DECLINING FISH STOCKS AND LIVELIHOOOD DIVERSIFICATION AMONG FISHING HOUSEHOLDS OF MFANGANO ISLAND IN KENYA

BY:

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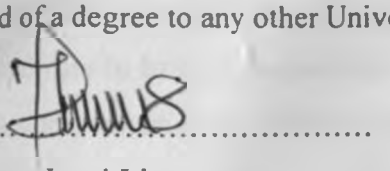
DECLARATION

This project paper is my original work and has not been presented either wholly or in part for the award of a degree to any other University.



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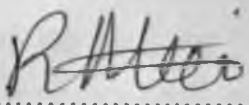
This project paper has been submitted for examination with our approval as University supervisors.



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DEDICATION

This project paper is dedicated to:

My late father Magego Mugaka and my living mother Leunida Magego. They both played a cardinal role in bringing me to this world. The passion and the inspiration that they perpetually injected in me during my childhood have all contributed to the fulfillment of this great dream.

To my only brother Marcus, be blessed. You became the model upon which this great venture has been achieved.

Most sincere dedication goes to my adoring and loving wife Monica Adhiambo, our three children Emmance, Jeanett and Basil. I thank you all for the emotional support, endurance and patience that kept me going. You all sacrificed a lot for me during the period of this journey. You comforted me when I was low and brought humor when the journey seemed far. turbulent and drowsy. May God the Almighty give you abundant life and live to reap from the benefits of this effort.

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ABSTRACT

Fishing activity in Lake Victoria has been the main source of livelihood for households living around the lakeshores for several decades. The recent changes in fresh water fish landing have brought challenges to the fishing households. This study examines declining fish stocks and livelihood diversification among fishing households of Mfangano Island. Specifically, the study sought to address three research objectives: first was to assess the existing patterns of livelihood diversification of fishing households in the study area; second was to examine the determinants of livelihood diversification patterns of fishing households in Mfangano Island and finally to establish policy interventions on livelihood diversification activities of the fishing households in the study area.

The study used three methods of data collection. These included a household survey in which a sample size of 80 fishing households were interviewed; key informant interviews were conducted among 7 informants and one focus group discussion was held with officials of fishing groups. The study findings indicate that fishing households were engaged in various activities. Among the key ones were fishing, selling smoked fish, working in food kiosk/hotel while others were employed either in government or Non- Government Organizations (NGOs). Further, the study revealed that fishing households supplemented their livelihoods with secondary activities such as firewood selling, charcoal burning, subsistence farming, boda boda and boat transport.

Key household characteristics such as education, age, land ownership and time spent in activity were found to be closely linked to livelihood diversification. The study found out that decline in fish stocks had caused fishing households to diversify their livelihoods into various activities. Furthermore, it was revealed that other factors such as theft of fishing nets, illness and death of household members had also prompted livelihood diversification. In conclusion, fishing households were severely affected by the decline in fish stocks hence the observed livelihood diversification.

In line with the study findings, it is recommended that fishing households consider the necessity to explore other livelihood options. The government and other organizations should support fishing households' livelihoods by availing affordable credit facilities to social groups.

TABLE OF CONTENTS

DECLARATION ii
DEDICATION iii
ACKNOWLEDGEMENTS iv
ABSTRACT v
TABLE OF CONTENTS vi
LIST OF TABLES ix
LIST OF ABBREVIATIONS AND ACRONYMS x

CHAPTER ONE: INTRODUCTION 1
1.1 Background Information 1
1.2 Problem Statement 4
1.3 Research Questions 4
1.4 Research Objectives 5
1.5 Justification of the Study 5

CHAPTER TWO: LITERATURE REVIEW 6
2.1 Introduction 6
2.2 Theoretical Literature 6
2.2.1 Fishing and Livelihood Diversification 6
2.2.2 Economic Value of Fish, Demand and Livelihood Diversification 9
2.2.3 Household Resources and Livelihood Activities 10
2.3 Empirical Literature 12
2.3.1 Declining Fish Stocks and Livelihood Diversification Among Fishing Households 12
2.3.2 Increasing Population and Fishing Methods 14
2.3.3 Remittances and Rural Livelihood Diversification 16
2.3.4 Decision Making, Gender and Household Livelihoods 17
2.3.5 Summary of Theoretical and Empirical Literature 19
2.4 Conceptual Framework 20

CHAPTER THREE: RESEARCH METHODOLOGY **23**
3.1 Study Site 23
3.2 Research Design 23
3.3. Population and Sampling Design 24
3.3.1 Sampling Procedure 24
3.4 Data Sources 28
3.5 Methods of Data Collection 28
3.6 Data Analysis 30
3.7 Challenges Faced During Data Collection 31

CHAPTER FOUR: HOUSEHOLD CHARACTERISTICS **32**
4.1 Introduction 32
4.1.1 Age 32
4.1.2 Gender 33
4.1.3 Marital Status 34
4.1.4 Educational Level 35
4.1.5 Household size 36
4.1.6 Social capital 37
4.1.7 Household Assets 38

CHAPTER FIVE: EXISTING PATTERNS OF LIVELIHOOD DIVERSIFICATION OF FISHING HOUSEHOLDS **41**
5.1 Introduction 41
5.1.1 Main Activities 41
5.1.2 Secondary Activities 43
5.2 Changes in Livelihood Activities 45
5.2.1 Trends of Fish Stocks in Lake Victoria 49
5.2.2 Fish Catch Trends of Different Fish Species 50
5.2.3 Effects of Declining Fish Stocks on Household Livelihoods 52

LIST OF TABLES

Table 1.0: Sampled Sub-locations 25
Table 2.0: Population of fishing households 27
Table 3.0: Proportional sampling of fishing households 27
Table 4.0: Age distribution of household heads 33
Table 5.0: Gender of household heads 34
Table 6.0 Marital Status of Household Heads 35
Table 7.0: Level of education of household heads 36
Table 8.0: Fishing houschold size 37
Table 9.0: Household social capital 38
Table 10.0: Total current values of household assets per year 39
Table 11.0: Main occupations of household members 42
Table 12.0: Secondary activities of household members 44
Table 13.0: Changes in livelihood activities within fishing households 46
Table 14.0: Reasons for livelihoods diversification 48
Table 15.0: Causes of declining fish stocks 49
Table 16.0: Effects of declining fish stocks on livelihoods of fishing households 52
Table 17.0: Relationship between Age of household members and main occupations 56
Table 18.0: Relationship between percent in activities and time spent in years 58
Table 19.0: Relationship between main occupation of household heads and land ownership 61
Table 20.0: Household Expenditure in 12 months 62

LIST OF ABBREVIATIONS AND ACRONYMS

BMUs	Beach Management Units
BVCs	Beach Village Committees
CBOs	Community Based Organizations
DFID	Department for International Development
EU	European Union
FAO	Food and Agricultural Organization
FBOs	Faith Based Organizations
FGDs	Focus Group Discussions
GDP	Gross Domestic Product
GoK	Government of Kenya
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome
KIs	Key Informants
KNBS	Kenya National Bureau of Statistics
LD	Livelihood Diversification
LVEMP	Lake Victoria Environment Management Project
LVFO	Lake Victoria Fisheries Organization
NGOs	Non-Governmental Organizations
SAPs	Structural Adjustment Programmes
SLF	Sustainable Livelihood Framework
SPSS	Statistical Package for Social Science
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Program

CHAPTER ONE

INTRODUCTION

1.1 Background Information

Livelihood studies involve all activities people engage in to earn a living. The approaches include analyzing in totality both income and domestic activities that people undertake in order to survive (DFID, 2000). In the 1970s, livelihood diversification was confined to poverty reduction. However, today the approaches cut across a number of fields and are viewed as increasing income and wealth accumulation among individuals and households. While overlaps occur between these arenas, each tends to bring rather partial insights to bear on the causes, opportunities, effects and policy implications of diversification. In reality, for people in the South, survival and prosperity depend on the pursuit of diverse and multiple activities simultaneously, by different family members, taking advantage of available opportunities and resources at different times (Cinner and Bodin, 2010). Regardless of numerous options that people have, resource diminution has been a constant constraint to the majority in the third world.

According to Ellis (2000) livelihoods are the activities, assets and access that jointly determine the living gained by an individual or a household. Livelihood diversification therefore, is an active social process whereby households engage in increasingly intricate portfolios of activities over time. In Sub-Saharan Africa, where most of the people are poor and live in rural areas, livelihood diversification studies have often concentrated on specific issues with divergence views. For instance, Hart (1994) contrasted diversification for survival with diversification for accumulation; Davies (1996) studied livelihood diversification as household risk and coping strategies; Bryceson and Jamal (1997) focused on diversification in the form of de-agrarianisation in response to income failures deriving from loss of farming activities. They link it to long term demographic and economic trends. Allen and Thomas (2000) discussed livelihood diversification in relation to environmental degradation as a consequence of increasing human activities on limited natural resources. Yet, there has not been consensus on what universally comprises livelihood diversification.

In Kenya, many studies on livelihood diversification tend to categorize livelihood sources as either farm or non- farm activities. A study conducted by Freeman et al (2004), found out that in Western Kenya where farming, livestock herding and fishing are the main sources of livelihood for many households, diversification was occurring in the form of migration to urban areas or non-natural resource-based activities. They further argue that unpredictable weather conditions and decreasing land size have all constrained household livelihoods. Diversification of livelihoods has occurred by moving to towns in search of other opportunities such as employment. On the other hand, Little (2001) observes that among pastoralists in Kenya, livelihood diversification entails how crop producers are increasingly keeping livestock and herders increasingly engaging in crop cultivation. Despite findings from these studies, livelihood aspects continue to be at the centre of most debates particularly in situations of severe resource depletion.

Peoples' livelihoods have often combined multiple activities most of which spring from fishing and related activities. Although fishing contributes very little to the national economy of Kenya, fishing industry has continued to record improved performance in terms of earnings especially with the introduction of fish farming. Further, its contribution is very high in terms of employment along the lakeshores. The fisheries industry is a major economic driver in the areas immediately bordering Lake Victoria. This sector is also becoming increasingly commercialized to a point of severe resource depletion. Almost all livelihoods around Lake Victoria draw from a combination of fish related activities. Recently the industry has been facing competition due to the scramble by large scale commercial operations of fish for export markets (KNBS, 2012).

According to UNEP (2008) fish is the main source of food and over 30 million people around the shores depend on it. Moreover, there are high numbers of people who earn their living from fishing related activities such as trade in fishing gears, fish processing, boat-making and timber selling. In spite of peoples' efforts in undertaking the activities, fishing household livelihoods along the lakeshores have continuously faced the challenge of diminishing stocks of freshwater fish. Literature abounds that livelihood diversification among fishing communities is a survival strategy common amongst rural households and is becoming increasingly prevalent in many communities (Allison, 2004). Resource depletion has driven most households out of their

mainstream livelihoods as fish resources become threatened by severe depletion. Yet, around the shores of Lake Victoria and some rivers, fishing still remains the main source of livelihood for households.

Around Lake Victoria, fishing has been a dual activity, often it is either a full- time or a part-time occupation for some households. Initially, fishing reinforced diversification of livelihoods, and those who had access to it were typically better off than those who depended on subsistence farming alone in the same locations. One reason for this is that, fishing is a highly monetized activity thus providing cash that can be flexibly utilized within households (Allison, 2004). The trend in average price of freshwater and marine fish has maintained an upward growth. The favorable prices were attributed to increased demand for fish in both domestic and export markets (KNBS, 2012).

Livelihood activities in Mfangano Island had been concentrated in the fishing sector for several decades; they were seen as means of subsistence to households as well as ways of increasing income and wealth especially among the better-off fishermen. In Lake Victoria, cases of fish decline have been recorded. For instance, in Suba District, fish catch in the year 1999 was recorded at 13,000 metric tonnes, this reduced to 6,375 metric tonnes in the year 2008 (KNBS, 2010). The decline in fish stocks has been attributed to various explanations. However, the result has been that both commercial and small-scale fishermen are continuously grappling with a diminishing fishing livelihood. The situation has been severe especially amongst households traditionally dependent on fish-based livelihoods. Livelihood diversification among fishing households of Mfangano Island needs to be understood in a different dimension. It is a new phenomenon that is yet to be exhaustively investigated. This study therefore sought to examine livelihood diversification as a means of household survival by establishing a link with declining fish stocks.

In addition, the study investigated how people were able to make a living within evolving social, institutional, economic and environmental contexts. In looking at the multiple and diverse character of livelihoods along the lake shores, fishing households are likely to exhibit different responses in a bid to improve their living standards in situations of declining fish catch.

1.2 Problem Statement

The decline of fisheries resources in L. Victoria has had overwhelming consequences on the surrounding fishing communities. In Mfangano Island, the majority of fishing households have been driven out of their traditional fish-based livelihood as fish stocks become scarce. Fishing activities have become limited as competition for fish faces intensive investments in technology. Therefore, the livelihoods of artisan fishers are threatened and their consumption patterns are drastically changing. People have lost their employment opportunities as fish processing factories are gradually closing down due to low operating capacity. Overall, fishing households have had to grapple with their lost livelihoods by diversifying into other activities.

The situation is further worsened by inappropriate policies, institutions and enforcement mechanisms to the common pool fishery resource in the lake. Relevant authorities show little regard for protection of fisheries resources. The fishing community's household incomes have also decreased in real terms as subsistence requirements continuously fluctuate. Moreover most livelihoods are at stake with only few options available for meaningful living (GoK, 2010).

Previous studies on livelihoods along the lakeshores have often focused on sectoral aspects. For instance, Townsley (1998) found out that fishing communities did not have savings. They also moved from one area to another depending on fish catch. Mitulla (1999) studied the politics and market dynamics that face Nile Perch Fish in Lake Victoria. While GoK (2010) focused on seasonal productivity fish. Very little is known on livelihood diversification patterns with respect to declining fish stocks in the area. This study attempts to develop a comprehensive linkage to examine livelihood diversification among households of Mfangano Island in response to declining fish stocks. Furthermore, significant policies have also been put in place by the government and other stakeholders to ensure fishing livelihoods get better, however, fishing households are faced with the challenge of dwindling fish catches.

1.3 Research Questions

The study was guided by three research questions.

1. What are the existing patterns of livelihood diversification of fishing households in Mfangano Island?

2. What determines livelihood diversification patterns of fishing households in Mfangano Island?
3. What are the policy interventions on livelihood diversification patterns of fishing households in Mfangano Island?

1.4 Research Objectives

The study focused on the following objectives:

- To assess the existing patterns of livelihood diversification of fishing households in Mfangano Island.
- To examine the determinants of livelihood diversification patterns of fishing households in Mfangano Island.
- To establish policy interventions on livelihood diversification activities of fishing households in Mfangano Island.

1.5 Justification of the Study

Livelihood diversification among fishing communities has enormous potential for assisting households to cope with various environmental uncertainties. This study contributes to building new knowledge that can be utilized in the understanding of the fishing households' well-being and coping strategies that make use of new activities for earning a living. It would open up new perspectives on public policies and would as well help design appropriate policies that may help in reducing vulnerability among fishing communities. The study also focuses on the fisheries resource degradation and associated impacts on the livelihood of fishing communities in Kenya. Further the study will broaden understanding of livelihood strategies within a context of limited resources. In looking into the type of activities that fishing households are engaging in to earn their living, appropriate strategies would be designed to avert potential challenges that face fishing households.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Livelihoods are constructed by households from different sources. Around Lake Victoria, people depend mostly on fishing as the main source of earning a living. However, in recent times, fishing households have experienced the challenge of declining fish stocks. The result has been that fishermen and their households have been forced to change to other activities for survival (Allison and Mvula 2002).

Livelihood diversification as a coping strategy has gained prominence among fishing households. Members of households seek for other alternatives that can provide a sufficient means of earning a living. Diversification has therefore occurred in different forms in which different activities have been adopted. This implies that some activities such as subsistence farming which were not very much regarded as sources of survival by fishing households have now become important means of livelihoods (Barrett et al 2001). Declining fish stocks has therefore brought changes in livelihood activities in which fishing households are seen to engage in a number of activities to meet their daily needs.

This section is divided into three sub-sections. The first sub-section reviews theoretical literature on issues of declining fish stocks and livelihood diversification. The second sub-section contains the empirical literature which entails various studies that hinge on livelihood diversification while the final sub-section contains the conceptual framework.

2.2 Theoretical Literature

2.2.1 Fishing and Livelihood Diversification

Whereas the importance of farming to rural livelihoods is clear, the interplay between fishing and people's everyday lives is not well understood. Yet, the actual contribution of this livelihood activity is very critical to fishing communities. Areas around the lakeshores are usually considered remote, rural and sparsely inhabited by poor people. This is due to the fact that the majority tends to conglomerate near urban areas where they depend mostly on non-farm activities. There are also pull factors such as higher wages which attract people in towns thereby

living few people in rural areas as far as in the lakeshores and rivers (Barrett et al, 2001). Rural families depend mostly on natural resources to meet their subsistence requirements. Livelihood diversification has therefore revolved around fishing activities. This implies that household livelihoods are closely intertwined with fishing activities.

Livelihood diversification as used in this study refer to efforts aimed at making a living, attempting to meet various consumption and economic necessities, coping with uncertainties, responding to new opportunities and making a choice between different value positions. It is a way of gaining a living through pursuant of different activities (Long, 1997; Ellis, 2000). Further it can either refer to an increasing multiplicity of activities (regardless of the sector) or it can refer to a shift away from traditional rural sector such as fishing to non-traditional activities in either rural or urban space. Households interweave their own perceptions and experiences with how a given strategy operates and this is bound to affect a livelihood outcome. As such different livelihood strategies are influenced by different aspects.

Livelihood is often a dynamic process and one in which new ideas are always emerging. As such the predominant livelihood strategies that people identify with are likely to change or be seen to have changed for various reasons. In this regard decline in fish resource would adversely affect livelihoods of fishing households (FAO, 2006).

Among fishing communities, livelihoods comprise of all the activities required to make a living. Livelihood diversification implies enlarging means of survival. This term is not synonymous with income diversification. Barret et al (2001) make a distinction by noting that a livelihood includes income (in both cash and kind) as well as the social institutions that support and sustain a given standard of living. Income diversity is therefore narrower as it only refers to the composition of a household's income at a given instance in time. There are therefore other factors that influence livelihood strategies in terms of access to assets and processes that affect household's ability to use these assets to achieve positive livelihood outcomes. Livelihood strategies are composed of activities that strive to generate the means of household survival especially in situations of declining stocks. According to the Department for International Development (1999) livelihoods comprise of capabilities, assets (including both material and

social resources) and activities required for a means of living, while the United Nations Development Programme (UNDP) defines livelihoods as the means, activities, entitlements and assets by which people make a living.

Livelihood diversification is neither just a rural nor only a developing country phenomenon. It is also a survival strategy of urban dwellers in developing countries. In diversified households, if one productive activity does not provide enough, or fails completely, there are other sources of livelihood that the household can fall back on. Along the lake shores, diversification has been for distress reasons due to declining fish stocks. In such situations, Ellis (2000) argues that household members are forced to undertake casual or less productive activities with poor prospects. In other words it is a last resort rather than an attractive alternative of survival. Moreover, Davies and Hossain (1997) add that, it may also lead to households adopting a more vulnerable livelihood system than they possessed previously.

Ellis (2000) further observes that when analyzing household level strategies it is important to identity the underlying trends and processes. This is because these two aspects may create general conditions that provoke livelihood diversification as a response to survival. However, individuals and households are likely to respond to these underlying changes in different ways depending on the factors that vary between households such as income levels and asset profiles.

In addition, Freeman and Ellis (2005) observe that diversification has also been analyzed as a rational response by households to lack of opportunities for specialization and was initially considered not the most desirable option. Recent studies indicate that rather than promoting specialization within existing portfolios, upgrading them to augmenting income could be more realistic and relevant for livelihoods around the lakeshores. Usually households diversify their portfolios depending on their income levels and resource availability. Along the lakeshores, fishing has recently failed to provide a sufficient livelihood for a substantial proportion of rural communities. Consequently livelihoods have become increasingly oriented to non-fishing activities. This has been attributed to severe decline of fisheries resources along the lakeshores.

2.2.2 Economic Value of Fish, Demand and Livelihood Diversification

Fishing as an economic activity has offered actual income to the fishing households living around Lake Victoria. This has been experienced through the high fish prices that are offered both locally and internationally. However, in the last four years, fish prices have been very unstable (KNBS 2012). Furthermore, the functioning of markets has constrained fishing livelihoods. The changing trends in the casualisation of labor markets have influenced livelihoods in fishing industry. In stark contrast to days when fish was plenty and people had permanent employment, today many jobs are so temporary that the cycle of work and work-search has become a permanent condition leading to a lifestyle of livelihood diversification in search of subsistence needs with a daily scramble for day wage. Around the shores of Lake Victoria, fishing activity provided a permanent source of income and livelihood for people living as far as in towns and in rural areas; this was due to stable market prices that existed together with a range of activities that people engaged in.

According to Mitulla (1999), in Kenya especially around Lake Victoria, fish dealers and middlemen have taken advantage of free market to involve in cartels that aim at exploiting fishermen. This has been on the backdrop of global economic recession. Most fishermen have therefore abandoned fishing and have diversified their livelihoods by moving into the sites of highest economic growth: near towns, cities and industries (Craig and Johnson 1997). Market dynamics in terms of fish demand have led to livelihood diversification for both the poor and the rich. The poor have continuously engaged in the diminishing fishing activity which has had poor returns. They have over-spent their resources on fishing to secure better returns. In addition, the politics of fluctuating fish prices continue to coincide with the declining fish stocks hence the observed diversification. The fishing households have opted for other sources of subsistence supply of food beyond fishing (Freeman et al., 2004). Most people who were used to a stable fishing livelihood have been rendered jobless due to diminishing returns. New markets have also emerged in which fish products have been in high demand. For instance, Nile perch swim bladder was being sold in the market at a comparatively higher price. Changes have also been realized in the fish size that was recommended for sale. The government policy has focused on a bigger size of fish in terms of kilograms to restrict fishermen to harvest mature fish only (Abila and Jansen 1997).

Tastes in the market for fish species have changed over the years. For instance tilapia fish that was meant for domestic consumption has been on high demand compared to Nile perch. The implication has been that fishing methods have been forced to change as well to harvest large quantities of fish species. In terms of diversification, fishing households who cannot afford the fishing gears required have abandoned fishing for other activities (Davies and Hossain 1997).

2.2.3 Household Resources and Livelihood Activities

People fail to secure livelihoods when they have no access to or control over resources or when the resources available are inadequate. Livelihoods around the lakeshores usually tend to rotate around access to and utilization of resources especially fisheries. Fishing therefore, is the main activity that enables fishing households to acquire resources such as land and other productive assets. The decline in fish stocks implies fishing households have to devise new ways to enable them continue earning a living (Davies, 1996).

Livelihood diversification among fishing households has been a matter of freely made choices subject to factors such as the amount of fish catch and availability of resources, assets, skills and incomes of individual household. In this view a household acts as an economic unit operating under predetermined factors. Yet, what people choose is also influenced by their social context such as family, kin, ethnic group, community and belief systems. Household resources can be enhanced or drained depending on various factors. Among fishing communities, reliance on fish is common practice hence households tend to diversifying least into non-fishing activities. This implies that their savings also tend to degenerate faster in times of low catches mainly due to their high expenditure and seasonality of the activity (Davies and Hossain, 1997).

Livelihood strategies are usually based on peoples' capabilities, assets and activities which are determined by resource availability and sustainability. Household resources are therefore utilized by household members to define and mobilize livelihood sources to earn a living. However, it is important to recognize that these livelihoods keep changing due to structural and institutional constraints. Fisheries resources are easily degradable either as a natural process through species extinction or exploitation due to human activities. Swift and Hamilton (2001:84) indicate that natural capital comprises of natural resources including stocks and "flows and environmental

services available in particular agro-ecological settings." Therefore, fish resources as natural resources are found in water and can be utilized by people to generate means of survival.

Ellis (2000) observes that endogenous factors modify access to resources while the exogenous factors provide the context within which actors devise livelihood strategies. Institutions on one hand influence the distribution and access to strategies as well as shaping actors' responses to contextual changes. Livelihood diversification may therefore be a coping mechanism for shocks or stresses and it may involve more permanent adaptation of livelihood activities. In general, people pursue different strategies at different times and for different reasons. Among fishing households living around the lakeshores and rivers, diversification has been necessitated by unstable fish catch and eventual decline of fish resources. Livelihood strategies that may be pursued, therefore, depend on the accessibility and availability of resources or assets. These combine to influence the type of a livelihood a household adopts. Thus the degree of specialization or diversification may relate to resources available and risks accompanying various options (Shackleton et al, 2001:1).

Societal structures such as belief systems may also determine household's ability to generate a livelihood in terms of its access to productive resources and its ability to control and use resources effectively. For instance, norms of behavior of certain activities may restrict some household members from accessing certain resources. Fishing being an activity that is very close to the cultural setting and sensitive to changes in society, it is shaped by people's livelihoods in terms of access and utilization of resources. According to Atieno (2001) households can also suffer from institutional barriers and physical access to some facilities such as credit. She further notes that market failures prompt households to switch between activities to avert risks and shocks in their livelihoods. The profile of any household strategy consequently is influenced and determined by the institutional set-up that exists at a given time and a household's personal and economic characteristics.

Households are constrained within certain boundaries of action to control resource exploitation. Their options are also determined by the structures (such as the roles of the government or of the private sector) and processes (such as institutional, policy and cultural factors) which people face

(Carney, et al, 1999). Usually, there is a tendency for public services to be biased toward the better-off and more accessible locations, communities, and social groups thus exacerbating the material deprivation already experienced by the small- scale fishers as a result of inadequate levels of assets to access other resources for a livelihood (World Bank, 2001).

Rules are dynamic hence patterns of behavior of individuals also shift. The rules are made and remade through people's practices. Therefore as fish resources decline so do households ability to regularize their behavior in terms of access to and utilization of resources. Further, utilization of resources is also determined by institutions. Consequently, it is through institutions that various assets such as social networks (welfare organizations) develop to enable access to various resources, knowledge and information. According to Scoones (1998) assets are transformed by institutions and also determine the terms of access to opportunity and production of a livelihood. Therefore, institutions whether formal or informal do not just confer resources and opportunities on a silver platter, people struggle and negotiate with each other, sometimes seeking to interpret institutional positions afresh.

Government and non-governmental organizations involve in power contest over resource control, they are actors and facilitators of livelihood strategies in societies. According to Leach et al, (1999), formal institutions influence and sometimes determine the kind of activities to be undertaken by households. Government is a regulatory agent that ensures resource distribution, access and utilization while non-governmental organizations support local-level programmes through credit facilities (Atieno, 2001). They both provide an enabling environment for various household activities. In line with this argument, livelihood diversification can therefore, be conceptualized as a series of unfolding events mediated by different actors at different times.

2.3 Empirical Literature

2.3.1 Declining Fish Stocks and Livelihood Diversification Among Fishing Households

In the recent years a large body of literature has evolved which tries to study and understand the causes and consequences of livelihood diversification in societies (Scoones, 1998; Ellis, 2000). Furthermore, studies into the causes of livelihood diversification among fishing households have attracted unresolved debates among scholars. For instance, Allison and Mvula (2002), argue that

climatic variations are major causes of fish stock fluctuations. This is in contrast to UNEP (2004) which contends that the introduction of the invasive species (*Oreochromis niloticus*) in the 1950s and Nile Perch (*Lates niloticus*) in the 1960s combined with heavy industrialized fish processing in the 1980s have led to fish depletion.

Allison and Ellis (2001) observe that in fishing industry the institutional policy has been to increase catch efficiency for small scale fishermen while simultaneously maximizing sustainable yield by state-enforced limitation of access. This approach rested on the belief that small scale fishermen have specialized livelihoods and that they depend only on the fishery resource. There has also been a widespread and empirically unverified belief that artisan fishing families are amongst the poorest of the poor hence they do not mind using the lake resources effectively (Bene, 2003). This view has been contested by most researchers on livelihoods along the lake shores. Fishermen have not been very keen on the use of lake resources. The result has been that fish stocks have declined thereby leaving fishing households with little sources of earning a living.

Exploitation of fisheries has attracted institutional policies. For example, in Malawi, community based natural resource management was introduced in fishing villages in the late 1990. The institutional device that was created was the Beach Village Committee (BVC). The initiative was aimed at coordinating and regulating fisheries resources which suffered from severe exploitation (FAO, 2006). Other studies have observed that human use and abuse of marine aquatic resources account in large part for the often unstable and alarming decline of economically important fish stocks. According to a study by Neher (1990) in Gulf of Thailand, salt water marshes and rivers have been turned into airports and residential as well as commercial buildings. Some have been turned into pleasure boat marines and commercial harbors. The activities have interfered with the aquatic system in such areas. In general, they are forms of livelihood diversification formed out of either necessity or voluntary arrangements without taking into consideration the harm caused on marine environment.

Prior monitoring of the fish catch in the 1990s showed that Kenya's small-scale fishers' catches were declining annually until 2000, when they reached less than 2kg per fisher per day (FAO,

2006). In another recent study by KNBS (2012), it is indicated that fish landing from Lake Victoria has been cyclical. The statistics according to the study show that in the year 2007 the catch was 117,231 tonnes, in 2008, it was 111,369, 2009- 108,934, 2010- 111,868 while in 2011 it was 111,619 tonnes. The figures explain why fishing communities are adopting other livelihood strategies in order to earn a living. There have been interventions by the Government to introduce fish farming in order to decongest fishing in Lake Victoria.

2.3.2 Increasing Population and Fishing Methods

Odada et al, (2006) argue that increasing populations, the introduction of commercial harvesting of Nile perch and the subsequent increase of fishermen together with their fishing gears have driven high demands for fish in Lake Victoria Basin. For example, in Suba district the population figures increased from 195,308 in 2008 to 200,401 in 2009 and further to 204,740 in the year 2010 (KNBS, 2010). A study conducted by Lake Victoria Fisheries Organization (LVFO) in 2006 found out that the period between the years 2000 to 2005, the number of fishermen in L. Victoria increased by 25% from 129,305 to 196,426, fishing vessels also increased during the time by 63% from 42,493 to 69,160 while, the number of fishing crafts using outboard motors increased by over 200% from 4,108 to about 12,000. In 2005, Kenya's Nile perch export was about 133,527 metric tonnes while 35% of the Nile perch exported were harvested in Suba District. This meant the district had a higher intensity and productivity in fishing. It further noted that the annual fishery yields from the lake realized were 600,000 tonnes valued in 2005 at US$ 350, this dropped to 289,000 metric tonnes equivalent to US$ 250 in 2006.

Heavy commercialization of fish resources has taken over the primary economic and nutritional resource of fish originally controlled by small-scale fishers who processed the fish for local consumption. In addition, due to higher prices in the international markets for fish, local fishermen sell almost all their fish catch for exports; consequently the high demand and heavy exploitation have resulted in gradual decline of fisheries in Lake Victoria. At the same time, cases of malnutrition such as kwashiorkor are often evident in lake communities (UNEP, 2004). Further, communities and households have lost their livelihoods which were heavily dependent on fisheries and little options were remaining for them to survive.

In a study that was conducted in Western Kenya by Geheb and Binns (1997) indicate that an example of diversification and its drivers has occurred on the shores of Lake Victoria, in which livelihoods have traditionally combined, farming, livestock herding and fishing. Declining land availability and removal of subsidies on agricultural inputs under Structural Adjustment Programmes (SAPs) together with new opportunities in fishing industry have all combined to increase pressure on Lake Victoria fishery resources. High population growth rate around the lakeshore has exacerbated the problem of competition for limited fisheries resources. For example in 1979 there were only 16,000 fishermen on the lake while in 1993 the number increased to 82,300 (GoK, 1994). This has resulted in declining profit margins as fishing activities are under heavy exploitation.

According to Ellis (2000) diversification occurring for distress reasons is "a bad thing", it results in household members undertaking casual or low productivity activities with poor prospects. In other words it is a last resort rather than an attractive alternative livelihood. Davies and Hossain (1997) add that it may also lead to a household adopting a more vulnerable livelihood system than it possessed previously. Along the lakeshores, further diversification in the form of migration to either urban areas or fish abundant areas has been a common phenomenon. Sometimes movement to non-natural resource based activities implies circular migration can be dictated by cyclical needs for labor in other sectors. People, therefore, migrate to adjust for job search probabilities in towns for need of higher wages thereby abandoning their traditional livelihoods in the rural areas (Freeman et al, 2004).

In Mfangano Island where the majority of households depend on fishing, population growth has been cited as one of the threats to livelihoods. According to KNBS, (2009), in 1999 the population of Mfangano Island was estimated at 14,282, it increased to about 18,000 in 2008. Fish harvest also reduced in the same period. The decline was attributed to increased number of fishermen in the Island hunting for fish in their breeding places, which drove fish away into other regions. Competition was also prompted by high prices due to increased demands for fish exports in both local and international markets. Heavy commercialization therefore set in to enable exporters to meet the international demand.

Empirical evidence on geographical diversification models shows that geographic factors have a strong effect on household livelihoods. This is explained by the geographical formation of the Island which determines access to different assets. At the hilltop, survival is purely on subsistence agriculture meant for domestic consumption, while along the lakeshores availability of fish contributes to both domestic and income sources for the households. In the recent past, households living along the lakeshores have faced the challenge of fish depletion. In some situations, household livelihoods along the lake revolve around incomes derived from fishing activities either directly or indirectly through exchange in the value chain.

Lake Victoria Fisheries Organization (2006) notes that the lake fisheries contribute about 5% to the Kenya's GDP with an average producer value of Kshs 8 billion, out of this, 4 billion is generated from export of fish products. The industry also provides a livelihood for almost 2 million people as well as serving as an essential source of protein for 22 million persons in the region. Lake Victoria therefore is the main source of livelihood for most households living along the lakeshores.

2.3.3 Remittances and Rural Livelihood Diversification

Sometimes when people lose their main source of livelihoods, they may opt to move out of their homesteads to look for other means of survival. Fishermen too migrate when they experience fish decline in the area. They engage in livelihood activities that help them to secure a living. At the same time they send back money or other resources that help their family members back home. According to Ellis (2000) it is illustrated that diversification can be due to circumstances beyond individuals. They are therefore forced into taking activities that may be of low quality. For example he argues that when people retreat into subsistence rather than in diversification of income sources, their living standards become disrupted and their household livelihoods collapse. Besides, he notes that when remittances from relatives in urban areas fall, rural households are forced to find new ways of constructing their livelihoods, subsequently subsistence agriculture becomes their fall-back opportunity to generate a livelihood. These are household mechanisms of livelihood diversification in a rural setting. Domestic consumption becomes the immediate concern for household members.

The remittances that members of fishing households receive from their relatives who stay away from home also help to construct new activities in rural areas where they reside. Bryceson and Jamal (1997) observe that rural income portfolios generally converge on the once startling figure that, on average, roughly 50% of rural households' income in developing countries are generated from engagement in non-farm activities and from transfers from urban areas or abroad. The study also confirms that diversity of income sources is prevalent across different income classes, but the nature of this diversification differs greatly between the better-off and poorer households. The better- off tend to diversify in the form of non-farm business activities while the poor tend to diversify in the form of casual wage work especially on other farms.

Livelihood diversification is also influenced by income levels or status of individual households. Households with more assets and high income are also likely to diversify into high status livelihood and activities compared to the poor. In a study conducted by UNEP (2004), it was found that in Kenya where rural areas are inhabited by the poor, approximately 39% live below the poverty line and people depend largely on primary resources for survival. Lake Victoria therefore is the main source of food, water and livelihoods for over 30 million people around its shores. In spite of abundance in terms of fish resources, the issue has been the dwindling stocks which cause the fishing communities a lot of instability both in terms of consumption and income flows.

2.3.4 Decision Making, Gender and Household Livelihoods

Studies on livelihood diversification have often treated the household as a single decision-making unit with a joint welfare function. They have placed men as the sole decision-makers, locators of resources and also assign roles to different members in the family (Francis, 1998). This view has been challenged particularly for being gender insensitive in the realm of gender studies. In an ideal situation, a household operates under different circumstances that exist. In whole it is treated as a consumption unit with every individual contributing to the overall welfare. However, in analyzing livelihood diversification strategies within a rural household, gender specificity is also important. This is due to the traditional set up of fishing communities and their households in which women are pushed to the periphery in performing certain activities that do not directly relate to fishing (Davies, 1996).

According to Madanda (2003) women in rural areas are more likely to undertake a wide range of diversification activities than men, but in many contexts, men are able to avail themselves to diversification opportunities that are not open to women due to socio- cultural constraints. For example, Abila and Jansen (1997) observe that in Lake Victoria, fishing is a highly male-dominated activity associated with taboos and myths. Women are not supposed to do the actual fishing but are expected to involve mostly in processing, vending and trading. Kabeer (2000) further notes that women strategies are limited by the practice of female seclusion which operates at a practical and ideological level in which key institutions act as sources of entitlement, therefore personal accumulation and consumption are sanctioned for men to fulfill their part of the patriarchal bargain: women try to negotiate this to protect themselves against the break-up of the household. In spite of the obstacles, among fishing communities where households are facing the challenge of fish depletion, women have been central actors in livelihood diversification due to their flexibility.

Labour market opportunities are also restricted by gender and class. Some existing institutions determine preferential access to resources to reproduce themselves as new opportunities emerge. In many organizations today, women are preferred to men due to the societal need for emancipation. More organizations are giving chance to females to ensure justice thereby empowering them. The casualisation of labour markets has further influenced livelihoods. Many jobs now are so temporary in the fishing industry that the cycle of work-search has become a permanent condition leading to a lifestyle of a daily scramble for day wage. This phenomenon has been observed to be common among men both in rural and urban areas. Diversification may therefore be related to the gender of household members in which the household head determines roles within the household (Bryceson, 2000).

According to Kinyanjui (2008), stereotypes assigned to women by the society make them work from a disadvantaged position; they are therefore confined to micro-level activities mostly located in the informal economy and which are largely considered reproductive activities. Women also benefit a lot from their informal networks. This enables them to diversify livelihoods much faster in times of hardships than men. The greatest barrier has been their

marginalization which can be attributed to many factors including: biased government policies, societal perception and inability to cultivate from the available opportunities.

Activities vary across gender. In Africa, cultural values and norms define most of the household activities. In rural areas, women engage in many activities some of which are considered reproductive ones. These activities play a vital role in supplementing the household budget. They are on the whole survival strategies. Women may also employ coping mechanisms that may not be easily available to men. For example, merry-go-rounds, tailoring, food processing and preparation have been seen as the preserve of women in many African societies (Kabeer, 2000). Likewise, women hold a major interest in many of the declining rural non-fishing occupations such as weaving, basket making and mat-making. Consequently, women are key actors in the process of livelihood diversification among fishing households.

While these are important income generating activities, it must be emphasized that the greater body of evidence suggests that diversification activities open to women are often less lucrative than those pursued by men, and that survival strategies of the household in times of stress differ across gender (Hussein and Nelson, 2008). Therefore, social proscriptions on permissible courses of action of women can make big differences in the livelihood options of women compared to men. The extent to which these assumptions hold true is yet to be exhaustively studied.

2.3.5 Summary of Theoretical and Empirical Literature

A review of the theoretical literature on livelihood diversification shows that fishing is the main source of livelihood for people who live around the shores of Lake Victoria. Fishing households therefore engage in activities that relate to fishing activity. Declining fish stocks influence and disorient the consumption and income flows of fishermen and eventually impacts on household livelihoods. Livelihood diversification has been the strategy to the lost livelihoods. Fishing households have adopted other activities that help in securing a living. Unstable market prices and demand of fish have caused diversification into other activities. However the nature of diversification also depends on household resources.

The empirical literature reveals that both declining fish stocks influence livelihood diversification. This is due to reliance on fishing activity as the main source of livelihood for communities living around Lake Victoria. Pressure on fish resources occasioned by increased demand and increasing population have resulted in exploitation of fish resources. Fishing methods have also become destructive as fishermen venture into new fishing technologies. Fishing households therefore diversify their livelihoods by moving to other areas while some adopt new activities. Moreover, the household head determines the type of activities that the rest of the family members may engage in.

This study attempts to create a better understanding of how fishing households are able to choose various activities that would help people to earn a living after the loss of their main source of livelihood. In examining different livelihood activities, it will be vital for policy formulation and implementation. In addition, analysis of declining fish stocks and livelihood diversification among fishing communities living around Lake Victoria implies that human activities have negative consequence hence need for sustainable use of resources. The study delves into these activities that households adapt to earning a living. The study looks at a broad framework within which fishing households operate for their livelihoods.

2.4 Conceptual Framework

The study adopts Sustainable Livelihood Framework (SLF) developed by Chambers and Conway in 1992 and whose definition was modified by DFID in 1999. This framework takes a more holistic view which unites concepts of economic development, reduced vulnerability and environmental sustainability while building on the strengths of the rural people.

Practitioners have developed different definitions of livelihoods. Chambers and Conway (1992) defined a livelihood as comprising of *"the capabilities, assets (stores, resources, claims and access) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from shocks and stresses and maintain and enhance its capabilities and assets both now and in the future, whilst not undermining the natural resource base."* Scoones (1998) sees assets as being transformed by institutions into outcome through access to opportunity to gain a livelihood. This view is in consonance with that of Moser (1998) who categorizes

livelihood coping activities around asset types. DFID's 1999 modified definition tries to make people more central by highlighting issues of ownership, access and decision making. Precisely, it defines a livelihood as "*people's capacity to generate and maintain their means of living, enhance their well-being and that of future generations.*" Thus, people are the means and ends to livelihood studies. Regardless of emphasis by different practitioners, the sustainable livelihood framework helps to identify what people are already doing to cope with risks and uncertainties that face them. On the other hand it tries to make connections between determinants that constrain or enhance people's livelihood, policies and institutions in the wider environment (Satge et al., 2002). The study looks at the three concepts: livelihood activities, determinants and policies.

The framework attempts to conceptualize how people operate within a vulnerability context that is shaped by different factors and hence draws on different types of livelihood assets or capital to develop a range of livelihood strategies to achieve desired livelihood outcomes. People look for ways in form of livelihood diversification to strengthen their asset base and find points of leverage to ensure maximum impact from targeted interventions. The essence of any intervention is to create opportunities for people to diversify their livelihoods and broaden household well-being. Households therefore use their assets and capabilities to engage in many different strategies to try to secure their livelihoods the more diversification there is in the livelihood strategies of a household, the more secure it is likely to be. According to Ellis (2000), the livelihood patterns that people adopt are expected to improve livelihood of household members as a substitute of the lost livelihood. It should also lead to a new or improved living standard.

The basic premise of the livelihood framework in the study is that households have access to different assets and capabilities that enable them to diversify their livelihoods. However, they are determined by the prevailing circumstances both external (macro) and internal (micro) such as household characteristics, institutional arrangements and policy interventions. In this way, the study identifies key trends which show how households in different categories of well–being move towards greater resilience and livelihood sustainability or falling into increased vulnerability. The framework also enables an understanding and analysis of changes in natural resource base over time for example in terms of seasonality and their concomitant outcomes

(Scoones, 1998). It is an analytical way of studying livelihoods in relation to factors that can help households to engage in sustainable livelihood strategies by having an enabling influence.

This study reviews assets that fishing households have as alternatives that they can utilize to engage in different activities for a living. A household's ability to access the resources required to meet both domestic and economic needs are mediated by factors such as household characteristics, social institutions, rules and policies that exist in a given society. Declining fish stocks is seen as the main cause of livelihood diversification of fishing households around Lake Victoria even though there can be other explanations. Livelihoods are the various activities that fishing households engage in for a living. Fishing households therefore involve in activities which help them to secure their livelihoods even after the loss of their main activity which is fishing. Fishing households also supplement fishing with other activities, however the activities are guided by existing policies.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Study Site

The study was conducted in Mfangano Island located in Suba District, Homa-Bay County of Western Kenya. Mfangano Island was selected on several grounds. First, it has a population which shares a strong cultural orientation and kinship ties in which the inhabitants have been living together for several centuries with those near the lakeshores deriving their livelihoods from fishing. Secondly, its geographical positioning in Lake Victoria presents a unique and interesting area of research: the Island is physically isolated and lies at the border of Kenya and Uganda right in Lake Victoria making it a strategic area that has for a long time thrived as a result of cross-border trade with Uganda in fishing activities. Finally, in spite of being the highest revenue earner from fisheries in the district, compared to agriculture, Mfangano Island has suffered from research biases, resource accessibility and poor infrastructural development. These have affected the ability of fishing households to diversify into other activities (Johnson, 2009).

Most development initiatives within the district have concentrated on improving livelihoods of people engaged in farming and who live in the mainland of the district. Therefore, given the decline in fish stocks which had interrupted fishing households' livelihoods, several policy interventions had been undertaken by different stakeholders. Therefore, the site was suitable for this research to enable an understanding of livelihood diversification activities that fishing households were adopting in order to continue earning a living. In addition, livelihood diversification was being experienced in the area due to changes in the fish stock catches.

3.2 Research Design

The study employed both qualitative and quantitative research designs. This was informed by the nature of the issues that were to be addressed in the study. Data collection was conducted through different methods which included: key informant interviews, household interviews and focus group discussion. The methods were important in providing rich data that was important for the study objectives. Furthermore, the use of both methods helped in checking biases that were inherent in either of the methods (Creswell, 2009).

Qualitative approach involved gathering in-depth information from key informants who were selected on the basis of their expertise on issues the study sought to address. They included programme officers of the local NGOs, divisional fishery officer, beach leaders and chairperson of the existing organizations. They further helped the researcher to identify sub-locations and beaches with high concentration of fishing activities. In order to carry out focus group discussions, existing groups were identified with the help of some key informants.

One focus group discussion was held with the officials of fishing groups. It comprised of two women and five men. The use of focus group discussion enabled the researcher to obtain variety of information about a range of livelihood experiences and opinions that might have been difficult to obtain through individual key informant interviews. The qualitative data from the discussions were used to supplement data gathered from individual key informants. Quantitative approach included the use of a household survey through structured interviews. This helped to identify existing livelihood activities as well as patterns.

3.3. Population and Sampling Design

The study population for the research was fishing households of Mfangano Island while the unit of analysis was the individual household. Fishing communities along the lakeshores and rivers derive their livelihoods mostly from fishing and a bit of subsistence agriculture. Therefore, in order to get data that could answer the study questions, the study used different sampling techniques for data collection.

3.3.1 Sampling Procedure

The study used both probability and non probability sampling methods. This was accomplished in two stages as described in the study below.

Phase One: Sampling of Locations and Sub-locations

Mfangano Division is divided into four administrative locations. They include: Mfangano East, Mfangano North, Mfangano West and Mfangano South. In order to sample three locations, the researcher used purposive sampling method based on the key informants' knowledge. The researcher first obtained a list of all the four locations from the District Officer's office. Three

locations and their respective sub-locations were then purposively selected on the basis of their proximity to the lakeshore and dependence on fishing activity (*see table 1.0*). In total the researcher sampled four sub-locations (Wakinga, Waware, Soklo North and Wakula South). It is from these sub-locations that the researcher was able to generate a list of key informants and fishing households for interviews.

Table 1.0: Sampled Sub-locations

Location	Sub-location
Mfangano East	Wakinga
Mfangano North	Waware
	Soklo North
Mfangano South	Wakula South

Source: Field data, 2012

Phase Two: Selection of Key Informants

Seven key informants were purposively sampled on the basis of their expertise on the issues the study sought to address. A checklist was developed in order to come up with an interview schedule/guide that took into account in-depth data to capture events, experiences and perceptions of individuals in the study area.

The researcher and the area Assistant chief of Wakinga Sub-location developed a list of key informants from the four sub-locations. They included: three beach leaders, one fishery officer, one agricultural officer, one programme officer and one chairperson of fishing organization. The area administrator and the village-elder also helped in identifying beaches with high concentration of fishing activities. The first beach leader was identified and the researcher continued to interview the rest who were identified through snowball method.

Five beaches had been identified and were targeted as sources of informants. They were selected on the basis of the fish catch statistics. The beaches were; Yokia, Ramba, Wakinga, Kitenyi and Ugina. The researcher was however, able to interview only three beach leaders from the three beaches (Yokia, Wakinga and Ugina). The other two were not available at the time of the

research. Further, the beach officials helped to confirm the sub-locations, villages and individual fishing households in their respective areas.

The fishery officer provided vital information on fish stock statistics, behavior of fishermen in terms of response to declining fish stocks and use of fishing gears. He further provided information on government measures to control fishing activities in the lake which included restrictions on the type, period of fishing and size of fishing nets. Divisional agricultural officer provided data on interventions that had been taken to secure livelihoods in the area. One Chairperson of a fishing organization provided information on livelihood activities. One Program officer of a local NGO called '*Ekialo Kiona*' provided data on livelihood interventions in the area including activities that the NGO was offering.

Sampling of Fishing Households

Selection of fishing households involved simple random sampling method. This was executed by first generating a sample frame (household listings) based on the four purposively selected sub-locations. This was done with the help of the area assistant chiefs and village elders. The names were listed in separate sheets of paper for clarity. The researcher was able to list down a total of 320 fishing households from the four sampled sub-locations: Wakinga-104, Waware-66, Soklo North-24 and Wakula South-126 (*See table 2.0*). In order to draw a random sample from the list, the study used proportional sampling technique. According to Creswell (2009) proportional sampling is a method of sampling which ensures that variables in the selected sample represent the study population proportionately. The sample frame helped the researcher to draw a sample size of 80 respondents.

Table 2.0: Population of fishing households

Sub-location	No. of fishing households
Wakinga	104
Waware	66
Soklo North	24
Wakula South	126
Total	**320**

Source: Field data, 2012

Proportional sampling technique was used to determine a sample size of 80. The choice of the sample size was guided by the fact that the four sub-locations would be adequately represented in equal proportions. The researcher was also constrained by resources such as time and money for data collection. The sample selection was arrived at on the basis of the researcher's decision to analyze and present data within the stipulated period. The study arrived at the proportions as shown in the table 3.0.

Table 3.0: Proportional sampling of fishing households

Sub-location	Total fishing households in Sub-location	Proportional sample Per sub-location
Waware	66	17
Soklo North	24	6
Wakinga	104	26
Wakula south	126	32
Total	**320**	**80**

Source: Field data, 2012

The researcher employed simple random sampling technique to pick names of individual fishing households from the four separate lists. All the names of the households were written in small pieces of paper and folded then put in a container shuffled for each sub-location. The researcher

then picked the papers one at a time without replacement until the proportions were represented adequately to form a sample size of 80. The names of the picked households from each of the four sub-locations were recorded separately in a sheet of paper. This formed the sample of individual fishing households that the researcher interviewed.

3.4 Data Sources

The study used both primary and secondary data sources. Primary data on livelihood activities were gathered through qualitative and quantitative methods. Quantitative data were gathered through a survey of the fishing households. According to Silverman (2010) quantitative research enables tracking of changes over time at the same time, data collected tend to be accepted as they stand and as valid measures of the variables they purport to indicate. Qualitative data were generated from key informants and focus group discussions through in-depth interviews using a checklist and a discussion guide. Both methods were used in the study to gain in-depth information and bring out broad issues pertinent to declining fish stocks and livelihood diversification in the area. According to Punch (2005), qualitative methods enable the researcher to obtain detailed information about a phenomenon being studied. It also enables a study to establish patterns, trends and relationships from the information gathered. This offered a detailed understanding and interpretation of issues that the study sought to focus on.

Secondary data were obtained from written sources which included: beach management records, published and unpublished materials, fisheries records, Government records, journals and periodicals, internet, working papers and NGO project documents. Details were explored in reference to the subject area of study.

3.5 Methods of Data Collection

The study began the process of data collection on 25th to 28th May 2012. The procedure laid foundation for questionnaire construction. A sample of ten fishing households and three key informants were purposively selected for the pretest. According to Mugenda and Mugenda (1999) pre-testing the questionnaire is important because vague questions are revealed hence the researcher has an opportunity to rephrase the questions until they convey the same meaning to all subjects. It also helps to improve the questionnaire by noting the inconsistencies and errors in the

instrument in order to restructure the questions to address the study objective. The actual data collection involved use of both quantitative and qualitative methods. The study applied the following criteria to collect primary and secondary data.

Key Informant Interviews

Key informant interviews were held through direct interviews with the identified individuals who had expert knowledge and experience on the issues of declining fish stocks and livelihood diversification (household responses). The researcher keenly filled in the questions as the interviews progressed. The researcher also provided explanations on the questions which did not seem clear to the informants. This enabled the study to proceed as scheduled. The first key informant interview was conducted on 14th June, 2012 with the Divisional fishery officer. All the subsequent key informant interviews followed up to 16th June 2012.

Household Survey

Primary data were gathered by use of structured survey questionnaires. The researcher obtained data from fishing households through face-to-face interviews. The questionnaire contained both open and closed-ended questions. Face-to- face interview was preferred to other methods because it reduced cases of non-response. According to Denscombe (2009), non-response is defined as when there appear to be no attempt to provide any information at all in relation to a question.

During data collection, the researcher was accompanied by village elders who introduced him to the respondents. Interviews evolved progressively one on one with the respondents until the sample size was complete. The interviews were held with the household head or spouse and where either was not present the eldest member of the family was interviewed. Observations that could not be captured by the questionnaire were also noted.

Focus Group Discussion (FGD)

The process of data collection through focus group discussion was done after the researcher had conducted key informant interviews and household surveys. The researcher got the names of the active fishing organizations from the social services officer in the Division. There were five

registered fishing groups but only three were active at the time of the study. The three were from Wakinga, Ugina and Yokia villages. The researcher ensured that all the sampled sub-locations were to be represented in the discussion. Contacts of the participants were obtained and arrangements were made for the session.

The researcher was able to conduct one focus group discussion with members of fishing association/group. There were seven participants in total although the researcher had expected to have a total of twelve participants from the four sub-locations. The group comprised of two women from Wakinga and five men (three from Ugina, two from Yokia and Wakinga beach).
The discussion was guided by a checklist which contained questions on livelihood activities, status of fish stocks and household responses. The researcher listened keenly and took notes of the sessions. He also guided the discussions where there were digressions. The session was moderated by a community mobilizer employed in a local NGO. There was a second person who helped in taking notes of the issues that were being discussed.

3.6 Data Analysis

Given the diversity of data that were gathered, both qualitative and simple descriptive data analyses techniques were employed in the study. Quantitative data that were gathered through structured interviews were first cross-checked and cleaned to iron out inconsistencies in recording and coding before being analyzed. Quantitative and qualitative data from the structured questionnaires were also edited before they were keyed in the computer using the Statistical Package for Social Science (SPSS). The SPSS was used to analyze data using simple descriptive statistics which have been presented in form of frequency tables, and cross-tabulation to show relationships.

Qualitative data that were gathered mainly through key informants and focus group discussion were first organized into sub-themes, put in their categories and then finally arranged according to their patterns and trends. They were then summarized and expressed in form of narratives and statements. The data were corroborated to inform the study findings.

3.7 Challenges Faced During Data Collection

Respondent Expectations

Most of the respondents sought to know how they would directly benefit from the study. This was because most of the previous researches that had been conducted in the area had resulted into arrival of some NGOs in the area. The researcher had to explicitly explain that the study was purely for academic requirements and that it could as well bring long time benefits in the area since it was focusing on a contemporary issue in the community.

Geographical Configuration

Mfangano Island is surrounded by water, transport system is therefore mostly through motorized boats even though there is also a rough road that was recently done. The mode of transport on land is through bicycles and motorcycles (boda boda) which operate on limited routes depending on accessibility market centers and availability of passengers. In some instances, the researcher was forced to trek for long distances in order to reach the respondents. At worst was when the researcher had to pay expensively for the boda boda when the interviews ended late in the evening and also when it rained.

Respondent Emotions

As the researcher was conducting the interviews, some respondents felt moved and almost broke down into tears especially those whose nets were stolen and fishing gears confiscated and had turned to abject poverty. At some points, the respondents did not want to imagine what had befallen their households, some even recounted how they had moved out of poverty and were enjoying a middle class status when fishing was at its peak. This rekindling of bitter memories almost plunged the researcher into empathy as the respondents paused in the middle of the interview sessions. The researcher was therefore forced counsel the respondents.

NOTE: *Boda boda is a local term used to describe a mode of passenger transport using a bicycles or motorcycle and is common in rural areas of Western Kenya.*

CHAPTER FOUR

HOUSEHOLD CHARACTERISTICS

4.1 Introduction

Social household characteristics are the basic components or features that define and identify one household from the other. They are individual attributes that make up a family unit in terms of behavior and role performance (Hart 1994). Household characteristics determine the type of livelihood activities that individuals within a household pursue to earn a living. This chapter describes the characteristics of fishing households with reference to household profile in terms of age, gender, marital status, education level, household size and social capital. Further, the study discusses household assets in terms of their total value per year.

4.1.1 Age

A household comprises of individuals whose age distribution varies within the family set-up. In terms of participation in various roles, their engagements also differ. Elderly people may engage in activities that do not take them far from their homes or villages. This is because they seem to be tied in terms of movement in search of a livelihood. They are closely tied to their families, and also consider the risks involved in undertaking particular activities that may detach them from their families. Young people enjoy the freedom of choice given their age and probably small family sizes (Craig and Johnson, 1997). They are at a better position to undertake many activities. Livelihood diversification would therefore be seen to differ across different ages of households. This depends on preferences of household members and the opportunities available to them. Table 4.0 summarizes the age distribution of household heads of fishing households in the sample.

Table 4.0: Age distribution of household heads

Age (in years) distribution of household heads		
Age	**Frequency**	**Percent**
21-30 yrs.	1	1.3
31-40 yrs.	32	40
41-50 yrs.	24	30
50 yrs and above	23	28.8
Total	**80**	**100**

Source, Field data, 2012

Findings from table 4.0, show that 40 per cent of fishing household heads in the sample fell within the age bracket of 31 – 40 years, while the respondents who were above 50 years made up for 28.8 per cent, the study further established that 30 per cent represented those who were between 41 and 50 years. There were few household heads (1.3 per cent) that fell between age 21 and 30. The results are consistent with the general age of household members in which 54.2 per cent were those aged below eighteen years, 37.3 per cent comprised of the household members between 18-45 years while those who were above 46 years made up for only 8.5 per cent. The study therefore dealt with a comparatively youthful population. The study findings revealed that household members who were young were the majority therefore putting much burden on the household heads to fend for food.

4.1.2 Gender

Gender refers to socially constructed roles assigned to males and females (Francis, 1998). These roles change over time thus they vary between and among cultures or societies. In the African context, gender roles were important in defining the nature of activities that family members engaged in. For example, females within the household were expected to perform domestic duties like water and firewood fetching while males were expected to involve in activities such as herding, hunting and gathering. However, with modernity and changes in lifestyles, roles within the family institution are gradually becoming universal. Individuals within the family are getting involved in almost the same livelihood activities thus defying the cultural boundaries (Francis, 1998). Informal institutions shape people's livelihoods in terms of access and utilization of resources.

However, households can suffer from institutional barriers and physical access to some facilities. Table 5.0 summarizes the study findings.

Table 5.0: Gender of household heads

	Frequency	Percent
Male	74	92.5
Females	6	7.5
Total	**80**	**100**

Source: Field data, 2012

From the study findings in table 5.0, the sampled population (fishing households) had more male heads than female heads. The males comprised of 92.5 percent while there were 7.5 percent female headed households. The findings coincided with gender distribution of household members within the household. The findings are also consistent with the results of a study conducted by Abila and Jansen (1997) which found out that more males were involved in fish-related activities than females.

4.1.3 Marital Status

Individuals within households occupy different statuses. Findings from table 6.0, 93.8 per cent of the sampled household heads were married, while 6.3 percent were widowed. Out of the 80 fishing households, the majority within the sample were those who were either single or never married (67.3%), it was reported as being due to the fact that most of the household members were school going. Findings revealed that within the sampled population, there were no cases of separation or divorce. The trend might have been attributed to the cultural setting within the area which holds strongly societal values. Table 6.0 summarizes the findings of the study.

Table 6.0 Marital Status of Household Heads

	Frequency	Percent
Married	75	93.8
Widowed	5	6.3
Total	**80**	**100**

Source: Field data, 2012

From the study findings in table 6.0, it was established from key informant interviews that widowed households got assistance from various organizations that were operating in the area. However focus group discussions revealed that some of the widowed household heads had been left with wealth which they utilized in gaining their livelihoods.

4.1.4 Educational Level

Skills acquired through education are important in choosing the nature of livelihood activity of an individual. People without education are most likely to involve in rudimentary or manual livelihood activities. This is because such jobs require low level of skills and professionalism. Fishing as an activity is becoming dynamic in terms of technology. This implies that upgrading of skills is vital. The earnings are also becoming unstable, unpredictable and sometimes low compared to the previous catches. Fishing is gradually turning to be an activity dominated by the highly skilled. Most of the local fishermen are being cut out due to limited skills (Abila and Jansen, 1997).

According to Bene (2003), many fishermen are people with low education; they are therefore not likely to get jobs that require high skills, many of them engage in wage employment. The ability to diversify into other livelihood sources depends on the individual's ability to weave skills to be able to tap the resources that can enable him or her to earn a living. Table 7.0 summarizes the study findings.

Table 7.0: Level of education of household heads

	Frequency	Percent
No formal education	5	6.3
Primary incomplete	14	17.5
Primary complete	20	25
Secondary incomplete	16	20
Secondary complete	24	30
College	1	1.3
Total	**80**	**100**

Source: Field data, 2012

From table 7.0, 17.5 per cent of the respondents did not complete primary education, 25 percent completed primary school, 20 percent did not complete secondary school, 30 per cent completed secondary education while, 1.3 per cent had acquired college education. There was no household head in the sample with university education. From the study sample, 6.3 per cent of the household heads did not have formal education. The observations are in line with the responses that most of fishing households comprised of semi illiterate individuals who did not go beyond the primary school. The 30 per cent of the household heads who had completed secondary education did not bother to join institutions of higher learning thereby accounting for the observed 1.3 per cent.

4.1.5 Household size

The number of people within a household varies from one fishing household to the other. Aspects such as the number of children and relatives determine the type of activities that the household involves in. Consumption patterns therefore are influenced by the size of the household. A household with more members needs more assets to meet the basic necessities for its members. Therefore, in ordinary circumstances, larger households are likely to engage in more activities because every member of the household struggles to get a means of earning a living. The behavior of households in terms of livelihood would imply extensive search for more activities to secure a living (Francis, 1998). Table 8.0 summarizes the household sizes.

Table 8.0: Fishing household size

Household size	Frequency	Percent
0-4	2	2.5
5-9	68	85
10 and above	10	12.5
Total	**80**	**100**

Source: Field data, 2012

Findings of the study in table 8.0 reveal that fishing household with less than four members were two. This meant also that the smallest household comprised of two members while the largest household had fifteen members. Overall, it was discovered that 85 per cent of the households had five to nine members, 12.5 per cent of the households interviewed composed of more than ten members. There were only 2.5 per cent of the households who had less than four family members. The sample had relatively few members thereby confirming that the fishing households were not very large. There were few members per household probably due to geographical setting of the area. Members were therefore found to engage in activities that did not go beyond their immediate environments. It was also revealed that there were some fishing households living together after decline in the fish stocks. This helped them to consolidate their resources in terms of consumption. Their livelihoods were therefore so much enhanced given their range of livelihood diversification.

4.1.6 Social capital

Household social capital in this study refers to social networks that members of a household engage in to secure their livelihoods. These arrangements range from simple informal settings to more complex ones. It may also imply the nature of social protection available to households during hardships or shocks. Household members therefore involve in institutional arrangements that may help in earning a livelihood. This study treats informal relationships such as membership to social groups such as merry-go-rounds as important sources of securing livelihoods (North, 1990). Table 9.0 summarizes the fishing households' institutional arrangement.

Table 9.0: Household social capital

Response	Frequency	Percent
Yes	35	43.8
No	45	56.3
Total	**80**	**100**

Source: Field data, 2012

From table 9.0, the study established that 43.8 per cent of the respondents belonged to social groups while 56.3 per cent of the respondents did not belong to any association. Those who belonged to different organizations derived various benefits from the groups. The extent to which fishing households engaged in more activities depended on the level of awareness of the existence of the groups. The groups helped in enhancing livelihoods of the members.

4.1.7 Household Assets

Livelihood comprises of peoples' means of earning a living. It includes food, income and assets which they have. Assets may be physical, financial, social, natural or human. Access to these assets and the use to which they can be put are mediated by exogenous trends such as economic trends and shocks (severe fish decline, drought, disease or floods) which result in the adoption and adaptation over time of livelihood strategies. The strategies may be dynamic and tend to respond to changing pressures and opportunities. Households have unequal endowment of these assts therefore the extent to which they access and put them into use also differs from one household to another. One type of asset can be substituted for another or they can be needed in combination to pursue a particular strategy. In some circumstances, access to one type of asset confers access to others thus a combination or clustering of particular assets can be associated with particular livelihood strategies. Therefore assets comprise of the aspects of livelihood diversification around which households build social support capabilities for survival in order to improve their standards of living (Ellis, 2000).

Further, Ellis notes that household assets are the resources tangible and intangible stocks of capital that can be utilized directly or indirectly to generate the means of survival of the individual or household. Further, assets also include the skills that people use to earn a living.

The translation of assets into a livelihood is a survival strategy that entails diversification of sources of earning a living. Assets therefore enhance and determine access and utilization of resources and services. Survey of household assets is important in understanding livelihood diversification patterns among fishing households. The study considered various household assets which included fishing nets, motor engine, boats rental houses, cows, goats land, lime hooks, Seine nets (*'Rimba'*), motorcycle sofa sets / chairs, stools, tables, cupboard, television radio, beds mattresses and other items. The investigation sought to know how the number of assets within a household influences a household's livelihood diversification. The value of certain commodities increases with time while in some the value decreases. The table 10.0 summarizes combined current values of the household assets.

Table 10.0: Total current values of household assets per year

Assets	Total Values (current) in Kenya shillings
Fishing gears (Nets, hooks and seine/*rimba*)	3,330,000.00
Motor engine	660,000.00
Boats	1,045,000.00
Land	15830,000.00
Rental houses	594,100.00
Livestock (Cows and Goats)	2,979,000.00
Motorcycle (boda boda)	150,000.00
Furniture (sofa set, chairs and stools)	939,650.00
Electronics (Radio and Television)	133,850.00
Beddings (Mattresses and beds)	349,300.00
Other assets (Solar panel/battery and inverter)	9,000.00

Source: Field data, 2012

From table 10.0, it was revealed that, fishing gears (nets, hooks and *rimba*) although had reduced in number compared to 2008, their value had gone up. The reduction in number might have been as a result of either loss, grown old, disappeared or stolen. The respondents said that the value of obtaining new fishing gears had increased due to high prices of nets. The implication was that

only few households could afford to buy nets. Fishermen who were interested in fishing therefore resorted to buying second-hand nets from their neighbors in Uganda. While some decided to sell their nets to venture into other activities for a living. The value of livestock had gone up. There was high demand for livestock in the local market. Many fishing households who had animals would sell them to get school fees for their children. The value of furniture had gone down compared to their values in the year 2008. The furniture had grown old hence nobody was willing to buy them. Some fishing households reported that they had sold some at a throw- away price. Households had also bought various electronics when there was plenty of fish in the previous years. The gadgets had depreciated in value even though they could be sold out for a living.

Fishermen had sold off their motor engines; they were using sail boats instead to fish because of the high operating expenses occasioned by high fuel prices. The value had also gone down due to mechanical problems. The number of boats had reduced but the timber prices had pushed up the value of obtaining a new boat. The findings indicate that not many people could afford to buy timber to build boats.

Other productive assets were also examined in terms of their value in the market. For example, land and rental houses, had acquired value due to escalating market rates. Therefore, those households with such assets could easily dispose some of them to earn a living or diversify into other activities. It was reported that those who had land were seen as wealthy because they could sell part of it to earn income.

CHAPTER FIVE

EXISTING PATTERNS OF LIVELIHOOD DIVERSIFICATION OF FISHING HOUSEHOLDS

5.1 Introduction

This section presents the findings of the first research question which sought to explore the existing patterns of livelihood diversification of fishing households. Further, it discusses the study findings on activities that members of fishing households were engaged in for their survival. The findings are also corroborated with qualitative data that were obtained from key informants and focus group discussions.

5.1.1 Main Activities

Main activity within the household are defined as the major sources of earning a living for members of a household. The entire household therefore relies wholly on such activities to meet both subsistence and economic needs of its members (Scoones, 1998).

In order to establish the type of main occupations of fishing household members, a household survey was conducted in which respondents were interviewed to identify livelihood activities of fishing households of Mfangano Island. The study therefore looked into existing activities in form of two categories: main activity and secondary activities. Main occupations were considered as the core livelihood activities that the household depended on for a living. The study therefore sought to find out which households members were still dependent on fishing and also to find out which households were involved in other activities. The study presumed that the more occupations a household was involved in, the more likely it could access diverse sources of livelihoods hence it stability in terms of livelihood security. The findings have been summarized in table 11.0.

Table 11.0: Main occupations of household members

Occupation	Frequency	Percent
Fishing	67	17.4
Selling dried/smoked fish	33	8.5
Working in food kiosk/hotel	29	7.5
Pupil/student	231	59.8
Employed (NGOs and Government)	26	6.7
Total	**386**	**100**

Source: Field data, 2012

From table 11.0, 59.8 per cent were either pupils or students. This shows that the majority of young people were not engaged in meaningful livelihood activities. They were consumers rather than producers within the household. However, there were cases of school drop-outs especially young boys getting involved in fishing while young girls were getting married at early ages. The results further show that, 17.4 per cent of the household members did fishing as their main activity; the majority had abandoned fishing for other activities. 8.5 per cent of the respondents within the household were engaged in fish related activities such as selling dried / smoked fish. It was reported that the majority who were selling dried / smoked fish were spouses. They traded both at local level and also traveled with their fish to markets as far as Mumias, Kericho and Kisumu, this group of fish traders were considered wealthy enough because they had dominated the trade. It was noted that majority of men who were boat owners and fish dealers had moved out of the fishing business and were undertaking other activities, 7.5 per cent of the sampled households especially spouses were operating food kiosks / hotel either at the beaches or market centers. They indicated that some people were still doing fishing and therefore offered market for their businesses, while, 6.7 per cent of the respondents were employed either by government or other organizations.

The findings indicated that people were increasingly realizing the importance of education and therefore sent their children to school instead of encouraging them to undertake fishing. The observations also support the data obtained from key informants that household members were diversifying into other activities due to decline in fish stocks. The small percentage of those

employed indicates that not so many people had gone to school to gain employment but were gradually seeking either formal or informal employment. It was reported that when fish was plenty, fishermen used to scorn at the employed individuals because they earned peanuts and could sometimes borrow from local fishermen.

5.1.2 Secondary Activities

Secondary activities are the livelihood choices that members of a household engage in to supplement their primary sources of earning a living. According to Ellis (2000) they are fall-back activities which households revert to (construct) when their main sources of livelihoods fail or fluctuate. They could also mean ways of expanding the means of a living within the household.

Fishing households also involve in more than one activity. The essence of that is to diversify and enhance livelihood chances within a household especially when fishing activity collapses. Other activities therefore serve to subsidize and also act as risk minimizing strategies in terms of household livelihoods. The study found out that household members were involved in different activities to earn a living. Interviews that were held with household heads showed that there were other activities that supplemented the main household activities. They were being done by the other members of the households. The study found out that the fishing households reverted to the secondary activities when the main sources failed to provide adequate living. They were therefore a kind of social protection within fishing households. Table 12.0 summarizes secondary activities of household members.

Table 12.0: **Secondary activities of household members**

Activity	Frequency	Percent
Maize/sorghum/ potato/cassava growing	76	62.3
Charcoal burning	15	12.3
Vegetable growing	12	9.8
Transport (boda boda)	4	3.3
Boat transport	3	2.5
Firewood selling	12	9.8
Total	**122**	**100**

Source: Field data, 2012

The findings from table 12.0 show that 62.3 percent of the household members were involved in maize/sorghum, potato and cassava growing, 12.3 percent were doing charcoal burning, 9.8 percent were growing vegetables (*Sukuma wiki* and local vegetable species), 3.3 per cent of the respondents were engaged in boda boda (motorcycle transport), 2.5 percent were engaged in boat transport while another 9.8 percent were selling firewood.

The observations indicate that farming (maize/ sorghum potato and cassava) were the most important activities that almost all households were diversifying into for a living. Most probably due to the fact that these activities offer diverse options of livelihoods in terms of economic and subsistence requirements. Households were also observed to have turned to environmental degradation (firewood selling and charcoal burning) as a source of earning a living. Transport sources (motorcycle) had also become attractive especially with the construction of the rough road and increased kiosk business between the market centers and beaches. However, the findings show that boat transport had reduced significantly due to few passengers who involved in fish and kiosk trade. Most of the customers for the sector were those individuals who got their products from the mainland for their businesses on the Island.

Findings from key informant interviews revealed that fishing was the main livelihood activity of many households in the area. Further, interviews showed that fishing households were gradually being relegated to low income activities such as charcoal burning, firewood selling and petty trading. The decline in fish stocks had impacted on household livelihoods. Family members were resorting to subsistence agriculture (growing vegetables) and a bit of poultry farming. It was also reported that it had become difficult to convince fishing households that they needed alternative sources of earning a living because fish catch had gone down. Use of illegal fishing gears, such as poisoning and small net-size, was mentioned as some of the main challenges that faced fishing industry.

5.2 Changes in Livelihood Activities

Livelihood diversification involves changes in activities that earn income or meet domestic requirements of a household (Ellis 2000). Livelihoods therefore change under different circumstances. In the study, interviews were conducted with various respondents in order to identify changes in the livelihood activities. The essence was to establish trends in the existing activities of the households. Fishing households also adopt other alternatives when fish resources become scarce. According to this argument, livelihood diversification among fishing households takes place as a matter of necessity. However, some households continue with fishing throughout their life (Geheb and Binns 1997).

Table 13.0 summarizes the study findings on changes in the nature and number of activities of fishing households.

Table 13.0: **Changes in livelihood activities within fishing households**

Activity	Previous Activity in 2008 (Number)	Current Activity (Number)
Bar operator	1	0
Beach recorder	3	1
Boat/Timber selling	2	0
Boat/boda boda transport	5	12
Carving paddles	1	0
Subsistence farming	34	61
Chang'aa brewing	2	3
Charcoal/Firewood selling	1	37
Employee (Gvt & NGO)	10	8
Fishing	73	33
Kiosk business	4	9
Petrol business	4	0
Tailoring	4	0
Selling cereals	8	3
Building and construction	0	5
Clothe hawker "mitumba"	0	1
M-pesa service provider	0	1
Pharmacist/cosmetics	0	2
Posho mill operator	0	2
Total	**152**	**179**

Source: Field data, 2012

From table 13.0, there were more new activities (179) being performed by people than previously (152). For example, 34 households were involved in subsistence farming in 2008 compared to 61 fishing households who undertook the same activity then. The findings show that there were changes in the number of livelihood activities which occurred in fishing. The study indicates that the number of fishing households was still high compared to those involved in other activities. However, the number had reduced to 33 in fishing. The indication might be the

decline in fish stocks which pushed some fishing households to look for other livelihood activities. Among other activities that respondents mentioned included: firewood selling, Sukuma wiki growing, selling cosmetics, pharmacy, M-pesa services, selling *mitumba* clothes cereal sales, collecting and selling fish mosh, building and construction. The changes in the nature and number of activities depicted a growing concern for other sources of livelihoods probably after the realization that fishing had become unreliable source of earning a living. There were also cases of illegal livelihood activities such as chang'aa brewing and charcoal burning; an indication of fishing households seeking any possible means of earning a living.

The study found out that fishing households had different reasons for diversifying into other activities. The main reasons for the observed changes were cited as loss of fishing gears either through theft or grew old while severe decline in fish catch was cited as the main cause of diversification. Advances in fishing technology required high capital and the locals could not afford, vegetable growing served both as subsistence and income sources, availability of ready market in the beaches and in urban centers drew fishing households into selling firewood and charcoal. In addition, the arrival of some NGOs in the area brought interventions in form of offering alternative sources of livelihoods such as employment to the locals. A majority of respondents also reported that they needed to expand their income sources as a strategy of spreading risks within the household.

Fishing households had a tendency of diversifying into other activities as a survival mechanism. However, the study established that the level of diversification varied from one household to another. It therefore implied that there were different reasons for change in activities. The study revealed that livelihood diversification did not only occur when resources were scarce but also happened as a matter of increasing income opportunities within the household. The findings revealed that there were various factors that explained the existence of the observed activities. Table 14.0 shows the various reasons given by the respondents for changes in activities.

Table 14.0: **Reasons for livelihoods diversification**

Reason	Frequency	Percent
Expanding income sources	8	10
Loss of fishing gears	18	22.5
Severe fish decline	25	31.3
Loss of employment	5	6.3
Ready market for vegetables and cereals	12	15
To meet subsistence needs	10	12.5
Emerging market demand for fish products (fish mosh)	2	2.5
Total	**80**	**100**

Source: Field data, 2012

Findings from table 14.0 indicate that 31.3 per cent of the households responded that severe decline in fish stocks was the main reason of adopting other activities to earn a living, 22.5 per cent represents households who indicated that loss of fishing gears which was experienced through theft, confiscation and other natural causes. Interviews with key informants further revealed that some fishing gears had grown old thereby forcing fishing households to abandon fishing for other activities. The study established that 12.5 per cent of the households reported that they engaged in other activities to meet their subsistence requirements. There were only 2.5 percent of those who diversified their livelihoods into selling fish products such as fish mosh. It was revealed that there was an emerging demand for such products even though the catch was relatively low. The findings show that 15 per cent of the households were growing vegetables such as *Sukuma wiki*, tomatoes and kales. The implication was that most of the fishing households were shifting from fishing activity to farming. The respondents indicated that the increasing number of day-secondary schools was offering a ready market for the vegetables. In addition it was revealed that 6.3 per cent of the fishing households had lost their employment hence had ventured into other livelihood activities in order to earn a living. The results confirm that fishing was the main source of livelihood in the area. It was indicated that disruptions in the fishing industry meant loss of livelihoods of many people in the Island.

5.2.1 Trends of Fish Stocks in Lake Victoria

Some natural resources are easily degradable when their use exceeds their level of replenishment. Fishing is one such activity that can easily cause certain marine resources to disappear. Competition for fresh water fish in Lake Victoria in both local and international markets was so high. This brought severe decline thereby forcing households to seek alternatives for survival. There are different interpretations which try to explain the causes of declining fish stocks in Lake Victoria. The study found out that the sampled households held different explanations on the causes of declining fish stocks. The study responses were noted and summarized in table 15.0.

Table 15.0: Causes of declining fish stocks

Response	Frequency	Percent
Advances in fishing methods	63	46.3
Increase in number of fishermen	50	36.8
Species extinction (predation)	21	15.4
Invasion of water hyacinth	2	1.5
Total	**136**	**100**

Source: Field data, 2012

From the findings of the study in table 15.0, 46.3 per cent of the fishing households reported that advances in fishing methods thus technological changes in fishing were responsible for the decline in fish catch, 36.8 per cent said the increase in the number of fishermen was responsible for the decline. This shows that indiscriminate fishing occasioned by high market demands both from the locals as well as from foreign countries resulted in fish resource exploitation. There was increased demand for fish therefore attracting high profits to those who were doing fishing. Further, 15.4 per cent of the respondents reported that with the introduction of Nile perch and other species in Lake Victoria, the small fish were being eaten by the big ones thereby resulting into extinction of some fish species. This observation coincides with the findings of a study conducted by UNDP in 2006 which holds that invasion of certain species like Nile perch brought competition in the lake biomass. Interference with the ecosystem (marine life) was also indicated as comprising of 1.5 per cent. This implies that a few areas/beaches had been invaded by the

water hyacinth weed. However, many of the respondents revealed that it did not take long before it was swept away by the strong waves. The findings preclude the fact that diversification into other activities was therefore necessary since fish had declined and households had lost their livelihoods.

The majority of the respondents indicated that they were forced to look for other activities in order to earn a living. Specifically, they were reporting that fishing had become unreliable source of household livelihood. They also reported that poor fishing methods were the major causes of fish decline. Therefore for the survival of their households, many of them had resorted to low income sources that could not sustain their large families. The respondents also indicated that some households were still stuck in fishing as their main source of earning a living. They had not opted for other activities in spite of the low catch.

5.2.2 Fish Catch Trends of Different Fish Species

Fishing households are likely to diversify into other activities that are either done alongside fishing or those which substitute fishing as a source of livelihood. The study sought to establish the decline in fish stocks, further by investigating and comparing the landings in kilograms per week against the previous landings in 2008. In order to arrive at a comprehensive conclusion, the study identified different species of fish that were commonly caught in the area. The results were used to account for the observed livelihood activities. The fish landings (in kilograms) per week were first assigned codes in order to analyze the findings of each fish species. The responses on observations were also noted and grouped into three categories.

From the study findings 6.3 per cent of Nile perch fish that were previously landed were below 200 kilograms, 87.5 per cent of the same species was being recorded per day implying the fish catch had significantly dropped. There was a significant catch of Nile perch fish landing comprising of 56.3 per cent being between 4001 to 600 kilograms per day. The figure dropped significantly to 8.8 per cent for the same number of kilograms of fish at the time the study was being conducted. However there was a recorded catch of above 1000 kilograms previously representing 11.3 per cent of the Nile perch catch compared to no catch beyond 600 kilograms then. The tilapia fish catch also did show the same trend of decline across time. For instance

from the study findings, fishing households did indicate that 88.6 per cent of the catch fell below 200 kilograms per week compared to 43.8 per cent of fish that were landing in 2008. This meant that sometimes the catch could go beyond 200 kilograms per week which could be explained by the abundance of fish that were caught per week. By the time of the study, it was noted that there was no tilapia catch that went beyond 400 kilograms per week. There was severe decline of tilapia then.

Omena (sardines) are highly nutritious fish species. Their biological nature enables them to reproduce in large numbers. At the same time they are commonly available hence affordable for domestic consumption. Further, their demand in the market is also high compared to other species. In Lake Victoria therefore, according to the study findings, respondents did mention that although the catch had reduced, it was still the most commonly caught species in the area. The households also did report that most households depended on *omena* for their daily meals since other types of fish had greatly reduced.

In terms of landings, *Omena* (sardines) fish showed a significant variation in that previously the catch recorded per week was spread across all categories of kilograms. From the findings, 22.7 per cent of *omena* were being caught in 2008 which was between 2001 and 400 per week this figure showed a slight drop at the time of the study comprising of 8.3 per cent. It was also indicated that the catch was comparatively different within the periods of the study in which 18.3 per cent of the catch was above 400 to 600 kilograms. The fish did not go beyond 800 kilograms by the time the study was being conducted.

From the results it was clear that there had been decline in fish stocks across the identified fish species. This could be an indicator to explain explicitly that fishing households would diversify their livelihoods to other activities. In addition, the study did find out that the respondents indicated that the government policy on regulating the fishing periods of omena was greatly affecting households in terms of meeting their subsistence requirements. However, some respondents did indicate that it was a good policy that ought to be extended to other fishing methods and species since it was a way of restocking fish in the lake after their decline due to human activities.

5.2.3 Effects of Declining Fish Stocks on Household Livelihoods

The question on decline in fish stocks was answered in consideration of the year 2008 that was taken as the benchmark. According to the findings of the study, 100 per cent of the respondents agreed that fish had declined. The findings supported the study objective which sought to establish the livelihood diversification as a result of declining fish stocks. Thus many respondents reported that the decline in fish stocks had caused them their lavish livelihood that they had become used to for many years. Many people had become displaced from their mainstream livelihoods sources which were predominantly related to fishing and related activities.

The study investigated the influence of declining fish stocks on livelihoods of fishing households in Mfangano Island. The responses varied across the sample. This was an indication that the effects had been felt almost in all fishing households. Table 16.0 shows the responses from sample.

Table 16.0: Effects of declining fish stocks on livelihoods of fishing households

	Response	Frequency	Percent
1	Income sources reduced and poverty set in	36	45
2	Consumption patterns changed	25	31.3
3	Lack of school fees	11	13.8
4	Poor clothing	3	3.8
5	Changed to other livelihood activities	5	6.3
	Total	**80**	**100**

Source: Field data, 2012

From table 16.0, the findings show that the decline in fish stocks had impacted differently on households. Most important was that a big number of respondents did indicate that household incomes had greatly reduced and poverty had set in. This was represented by 45 per cent of the respondents, 31.3 per cent of the households had changed consumption patterns in terms of dietary requirements due to inability to buy other food staffs given reduced income. Fishing

households also did indicate that the decline had prompted them to engage in other livelihood activities such as firewood selling, charcoal burning and vegetable growing. It was noted that even though most of the fishing households had decided to do other activities other than fishing, some people were still stuck in fishing earning meager income. According to some households, it was reported that those who had opted to engage into other activities were finding it easy to run their families. 13.8 per cent of the respondents indicated that their children lacked school fees due to decline in fish stocks. This implied that fishing was the main source of income for many households while 3.8 per cent said that clothing their families had become difficult due to reduced income.

The results show that declining fish stocks had different effects on livelihoods of fishing households; however responses differed from one household to another within the same sample population. The study found out that some households had turned to certain activities that had serious environmental implications and consequences. The study findings indicate that besides severe declining fish stocks, fishing households involved in other activities due to loss of their fishing gears and probably they could not get money to buy the nets and other fishing equipment. It was also revealed that fishing households diversified their livelihoods into vegetable growing perhaps due to ready market in the beaches and market centers. Scarce fish implied that consumption patterns had also changed to vegetable intake as part of the household diet.

Further, the study results show that fishing households also engaged in other livelihood activities to meet their domestic requirements. These activities might have been used to supplement fishing activity because fishing alone could not provide enough for the households. The extra income from such activities could be used to expand income sources of the fishing households. In the context of livelihood diversification, the study findings indicate that the desire to engage in other activities entails more than just declining fish stocks. Fishing households also involve in other livelihood activities to have secure and enhanced income sources that they can utilize. New market demands were also found to be reasons for livelihood diversification among fishing households in Mfangano Island.

CHAPTER SIX

DETERMINANTS OF LIVELIHOOD DIVERSIFICATION PATTERNS OF FISHING HOUSEHOLDS

6.1 Introduction

Livelihood diversification involves enlarging means of survival or ways of earning a living. However, the extent of diversification within households depends on the existing circumstances which present opportunities, for instance, household assets. The study investigated different aspects which determine the type of livelihood an individual or household can adopt. This section presents a comprehensive analysis of social and economic issues that influenced livelihood diversification of fishing households. In looking into these, the researcher first focused briefly on two variables: level of education and age. These were found to be closely linked to livelihood diversification of fishing households. The researcher then cross tabulated the two variables with main occupations of all household members to establish relationship. The two characteristics were chosen due to their impact on the type of activities that members of fishing households are likely to engage in.

6.1.1 Relationship Between Level of Education and Type of Occupation

There is a link between level of education and the type of occupation an individual is likely to undertake. The more educated individuals prefer high income or salaried employments which look stable. The uneducated or those with low levels of education are usually absorbed in wage labor which involves manual work or physical energy (Kabeer, 2000). The study set out to find the relationship between level of education of fishing households and the types of main occupation they were engaged in for a living.

The relationship between the occupations of household members and their level of education show that there were differences. From the study findings, 15.2 per cent of those respondents who had no formal education were selling dried/ smoked fish, none of the respondents with no formal education was employed, 23.9 per cent of the respondents who did not complete primary education were involved in fishing and only 11.5 per cent of them were employed. A big number of respondents who completed primary school were doing fishing while 69.0 per cent of those who completed primary school were working in food kiosk/hotels. The study further found

out that 30.8 per cent of the fishing households were employed in the local NGOs and educational institutions either as support staff or manual laborers. Fishing was also being done by those who had completed secondary education which comprised of 25.4 per cent. Most of the respondents indicated that they took up fishing for lack of money to further their education. The 3.4 per cent of those who completed secondary education engaged in hotel/food kiosk business. 19.2 per cent of the respondents who completed secondary education were employed while 15.4 per cent of those who completed college and university worked as employees of either NGOs or Government. The study findings show that none of those who had finished either college or university was doing fishing this confirms the earlier assertion that fishing was an activity of those who did not acquire higher education.

The study therefore deduced that fishing households who had high education level involved less in fishing as a means of livelihood. However, it was evidenced that prospects of getting employment increased with the level of education of individuals. From the findings, those activities which did not attract high skills were undertaken by those who did not go beyond primary school. Diversification involved getting into doing other activities beyond fishing regardless of level of education.

6.1.2 Age of Household Members and Main Occupations

Activities of household members may also be influenced by the age of individuals. Young people below the age of 18 years are usually in school however they sometimes attend to household activities during holidays. Along the lakeshores, they involve in fishing as a means of assisting their parents to get them school fees. The parents remain doing major activities that are beneficial to the livelihood of the entire family. The study investigated how the age of household members was related with their main occupations. The findings were summarized in table 17.0.

Table 17.0: Relationship between Age of household members and main occupations

Age (Years)	Main occupations (%)					
	Fishing	Selling dried/smoked fish	Working in food kiosk/hotel	Pupil/student	Employed	**Total**
Less than 18	2.2	.0	3.2	94.6	.0	**100**
18-45	26.5	25.8	14.8	25.8	14.2	**100**
46 and above	64.7	11.8	.0	11.8	11.8	**100**

Source: Field data, 2012

The findings in table 17.0, show that 94.6 per cent of household members were below the age 18, 26.5 per cent of those who did fishing fell in the age bracket of 18-45, 18.7 were selling dried/smoked fish, 14.2 per cent were employed. Household members who were above 46 years comprised of 64.7 per cent of those involved in fishing while 11.8 per cent of this category were employed, none of them worked in food kiosk/hotel.

It was established that the household members of age 18-45 participated in all the main activities. This justifies the fact that they were the most active members who could be engaged in meaningful livelihoods since the onus of family needs lie with them. They were also the greatest number that was employed in the area. The age category of household members who were above 46 years was found to have been still actively stuck in fishing (64.7%), despite fish decline. The indication was that their livelihoods had been closely embedded in their traditional way of earning a living which was mainly fishing. They therefore faced many challenges as a result of fish decline but had little options for alternative livelihoods. It was also noted that none of them worked in food kiosk/hotel, probably due to their age which did not suit the activity.

6.1.3 Time in Activity

Households have different spans in terms of the years they take in performing one particular activity. These activities are considered main occupations because they constitute the main source of livelihood. Among fishing households, livelihoods have depended on fishing thereby making diversification complex due to inability to adjust easily. The cultural orientations on fish dominated livelihoods may impede change into other activities. The study investigated the number of years the respondents had taken in particular activities. This was to enable understanding of how fast the households were able to adopt other activities after the decline in fish stocks the results were tabulated as shown in table 18.0.

Table 18.0 Relationship between percent in activities and time spent in years

Activity	Time in activity (years)				
	1	2	3	4>	Total
Fishing	.0	25.0	22.7	52.3	100
Selling dried/ smoked fish	68.4	31.6	.0	.0	100
Vegetable growing (Sukuma wiki)	44.1	55.9	.0	.0	100
Cassava/potatoes growing	25.8	48.4	.0	25.8	100
Boda boda (motorcycle)		.0	.0	.0	100
Boat passenger transport	100	.0	.0	.0	100
Firewood selling	82.4	5.9	11.8	.0	100
Charcoal burning	94.4	.0	5.6	.0	100
Hotel/kiosk business	100	.0	.0	.0	100
NGO employee	100	.0	.0	.0	100
Government employee	50	.0	.0	50	100
Other activities (Changaa brewing, fish mosh selling and cereal sale)	71.4	28.6	.0	.0	100

Source: Field data, 2012

From table 18.0, there are a number of activities that had not taken more than one year. Fishing households had engaged in them as a matter of earning a living after the loss of main stream fishing livelihood. The activities included: boda boda, boat passenger transport, hotel/kiosk business and NGO employment. The results show that the activities were recently adopted in the area thereby confirming the number of years fishing households had spent. Probably, the activities were prompted by decline in fish stocks. Fishing was the main activity in which many households had spent many years doing. From the study findings, 52.3 per cent of the respondents had taken more than four years, the results confirm that livelihoods had been

dependent on fishing for a long time than any other activity. Any sort of shocks implied the fishing livelihoods were adversely affected. Activities such as selling dried/ smoked fish (68.4 %), vegetable growing (44.1%), cassava growing (48.4%) and government employee (50%) comprised of activities in which fishing households had taken less than two years. The indication was that they were new activities which had been co-opted by household members after fish decline. Other observations that could be drawn from the study findings were that firewood selling (82.4%) and charcoal burning (94.4%); they were the second recent activities that fishing households had adopted. The majority of the respondents reported that individuals had resorted to the two activities because they were the most reliable sources of livelihoods for the fishing households. The results further indicated that other activities were also being undertaken by fishing households. They included: chang'aa brewing, fish mosh sale and selling of cereals (beans, peas and rice).

Interviews with key informants and focus group discussion revealed that the time individual households had taken doing one activity influenced how fast it could change to new activities. Many fishing households were not flexible in adopting new activities due to various factors such as lack of assets (land), low income levels and large family sizes. Fishing households lived in anticipation that the fish catch would get better. The rate of diversification therefore was dependent on the severity of fish decline experienced within the household.

6.1.4 Land Ownership

Land is an essential factor of production. Most livelihood activities take place on land. For example, households practice farming either for subsistence or for commercial purposes on land. Those who have access to land along the lakeshores, have advantage in that they are able to do vegetable growing mainly for both subsistence income and domestic consumption. Some individuals who have large parcels of land may opt to lease or sell part of it to get some money Ownership of land therefore determines a household's ability to diversify into other activities. The study sought to investigate the influence of land on fishing households' livelihood diversification patterns. The study identified the respondents who owned land as an asset and further sought to know how it was related to their main occupations and other activities the findings.

From the study findings, 78.2 per cent of the respondents owned land through inheritance, 12.8 per cent of the respondents had bought land while 5.1 per cent owned land as a communal property. The study findings indicate that the majority of the respondents who owned land chose to carry out vegetable growing for subsistence purposes. Data obtained from some key informants indicated that land had become an important asset for households. Many fishing households had resorted to horticultural farming for their survival. Some households sold part of their land to either individuals or the local NGOs for income as well. However, only few households had leased their land as a means of income. The 12.8 per cent of those who had bought land comprised of individuals who were initially doing well in fishing and had used part of their wealth to acquire land. Some individuals from large families had also bought land either for residence or for other household purposes. In some areas, the study found out that land was still communally owned due to various reasons including disputes on mode of division or that the department concerned had not reached the areas.

Land as an asset was important since it offered alternative means of survival. 2.5 per cent of the respondents did not own land probably they might have been immigrants or mobile fishermen in the area. It was further established that fishing households who owned land through inheritance and those who had bought land were increasingly involving in various livelihood activities. Land appreciates in value; therefore, it was reported that when fish declined, many households were going back to land to practice agriculture. As an asset, it offered better livelihood opportunities to the households. This was contrary to the earlier days when land was lying idle as everybody concentrated on fishing. Therefore the level of household livelihood diversification within the sampled population differed across the area. Cross tabulation of main occupations and land ownership showed features of livelihood diversification. Table 19.0 summarizes the findings.

Table 19.0: **Relationship between main occupation of household heads and land ownership**

Occupation	Land ownership (%)	
	Yes	No
Employed	6.3	1.3
Fishing	57.5	1.3
Boat Selling	6.3	0
Selling dried/smoked fish	12.5	0
Working in food kiosk / hotel	15	0
Total	**97.5**	**2.5**

Source: Field data, 2012

NB: The figures were rounded off to one decimal point

From table 19.0, 57.5 per cent of respondents who did fishing owned land, 15 per cent working in food kiosk/hotel, 12.5 per cent selling dried/smoked fish, 6.3 per cent employed while another 6.3 per cent were selling boats. The findings confirm further that ownership of land was vital to the livelihoods of fishing households; it supported fishing households' livelihoods particularly in carrying out agricultural activities such as growing maize/sorghum/potatoes or cassava. Households also grew vegetables such as (*Sukuma wiki*) and tomatoes. These were used in providing subsistence and economic needs of the households. Land was therefore an important asset besides getting involved in fishing and other activities it was a potential asset that offered alternative sources of livelihoods.

6.1.5 Household Expenditure

Households with low income levels are likely to spend less given their limited sources but can also spend more if they depend on debts. However, poor families tend to spend more on food than any other items. Households have basic things that they have to attend to for their members' survival. However, when income reduces, they are likely to spend little because it is not available. Other aspects such as economic depressions greatly interfered with household expenditure. Increases in food prices driven by inflation were also reported. Fishing households also were seen to spend more when the catch was plenty. The study investigated the respondents' expenditure in the last twelve months and noted the trends. It was established that households

had spent more due to inflation although their incomes had reduced. People were seen to engage in many activities to be able to meet their daily household expenditure

Table 20.0: Household Expenditure in 12 months

Item	Expenditure in the last 12 months (Kshs)
School fees/Education	3,181,200.00
Food Items	2,172,500.00
Health care	304,500.00
Rent	20,300.00
Clothing	385,500.00
Repair of fishing gear	61,500.00
Fuel (Kerosene)	306,280.00

Source: Field data, 2012

From the study findings in table 20.0, expenditure in the last twelve months on education was higher compared to expenditure on food items. It was reported that many families were resorting to taking their children to private schools after realizing that quality in public schools had been comprised. Some fishing households also said that the majority of the households had become aware of the importance of education after the fishing as the main economic activity had become unreliable. Only those who had stable employment were able to withstand the shocks occasioned by fish decline. Many respondents had reported that expenditure on food items had increased in the last five years. Diseases had also set in given poverty levels and increased cases of HIV/AIDS along the fishing beaches. The implication was that many people fell ill hence the recorded figures. Repair of fishing gears had recorded less expenditure indicating that few people involved in fishing. Fuel prices had also pushed up households' expenditure due to unstable fuel prices. The study established that expenditure within the household varied with the number of family members within a household. For example, most households were large enough with more than five members in each family. The implication was that consumption had to shoot up to meet the domestic requirements.

Many households also reported that expenditure on school fees/education had gone up since most of their children had stepped into secondary schools. Parents had also realized the importance of education and were investing heavily in education. While the household expenditure in basic items had increased, many respondents did agree that it was inevitable for every household to seek alternative sources of livelihoods for extra income. Diversification within the household was therefore meant to expand income sources to meet the demands of the increased expenditure. Large families were likely to diversify more into other activities due to their family expenditure while smaller families diversified less given their limited expenditure needs. The study findings show that expenditure trends in the last 5 years had been reported in almost all households.

6.1.6 Shocks within Fishing Households

Shocks within households disrupt the livelihood of family members. Among fishing households, people's livelihoods revolve around fishing therefore most shocks occur within their common activity. The magnitude of the shock can influence the kind of activity a household can engage in. The event can serve as an experience to diversify into other activities or it can reorient the livelihood of a household. The study examined various shocks that befell the households. This was aimed at investigating the kind of mitigation strategy in form of livelihood diversification pattern that was adopted by various households.

The study ranked the responses into three categories to depending on the magnitude and effects that were felt within the family. The study further sought to understand how fishing households managed to adopt new strategies for survival.

From the study findings, 22.2 per cent of the household members reported that decline in fish had severely affected their households. Drastic fall in fish prices comprised of 19.5 per cent, 18.5 per cent reported that drought had affected their livelihoods, 15.8 per cent reported that illness had affected the household livelihood while 9.4 per cent responded that theft of fishing gears had affected their livelihoods. Death of working household members was also cited as one of the tragedies that had interfered with livelihoods flows.

The findings confirmed that fishing was the main activity of the households. It was also reported that fish decline was the most severe shock that happened to the households. Therefore, decline in fish stocks meant loss of livelihoods of many households. The results showed that fishing households were affected differently by shocks across time. The nature of shocks was seen as one of the determinants of livelihood diversification of fishing households. For example, the study findings showed that households responded differently to the shocks.

Households develop different responses when they are struck by calamities. Some of the responses are determined by many factors. The study investigated the mitigation strategies adopted by different households to secure livelihoods. It was also important in the study in order to identify the households' coping mechanisms.

From the study findings, 23.8 per cent of the respondents opted to seek employment either in government or in NGOs, 23.3 per cent of households abandoned fishing, 21.1 per cent of the households resorted to vegetable growing, 15.7 per cent of the households depended on remittances from friends and relatives. There were those who migrated to other fishing grounds for better catches making up for 15.2 per cent, while 0.9 per cent of households moved to towns in search of employment. The findings show that nobody opted to go back to school. The reason given by most respondents was that they had already established large families and many dependants who were demanding too much and hence could not allow them to concentrate with studies even if they went back to school.

The findings show that the majority of the household members had opted for employment. It was reported that the group comprised of young people who had acquired secondary education and were willing to take up any kind of job. It was also reported that fishing households who had lost family members through death were receiving assistance from relatives most of who lived in town. Households had resorted to vegetable growing after being displaced from fishing. The responses were that the majority of them were practicing subsistence farming both for domestic as well as for income within the household.

6.1.7 Migration and Remittances

Migration is a diversification strategy that is adopted by fishing households. It is a common occurrence along the lakeshores that most fishermen migrate to other fishing zones when there is scarcity of fish in certain fishing grounds. They therefore move from one beach to another in search of sufficient catch. Some of them move with their families while others leave their household members behind or choose to join them later. When they move they engage in other activities or may continue with fishing. In the study it was reported that those who migrated to other fishing zones soon came back home after a short period due to severe decline. However, some of those who migrated to towns secured employment in security firms, supermarkets such as Nakumatt and were able to send remittances to their family members back home.

The study found out that 53.8 per cent of the respondents revealed that no members of their households migrated to any other place, 23.8 per cent of the households responded that some of their households had moved out in search of other livelihoods. It was indicated that a total of 18 males had migrated while only 10 females had moved out in search of other activities. The figures support the view that in the fishing households studied, fishing was dominated by males while females were engaged in other livelihood activities near the homesteads.

The study found out that decline in fish stocks impacted on fishing households in different ways. It was established that members of fishing households who had migrated comprised of 59.3 per cent and had moved to other small fishing islands such as Remba, Ringiti and Migingo. The study found out that the emigrants were engaged in various activities which included; fishing, boat making and kiosk/hotel business. However, some people who had migrated to the islands were involved in illegal trade such as selling *chang'aa*. 40.7 per cent represented those who had migrated to towns to secure employment in various sectors. The study found out that those who had migrated to towns were either employed in Nakumatt supermarket or worked as security guards in firms.

These findings revealed that fish decline resulted in members of the fishing households adopting a range of survival strategies. It was further established that migration was important to the households given the remittances in form of money they sent back home to their family

members. The study found out that the majority of the household members who moved to towns sent less than two thousand shillings back home while those who had moved to other small Islands were sending five hundred shillings weekly. The diversity indicated that those who were in town were depending on their salaries while members who went to other fishing zones relied on wages / incomes related to fishing activities.

The study further found out that 11.3 per cent of the respondents whose household members had moved out were less dependent on remittances. This contradicts the findings of a study conducted by Kayizzi-Mugerwa (1995) in Uganda which held that most of the rural communities depend on their kinsmen in town for their livelihoods. The difference could be due to increasing individualism as a consequence of modernization and also that Kenya's societal set up has capitalist tendencies. 8.8 percent of the sampled fishing households were relying on remittances for their livelihood. From the findings, it can be deduced that not all forms of livelihood strategies yielded sustainable earnings for the families. Some might have been worse than the previous strategies.

6.1.8 Proximity to Facilities and Services

Infrastructure such as roads, electricity and market centers are important in determining a household's livelihood. These facilities offer livelihood opportunities in which individuals can draw their earnings for a living. For example, employment opportunities can be found in beaches and in NGOs while availability of a market can serve both as a source of customers to the goods produced and also a potential ground for other subsistence livelihood activities. Along the lakeshores most people involve in petty trade especially fish vending, however with the decline of fish, people have sought other alternatives in order to earn them a living. The study investigated livelihood activities in various facilities such as beaches, market and NGOs in the area.

The study found out that in the beaches, most activities were still concentrated in fishing. Most people were doing small-scale fishing, fish vending, net selling and mending, boat making and selling. These were indications that in spite of reduction in fish catch, fishing households' livelihoods were still trapped in fishing. The study further established that, beaches acted as

ready markets for firewood and charcoal selling. There were also entertainments such as video-showing and pool-table, all which were sources of earning a living to some individuals. They reported that the potential customers were the youth who had found themselves idle after fishing expedition. Craftsmen earned their livelihoods through boat making and carving paddles. Financial services such as M-Pesa and banking facilities (agents) were being offered both in beaches and market centers. There were tailoring services, mitumba selling, transport services (motorcycle), small-scale businesses such as cereal sales, kiosk/hotel owners and posho mills. The NGOs were important areas for employment. Most people were earning their living by doing manual jobs such as working in the farms, building and constructions as well as being employed as security guards. It was established that paralegal services were also offered thereby creating jobs to the locals. Training in computers, health emergency services as well as counseling and HIV/AIDS testing were offered by the NGOs.

The activities that were being undertaken in the facilities had acted as new ways of offering means of survival. However, it was reported that proximity to the facility was very important. For example, two respondents confirmed that NGOs offered employment to those who were living nearer while those were residing near the beaches also took advantage by engaging in hawking smoked or dried fish to those who lived far from the beaches. Nearness to the market center was also important to those who were doing kiosk/ hotel business, they extended up to late hours which gave them an advantage over others.

6.1.9 Membership of Fishing Households to Credit Institutions

Informal institutional arrangement is an important factor that influences a household livelihood. Resources are distributed through socially constructed institutions which may constrain or enable individuals to choose the type of activities that earn them a living. According to Watson (2003) institution are structures of power and therefore determine household's ability to generate a livelihood. These arrangements also define choices and decisions of individuals, community or society. Livelihood patterns are therefore guided by the institutional set up of households and those set by the society as a whole.

Households also adopt saving strategies either through informal or formal institutions. These institutions may offer credit facilities such as loans and dividends. The informal ones such as self-help groups may serve in uplifting livelihood status of individual members within a group through social arrangements in form of performing joint activities or *Chamaas*. The study sought to investigate the credit situation of the respondents through belonging to social groups/ associations as vehicles to access credit facilities as a strategy of livelihood diversification. The study first sought to establish the fishing households which belonged to the associations. The associations/groups may serve as sources of livelihoods through collective activities as well as sources of borrowing and saving. The study found out that household belonging to different groups was an important aspect in livelihood diversification.

The study findings show that 56.3 per cent did not belong to any credit or social group/association, 41.3 per cent belonged to the groups. It was reported that the majority who did not belong to any groups composed of those who were not aware of the groups' existence. Some households indicated that they were too poor to make contributions thereby locking themselves out. The responses also pointed to corruption as the main reason of not belonging to the groups. A few who did not belong to the groups said the groups were based on discrimination such as age, friendship and family ties. However, those who belonged to the groups said they had benefited a lot from the social groups. Local NGOs had used the groups as entry points to initiate community projects. Most of the community projects offered alternative sources of livelihoods. The groups also lessened the household burdens such as paying fees for the orphans in the area.

From the study findings, 64.7 per cent represented borrowing/lending, 17.6 per cent represented buying household items, 13.7 per cent comprised of fish trade while only 4.0 per cent were paying fees for orphans. The activities were driven from the social groups in the area. Therefore, those who were members of social groups were seen to involve in different activities beyond earning a living.

In so far as belonging to social groups was concerned, the study sought to investigate how group membership was important in terms of livelihood diversification. Focus was given to income

sources from the groups through membership contribution. This was a way of mobilizing the members' savings in order to enhance their living standards. It was reported that some of the groups were started long before experiencing fish decline although some died out. There were some organizations which had been formed after losing livelihoods that depended on fishing activities. They were therefore, new strategies within the households to help households cope with lost incomes and livelihoods.

From the study findings, 43.7 per cent got loans from the social groups, 22.5 per cent used groups to fundraise for their small businesses, 12.7 per cent comprised buying assets while 8.5 per cent derived their dividends from the social groups. The findings indicate that group membership determined household's livelihood. There were benefits that accrued from the social groups, such as loans, dividends and assets. The respondents indicated that the groups were very important especially after most households experienced decline in fish stocks. The savings in the social groups helped to boost the livelihood status of the households through loans. The results were confirmed by the respondents who had borrowed money from the groups for alternative investments.

Those who had borrowed money from the groups invested in different things. For example, some households reported that after fish decline, they used the money to start small businesses such as kiosk/ hotel; some bought motor cycle for transport while others bought Posho-mills. They used the proceeds from these sources to repay the loans. However, there were households who had outstanding loan balances which they had not repaid. The study further examined whether respondents had borrowed money from other sources other than the groups/associations, it was found out that 63.8 per cent had borrowed from other sources such as NGOs, Cooperatives, Banks, Microfinance institutions and neighbors/friends.

From the study findings, 69.6 per cent of the respondents borrowed from their neighbors/friends, 17.4 per cent borrowed from other microfinance institutions, Banks, Cooperatives and NGOs each had 4.3 per cent. The findings indicate that fishing households had credit liabilities from various sources or organizations. Most of the households had borrowed from neighbors and friends probably due to the informality that was involved. Those who had borrowed from

established institutions reported that the conditions set by the organizations were beyond their reach especially when it came to repayment of the loan. Therefore, most of those who borrowed from financial institutions were those in stable employment. It was reported that the NGOs lent money to those who belonged to community groups as a way of encouraging households to initiate local-level development projects in the area.

There were some fishing households who had not borrowed from other sources other than the social groups. The study set to find out why they had not borrowed. The researcher found out that, 50 per cent comprised of households who did not borrow money to avoid many debts, 26.9 per cent low/unreliable income sources, 9.6 per cent represented stringent conditions, 7.6 per cent did not borrow from other sources due to availability of merry-go-rounds while 5.7 per cent of those who respondents indicated that there were no social groups in the area to borrow from.

The findings indicate that fishing households gave different reasons for not borrowing money. This implies that livelihood diversification depends on individual decisions but also the circumstances that exist at a particular moment. For example the majority 50 per cent did not borrow to avoid debts. It indicated that people avoided conflicts that would arise due to none compliance/defaulting payments. This was supported by the fact that many households had lost their main sources of income which were predominantly fishing activities.

Some fishing households reported that they had looked for social groups to join but they were none-existent. This indicates that households would have opted for every means available that could offer them a livelihood particularly after the fish decline. Groups according to the respondents helped when an individual household was faced with a crisis hence were a form of security to the members. They determined how households accessed resources such as finances at the same time they came together when there were occurrences such as illnesses or death within the household. One respondent indicated that people within social groups were better-off due to their ability to share their resources and also ability to carry out joint activities for their livelihoods.

6.10 Role Differentiation and Decision Making Within Fishing Households

The nature of household set up in terms of role performance can influence the type of livelihood activities that different family members can undertake. For example in an African cultural set up, there are gender roles that the society defines. This study investigated the effect of role differentiation and decision making within the household and how these influenced livelihood diversification. It was found that females had specific roles defined within the household. The table 28.0, shows the activities that were being performed by females within the household.

The study found out that, 30 per cent represented food processing/ preparation as female activities, 26.7 per cent fetching firewood, 6.7 per cent charcoal burning while 3.3 per cent building and construction. The findings on food preparation and fetching water confirmed that females were largely engaged in reproductive activities within the household. Therefore, their diversification strategy was confined within the homestead. This trend of female livelihood diversification has been confirmed by several studies such Kabeer (2000) who notes that women strategies are limited by the practice of female seclusion which operates at a practical and ideological level.

The study established that women were also participating in construction through making ballast as well as fetching water in construction sites. This was a significant revelation for the study since it shows the level of female diversification in terms of fending for their livelihoods. It was reported that a few women were involved in selling boats for a living although the business had seriously gone down with the decline of fish stocks.

The study further established that even though the society was changing in terms of activities, within the sample, 57.9 per cent held that roles within the family had not changed while 42.1 per cent acknowledged that female roles had changed within the fishing household. The changes according to the study findings were due to the nature of family demands. They reported that crucial livelihoods had been lost thereby forcing females to take up some activities that were initially meant for male. For example, it was reported that charcoal burning was previously being done by males while firewood selling was the preserve of females. The findings reveal that everyone within the household had an obligation to look for an activity that would secure a

livelihood regardless of cultural barriers. It was also indicated that those households which were able to undertake more activities were more food secure. They got income from all sorts of available activities and that gave them plenty of opportunities in terms of livelihoods.

CHAPTER SEVEN

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

Fishing households are those households whose livelihoods depend on fishing as their main source of earning a living. Household members may engage in different activities other than fishing alone. The secondary activities are used to subsidize the main activities within the household. This study particularly investigated three research questions: the existing livelihood patterns of fishing household and to establish policy interventions on livelihood diversification activities of fishing households. This chapter presents the summary of findings and also draws conclusions based on the study findings. In addition, it gives policy recommendations.

7.2 Summary of Findings

Social characteristics of a household are important in the understanding of the livelihoods pursued by members of fishing households. Age of an individual influences the type of livelihood activity to be performed. Adult members are likely to involve in more productive activities than young people. However fishing being labor- intensive it was dominated by young people. The study findings revealed that there were more male-headed households than female headed-households. Fishing is a male dominated activity in which females participate mostly in fish processing. Marital status determines the number and nature of livelihood activities. It was established that fishing households which had married couples undertook a wide range of activities, while the widowed households benefited from remittances offered by NGOs and well-wishers.

Education level of fishing household heads influences the type of livelihood activities within the household. It determines the nature of livelihood activity that individual households heads were likely to be engaged in. The study established that the majority of household heads had finished secondary education (30%). There were few cases of those who had acquired college education (1.3%). The findings indicate that most of the fishing households were headed by those who did not proceed beyond secondary education. The household sizes varied from the smallest household having two family members to the largest household having fifteen members. The

concentration of household members reduced towards the highest figure. Livelihood diversification was highest in large families for need of consumption.

Household social capital involves informal institutional arrangements that fishing households build in order to secure livelihoods. It was established that 56.3 percent did not belong to any local level social groups, while 43.8 per cent were members. Those who belonged to groups were at a better position to diversify their livelihoods into other activities because of the benefits that accrued from their social networks. They were a form of social protection against subsequent shocks. The study revealed that some households were not aware of social groups in the area.

The study established that household assets were important in livelihood diversification. For instance, the value of land had gone up compared to other assets such as furniture and boats. However, the value of fishing gears within fishing households had gone down due to old age. The study also revealed that the cost of acquiring new fishing gears was very high compared to their cost in 2008. The value of livestock had gone up due to market demands. Land was the most valuable asset for fishing households. It could be sold to the local NGOs or individuals at a very high price. At the same time it was used for subsistence farming.

The study found out that the main livelihood activities of fishing households comprised of fishing, working in food kiosk/hotel while some individuals were employed in government as civil servants or teachers, the rest were working in the local NGOs. It was established that subsistence farming was important source of earning a living. Some households also engaged in boat or boda boda transport, charcoal burning and firewood selling. Chang'aa brewing was also livelihood activity in the area. Major livelihood changes in the nature and number of activities were experienced after severe decline of fish stocks in 2008.

Livelihood diversification of fishing households depended on many factors. Among the variables that the study investigated include the age of household members in relation to main occupations. The study findings revealed that fishing activity was dominated by members whose age was above 46 years. They were also the least employed. The majority of household members between 18-45 years were those still in school. The study established that the majority of fishing

households had spent one year performing new activities, even though many years had been spent on fishing activity as the main source of livelihood. The study further revealed that the majority of fishing households owned land but also engaged in various activities such as fishing, selling dried fish and working in food kiosks.

7.3 Conclusion

The study findings show that declining fish stocks greatly impacted on the livelihoods of fishing households. This was experienced through livelihood diversification activities in which more fishing households were found to be adopting other activities. However, some of the fishing households were still reliant on fishing for survival. Declining fish stocks was not the only reason that explained changes in livelihood activities. Households engaged in different livelihood activities for other reasons. For instance, some fishing households ventured into other activities after losing their fishing gears. Availability of ready market for vegetables attracted vegetable growing while need to expand income sources was also cited as an explanation for fishing households' diversification into other activities. Therefore the study concludes that fishing household livelihoods ought to have an integrated policy approach in which all spheres of livelihoods are targeted for the benefit of all households. Skewed interventions on livelihood activities may exclude other aspects of earning a living. All sectors of the economy were important and hence influenced further diversification into activities.

The nature of livelihood diversification was determined by individual household characteristics hence the activities of one household differed across the sampled population. Declining fish stocks affected livelihoods of many households in terms of income and consumption patterns. The decision to undertake alternative sources of earning a living were strategies of enlarging livelihood options. From the study findings, most of the fishing households diversified their livelihoods into activities that utilized natural resources such as subsistence farming, charcoal burning and firewood selling. The study concludes that livelihood diversification revolved around primary sources that were available in the area.

The nature and level of livelihood diversification activity was influenced by among other factors age, education and time. Land as a household asset was also found to be crucial to livelihood

diversification. Fishing household occupations were closely related to availability and accessibility of assets. The study concludes that livelihood choices are strongly related to individual household characteristics.

7.4 Recommendations

The study established that declining fish stocks influenced livelihood diversification of fishing households. It has taken the involvement of the government and other stakeholders to help the community to adopt new strategies of earning a living. In spite of these efforts, much needs to be done to assist fishing households. The study therefore makes the following recommendations:

The government and other stakeholders should carry out awareness campaigns to inform fishing households on the need to adopt other means of survival. The long tradition of dependence on fishing alone would be substituted with other activities. The need for sensitization exercise on sustainable use of resources such as fish and forest would alleviate pressure on the scarce resources. It would be better done through local-level mechanisms such as village management committees and participatory seminars.

The need to educate young people so that they can better understand that some natural resources become depleted over time hence the need for other alternatives of earning a living which may not involve direct reliance on primary resources. Education creates opportunities for survival through employment which brings income. These can be ways of giving fishing households options to diversify into other sources of livelihoods, without necessarily having to be employed.

More emphasis should be put on the government policy of introducing fish farming as another potential source of income without necessarily abandoning fishing as an activity. Over the years, this intervention had not been taken seriously by the government especially in areas around the lakeshores. There had been inadequate funding as well as low expertise that is necessary for implementing such projects. Fishing communities should consider doing fish farming since it could be a better alternative to natural fishing. Other projects such as horticultural farming can thrive especially in areas bordering the lake due to abundance of water. Government and other organizations should offer infrastructural facilities access roads, electricity, water-pumps,

fencing wire, seeds and extension services. This could be achieved by encouraging fishing households to form social groups which can act as mechanisms to access the facilities.

Increased credit facilities to the existing groups would be another way of introducing social protection. In the past, rules governing disbursement of finances have been very stringent and discriminative. Microfinance institutions should reduce rigidity on lending conditions so as to encourage more members at the local level to access credit facilities that can enable them to invest in other areas. This would help fishing households to develop long- term solutions to their livelihoods. The local fishermen should be given priority in formulating policies and also have an opportunity in the decision-making process. This would ensure that policy implementation reaches the intended beneficiary.

Government policies on fishing activities such as recommended fishing methods and nets should be implemented strictly so as to improve livelihoods of fishing households as they venture into other activities for a living. Some of the households had started benefiting from such interventions. Other stakeholders such as NGOs should come in full force to offer livelihood programmes to fishing households. At the same time the government should come up with specific schemes of social protection that target fishing households rather than individuals. Such schemes should also aim at generating new livelihood without necessarily having to make fishing households dependent.

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APPENDIX I

Survey Questionnaire (Structured Interviews)

Good morning/afternoon/evening? My name is **Jared Magego**. I am a student at the Institute for Development Studies, University of Nairobi. I am conducting a study on declining fish stocks and livelihood diversification among fishing households of Mfangano Island. I would like to discuss these issues with you. All information will be kept confidential.

Questionnaire Number .....

Date of Interview.....

SECTION 1

A: *Basic household characteristics*

ID	Relationship to household head	Age in years	Gender	Marital status	Educational level	Main occupation/activity	Other activities/Secondary activity
	1 Household head 2 Spouse 3 Child/son/daughter 4 Other Relatives 5 Worker 6 Other(specify)		1 Male 2Female	1 Married 2 Widowed 3Single/Never married 4Divorced/separated	1 No formal education 2 Primary incomplete 3 Primary complete 4 Secondary incomplete 5 Secondary complete 6 College 7 University	1 Fishing 2.Selling dried/smoked fish 3 Boat making 4 Boat selling 5Working in food kiosk/hotel 6 Pupil/student 7 Other(specify)	1 Subsistence farming 2 Charcoal burning 3 Vegetable growing 4 Transport (Boda boda) 5 Boat transport 6 Timber selling 7 Firewood selling 8 Other (specify)
1							
2							
3							
4							
5							
6							
7							
ID	Household size should be consistent with the above table (be accurate not to forget)						

Section 3: Existing patterns of Livelihood diversification of fishing households

A. Information on livelihood changes

1	What was your main source of livelihood in the last 5 years?	1 Fishing 2 Subsistence farming 3 Boat making 4 Boat repairing 5 Other(specify)	
2	Do you still earn your living from the same activity (ies)?	1 Yes 2 No	
3	If no, What are the new livelihood activities your household is engaged in?	1 Still fishing 2 Boat selling 3 Firewood selling 4 Charcoal burning 5 Vegetable growing 6 Sweet potato/cassava growing 7 Maize/ sorghum farming 8 Livestock keeping 9 Poultry keeping 10 Other (specify)	
4	How do you rate the earnings from the new activities in relation to the main activity in the last 5 years?	1 Increased 2 Decreased 3 Constant	
5	What changes do you experience in your household income?	1 Diminishing savings 2 Decreasing income sources 3 Other (specify)	
6	What changes do you experience in your daily meals intake?	1 Reduced fish intake 2 Increased vegetable intake 3 Increased cereals intake 4 Other (specify)	

7	What are the interventions to changes in your household livelihood?	1 Cash for work 2 Provision of financial services by NGOs 3 Selling off remaining assets 4 In-kind assistance 5 Temporary employment to family members 6 Migration for menial work 7 Other (specify)	

8	In your opinion what are the main causes of the livelihood changes in q5?	1 Declining fish stocks	
		2 Increase in household size	
		3 Other (specify)	

9 Proximity to market/beach

(a)What is the actual distance from your home to the nearest market (in km)?

(b) How do you benefit from the market/beach?

B: Economic activities of fishing households

NO	Economic activity	Current earnings (Kshs) approximately			Previous Earnings in 2008 (5 yrs ago) approximately		
I		Daily	Weekly	Monthly	Daily	Weekly	Monthly
	1 Fishing						
	2 Boda boda (motorcycle)						
	3 Vegetable growing						
	4 Boat passenger transport						
	5 Government employment						
	6 Hotel/kiosk business						
	7 Other (specify)						

2. Do you still prefer fishing as an economic activity?
1-Yes 2-No

3. If no, briefly explain?

C: Household Assets

No	Household asset	No. of Household assets in 2008	Current no. of household assets	Current earnings per year	Previous earnings per year in 2008	Observation 1 Increased 2 Decreased 3 Same
1	1 Fishing nets					
	2 Motorized boats					
	3 Non-motorized					
	4 Rental houses					
	6 Livestock					
	7 Line hooks					
	8 Seine nets(*Rimba*)					
	9 Other (specify)					

D: Land ownership and use

No	Question	Response	Code
1	Do you own your farm or is it rented?		1 Owned 2 Rented
2	Which type of land rights do you hold?		1 Title deed 2 Customary rights 3 Other
3	Total land size of your farm (in acres)		
4	Do you do farming on your land?		1 Yes 2 No
5	What do you grow in the farm?		1 Maize 2 Sorghums 3 Cassava 4 Sweet potatoes

			5 Bananas 6 *Sikuma wiki* and tomatoes 7 Others
6	When did you start farming (year)		
7	Do you still grow the same crops as when you started farming?		1 Yes 2 No
8	If no why have you changed		1 Poor yield 2 Persistent diseases 3 Lack of market 4 Lack of farm inputs 5 Other
9	When you started farming how did you acquire your land?		1 Inherited 2 Bought 3 Rented 4 Other

E: Declining fish stocks

1 Have you experienced fish stocks decline?

1-Yes 2- No

2 If yes, briefly explain how declining fish stocks influence your household livelihood?

3 In your opinion what has contributed to the decline in fish?

1- Increase in number of fishermen 2- Invasion of water hyacinth

3- Species extinction (predation) 4 Other (specify)

4 What is the security situation of fishermen and their gears in the lake today? 1-poor 2-fair 3-good 4- very good

5 Please comment on the above answer?

D: Household food consumption

1	How many meals per day would this household have previously in the year before 2008?	1 Three	
		2 Two	
		3 One	
		4 Other	
2	Currently how many meals does this household have per day?	1 Two	
		2 Three	
		3 One	
		4 Other	
3	What is the cause of change if any?	1 Declining fish stock	
		2 Increase in family members	
		3 Loss of main occupation	
		4 Loss of household head	
		5 Other (specify)	
4	What is the main diet of the household today?	1 Fish and *ugali*	
		2 Greens and *ugali*	
		3 Cereals (*githeri)*	
		4 Drinks /milk and *ugali*	
		5 Boiled cassava or sweet potatoes	
		6 Other (specify)	
5	What was the main household diet composed of before 2008?	1 Fish and ugali 2 vegetables and Ugali 3 Other (specify)	

E: Fish intake within the household

Fish type	Current intake per week (How often)	Previous intake per week (How often)
Nile perch		
Tilapia		
Sardines (*omena*)		
Mud-fish		
Others species		

2 Briefly explain how fish intake has impacted on the health of your family members?

F: Changes in fishing methods

7. Have there been changes in fishing methods?

1- Yes 2- No

Previous fishing methods	Current fishing methods

8 Comment on the changes in relation to declining fish stocks

G: Types of fish

9 (a) Are there any types of fish that were available some years back but have become scarce today?

1- Yes 2- No

(b) If yes, where was the fish being consumed/marketed/sold?

Type of fish	Current stock 1 abundant 2 Scarce 3 Same 4 Seasonal	Point of consumption/Market 1 Local 2 International/outside 3 Both
1 Nile perch		
2 Tilapia		
3 Sardines(*omena*)		
4 Mud fish		
5 Other (specify)		

(c) Do you nowadays have access to raw fish such as Nile perch for your household meals?

1- Yes 2- No

10. If no, what is the reason for the above answer.

11. Approximately what was the acceptable size of Nile perch fish (kgs) that could be sold to fish dealers in 2008?

12. Today, what is the recommended size (in kg) of Nile perch fish acceptable to fish dealers?

13. Please comment on the answer in q12?

SECTION: 4

Livelihood diversification patterns of fishing households

A: Information on shocks within households

No.	Has the household been negatively affected by the following events in the past 5 years?	1 Yes 2 No	Rank the 3 most important shocks 1 Most severe 2 Second most severe 3 Third most severe	When did this shock occur (Year) Only for the three most important shocks
1	1 Drought			
	2 Fishing gear stolen			

	3 Fishing gear confiscated			
	4 Severe decline in fish catch			
	5 Drastic fall in fish prices			
	6 Unfavorable fishing weather conditions			
	7 High increases in prices of fishing gear			
	8 Death of working household member			
	9 Chronic or severe illness of working household member			
	10 Other (specify)			

2	What has your household done to mitigate the shocks?	1 Migration to towns	
		2 Migration to other fishing grounds	
		3 Abandoned fishing	
		4 Seeking employment in NGOs	
		5 Gone back to School	
		6 Remittances from other members	
		7 Vegetable growing	
		8 Other (specify)	
3	Have the new activities mentioned in q2 changed your household well being?	1 Yes	
		2 No	

4	If yes, how do you rate the current household activities with those in the past 5 years?	1 Very good	
		2 Good	
		3 Fair	
		4 Poor	
		5 Other	

B: Household expenditure

No	Item	Expenditure in the last 12 months	Trends in the last 5 years 1 Increased 2 Decreased 3 Same	Explanation of the trends
	1 School fees			
	2 Food items			
	3 Health care			
	4 Rent			
	5 Clothing			
	6Repair of fishing gear			
	7 Fuel (kerosene)			
	8 Other (specify)			

C: Fishing households migration patterns

1	How many former household members have migrated during the last 5 years due to declining fish stocks?	**Males**	**females**	**Total**
2	Where have they moved to?	1 Towns 2 Other small Islands (fishing zones) 3 Other (specify)		

3	What is the amount the household receives from family members living outside this household (in Kshs)	Per week Per month Per year	**Only one entry**
4	Today, do you rely more or less on remittances than 5 years ago?	1. More 2. Less 3. Same	

D: Institutions and household livelihood

No	Question	Response	Code
1	Do you belong to any credit or social group/ association?	1Yes 2 No	
2	If yes, what activity (ies) does the group engage in?	1Microfinance 2 Borrowing / lending 3 Buying household items 4 Paying fees for orphans 5 Fish trade 6 Other	
3	Does membership to these associations enhance your household livelihood?	1Yes 2 No	
4	Does the household have an outstanding loan or money borrowed during the last 12 months?	1 Yes 2 No	
5	This loan was given by?	1 Neighbors or friends 2 Savings group 3 Other microfinance institutions 4 Cooperatives 5 Banks 6 Other	

E: Role differentiation and decision- making within fishing households

1	Are there duties specific to female members of the household?	1 Yes	
		2 No	
2	Which ones are they?	1 Food processing/preparation	
		2 Fetching firewood	
		3 Fetching water	
		4 Building and construction	
		5 Boat building/ selling	
		6 Charcoal burning	
		7 Other(specify)	

Section 5: Policy interventions on livelihood diversification patterns

No	Question	Response	Code
1	What has the government done in terms of policies to help restore fish stock?	1 Ban fishing at some periods of the year	
		2 Control number of fishermen	
		3 Introduced new fishing methods/ fish farming	
		4 Encouraged alternative means of livelihoods	
		5 Regulation of size of fishing nets	
		6 Other(specify)	
2	Are there organizations/ NGOs in the area?	1Yes	
		2 No	
3	If yes, what do they do to the households?	1 Educate/ sponsor children	
		2 Build houses for old/ widowed families	
		3 Build schools/Hospitals	

		4 Initiate horticultural projects	
		5 Other(specify)	
4	Has your household's livelihood changed positively with the coming of the organization(s)?	1 Yes	
		2 No	
5	If yes, what has happened to households livelihoods?	1 Reduced birth rate	
		2 Improved income	
		3 Improved nutrition	
		4 Increased livelihood opportunities	
		5 Increased number of school going pupils	
		6 Other(specify)	
6	In your view as the household head/ spouse, what is the way forward on declining fish stocks?		

APPENDIX 2

Key Informant Interview Guide - General questions

Name of KI: .....

Date of Interview ..... Time of interview.....

Questionnaire No.....

Good morning/afternoon/evening? My name is **Jared Magego**. I am a student at the Institute for Development Studies, University of Nairobi. I am conducting a study on declining fish stock and livelihoods diversification among fishing households of Mfangano Island. I would like to discuss these issues with you. All information will be kept confidential.

Basic information about the KI

Age ..... Level of education.....Occupation.....

1 Economic activities in the area

- Name the dominant livelihood activities.....
- How do the households integrate fishing and other activities.....
- Which factors account for the observed trends...?

2 Importance of fishing

- What are the trends of fish catches in the area...
- Where are the fishing households concentrated (location, sub-location, village and beach)
- What are the effects of declining fish stocks in the area
- How do people respond to declining fish stocks

3 Other sources of livelihoods

- Which other activities do households engage in other than fishing for livelihoods
- What are the other sources of livelihoods for the households in the area

4 Challenges facing fishing households in the area

- What challenges are facing fishing households in the area
- What efforts are being made to address these challenges

APPENDIX 3

Check List for the FGD (for fish mongers and officials of fishing groups/associations)

Good morning/afternoon/evening? My name is Jared Magego. I am a student at the Institute for Development Studies, University of Nairobi. I am conducting a study on declining fish stocks and livelihood diversification among fishing households of Mfangano Island. I am interested in your ideas, comments and suggestions. In this discussion there is no right or wrong answer. Please feel free to participate. All information will be kept confidential.

1 Discuss the main economic activities in the area.

2 Describe the livelihood patterns of fishing households.

3 Explain the effects of declining fish stocks on households.

4 Explain how households respond (cope with) to declining fish stocks.

5 Discuss any social support institutions or interventions in the area.