihood lifestyle influence people’s susceptibility to becoming infected with HIV but it is also a major determinant of their vulnerability to the impacts of AIDS. Amongst the most immediately vulnerable are those whose livelihood depends on their physical well-being, such as the fishing crew and fish traders who cycle considerable distances to market. Other members of the community may continue with their businesses but the fear of stigmatization and discrimination (once their sickness becomes apparent) may force them to withdraw from daily life and even retreat from the community. Bene et al. (2005) underline that the high HIV/AIDS vulnerability among fishing communities stems from insecure rights, uncertain production systems, high

physical, economic and regulatory/institutional risks. In reference to the responses from the interview and focus group discussions, the high HIV/AIDS susceptibility and vulnerability among Kaswanga and Kolunga fishing communities compared to other occupational groups stem from complex, interacting factors: environmental, economic, socio-cultural and institutional. These factors are explored in-depth in this section.

Respondents from both communities also pointed out that some of the conservational and management regulations/policies set by the Ministry of Fisheries made them vulnerable (increased their risks) to the HIV/AIDS impacts. Figure 10 below summarizes some of the factors they believe explains their susceptibility and vulnerability to HIV/AIDS.

Figure 10 is grounded in the findings from participant observation, SSIs, and focus group discussion responses from both fishing villages, underlining all the factors mentioned (social, economic, environmental, institutional, and socio-cultural). It is evident from the findings that all these factors drive the fishing communities to engage in activities that further threatens the long term sustainability of their artisanal fisheries (Bishop-Sambrook & Tanzarn 2003; Tobey et al. 2005; Torell et al. 2006).

As some scholars would argue that the socio-cultural, institutional, economic and natural factors discussed in this section have an indirect link/relationship to HIV/AIDS, I stress that these relationships helps understand the most significant long-term consequences of HIV/AIDS and provide the basis for new responses to positively deal with HIV/AIDS in the fishery sector.

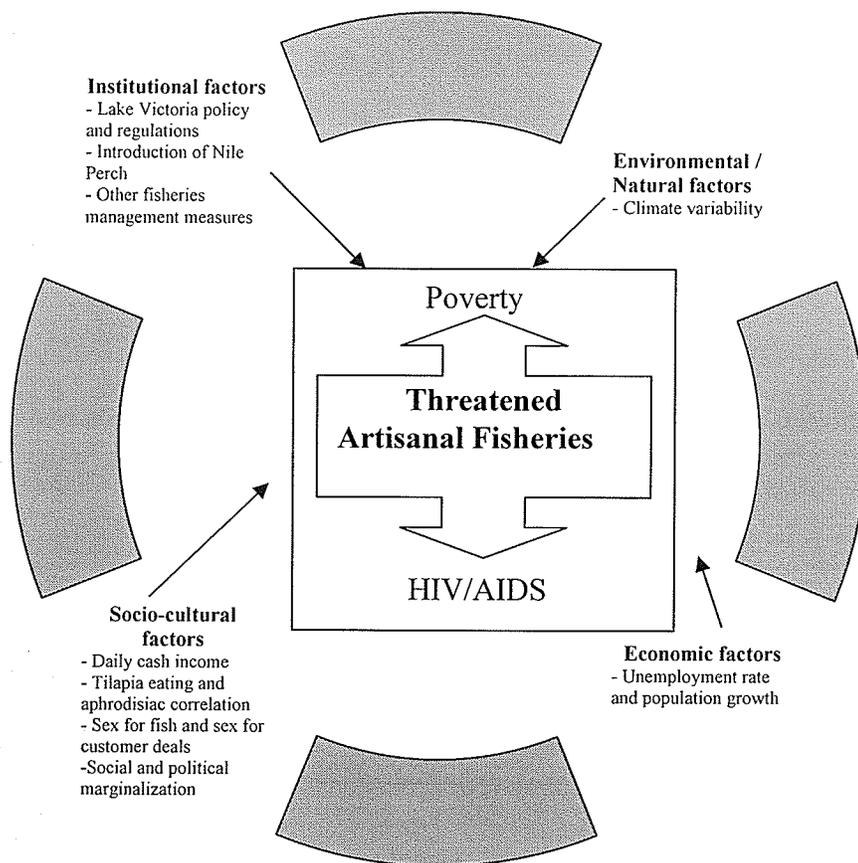


Figure 10: Relationship of factors that contribute to the susceptibility of the two fishing communities' to HIV/AIDS.

Institutional factors

There is very little empirical evidence linking fisheries management policies with HIV/AIDS. During focus group discussions, both communities argued that the Ministry of Fisheries has passed on fisheries regulations and policies without consulting them (primary users), they further argued that these policies have been so harsh on them pushing them to engage in activities that increase their vulnerability to HIV/AIDS (Focus

Group Discussions 2008). This section highlights on some of these fisheries regulations/policies.

a) Lake Victoria Fisheries Policy and Regulations

The Ministry of Fisheries placed an annual ban on Omena fishing from beginning of April to the end of August (Personal Observation & Interviews, 2008). The ban is a management strategy intended to avoid fishing of juvenile fish species during the breeding season with an aim to control further extinction of native species (Interviews, 2008). Unfortunately, in Lake Victoria the ban has only been enforced in beaches fishing Omena, excluding other beaches. Kolunga has been gravely affected by the ban, since the community mainly fish Omena, and is very dependant on the fishery resources for food and livelihood (Focus Group Discussion, 2008). The ban has aggravated the food insecurity and poverty situation in the community, forcing women and young girls to succumb to sex-for-fish deals for survival and increasing their susceptibility to HIV infection (Focus Group Discussion, 2008).

Also due to the ban, some fishers, fish processors and mongers have been left no choice but to migrate to other landing sites in search of income and food. In their new temporary landing sites, women fish processors and fish mongers often find themselves complying to sex-for fish deals when the competition is so high for the catch or when they have no money to afford fish, thus increasing their susceptibility to HIV infection (Interviews & Focus Group Discussions, 2008). As one fish processor explained:

“Our government closes the lake and says no to Omena fishing from April to August. This makes us become very poor and people are very hungry because here in my community we live on the lake for our food and work. Women who are single women with children and who have lost their husbands who were taking care of the family to the big disease have no choice but to do sex-for-fish to survive the four months. So at this time we go to beaches that are allowed to fish and ask the

fishermen there for fish and because we don't have money to give them, then sometimes if they refuse to give us for free then we exchange it with sex." (Interview response from a fish processor in Kolunga village KOL05)

The seasonal migration pattern also affected fishers as they had to migrate to other landing sites during the ban, often leaving behind their wives and children. During this four month period away from home, fishers often develop sexual relationships with women in the new landing sites. During focus group discussions, Kolunga fishers admitted to having multiple wives in every landing site they had been.

The topic on Omena fishing ban was brought up in July 2007 at the Kenya National Assembly during the Parliamentary debate, throughout the debate it was evident that there was no scientific proof that the ban boosts Omena fish stocks (National Assembly Report 2007). The Minister of Livestock and Fisheries Development stressed that the ban was in fact a request placed by all stakeholder in the industry. From my conversations with the Kolunga fishers, fish processors, clan elders and members of the communities, and after reading the Kenya National Assembly Report, I found out that this ban was actually a request made by the elite fishers to control their competition with Omena artisanal fishers for access to fish and when this request was tabled artisanal fishers were never informed of it, they only found out after it was passed as a regulation and the reason given to them for the ban, was that "it was a management strategy to prevent over-fishing of Omena ." In March 2009, I met with an official at the Ministry of Fisheries who informed me that the ban had been lifted in January 2009. However, after my discussions with Kolunga fishers in November 2009, I found out that the ban is still in effect and they had not been informed of the change. It is important to note that this ban had only been in effect on the Kenyan waters of Lake Victoria, which brings me to

argue its practicability, since Lake Victoria waters is shared by the three countries (Uganda, Tanzania and Kenya).

c) Introduction of Nile Perch

In their research study Geheb et al. (2008) underscore that one of the main implications of introduction of Nile Perch in Lake Victoria is the devastation of the *haplochromis* species, a chief food source of fishing communities. They further explain that by the time Nile Perch had established itself, the contribution of *haplochromis* to the lake's fish biomass had declined from 90% to less than 1% (Geheb et al., 2008). Geheb and Binns (1997) underline that with a decline in species diversity through Nile Perch predation, intensive fishing and ecological niche completion between different species of tilapia, the fishery has come to be dominated by just three fish species: Nile Perch, Tilapia, Omena.

According to some interview responses, women in Kaswanga community were involved in the fishing of small fish species (at the shores), which were in abundance before the introduction of Nile Perch (Interviews, 2008). With the introduction of Nile Perch causing a rapid decline and depletion of these fish species, most women lost their source of livelihood and were forced to consider other alternative livelihoods such as fish processing and fish trading (Interviews, 2008). Unfortunately, for some who had no capital to engage in alternative livelihoods, they were left no choice but to engage in sex-for-fish deals for survival (Focus Group Discussion, 2008). As one fisher sadly narrated:

"I have to say poverty level situation has become bad and brought many problems in my community that has become a route for the big disease. So how did we become so poor? We started becoming poor after the colonialists brought the big fish in the lake, yes they wanted to give us more catch, and also to make money and eat from our only lake that we have. As the big fish started reproducing in our lake they grew to big sizes and weight and then started eating our fish, with time they

were big and to catch them one would make big money from fish factories and because of this people from other areas were moving to our fishing villages and filled our one and only rich lake. After some time there were many fishermen and boats and we started losing on our income. Within a short time middlemen also came and took control of our fish business by telling us the price of fish leaving us only with a quarter of the actual price. Soon after my community became hungry and desperate for food because the fish that used to be a lot was now not enough, because of this, women started becoming involved in sex-for-fish deals for survival. As for fishermen they started making sexual relationships with rich women (also middlemen) in order to continue being their customer even after the catch dropped (became less). Sex for fish and sex-for-customer started increasing in our community and then the big disease started becoming a big problem.” (Interview response from a fisher in Kaswanga village KAS5).

c) Other Fisheries management measures

The Ministry of Fisheries also placed a ban on the use of mesh size of gill nets smaller than 5” and monofilament nets; to control fishing of juvenile Omena, Nile Perch and Tilapia (Focus Group Discussion, 2008). As one Kolunga fisher pointed out:

“The banning of the use of small mesh nets that we use for catching Omena is a reason for why the big disease is common in my community. Because we cannot afford the required nets when the authorities catch us using smaller nets (which are also the regular nets which we always use and can afford), they usually take them away from us and this makes us even poorer and makes us to agree to sex-for-customer deals with our rich customers in order not to lose them during this time.” Also because the rich customers have money, sometimes when we have sexual relationship with them, they give us money to buy other nets when our nets have been taken and they remain being our customers. (Interview response from Kolunga fisher KOL2)

Unfortunately fishers have been gravely affected by this ban as well, since the small size gillnets (<5”) are readily available at affordable price while the required net size (>5”) are very expensive (Focus Group Discussion, 2008). Some fishers who have not been able to afford the recommended net size, have succumbed to sex-for-customer deals in order to maintain their customers even after they are caught with illegal gear and the gears confiscated (Interviews, 2008). The deal helps them maintain their rich customers till they are able to afford another type of gear. Also as pointed by KOL2, rich customers

will offer fishers (who they are sexually involved with) money to replace the confiscated gear.

During my visits at the landing site, I met a fisher in Kolunga who had been fishing for 35 years, and had just had his nets confiscated since they were the illegal size. For this fisher and his family, fishing had been the main source of livelihood, and so with the nets gone he turned to fishing by the shores using mosquito nets which he had just received for free from ICIPE (International Centre for Insect Physiology and Ecology, Mbita) for malaria prevention. Every dawn he and his family cast the nets in the lake and wait till dusk to pull the nets. For the times when nature is generous, they leave the beach with a handful or a basketful of fish, but unfortunately most times they leave the beach with no catch. Whenever this happens the wife and daughters would go to the beach and try to negotiate sex- for- fish deals so the family can have food for the night (Participant Observation 2008). This policy mainly affects Kolunga fishers since they are known to fish Omena, which requires a very small mesh size. In order to catch all sizes of Omena, they often have to use mosquito nets that are less than 5" in size (the illegal size).

The Ministry of Fisheries has also placed fines, license fees and taxes, to manage the fisheries and control over-fishing and the use of destructive gears. Fishers from both communities pointed out that the license fees and taxes placed by the government are exploitive (Focus group discussions, 2008). Some of the taxes/fees they reported to be paying were boat fees, fishers' landing fees, court fines, fish traders' license fees and fish processing taxes. They also noted that the local councils and co-operative societies in their beaches also received an amount levied on each kilogram of fish they sold. They

claimed that compared to other occupational groups in Kenya, particularly farmers, they paid way too much in taxes and license fees (Focus group discussions, 2008).

Respondents complained that irrespective of the multiple taxes collected from them by the government, the revenue thus generated was not used to improve their social services or even financially support them with their fishery sustainability efforts. They noted that high taxes and license fees were actually pushing them out of business, especially during the low-catching (dry) season, increasing poverty rate in their communities, and making them succumb to sex-for-customer deals in order to maintain their customer during this period (Focus group discussions, 2008).

Environmental factors (climate variability)

DFID/FAO (Undated) argues that climate change may affect fisheries through changes in climate variability, trends that result in incremental changes, or dramatic shifts. Trends include the shift in distribution of fisheries stocks, or increasing frequency and severity of extreme events such as floods, storms and droughts.

It was noted in the interviews and focus group discussions that seasonality (high and low seasons) and monthly fluctuations of fish catch leads to fishers, fish processors and fish mongers frequently moving to other beaches or landing sites (Focus Group Discussions 2008). The movement is mainly short term and seasonal. This finding concurs with Allison and Seeley (2005) finding that, many fisher folk are geographically mobile, seasonal, or long term migrants or even in some cases nomadic, this characteristic accounts to their high susceptibility and vulnerability to HIV/AIDS. Kolunga fishers and fish processors reported more frequent and long-term migration compared to Kaswanga fishers and fish processors. This may be attributed to both the

longer low season (less rains less fish breeding) and the banning of fishing during the April-August months which intensively affect Kolunga fishers.

McConnel and Moran (2002) argue that environment variability (e.g. climate, water and soil characteristics, and land use changes), can place an additional stress on food production and livelihoods. To underpin this argument, the communities believed that the rains facilitate breeding of most fish species in their lake, and since in the past the rainy season was long and more frequent, there was always a good catch (Focus Group Discussions, 2008). However, with today's shorter wet season, less breeding takes place, attributing to the low catches. This results in extreme cases of food insecurity, since fish is the main food source, and increased poverty. As one Kolunga fisher related:

“Before the weather pattern changed and became bad, there was so much rain during rainy season and because of this fish reproduced a lot in the lake and we had so much fish, today there is so much sun and very little rains (hardly no rain) and so because of this there is very little fish in the lake which means small catch this force us fishermen to increase the price for fish in order to make some profit and too bad for women who cannot afford to buy the fish because they are forced to make deals with us so they can get the fish for free, for some of us fishermen we give them the fish for free but other fishermen if you don't have money to buy the fish you must give them sex so they give you fish this is what is creating the big disease problem in our community because most of the times no condom is used.” (Interview response from Kolunga fisher KOL1)

At a focus group discussion, one clan elder noted:

“Fifteen years ago when I used to fish, we predicted when it would rain, and because the rains never failed, and was always enough, we always had big catches, today so much has changed, there is very little rain which cannot be predicted, and very little catch because the fish are reproducing very slowly.” (Focus group discussion excerpt from a Kaswanga clan elder)

Munro et al., support this finding linking breeding seasonality and fish catch, pointing out that many species in Lake Victoria and Lake Chad move to the mouths of rivers at the end of the dry season to make brief spawn migrations upstream during the

wet season (1990). Leary et al. speculate that non-health impacts of climate change on the environment or ecosystem could also be additional stressors contributing to the vulnerability of diseases such as malaria, cholera and even HIV/AIDS (2008). This point underpins findings from my visits at Tomboya Health Clinic in Kaswanga and Kageno Clinic in Kolunga that reported HIV/AIDS, malaria and water borne diseases such as cholera, bilharzia, and typhoid as the leading health problems in the two fishing communities. DFID/FAO (Undated) argues that greater impacts of climate variability will reduce fishing communities' resilience and ability to cope.

Drawing on my own observation, I also argue that the type of livelihood may explain the high vulnerability to HIV/AIDS impact among fishing communities compared to other occupational sectors. Unlike other occupational sectors in Kenya, Kaswanga and Kolunga fishing communities are mainly dependant on fishing as their source of livelihood and rarely practice farming, since most of their land is infertile. Faced with a rapid decline in fish stock, these communities are left with very limited livelihood diversification options. Many opt to engage in transactional sex, which further increases their susceptibility to HIV infection. Also, most of the alternative livelihoods require capital, which is difficult for community members to acquire.

Socio-cultural factors

a) Daily cash income

In contrast to most other occupational groups, fishers get money on a daily basis depending on their fish catch. Based on the responses from focus group discussions, the average income they make per crew member during high season ranges from 500-600 shillings per day (Focus group discussions, 2008). During this season, some tend to spend

money daily on *chang'aa* (local brewed beer), drugs and sex-workers, and live by the motto: "*meth kawuono, kiny nwalupi*" (Drink today, for tomorrow we will fish). They also understand that their daily culture of alcohol and sex may be a possible route for HIV/AIDS infection and transmission, since they hardly use protection, claiming that "*it's very expensive for no reason and see no importance of it*" (Focus group discussions, 2008).

b) Tilapia eating-aphrodisiac correlation

Fishers from both communities believe that eating Tilapia often stimulates their sexual hormones (aphrodisiac nature), and hence Kaswanga fishers claim that the high sexual activity in their community could be explained by the fact that Tilapia is one of the common species of their daily catch (Focus Group Discussions, 2008). In addition to this point, Kolunga fishers admitted that even though they only fish Omena, their daily meal is often Tilapia because of the "manly benefits" they get from eating it (Focus Group Discussions, 2008). Based on the Focus Group Discussion responses with the fishers in both villages, the following quote was often tied to the topic of tilapia eating and sexual activity; "*wan jonam rembwa liet*" (*we fishermen our blood is very hot*). To further explain the tilapia eating and the aphrodisiac correlation, one fisherman pointed this out:

As fishermen we believe eating tilapia gives us so much sexual excitement and because we interact with women every day to do business at the beach who sometimes don't have money to buy fish, when this situation comes we then make sex for fish deals with them. Most of the times by the time we get to the beach our blood is so hot from eating tilapia, and so as soon as we make the sex for fish deals, we want to do it fast and most of the times the excitement is so strong that we cannot waste any time looking for condoms and so we just do it and after we finish doing it we feel normal again. (Interview response from Kolunga fisher KOLA)

There is very little research available that provides an indication of the relationship between fish and sexual function. To corroborate this finding, there has been speculation

that fish species high in zinc and essential fatty acids (fish oils), such as oysters, salmon, and mackerel, have libido and testosterone boosting ability (Natural remedies-natural supplements website 2009). Drawing from some literature evidence, Sahelian (2003) underline three factors that may explain the association between fish oils and sexual activity: fish oils may positively influence certain parts of the brain involved in the sexual response, fish oils may help the formation of androgens in genital organs; and fish oils may improve circulation of the blood in the genital region. Based on the findings from fishers Nile Perch fish is oilier than Tilapia, but given its value, fishing communities prefer to sell it rather than use it for their own consumption (Focus Group Discussions, 2008). Compared to all other native species, Tilapia is considered very oily, and it is easily accessible to the fishers and the fishing communities. I was not able to find any research evidence on the tilapia eating and aphrodisiac association.

Fishers stressed that HIV/AIDS rates could be high in their community given that there is an intense sexual activity and most people were not using protection (Focus Group Discussions, 2008). This finding on protection usage corresponds with a recent study carried out in South Africa that pointed out that the majority of the study's respondents still resisted condom usage, used condoms inconsistently or were not in a position to negotiate protected sexual intercourse. The main reasons reported in the study were: reduced pleasure, perceived and real physical side-effects, myths, lack of information, status, financial reasons, distrust in the efficacy of condoms, family planning, cultural reasons, gender-related reasons and trust (Focus Group Discussions 2008; Versteeg & Murray, 2008).

c) Sex-for-fish deals affecting women (fish processors and fish mongers)

Sex-for-fish in both communities is a phenomenon that has risen with the rapid decline of the fish catch and has aggravated the poverty situation (Focus group discussions 2008). The decline in catch has created serious competition among middlemen, fish processors and fish mongers, in which women (fish processors and fish mongers) who are not able to provide the fishers with high bids have lost (Merten & Haller 2007; Focus group discussions 2008). This has created desperation, forcing some women to succumb to sex-for-fish deals in order to access the catch and for survival. This situation has allowed fishers to place conditions even on sex-for-fish deals, such as not using a condom to get more fish (Focus group discussions 2008). As a fish processor miserably narrated:

As a fish processor when you do not have money to buy Omena from the fishermen then you find yourself accepting to exchange sexual relationship for Omena. If you agree to have the relationship and not use a condom then are able to get a whole crate of Omena, if you want the fisherman to use a condom then you only get ½ or even ¼ of the crate depending on the fisherman and also depending on the catch. Sex-for-fish relationship gives us fish. But then we get infected with the big disease. (Interview response from a fish processor in Kolunga village KOL01)

A recent report in Dunga Beach, Lake Victoria Kenya raised a very important point of older women using younger women (daughters) in exchange for fish; the more young and beautiful the girl is the higher chance they had for getting a good catch, this exchange involves sex (Pers. Comm. with fish processors and fish mongers in both Kaswanga and Kolunga; IRIN/Plus News 2008).

Benne and Merten (2008) offer two explanations that emerge from the sex-for-fish phenomenon. The first explanation is that women (fish processors/fish mongers) are poor and are compelled or coerced to offer sex in exchange for fish, while the second

explanation is that women choose to engage in sex to reduce the transactional costs of trade. In reference to the Kaswanga and Kolunga case study, I only agree with the first explanation and stress that, the extreme poverty situation among women in fishing industry has risen from middlemen joining the fish distribution chain and fishers becoming actively involved in fish processing and trading activities; hence creating difficulty and stiff competition for women's access to fish, in my opinion these are the two key reasons explaining why women engage in transactional sex. I disagree with Benne and Merten (2008) second reason, since from my observations and focus group discussion findings, as the women gained financial stability through the merry-go-round groups they became self-reliant and opted out of transactional sex. In their Zambia study, Merten and Haller (2007) raise a very important point that sex-for-fish exchanges are not based on cultural practices, but on the harsh economic hardships and changing livelihoods that women in fishing communities continually face.

- The *Jaboya system*

The term "*Jaboya system*" has become a common terminology in most HIV/AIDS literature in the context of Lake Victoria, Kenya. IRIN (2005) points out that around the shores of Lake Victoria there is a system in operation called "*Jaboya*" where women traders must sleep with fishermen in order to have access to fish. Odek (2006) describes *Jaboya* as a client or customer who is also a lover. Based on his study done in Mageta Islands, he argues that through *Jaboya system*, whenever fish are scarce, fishermen prefer to sell to their own customers who are also their sexual partners; he refers to this as an in-kind giving that involves sexual favours to ensure a consistent supply of fish. He (2006)

also points out that *Jaboya* also refers to a rich woman who can fund fishing activities of a young man and in turn get sexual favours.

Throughout the focus group discussions, the respondents were quick to note the misconception NGO's and scholars have time and time made by viewing sex-for-fish and *Jaboya*⁹ system as a single entity that is culturally constructed. They strongly argued that sex-for-fish and the *Jaboya* system are two separate entities that should not be mistaken to be a single entity. They argued that sex-for-fish is socially constructed from the extreme poverty situation they face and is not in any way cultural, on the other hand the *Jaboya system* is culturally constructed and remains a "clean/social acceptable" business relationship fishers have with fish processors and fish traders (Focus group discussions 2008). According to them, the *Jaboya* system has been in existence for generations and is still in existent to date (Focus group discussions 2008).

While scholars view the *Jaboya* system as a factor accounting for the high HIV/AIDS vulnerability and susceptibility among fishing communities, in reference to my findings I disagree with the scholars (IRIN 2005; Odek 2006)

d) Sex for customer deals affecting fishers

Also with the decline of fish catch and decline in demand for fish (for export and local markets), fishers are now forced to look for ways to attain stronger (solid) fisherman-trader ties (mostly male-female). To achieve this, some fishers are succumbing to sexual relationship with their rich customers in order to maintain them during low season. This is common in Kolunga because of the annual fishing ban placed between April and August. As one fisher explained:

⁹An ethical customer relationship fishers have with fish processors and fish traders

The government has passed a fishing ban on Omena between the months of April to August which mostly affect our beach because Omena is the only fish we catch here and they only live for two months so by the time the ban is removed we have lost so much fish that would have given us so much money. So for some of us fishermen we already have our rich customers in Kolunga, during this time we have to move to other landing sites and because we want to have our customers when we come back to Kolunga then to do this some of us have a sexual relationship with our customers that way they do not leave us or forget us. (Interview response from a fisher in Kolunga village KOL01)

After reviewing past field evidence, it is important to note that this study brings to attention for the first time the sex-for-customer phenomenon affecting poor fishers. The past literature has only focused on “sex-for-fish” phenomenon affecting women and not the “sex-for-customer” phenomenon that affects men too in a very similar way, thus for this reason it is important to further explore this phenomenon. The sex-for-customer factor was mainly common among fishers in Kolunga.e) *Social and political marginalization*

Bishop-Sambrook and Tanzarn (2004) indicated that one of the defining characteristics of fishing communities which make them vulnerable to HIV/AIDS infection is the near neglect by the government and the service sector. As in the case of fishing communities of Lake Victoria, social and political marginalization in the region dates back to the political rivalry between the late former President Jomo Kenyatta and the late Oginga Odinga that led to the lake region being neglected from much social or economic development. Even though the two principals are long gone, the present leaders have done very little to change this. This marginalization is reflected by the lack of tarmac roads connecting the beaches to Kisumu or fish factories, the lack of preservation facilities in the lake region, the lack of well-run hospitals at the beaches, the lack of proper communication infrastructure (connecting fishers with potential buyers) in the

area, the lack of government subsidies during low seasons or the fishing ban period, and the lack of fish factories in the lake region.

In their Uganda study, Bishop-Sambrook and Tanzarn also noted that in most of the landing sites there was no electricity, had poor quality roads and had minimal health and education services (2004). They went further to stress on how the policy environment had failed to integrate fishery concerns into general HIV/AIDS strategies and, conversely, how fisheries initiatives had failed to integrate an HIV/AIDS perspective. This discussion point underpins past research findings on the government enforcing the fishing ban April-August and the ban on <5” mesh nets. By not offering any alternatives to address the poverty situation that arises from these laws, government further perpetuates the communities’ vulnerability to HIV/AIDS.

Economical factors

a) Unemployment rate and Population growth

“Many fishers, many fish processors, many boats, and very little catch” Focus group discussion excerpt from Kaswanga and Kolunga fishers, fish procesors and clan elders). With the high unemployment rate in Kenya, there has been an upward trend in migration to the beaches in search of jobs, since most jobs at the beaches are easy to learn and do not require intensive technical skill. By 2007, Kaswanga and Kolunga’s population projections had soared to 2183 and 3001 inhabitants respectively. The Nile Perch export boom is the main factor that could explain the rapid population growth and movement of newcomers to the fishing villages. Respondents believe that the rapid population growth (discussed in Chapter 4) and the increased intensity of fishing activities taking place in the lake increases pressure on the limited fishery resources and

results in a high poverty rate within the lake region. Also, the fishing communities blame population growth for the severe decline in fish stock and the high poverty rate in their villages. This is well reflected in the 2008 Kenya Fisheries Frame Survey report, which shows a rapid increase in the number of fishers from 38,431 in 2000 to 42,307 in 2006 and fishing crafts from 11,515 in 2000 to 14,257 in 2008 (Frame Survey National Working Group Kenya 2008). As one fisher explained:

“Before the big fish (Nile Perch) was brought in our lake, our beach and villages was full of only the Kaswanga people, but when the big fish (Nile Perch) came, there was so much money that came for big fish (Nile Perch and Tilapia) catches, and so many people started moving from other villages and towns that did not do fishing to our beach and they all started fishing and so there were many fishermen and boats in our beach and fishing became an activity for money. After some time we were only getting low catch and becoming very poor.

When the government saw that there was a low catch they introduced a rule to not use small nets and they also banned our gears which we were using because they were cheap. This made us become very very poor. And so because we could not afford the right size we went on using the small nets and our own gears that were banned. We are only lucky when we are not caught but when we are caught by fishery officials the nets are taken away from us. Most of us fishermen our families rely on our catch for food, school fees and basic home needs and so when this happens we are not able to provide and so we make our wives and children help us to provide. Because of this our women and daughters have to sell sex to get fish for the family, and so I think now this is the route that the big disease is spreading in our village.” (Interview response from a fisher in Kaswanga village KAS3)

According to Mbita Health Official, the rapid population growth has created overcrowded fishing slums on the beaches, causing poor sanitation, and limited access to clean water and affordable health care. This is reflected by the high incidences of malaria, water-borne diseases such as bilharzia, cholera, and typhoid, and other infectious diseases such as HIV/AIDS (Pers Comm. with Mbita Health Official, 2008).

5.4 Coping strategies (N=50)

In the context of my case studies, I refer to coping strategies as the individual, household and community responses in dealing with the implications of HIV/AIDS. Such responses may have negative or positive consequences. Walker and Jodha (1986) argue that the best response/coping strategy for an individual or community depends on the available resources, financing available, market availability, goals, risk attitudes, equity position and other factors. However, based on my findings from both communities, the responses deployed by the people of Kaswanga and Kolunga to deal with the implication of HIV/AIDS were similar across the individuals/villages and communities. This can be explained in part by the communities' homogeneous nature (similar cultural practices, traditions and beliefs) and a similar lack of access to support agencies. Niehof (2004) argues that even though rural households employ strategies to cope with HIV/AIDS, two factors complicate their ability to cope well. The first is the fact that impacts are not one-time events but processes and that are often hidden - slow moving, but destructive (Niehof 2004). The second is their clustered nature, since HIV/AIDS usually affects more than one person within a household and often strikes several households within a community (Niehof 2004). Barnett et al. (2006) points out that some dimensions of poverty and inequality can drive those on the margin of destitution into risky livelihood and coping strategies that raise their likelihood of contracting HIV. This argument supports the findings on some of the coping strategies which are discussed below that actually aggravated the fishing communities' vulnerability to HIV/AIDS impacts. On the other hand, despite their poverty, the communities were also able to employ positive coping strategies that reduced their vulnerability and susceptibility to HIV. It is also

important to note that the coping strategies discussed below were not only employed by those affected with the HIV/AIDS, those already infected with HIV also did employ them.

The following section explores some of the coping strategies the fishing communities adopted and the different channels of learning involved in the coping strategies. The channel of learning consists of individual, peer-to-peer (social), and community (social) learning. Table 2, drawn from the research findings from both communities, presents a summary of the coping strategies and the channels of learning.

a) Livelihood Diversification (See also page 62)

Much has been written about diversification by scholars from various countries and with different backgrounds. A growing body of literature on the impacts of the HIV/AIDS pandemic and rural livelihoods underlines livelihood diversification as a principal coping strategy (Loevinsohn & Gillespie 2003; Alex de Waal & Tumushabe 2003). Based on the findings, as a result of rising poverty situation brought forth by the loss of productive members in the family to HIV/AIDS, Kaswanga and Kolunga fishers and fish processors now consider livelihood diversification a primary response strategy (Focus Group Discussions 2008).

Merry-go-round groups

Fish processors/women in both communities reported forming merry-go-rounds as a financial strategy to cope with income loss in their households. In this group, they contribute a fixed amount to *agulu* (contribution pot) on a monthly basis. Distribution of the fund rotates in turn to each member. Once it is one's turn to receive the funds, the woman will often use it for daily expenses such as food other basic needs. Some women

have been able to save enough money through this group, to buy themselves fishing gear and rent it out to fishers. With the catch they get from their boats, some women are now able to sustain their families and opt-out from sex-for-fish deals. Women find these groups effective and efficient because they pay no interest on the money saved and also for the fact that they are able to access a significant lump sum of cash at a predictable time. This is one strategy that the fish processors felt contributed to reducing their vulnerability and susceptibility to HIV/AIDS. Fishers also claimed to have their own merry-go-rounds that have had the same impact as that of the ones operated by women fish processors.

b) Social support schemes

In a focus group discussion in Kolunga with the fish processors, one fish woman carefully pointed out that “*the big disease is now forcing us to come up with ways to deal ... as a community.*” Both communities reported having informal social support schemes that they had formed to deal with the stress and poverty brought forth by the HIV/AIDS mortality. These include HIV/AIDS orphans support schemes, self-help support schemes, church based support schemes and funeral support schemes. Churches were reported to support orphans by providing food through school feeding programs and sometimes even help in paying school fees. This coping strategy of community support is documented by Gordon (2005), who presents an example of a community-based initiative from Lake Edward in Uganda. There, local fishing crew associations and Beach Management Units donate a proportion of their day’s catch to support the education of orphans whose parents have died as a result of HIV/AIDS.

Churches have also raised HIV/AIDS awareness by incorporating an HIV/AIDS forum in their Sunday programs. Kaswanga community had self-help support schemes for youth, women and men. Through these self-help support schemes, the youth, women and men would save money on a monthly basis and once they had a huge lump sum they would start up an income generating project such as poultry keeping, apiko (motorcycle) business. Some were even engaging in crop farming. The funeral support scheme involved community members getting together and assisting the bereaved family with funeral arrangements and procedures. During the focus group discussions, both communities reported the significant benefits of the schemes. When the schemes are successful, young men and women have opted out from high-risk behaviours such as drug addiction, alcoholism and transactional sex deals. Given the financial instability in both communities, these schemes are sometimes short term.

c) Training new fishers

To reduce the loss of fishing expertise, some boats now have two experts and two trainees along on a fishing trip. In this way, the trainees would learn from the experts how to fish, and once they themselves become experts, they would be expected to teach others how to fish. During a focus group discussion with fishers in Kolunga, one fisher pointed out that:

“We have lost so many of our fishing experts to the big disease many who did not take time to teach newcomers, as Kaswanga fishers we have now decided to make sure that our fishing expert lives for many generations and for this to happen we try and make sure that in every trip there is a fishing expert and some newcomers and when we can we take time to teach the newcomers the Kaswanga tricks..we only do this with our own people not outsiders.”

On the other hand, some fishers argued that due to factors such as the exponentially-growing rate of fishers, high demand for fish and decline of fish stock, fishing experts are finding themselves time constrained and unable to train young fishers.

d) Shift to less labour-intensive jobs (See also page 60)

Once fishermen are infected, they try to limit further opportunistic infections by avoiding fishing at night or the more labour-intensive deep sea fishing. Usually, they opt for fishing closer to the shore in shallow waters. Unfortunately fishing in shallow waters interferes with the breeding of fish and thus with time creates a decline in catch. This only fuels the rising poverty rate, which makes community members increasingly vulnerable to the impacts of HIV/AIDS.

As we discussed in the previous section, when some fishers get sick they shift to fish processing activities, this shift displaces women from their jobs, making them vulnerable to sex-for-fish deals and further increasing their susceptibility to the HIV infection.

e) Withdrawing children from schools

In coping with poverty after the death of a breadwinner in the family and the resulting lost income, affected households often withdraw their children from school and have them engage in fishing activities. When the affected families do not have enough money to procure fish, they would use their young girls in sex-for-fish deals, a strategy which greatly increases their susceptibility to the HIV infection.

f) Engaging in multiple fishing trips (See page 63)

g) Selling of fishing gear

To cope with the illness of the breadwinner in the family and income loss, affected households often sell their fishing gear in order to get money for medical expenses and meet the family's basic needs. When the breadwinner dies, this coping strategy further exacerbates the poverty of the affected family, thus increasing their vulnerability to the HIV/AIDS impacts and susceptibility to HIV infection. In corroboration of this finding, Gordon (2005) asserts that as HIV/AIDS affected families sell their fishing gear, such as nets and boats, to meet medical and family basic needs after lost income, they eliminate a future source of income for other household members or current income from loaning out the fishing gear.

In summary, through reviewing the findings on coping strategies, I realized that the communities' adapted strategies that reduced their susceptibility and vulnerability to HIV/AIDS such consisted of livelihood diversification, social support schemes, and merry-go-rounds. The communities also adapted coping mechanisms that further increased their susceptibility and vulnerability to HIV/AIDS, including the shift to less labour-intensive jobs, withdrawing children from school, engaging in multiple fishing trips and selling their fishing gear.

5.5 Learning dynamics and coping strategies (N=50)

Based on my findings, once an individual, members of household or community gets infected and/or affected with HIV/AIDS they search for strategies to help them cope. The acquisition of these strategies is often through; social (community and peer-to-peer) and individual channels of learning. Individual learning involved the ability of individual fishers, fish processors, household members and other members of community to obtain

knowledge on different coping strategies through their interactions with other members of the community. Individual learning mainly occurred through personal observation and reflection. Individual learning did not necessarily involve dialogue. Peer to peer learning involved fishers and fish processors sharing their knowledge and experiences with one another, this took place through formal (fishers and fish processors association meetings and merry-go-round meetings) and informal (fishing trips involving fishing crew members, fish processing groups, habitual talks) social networks. Peer to peer learning involved dialogue. Community learning involved members of the community engaging one another through sharing their views and experiences. Through the experiences and knowledge they shared, the community members then devised ways of dealing with the implications of HIV/AIDS as a community. Community learning involved dialogue between members of the community and took place during social gatherings (community meetings and events, and church events and meetings). Consequently, I consider both peer to peer and community learning as social learning, since both forms of learning took place when fishers/fish processors/village and community members engaged one another (through formal/informal discussions or talks), sharing diverse perspectives and experiences to develop coping mechanism to deal with the implication of HIV/AIDS. Table 2 summarizes my thoughts on the implications of HIV/AIDS on the fishing communities, the coping strategies they adapt to deal with the implications and the channels involved in acquiring the coping strategies.

Table 2: Impacts of HIV/AIDS, coping strategies and channels of learning.

<u>Impacts of HIV/AIDS</u>	<u>Coping strategy</u>	<u>Channels of learning</u>
- Loss of income (in household)	Livelihood diversification	Community and peer-to-peer (social) learning
- Loss of income (fishers and fish processors)	Merry-go-round groups	Community and peer-to-peer (social) learning
- Increased number of child-led households, high HIV vulnerability (community)	Social support schemes	Community (social) learning
- Loss of fishing and fish processing expertise (fishers and fish processors)	Training new entrants: fishers and fish processors)	Community and peer-to-peer (social) learning
- Illness and caring of the sick (fishers and fish processors)	Shift to less labour intensive jobs	Individual, peer-to-peer and community (social) learning
- Loss of workforce and productivity, loss of income (fishers)	Engaging in multiple fishing trips	Individual and peer-to-peer (social) learning
- Loss of income (in household)	Withdrawing children from school	Individual and peer-to-peer (social) learning
- Meet medical expenses, loss of income (in household)	Selling of fishing gears	Individual and peer-to-peer (social) learning

In reference to Table 2, I argue that to mitigate the impacts of HIV/AIDS among fishing communities there is a need to promote strategies that the communities have adapted that aim at reducing their susceptibility and vulnerability to HIV and AIDS.

There is also a need to discourage strategies that further increase their susceptibility and vulnerability. HIV impact mitigation and prevention strategies are further explored in Chapter 6.

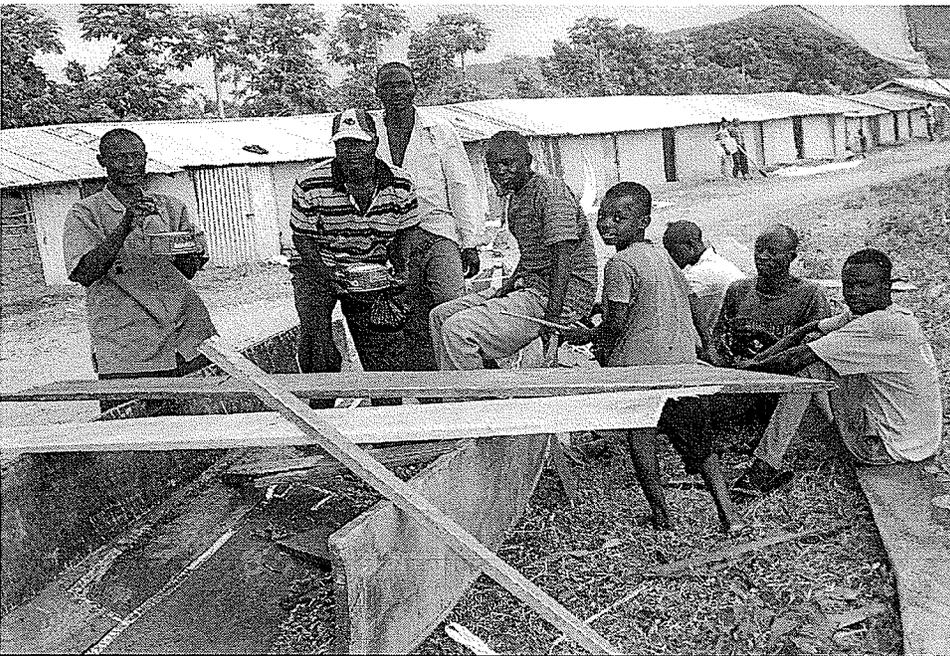
5.6 Summary

This chapter provides an analysis on the artisanal fishery and HIV/AIDS linkage and their relationship to susceptibility and vulnerability to HIV/AIDS based on the Kaswanga and Kolunga case studies. The findings show that both fishing communities have been hard hit by HIV/AIDS. It has significantly impacted their fisheries activities, as well as household and community activities. Their vulnerability to HIV/AIDS is based on natural/environmental, social-cultural, institutional and economical factors. Based on the findings it is evident that all these factors and the HIV/AIDS implications have pushed the communities to engage in activities that further threaten the sustainability of their livelihoods and fisheries. Also, the findings show that in order to adapt to the impacts of HIV/AIDS the communities have deployed coping mechanisms, some which have mitigated the impact of HIV/AIDS and some which have further aggravated the situation. These coping mechanisms have been learned in a variety of ways that exist in the communities, such as individual, peer-to-peer (social), and community (social) learning.

CHAPTER 6



Photos by Sheila Omom



Top: Fish processors/traders in a women's group meeting, Kolunga village
Bottom: Fishers in Kaswanga fixing an old boat

Chapter 6 – Conclusions

6.1 Introduction

The purpose of this study was to understand the HIV/AIDS and artisanal fishery nexus. To understand this nexus, a qualitative approach borrowing PRA (Participatory Rural Appraisal) tools such as semi-structured interviews, focus group discussions, participant observation and transect walks, was used. Research objectives for this study were; to establish if HIV/AIDS is having a similar impact on the artisanal fishery in Kenya as has been documented for fisheries in other regions of Africa; to determine coping strategies the fishing communities have adopted in an attempt to adjust to the HIV/AIDS implications; to explore whether social learning played a role in the coping strategies adopted; and to consider policy implications for artisanal fishery practices and management. This chapter ties the findings of the study together, drawing conclusions for each of the study's research objectives.

6.2 Conclusions

Generally, it can be concluded that the fishing communities of Kaswanga and Kolunga have been significantly impacted by HIV/AIDS; this is well reflected in the state of their fishery and their resulting livelihood security. Their susceptibility and vulnerability to HIV/AIDS stems not only from socio-cultural and economic factors, but also from institutional and environmental factors. To cope with the impact of HIV/AIDS they have adopted strategies that both reduce and increase their susceptibility and vulnerability. These coping strategies adopted were acquired through social and individual learning.

6.2.1 Comparing the HIV/AIDS implications in Kaswanga and Kolunga to other regions in Africa

Based on my research findings as outlined in Chapter 5, I found that HIV/AIDS has had a similar and very significant impact on the artisanal fishery in Kaswanga and Kolunga in comparison to other regions of Africa (ABCG 2002; Drimie 2002; Simon-Meyer 2002; Bishop-Sambrook 2004; Torell et al. 2006). The impact of HIV/AIDS in the two fishing villages can be categorized at three distinct levels - household, community and the fisheries sector. At the household level, HIV/AIDS has led to a shift to jobs that are less labour-intensive than fishing, the sale of fishing gear, and the diversification of livelihoods, as also noted by Bishop-Sambrook & Tanzarn (2004), Seeley et al. (2003) and Tobey et al. (2005) in their studies in Uganda and Tanzania. At the community level, HIV/AIDS has caused a loss of fishing expertise and a decrease in the workforce and productivity, as corroborated by ABCG (2002), Torell et al. (2006), Allison & Seeley (2004) and DAI (2003) in their studies in Malawi, Kenya, Namibia, South Africa and Tanzania. Moreover, at the fisheries sector level, HIV/AIDS has resulted in increased pressure on fishery resources, the loss of BMU staff and conservation expertise and the loss of traditional knowledge on management and conservation efforts, as was also found by Oglethorpe & Gelman (2004) and Torell et al. (2006) in their studies in Tanzania.

In further exploring the factors that help explain the fishing communities' high susceptibility and vulnerability to HIV/AIDS compared to other occupational groups, the findings showed that these stem from complex, interacting factors, including environmental, economic, socio-cultural, and institutional factors. The environmental/natural factors centered around climate variability, while the economic

factors included high unemployment rates and population growth. Socio-cultural factors of note that have not been noted in other studies were; sex-for-fish, tilapia eating-aphrodisiac correlation, and sex-for-customer deals. Other local issues found in this study that contribute to HIV/AIDS were institutional, such as high taxation and license fees for fishers, political and social marginalization of fishers, bans on small size mesh nets, ban on Omena fishing April-August, and the introduction of Nile Perch. The communities' vulnerability to HIV/AIDS impacts has exacerbated their poverty situation, hence increasing their susceptibility and vulnerability to HIV/AIDS. As a result, their aggravated poverty situation and the high HIV/AIDS susceptibility and vulnerability threaten the long term sustainability of the artisanal fishery in these two communities.

Studies show that the impacts of HIV/AIDS vary considerably among individual households and communities (Simon-Meyer 2002; Bishop-Sambrook 2004; Allison & Seeley 2004; Torell et al. 2006). This variation is dependent on, among other things, the type and availability of resources. The most vulnerable individuals, households or communities are the ones with limited resources. The research findings clearly showed that the type of fishery played a role in increasing the fishing communities' vulnerability to HIV/AIDS in that the ban placed on Omena fishing, mainly affecting the Kolunga fishing community, further aggravated their existing poverty situation and made them more susceptible and vulnerable to HIV/AIDS when compared to the Kaswanga fishing community. In addition, the Omena fishing ban in Kolunga resulted in the seasonal migration of fishers and fish processors, which increased their susceptibility and vulnerability to HIV/AIDS. Seasonal migration was not common to Kolunga fishers and fish processors prior to this ban since they had access to fish all year round. Also, the

returns obtained from the fishery played a role in determining the communities's vulnerability rate. The study found that the Kaswanga fishing community was slightly less vulnerable to HIV/AIDS compared to Kolunga, due to the fact that Kaswanga had access to the two export fish species (Nile Perch and Tilapia) that translated to substantial returns and somewhat better livelihoods.

As there is very little empirical evidence showing the linkage between HIV/AIDS and socio-cultural, institutional, and natural factors (Nguyen & Stovel 2004), this study has provided significant data showing this linkage. I therefore underline that this linkage helps understand the most significant long-term consequences of HIV/AIDS and provide the basis for new improved responses to positively deal with HIV/AIDS in the fishery sector.

6.2.2 Coping strategies adopted in Kaswanga and Kolunga

As Kaswanga and Kolunga fishing communities were engaging in positive coping strategies to reduce their vulnerability to HIV/AIDS, it was noted that the HIV/AIDS illness and mortality was also pushing them to engage in coping strategies that were ultimately self-defeating and that actually increased their vulnerability. Coping strategies such as; withdrawing children from school to help out in the fishing and fish processing activities, selling of fishing gear to meet medical expenses or to cover lost income, going on multiple fishing trips, all had negative impacts on the current well-being of the community and the fisheries, threatening long term sustainability as outlined in Chapter 5. On the other hand, some coping responses, such as livelihood diversification, women joining groups offering credit schemes, the community making efforts to financially support orphans, and churches and schools creating HIV/AIDS awareness programs had

positive impacts on the long term well-being of the community and the fisheries. For example women in a merry-go-round credit schemes in Kolunga were able to purchase their own fishing gears (fishing nets and a boat), and hire fishers to fish for them.

Interventions strategies to mitigate the HIV/AIDS problem in Kaswanga and Kolunga need to promote the fishing communities' positive coping strategies, such as fishers training new entrants on sustainable fishing practices that would particularly help the fishery. Also the intervention strategies need to build on awareness of the negative consequences of some of the coping strategies.

6.2.3 Learning dynamics and coping strategies

According to the study, it is also clear that learning played a big role in most of the coping strategies adopted. This was explained using two channels of learning; social (community and peer-to-peer) and individual channels of learning. Peer to peer (social) learning involved fishers and fish processors sharing their knowledge and experiences with one another, this took place through formal (fishers and fish processors association meetings and merry-go-round meetings) and informal (fishing trips involving fishing crew members, fish processing groups, habitual talks) social networks as outlined in Chapter 5. Community (social) learning involved members of the community engaging one another through sharing their views and experiences. Community learning involved dialogue between members of the community and took place during social gatherings (community meetings and events, and church events and meetings). For example churches would organize HIV/AIDS awareness Sundays packed with discussion topics on HIV/AIDS, HIV/AIDS songs, and skits to create HIV/AIDS awareness in the community. Coping strategies acquired through social (peer-to-peer and community)

learning consisted of; livelihood diversification, establishing merry-go-rounds groups, social support schemes, fishers and fish processors training new entrants, and shift to less labour intensive jobs.

Individual learning involved the ability of individual fishers, fish processors, household members and other members of community to obtain knowledge on different coping strategies through their interactions with other members of the community. Individual learning mainly occurred through personal observation and reflection. For example after losing a father (fisherman/breadwinner) an elder son in a family would learn on a coping strategy to make up for the lost income through observing how his other peers are managing, and later reflecting on how he too can adapt the same coping strategy. Coping strategies acquired through individual learning and also peer-to-peer learning consisted of; engaging in multiple fishing trips, withdrawing children from schools, and selling of fishing gears.

6.2.4 Policy interventions and recommendations for fishery management

According to Topouzis (2000), interventions need to be designed and assessed not only in terms of their ability to mitigate the current impacts of HIV/AIDS, but also in terms of their ability to reduce susceptibility to future infection and vulnerability to various types of impacts. Effective mitigation can be one of the best methods of prevention. For example, support for sustainable livelihoods can reduce future exposure to infection, although this is not always the rule (Topouzi 2000). Sustainable livelihood options can help reduce the incentive to undertake livelihoods that are built upon either risky behaviour (e.g. commercial sex workers) or on long periods of non-residence (migration a risk factor in HIV transmission) (De Waal & Tumushabe 2003). Studies in

Uganda carried out in the early 1990s also found out that AIDS prevention strategies built along HIV/AIDS counselling and testing, care giving and support to families affected by HIV/AIDS provided a package for effective prevention and mitigation that was non-conflicting (Topouzi 2000).

Even though fishers in the communities studied were still engaging in behaviours that increased their vulnerability to HIV/AIDS, the participants from each community did have suggestions on policy changes and interventions they felt would help mitigate the impact of HIV/AIDS on their fisheries. Analysis of the data revealed needed policy reform on existing fisheries management policies that aggravate the local poverty situation and making people vulnerable to HIV/AIDS. As for the effectiveness of the policy that bans the use of small size mesh nets below 5" (12cm), they suggested the need for government to provide loans to fishing communities or subsidies, in order for them to purchase the required mesh nets, so they can maintain their livelihood and not fish illegally. To control the impacts of the April-August fish ban, they suggested the need for the government to set up micro-finance projects to assist Kolunga fishers and traders with capital for livelihood diversification. In regards to the issue of the high tax imposed on them by the government, fishers recommended tax cuts on legal fishing gears.

In addressing existing poverty, they recommended in relation to the fishery: the construction of small-scale fish farms for the beach communities to supplement their income and improve access to food during fish off-season; the establishment of cooling plants along the landing beaches; the establishment of government-enforced fish price regulation to prevent exploitation of fishermen by the middlemen; the empowerment of women to improve their status in fishing communities and their access to support services

and benefits from the fisheries; the promotion of business training to help fishers and traders learn other business ventures they could pursue during the ban; and, further strategies in prevention of HIV infection, particularly targeting fishermen, fish processors and fish traders, and assistance from government and private health sectors to assist in improving their access to support, care and treatment (including anti-retroviral therapy) for those living with, or affected by, HIV/AIDS.

They also stressed the need to employ prevention, treatment and care interventions and suggested some more general poverty alleviation actions such as; the development of private sector and government initiatives to assist them in accessing savings and credit facilities; support for improving livelihoods and social safety nets for those households that are so affected by HIV/AIDS; and, improved access to other facilities and services, such as potable water and sanitation.

Based on the study findings and conclusions I concur with the respondents' policy/intervention recommendations, however I advocate for a more holistic approach in which all the artisanal fishery stakeholders, fishing communities, the private sector (middlemen and fish processing factories) and the government work together to mitigate the HIV/AIDS problem in the fishery sector.

For example, the impact of HIV/AIDS on fishers may be mitigated if BMUs and fishing crews work together to donate a proportion of the daily catch to starting projects such as small-scale fish farm projects, legal fishing gear rental projects, and purchasing of community-based non-electric solar freezers. Fish processing factories can support the fishing communities by assisting them in improving access roads connecting landing sites to the processing factories. Local government can support by allocating to the fishing

communities a fair proportion of safety net/CDF funds (community development funds) sourced through poverty reduction strategy plans to aid in the community development projects. In dealing with HIV/AIDS prevention, the BMUs and the fishing communities can also work together to devise HIV/AIDS awareness raising campaigns, and peer-to-peer behavior change education programs. Fisheries policies while focusing on sustaining fisheries resources, must also address the issues of poverty and HIV/AIDS vulnerability to promote true sustainability. The Health sector needs to improve local access to Voluntary Counseling and Testing Centers, anti-retroviral drugs and health care facilities by adapting them to the mobility and irregular working hours of the fishing communities.

Having mentioned the fishing communities' views on policy and their recommendations necessary to improve the sustainability of the fishery, it is important to note that the representation of the two fishing communities in mainstream politics is basically absent (Mutunga 2002, Regional Workshop 2005, Pers. Com. with Fishers from Rusinga Island 2008). This limits the ability of the fishing communities to influence policy or lobby for development projects and schemes in their interest, as outlined above. For this situation to change incrementally, a sound first step will be for fishing communities to mobilize through their own local institutions, such as BMUs, Fishers and Fish Processors Association, and use these institutions as platform to influence policy or lobby for development.

6.3 Future Research

It is evident that there is very little empirical evidence addressing the interaction between HIV/AIDS and artisanal fisheries. Thus I underline that there is need to explore further the nexus between the sustainability of fishery resources and the high incidence of

HIV/AIDS. This is because; HIV/AIDS continues to have a significant impact on the fishing communities' livelihoods which is increasing their susceptibility and vulnerability to HIV/AIDS. Therefore, this is particularly important since some fisheries management efforts aimed at improving resource sustainability are actually increasing the vulnerability of the fishing communities to HIV/AIDS and are also not protecting the fishery.

Emerging issues such as unpredictable weather patterns (climate variability), sex-for-fish, sex-for-customer, and tilapia-aphrodisiac phenomenon are contributing to fishing communities' susceptibility and vulnerability to HIV/AIDS, are not clearly understood and each requires further research.

6.4 Concluding thoughts

This study does not neglect the role of other factors that render challenges to artisanal fisheries and fisheries management. Rather, it points out the way in which HIV/AIDS and artisanal fisheries management policies accentuates existing difficulties, compelling fishing communities to engage in practices that further threaten the sustainability of artisanal fisheries and their own livelihoods.

References

- Abila R. & Jansen E. (1997). 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.
- Abila R. (2003). "Fish trade and food security: Are they reconcilable in Lake Victoria?" *FAO Fisheries Report No. 708. Report of the Expert Consultation on International fish trade and food security. Casablanca, Morocco, 27-30 January 2003*. pp. 128.
- Abila R., Lwenya R., Geheb K. & Crean K. (2005) An assessment of co-management potentials in the Lake Victoria fisheries in Kenya. *In: The State of the Fisheries Resources of Lake Victoria and their Management. Proceedings of the Regional Stakeholders' Conference 24th–25th February 2005. Entebbe, Uganda*. (eds) Ogutu-Ohwayo R., Balirwa J., Njiru J., Mkumbo C., & Birabwa E. Swift Commercial Establishment. Kampala, Uganda.
- Africa Biodiversity Collaborative Group (ABCG). (2002). Executive summary of the ABCG HIV/AIDS workshop proceedings. *Paper read at HIV/AIDS and Natural Resource Management Linkages Workshop*. Nairobi, Kenya.
- Allison E. & Seeley J. (2004). HIV and AIDS among fisherfolk: a threat to responsible fisheries? *Fish and Fisheries*. 5:215-234.

- Allison E. & Seeley J. (2005). HIV/AIDS in fishing communities: Challenges to delivering antiretroviral therapy to vulnerable groups. *AIDS Care*. 17(6):688-697
- Allison E. & Seeley J. (Undated). HIV/AIDS threat among fisherfolk: What is at stake? (Accessed July 2008). KMFRI Library.
- Awange J.L. & Onganga O. (2006). *Lake Victoria: Ecology, Resources and Environment*. Springer. Heidelberg.
- Alex de Waal & Tumushabe J. (2003). HIV/AIDS and food security. A report for DFID. http://www.sarpan.org/documents/d0000235/P227_AIDS_Food_Security.pdf (Accessed November 2009).
- Bain I. (1998). South-East Asia: Special Issue on HIV/AIDS and mobile populations. *International Migration*. 36(4):553–585.
- Barnett T. et al. (2006). The social and economic impact of HIV/AIDS on farming systems and livelihoods in rural Africa: Some experience and lessons from Uganda, Tanzania and Zambia. *Journal of International Development*. 7(1)163-176.
- Baylies C. (2002). The impact of AIDS on rural households in Africa: a shock like any other? *Development and Change* 33(4). pp. 611–632.
- Bene C., Mc Fadayen G., Allison E. (2005). Increasing the contribution of small scale fisheries to poverty alleviation and food security. *FAO Fisheries Technical paper*.
- Bene C. & Merten S. (2008). Women and fish-for-sex: Transactional sex, HIV/AIDS and gender in African fisheries. *World Development*. 36(5):875-899.
- Berkes, F., Colding J., & Folke C. (2000). Rediscovery of traditional ecological knowledge as adaptive management. *Ecological Applications* 10:1251–1262.

- Berkes F., Mahon R., McConney P., Pollnac R., & Pomeroy R. (2001). Managing small-scale fisheries: alternative directions and methods. IDRC (International Development Research Centre) Ottawa, Canada.
- Bishop-Sambrook C. (2004). The challenge of the HIV/AIDS epidemic in rural Ethiopia: the crisis in low AIDS impacted communities, findings from fieldwork in rural Ethiopia, Hanarghe zone. Oromiya region. Rome: FAO.
- Bishop-Sambrook C. & Tanzarn N. (2004) The susceptibility and vulnerability of small scale fishing communities to HIV/AIDS in Uganda. Food and Agriculture Organization (FAO). Rome p.12.
- Bishop-Sambrook C. (2003). Labour Constraints and the Impact of HIV/AIDS on Rural Livelihoods in Bondo and Busia Districts Western Kenya. *Joint study by the International Fund for Agricultural Development and the Food and Agriculture Organization of the United Nations*. Rome.
- Bishop-Sambrook C. & Tanzarn N. (2003). The Dynamics of HIV/AIDS in Small-scale Fishing Communities in Uganda. *Sector project supported by Policy Advice for Sustainable Fisheries, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH*. Rome: FAO HIV/AIDS Programme.
- Bodgan R., & Taylor S. J. (eds.). (1975). Introduction to qualitative research methods: a phenomenological approach to social science. New York: Wiley.
- Buck L., Wollneberg E., & Edmunds D. (2001). Social learning in collaborative management of community forests: Lessons from the field. In: Wollenberg E.,

- Edmunds D., Buck L., Fox J., & Brodt S. (Eds.) (2001). Social learning in community forests. Centre for International Forestry Research.
- Chambers R. (1994). The origins and practice of participatory rural appraisal. *World Development*. 22(7):953-969.
- Charles A. T. (2001). Sustainable fishery systems. Oxford: Blackwell Science.
- Cinner E., Wamukota A., Randriamahazo H., & Rabearisoa A. (2008). Toward institutions for community based management of inshore marine resources in the Western Indian Ocean. *Marine Policy*. 33(3):489-496.
- Cooper P.A. (1993). Paradigm shifts in Designed Instruction: From behaviourism to Cognitivism to Constructivism. *Educational Technology Research and Development*. pp. 12-18.
- Creswell J. W. (2002). Research design: Qualitative, quantitative, and mixed methods approaches. Second edition. Sage Publications. Thousand Oaks. CA.
- Cowx I. G., Knaap M., Muhoozi L. & Othina A. (2003) Improving fishery catch statistics for Lake Victoria. *Aquatic Ecosystem and Health Management*. 6:299–310.
- DAI. (2003). AIDS brief for sectoral planners and managers: Community-based natural resource management. *Bethesda, MD: Development Alternative Inc. (DAI)*.
- DFID/FAO (Undated). Building adaptive capacity to climate change: Fisheries, climate change and poverty reduction. DFID/FAO SFLP Draft Policy Brief.
- <http://www.research4development.info/PDF/Outputs/R8475d.pdf> (Accessed December 2009).

- Daniels E. & Walker B. (1999). Rethinking public participation in natural resource management: concepts from pluralism and five emerging approaches.
<http://www.mtnforum.org/oldocs/260.doc> (Accessed March 2008).
- Demuyneck K. (1994). The participatory rapid appraisal on perceptions and practices of fisherfolk on fishery resource management in an artisanal fishing community in Cameroon. FAO Technical Report # 60. Cotonou. FAO.
- Denzin N. & Lincoln Y. (1998). Collecting and Interpreting Qualitative Materials. In: Rudestan, J.E and Newton R.R. (eds.). *Surviving your dissertation: A Comprehensive Guide to Content and Process. (2nd ed.)*. Sage Publications. Inc. Thousand Oaks.
- Drimie S. (2002). The Impact of HIV/AIDS on Rural Households and Land Issues in Southern and Eastern Africa. *Background paper prepared for FAO*: Rome.
- Dwyer C, & Limb M. (2001). Introduction: doing qualitative research in geography. In: *Qualitative Methodologies for Geographers: Issues and Debates*. Oxford University Press, New York. pp.1-20.
- Fabricius C., & Koch E. (2004). Rights, resources and rural development: community-based natural resource management in Southern Africa. Earthscan. London, UK.
- FAO (2005a). Fisheries Topics: Technology. Small-scale and artisanal fisheries. In: Johnson J. FAO Fisheries and Aquaculture Department. Rome. Updated 27 May 2005. <http://www.fao.org/fishery/topic/14753/en> (Accessed May 2008).
- FAO (2005b). Impact of HIV/AIDS on fishing communities. New directions in fisheries a series of policy briefs on development issues.

<http://www.eldis.org/fulltext/hivandaidsinthefisherysector.pdf> (Accessed February 2008).

FAO (2005c). AIDS in fishing communities: a serious problem frequently overlooked.

<http://www.fao.org/newsroom/en/news/2005/100061/index.html> (Accessed June 2008).

FAO (2002). The impact of HIV/AIDS on agricultural production and mainstreaming HIV/AIDS messages into agricultural extension in Uganda.

<ftp://ftp.fao.org/docrep/fao/005/AC912E/AC912E00.pdf> (Accessed February 2008).

Flowerdew R. & Martin D. (eds.) (1997) *Methods in human geography: a guide for students doing a research project*. London: Longman

Flowerdew R. and Martin D. (eds.). (2005). *Methods in human geography:*

A guide for students doing research project. PEARSON; Prentice Hall, London.

Folke C., Colding J., & Berkes F. (2003). Synthesis: building resilience and adaptive capacity in social-ecological systems. pp 352-387 In: Berkes F., Colding J., & Folke C. (eds). *Navigating social-ecological systems: building resilience for complexity and change*. Cambridge University Press. Cambridge, UK.

Frame Survey National Working Group Kenya. (Undated) (Unpublished). Report on the Lake Victoria (Kenya) Fisheries Frame Survey 2008. Accessed March 2008.

KMFRI Library.

- Geheb, K (1996). The Regulators and the Regulated: Fishery Management, Options and Dynamics in Kenya's Lake Victoria Fishery. *PhD Thesis*. University of Sussex, UK.
- Geheb K. & Binns T. (1997). 'Fishing farmers' or 'farming fishermen'? The quest for household income and nutritional security on the Kenyan shores of Lake Victoria. *African Affairs*. (96)73-93.
- Geheb K., Kalloch S., Medard M., Nyapendi A., Lwenya C. & Kyangwa M. (2008). Nile Perch and the hungry of Lake Victoria: Gender, status and food in East African fishery. *Food Policy*. 33:85-98.
- Glaesel H. (1997). Parks and power: the socio-environmental dimensions of marine resource decline and protection on the Kenyan Coast. PhD thesis, University of Wisconsin, Madison. In: Cinner E., Wamukota A., Randriamahazo H., & Rabearisoa A. (2008). Toward institutions for community based management of inshore marine resources in the Western Indian Ocean. *Marine Policy*. 33(3):489-496.
- Gordon A. (2005). HIV/AIDS in the Fisheries Sector in Africa. *WorldFish Center*. Cairo, Egypt.
- Graham M. (1929). The Victoria Nyanza and its fisheries. A report on the fishing surveys of Lake Victoria (1927-28). Crown Agents Colonies, London.
- Greenwood P. (1974). The cichlid fishes of Lake Victoria, East Africa: the biology and evolution of a species flock. *Bulletin of British Museum of Natural History Zoology Supplement*. 6:1-134.

- Haddad L., & Gillespie S. (2001). Effective food and nutrition policy responses to HIV/AIDS: what we know and what we need to know. *Journal of International Development*. 13:487–511.
- Hardin G. (1998). Extensions of “The tragedy of the commons”. *Science*. 280 (5364): 682-683.
- Hart J. B., & Reynolds J. D. (2002). Handbook of Fish Biology and Fisheries. Volume 1. Wiley-Blackwell.
- Hemrich. G. & Topouzis D. (2000) Multi-sectoral responses to HIV/AIDS: constraints and opportunities for technical co-operation. *Journal of International Development*. 12:85–99.
- Niehof A. (2004). The significance of diversification for rural livelihood systems. *Food Policy*. 29(4):321-338.
- Holland J. & Blackburn J. (1998). Whose Voice? Participatory Research and Policy Change. London: Intermediate Technology.
- Huang M. (2002). HIV/AIDS among fishers: vulnerability of their partners. In: *Global Symposium on Women in Fisheries: Sixth Asian Fisheries Forum 29 November 2001 Kaohsiung, Taiwan*. (eds Williams M. J., Chao N. H., & Choo P. S.). The World Fish Centre. Penang, Malaysia. pp. 49–53.

ILO (Undated). Facts on HIV/AIDS and the world of work.

<http://www.ilo.org/wcmsp5/groups/public/---dgreports/--->

[dcomm/documents/publication/wcms_067561.pdf](http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_067561.pdf) (Accessed February 2008).

IRIN/Plus News. (2008). KENYA: Young girls the new bait for fishermen. *IRIN*.

<http://www.plusnews.org/Report.aspx?ReportId=80315> (Accessed February 2008).

Ison R. (2003). Social Learning for Integrated Catchment Management.

<http://slim.open.ac.uk/page.cfm?pageid=aimshome> (Accessed March 2008).

Jansen E. (1973). The Fishing Population in the Kenyan part of Lake Victoria. *Report to the East African Freshwater Fishery Research Organization, Department of Social Anthropology*, University of Bergen, Norway.

Jeffris K., Nannyonjo J., Byamugisha J., & Baine S. (2007). Assessing the macroeconomic impact of HIV/AIDS in Uganda. Phase 1 report literature review. Final Draft.

<http://www.econsult.co.bw/Phase%20I%20Report%20Uganda%20Study%20Final.pdf> (Accessed December 2009).

Johannes R.E., Freeman M. & Hamilton R.J. (2000). Ignore fishers' knowledge and miss the boat. *Fish and Fisheries*. 1:257-273.

Johnson B. & Turner L. (2000). Data collection in mixed methods research. In:

Tashakkori A., & Teddlie C. (2002). *Handbook of mixed methods in social and behavioural research*. Sage Publications. Inc.

Kenya Ministry of Fisheries Development. (Undated) (Unpublished). Accessed March 2008. KMFRI Library.

- Kitchen R. & Tate N. (2000). *Conducting Research in Human Geography: Theory, Methodology and Practice*. Prentice Hall, London and New York.
- King A. (2000). Systemic Processes for Facilitating Social Learning. Challenging the legacy. Department of Rural Development Studies. Swedish University of Agricultural Sciences. Doctoral Thesis.
- Kissling E., Allison E., Seeley H., Janet A., Russell S., Bachmann M., Musgrave S., & Heck S. (2005). Fisherfolk are among groups most at risk of HIV: cross-country analysis of prevalence and numbers infected. *AIDS. Official Journal of the International AIDS Society*. 19(17):1939-1946.
- Kuhanen J. (2009). Sexualised space, sexual networking & the emergence of AIDS in Rakai, Uganda.
http://www.sciencedirect.com.proxy2.lib.umanitoba.ca/science?_ob=MIimg&_imagekey=B6VH5-4XFFJV4-1-3&_cdi=6057&_user=1068138&_orig=search&_coverDate=10%2F13%2F2009&_sk=999999999&_view=c&_wchp=dGLbVzz-zSkzS&_md5=fal128b36b1c0e2562f65e4990926d13&_ie=/sdarticle.pdf (Accessed December 2009).
- Laws of Kenya. (1991). The Fisheries Act. Chapter 378. Revised Edition 1991.
<http://iodeweb1.vliz.be/odin/bitstream/1834/297/1/FishAct-Kenya1991.pdf> (Accessed July 2009).

- Leary N., Burton I., Adejuwon J., Barros V., & Lasco R. (2008). Climate change and adaptation. *Climate, Malaria, and Cholera in the Lake Victoria region: Adapting to changing risks*. (ed). pp.110. Earthscan, London.
- Leedy P. & Ormrod J. (2005). Qualitative research methodologies. In *Practical research planning and design*. 8th ed. pp.133-160. Upper Saddle River NJ: Pearson.
- Lee K. N. (1993). *Compass and gyroscope: integrating science and politics for the environment*. Island Press. Washington DC.
- LVFO (2008). <http://www.lvfo.org/> (Last updated 2009). (Accessed February 2008).
- Lwenya C., & Abila R. (2003). Lake Victoria Fisheries: Status, biodiversity and Management. Co-management in the Lake Victoria fishery, realities, constraints, and opportunities in Kenya. *Aquatic Ecosystem Health and Management Society*.
- Loevinsohn M., & Gillespie S. (2003). HIV/AIDS, Food security and rural livelihoods: understanding and responding. *RENEWAL Working Paper No. 2. IFPRI*. Washington DC; ISNAR, The Hague
- http://www.aehms.org/pdf/Lwenya_Abila.pdf (Accessed March 2009).
- Maarleveld M. and Dangbegnon C. (2002). Social learning: Major concepts and issues. In: *Wheelbarrows full of frogs: Social learning in rural resource management*. eds. Leeuwis C.& Pyburn R. pp.67–84. Assen The Netherlands: Koninklijke Van Gorcum.
- Maarleveld M. & Dangbegnon C. (1999). Managing natural resources in face evolving conditions: a social learning perspective. *Paper presented at the 7th conference of*

the International Association for the study of common property. 10-14 June 1998.
Vancouver. Canada.

Merten S., & Haller T. (2007). Culture, changing livelihoods, and HIV/AIDS discourse: Reframing the institutionalization of fish-for-sex exchange in the Zambian Kafue Flats. *Culture, Health & Sexuality*. 9(1): 69–83.

McConnell. J& Moran E. (Eds.) (2000). Meeting in the Middle: The Challenge of Meso-Level Integration. *LUCC Report Series No. 5. International Workshop on the Harmonization of Land Use and Land Cover Classification*. Ispra, Italy, 17-20 October, 2000. Bloomington: Indiana University. 62 pp.

McConney P. & Charles A. (2008). Managing small-scale fisheries: Moving towards people-centered perspectives. *Handbook of Marine Fisheries Conservation and Management*.

McCracken G. D. (1988). Long Interview. *Qualitative research methods*. Sage Publications, London.

McGoodwin J. R. (1990). Crisis in the world's fishery: people, problems and policies. Stanford, CA: Stanford University Press.

Munro D. A., Scott P. A., & Lam J. T. (1990). Reproductive seasonality in tropical freshwater teleosts. *Reproductive seasonality in teleosts: Environmental influences*. pp. 149. IRC Press, Inc. Boca Raton. Florida.

Mutunga C. (2002). The Problem of Open Access in an Unregulated Common Property: The case of Kenya's Lake Victoria fisheries. *Paper presented at the Beijer*

*International Institute for Ecological Economics Research Seminar, Durban,
South Africa 28-30 May 2002.*

National AIDS and STI Control Programme (NASCOP)/ Ministry of Health, 2005: *AIDS
in Kenya: Trends, Intervention and Impact*. 7th ed. NASCOP. Nairobi.

NASCOP (2007). Kenya AIDS indicator survey 2007.

http://www.aidskenya.org/public_site/webroot/cache/article/file/KAIS_Key_Highlights.pdf Updated 2008. (Accessed May 2008).

National Assembly Report. (2007). Accessed from KMFRI Library April 2008.

Natural remedies-natural supplements website. (2009).

<http://www.goherbalremedies.com/blog/how-to-boost-sex-drive-with-foods/>
Updated 2008. (Accessed July 2009).

Nguyen V. & Stovel K. (2004). The social science of HIV/AIDS: A critical review and priorities for action. Social Science Research Council Working Group on HIV/AIDS.

Nomura I. (2007). Fisheries management: status and challenges. In: Tsukamoto K., Kawamura T., Takeuchi T., Beard D., Kaiser J. (eds.) (2008). Fisheries for global welfare and environment. 5th World Fisheries Congress. pp.1-16. TERRABUB.

Njiru M., Nzungi P., Getabu A., Wakwabi E., Othina A., Jembe T., & Wekesa S. (2007). Are fisheries management, measures in Lake Victoria successful? The case of Nile Perch and Nile Tilapia fishery. 45(3):315-323.

- Nunan F. & Scullion J. (2004). Lakes and Livelihoods: Integrated co-management in Kampala Uganda. CARE Uganda.
- Odada O. E., Olago O. D., Kulindwa K., Ntiba M., & Wandiga S. (2004). Mitigation of environmental problems in Lake Victoria, East Africa: Causal chain and policy options analyses. *Ambio*. 33(1):13-23.
- Oglethorpe J., & Gelman N. (2004). HIV/AIDS and Conservation: Impacts and Ways to Reduce Them. Fact Sheet for the Conservation Community. http://www.hm-treasury.gov.uk/d/alice_1.pdf (Accessed April 2008).
- Ongaro S & Omwoyo F. (1983). Significance of Fishing in Kenya. In: Kenya Literature Bureau. *Secondary Geography*. Nairobi.
- OSIENALA. (2008). <http://www.osienala.org/index.html> (Last updated 2009). (Accessed May 2008).
- Oucho J. (1993). Demographic profile and human resources in Nyanza. In: Provincial Monitoring and Evaluation Committee (PMEC) Workshop Proceedings. Nyanza 30 Years After Independence: Where It Was, Where It Is, and Where It Is Going. 9–10 December, 1993, Tom Mboya Labour College, Kisumu, Kenya (eds F. M. Rugenyi & J. A. Odondi) pp. 22–27. Provincial Commissioner's Office, Nyanza Province, Kisumu.
- Owino J. P. (1999). Socio-economics of the Lake Victoria Fishery: traditional and Centralised Management systems of the Lake Victoria Fishery in Kenya. *IUCN Eastern Africa Programme Report no 4* pp 1-19.
- Pahl-Wostl C., Craps M., Dewulf A., Mostert E., Tabara D., & Taillieu T. (2007). Social learning and water resource management. *Ecology and Society*. 12(2):5.

- Palincsar A. & Magnusson S. (1997). Design principles informing and emerging from a community of practice. *Teach. Teach. Educ.*
- Patton. M. Q. (1990). Qualitative evaluation and research methods. Social edition. Sage Publications, London.
- Pickering H., Okongo M., Bwanika K., Nnalusiba B., & Whitoworth J. (1997). Sexual behaviour in a fishing community on Lake Victoria, Uganda. *Health Transition Review. 7: 13-20.*
- Pitcher T. J. & Hart J. B. (1995). The impact of species changes in African Lakes. Chapron and Hall. Fish and Fisheries Series 18. Great Britain. Cambridge University Press. pp. 81
- Pretty J. N., Guijt I., Scoones I, & Thompson J. (1995). A trainer's guide for participatory learning and action. *International Institute for Environment and Development.* London.
- Repstad P. (1993). *Närhet och distans: Kvalitativa metoder i samhällsvetenskap.* In: Studentlit-teratur, Broebeck S., & Kaloczy E. (2005). *Advantages and disadvantages regarding usage of wireless systems in a warehouse setting.* Bachelors Thesis. Jönköping International Business School.
- Regional workshop on Legal and Operational Framework for Beach Management Units in East Africa (2005).
<http://www.ilegkenya.org/pubs/docs/REPORT%20OF%20BMU%20WORKSHOP.pdf> (Accessed July 2009)
- Riedmiller S. (1994). Lake Victoria fishery: the Kenyan reality and environmental implications. *Environmental Biology of Fishes.* 39:329-338.

- Röling N. & Jiggins J. (1998). The ecological knowledge system. In: Rolling N. & Wagemakers A. (eds.). *Facilitating sustainable agriculture: participatory learning and adaptive management in times of environmental uncertainty*. pp28. Cambridge University Press. Cambridge UK.
- Röling N. G. & Wagemakers M. A. E. (1998). *Facilitating sustainable agriculture: participatory learning and adaptive management in times of environmental uncertainty*. Cambridge University Press, Cambridge, United Kingdom.
- Rugalema G. (1999). Consequences of loss of labour due to HIV/AIDS in smallholder households in a Buhaya Village, Bukoba District, Tanzania. In: Mutangadura G, H. Jackson and D Mukurazita, 1999, Editors. *AIDS and African smallholder agriculture*. SAFAIDS. Harare.
- Sahelian R. (2003). Fish oils: lube your love glands. *A practical guide to herbs and nutrients that really work: natural sex boosters. Supplement that enhance stamina, sensation and sexuality for men and women*. pp. 55-60. SquareOne Publishers. Inc.
- Schwandt, T. A. (2000). Three epistemological stances for qualitative inquiry: Interpretivism, hermeneutics, and social constructionism. In: Denzin K. & Lincoln Y. *Handbook of qualitative research*. pp.189–213. Thousand Oaks CA: Sage.
- SEDAWOG (1999). Marketing Study. LVFRP Technical Document No. 2. LVFRP/TECH/99/05. The Lake Victoria Fisheries Research Project. Jinja.

- Seeley J., Sutherland K., Dey R., & Grellier R. (2003). Mitigation of the gender specific impact of HIV/AIDS on rural livelihoods. *Programme of Advisory and Support Services to DFID*. London. 138 pp.
[http://www. passlivelihoods.org.uk/default.asp?project_id%54](http://www.passlivelihoods.org.uk/default.asp?project_id%54)
- Silverman D. (2000). *Doing Qualitative Research: A Practical Handbook*. Sage. Publications. London and New Delhi.
- Simon-Meyer J. (2002). AIDS Brief for sectoral planners and managers: Fisheries industry. Health Economics and HIV/AIDS Research Division. University of Natal: Durban. pp.6.
- Tobey J., Torell E., Thaxton M., Crawford B., Kalangahe B., Abdhulrahman I., & Ndalaha M. (2005). HIV/AIDS and threats to coastal biodiversity in Tanzania: Cross-sectoral dimensions of HIV/AIDS, gender, and population dynamics in critical areas. http://www.crc.uri.edu/download/Final_threats_assessmen.pdf (Accessed April 2008).
- Tompkins E. L. & Adger W. N.(2004). Does adaptive management of natural resources enhance resilience to climate change? *Ecology and Society* 9(2): 10.
- Torell E., Tobey J., Thaxton M., Crawford B, Kalangahe B., Madulu N., Issa A., Makota V., & Sallema R. (2006). Examining the linkages between AIDS and biodiversity conservation in coastal Tanzania. *Ocean & Coastal Management*. 49:792-811.
- UNAIDS (2006). 2006 Report on the Global AIDS Epidemic.

UNAIDS/WHO (2007). 2007 AIDS Epidemic update.

http://data.unaids.org/pub/EPISlides/2007/2007_epiupdate_en.pdf (Accessed April 2008).

UNAIDS (2008). The global HIV challenge: assessing progress, identifying obstacles, renewing commitment. *The Global HIV Challenge: 2008 Report on the Global AIDS Epidemic*.

http://data.unaids.org/pub/GlobalReport/2008/jc1510_2008_global_report_pp11_28_en.pdf (Accessed December 2008).

Verheijen J., & Minde I. (2007). Agricultural Innovations: A Potential Tool to HIV Mitigation. *Journal of SAT Agricultural Research*. 5(1).

Versteeg M., & Murray M. (2008). Condom use as part of the wider HIV prevention strategy: Experiences from communities in the North West Province, South Africa. *Journal of Social Aspects of HIV/AIDS*. 5(2):83-93.

Walker T. & Jodha N. (1986). How small farm households adapt to risk. In crop insurance for agricultural development. Issues and experience. Hazell P. ed. Baltimore Maryland. The Johns Hopkins University Press.

Willis J. W. (2007). Foundations of qualitative research: Interpretive and critical approaches. Thousand Oaks. CA: Sage.

Wilson C. D. (Undated). Social literature review for the knowledge in fishery management project. *Institute for fishery management*.

Witte F., Goldschmidt T., Goundswaard P., Ligtoet W., Oijen M., & Wanink J.(1992). Species extinction and concomitant ecological changes in Lake Victoria. *Netherlands Journal of Zoology*. 42:214-232.

- Wollenberg E., Anderson J., & Edmunds D. (2001). Pluralism and the less powerful: accommodating multiple interests in local forest management. *International Journal of Agricultural Resources, Governance and Ecology*. 1(3-4):199-222.
- Wondolleck J. M. & Yaffee S. L. (2000). Making Collaboration Work: Lessons from Innovation in Natural Resource Management. Washington, DC: Island
- Yin R. (2003). Case Study Research. 3rd ed. Thousand Oaks. CA: Sage Publications.

Appendix A. Interview Guide

Interviewees: Artisanal fishers, fish processors, village/clan elders and chief.

Interview location: Fishing villages, landing beach and any other location suggested by the interviewees.

Interview Questions:

Questions for artisanal fishers

1. *How long have you been fishing?*
2. *Has the fishing practices changed in recent years?*
3. *Where do you mainly fish, and what fishing gear do you use?*
4. *Has HIV/AIDS in the community changed how people fish and manage the fishery?*
5. *If yes..how has it changed how your community fishes?*
6. *What strategies has your community adopted in dealing with these changes?*
7. *How have you learnt about these strategies you are now using to adjust to the HIV/AIDS implications?*
8. *Who have you learnt from the strategies you are now using to adjust to the HIV/AIDS implications?*
9. *How is your community trying to retain traditional knowledge?*
10. *Are you a member of the fishermen community association?*
11. *If yes..how long have you been a member?*
12. *What are the functions of the association?*
13. *Has HIV/AIDS changed the structure and functions of the association?*
14. *If yes..how has it changed?*

15. *Are you involved in any management fishery practices?*
16. *If yes..what management practices are you involved in?*
17. *Do you have any suggestions of changes that are needed to help you deal with the impacts of HIV/AIDS?*
18. *Are there any other relevant and related issues that have not been mentioned during this interview session? If yes..please discuss them?*

Questions for fish processors

1. *How long have you been involved in fish processing?*
2. *Has the fish processing methods changed over the years?*
3. *What methods do you use to process fish?*
4. *Has HIV/AIDS in the community changed how your community process fish?*
5. *If yes..how has it changed the way of processing fish*
6. *What coping strategies have you and your community adopted in dealing with these changes?*
7. *How have you learnt the strategies you are now using to adjust to the HIV/AIDS implications?*
8. *Who have you learnt from the strategies you are now using to adjust to the HIV/AIDS implications?*
9. *Which strategy is your community using to retain traditional knowledge?*
10. *Do you have any suggestions of changes that are needed to help you deal with the impacts of HIV/AIDS?*
11. *Are there any other relevant issues that have not been mentioned during this interview session? If yes..please discuss them?*

Questions for Village/clan elder and chief

1. *How long has your village been involved in fishing activities and fishery management?*
2. *Has fishing activities and management changed over the years?*
3. *Has HIV/AIDS been one of the factors that have contributed to the changes? If yes..how has it changed the fishing activities and fishery management?*
4. *Do you have any suggestions for how the local NGOs and the government can support your community to help deal with the impacts of HIV/AIDS?*
5. *Are there any other relevant and related issues that have not been mentioned during this interview session? If yes..please discuss them?*