

ROLE OF AQUACULTURE ENTREPRENEURSHIP IN YOUTH ECONOMIC
EMPOWERMENT IN SAGANA FISHERIES, KIRINYAGA COUNTY, KENYA

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BY

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A Research Project Report Submitted in Partial Fulfillment for the Award of Master of Arts
Degree in Project Planning and Management, University Of Nairobi

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DECLARATION

This Research Project Report is my own original work and has not been presented for a degree or any other award in any university or any other institution of higher learning.





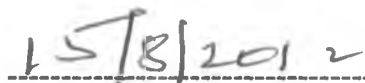
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This Research Project Report has been submitted with my approval as the university supervisor.





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DEDICATION

This work is dedicated to my wife Mary Mwenda, our daughter Annette and our sons Ernest and Ephy for your understanding, patience, encouragement and moral support.

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ABBREVIATIONS AND ACRONYMS

AAK:	Aquaculture Association of Kenya
AFIPEK:	Association of Fish Processors and Exports of Kenya
GDP:	Gross Domestic Product
GoK:	Government of Kenya
KKK:	Kazi Kwa Vijana
KMFRI:	Kenya Marine and Fisheries Research Institute
KPIA:	Kenya Poverty and Inequality Assessment
MDGs:	Millennium Development Goals
MOFD:	Ministry of Fisheries Development
MT:	Metric Tonnes
NGO:	Non- Governmental- Organization
NOFP:	National Oceans and Fisheries Policy
SACCOs:	Savings and Credit Co-operative Societies

ABSTRACT

Since independence, Kenya has been grappling with an increasing population which is not in tandem with the rate of job creation hence slow economic growth and development. The Youth form the largest segment of the unemployed population in Kenya and yet are an important agent of economic growth and development. The Government has shown a concerted effort to integrate the Youth agenda in development plans, policies and strategies such as Youth Development Enterprise Fund, “Kazi Kwa Vijana” initiative, Innovation Fund for Agriculture and Agribusiness and Economic Stimulus Programmes so as to alleviate poverty and unemployment among the youth. Kenya is endowed with numerous aquatic resources with aquaculture potential. Farmers in suitable areas across the country are turning to fish farming as a way of producing high quality food, either for their families or for the market, and as a way of earning extra income. This study therefore sought to examine the role of aquaculture entrepreneurship in youth economic empowerment in Sagana Fisheries in Kirinyaga County. Literature reviewed showed that following the renovation of several government fish rearing facilities, the establishment of research programmes to determine best practices for pond culture, and an intensive training programme for fisheries extension workers, there is renewed interest in fish farming in Kenya. Youth’s contributions to sustainable development are important to meet the needs of the present without compromising the ability of future generations to meet their needs. The growth and development of aquaculture entrepreneurship is therefore in line with the government’s agenda for National Development since it is an important means of earning income for the youth. This agenda cannot be realized without youth participation so as to sustain economic growth and possibly alleviate the debilitating and undignified effects of poverty through creation of wealth and employment. The first Millennium Development goal on eradication of extreme hunger and poverty among others and Vision 2030 under the Social Economic Pillar are discussed in order to relate this study. The study employed descriptive survey design and stratified sampling design was used in order to select a sample size of 67 respondents. The study adopted questionnaires as instruments of data collection through the help of one research assistant. The raw data collected was processed and then analyzed by the use of descriptive analysis methods of mean, mode and median. The findings have been presented using percentages and tables. The study indicated that aquaculture entrepreneurship provides employment to the youth. The study results indicated that most of the fish-farmers did not have technical skills (training) in the field of fish-farming. The study also revealed that fish farming was not the major source of income to many despite having supplemented their income and protein sources. The main conclusion from the study was that aquaculture is a source of employment and a profitable venture. Another conclusion from the study was that majority of the youth entrepreneurs lack the collateral required by financial institutions to secure credit. The recommendation is that there is need for financial institutions to lower interest rates to make them friendlier and affordable to the youth. Aquaculture entrepreneurs should be encouraged by the government to form business associations in form of Saccos or self-help groups to share ideas, experiences and suggestions. Research should be enhanced by the government to find out the best fish species that gives the highest level of output. The community should also be sensitized about the importance of fish as an alternative source of protein. The government and donors should create conducive business environment for the youth by providing supportive infrastructure and capital to start and run aquaculture operations. The youth should be made aware of the business opportunities in aquaculture entrepreneurship and through resource mobilization the youth can overcome the challenges of inadequate finances and inaccessibility of credit.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Aquaculture remains one of the most valuable management techniques in fisheries today (Stroud, 1986). Aquaculture is not a new industry, nor is it an untested concept. Although aquaculture is a fairly new concept in Kenya, it has a long history in Asia and Europe. The care and farming of fish is rooted in ancient history. The earliest records of fish farming are from Asia (China) where the practice was used often, perhaps as far back as 2500 BC. Egyptians of the Middle Kingdom developed ornamental fish ponds and attempted intensive fish culturing. The Roman's were quite adept in raising fish in ponds and also cultivated oysters. The Hawaiian people practiced aquaculture by constructing fish ponds; an example from ancient Hawaii is a pond at Alekoko dating back at least 1000 years. (Stroud R.H.1986). According to Larry 1998, where people and water meet, fisheries exist; where people and water could meet, potential fisheries exist; and wherever fisheries, real or potential, exist, fisheries management can make them better.

Inland aquaculture can generally be described as being under-developed in Eastern Africa, though it should be noted that considerable success has been achieved through farming of Nile Tilapia in Egypt. The under-developed status of aquaculture in Eastern Africa can be explained by four problems namely: knowledge mobility and know-how, Lack of suitable fish species, Improvement of hatchery development and poor fish seed availability, and Lack of markets. East African countries are amongst the poorest in the world. The economies of these countries depend mainly on agriculture, which includes fisheries. The countries are harnessing their agricultural resources to improve the welfare of their citizens. The national developmental objectives of these countries, in relation to agriculture, are to ensure food supply at adequate nutritional levels, increase and diversify the production of agricultural export commodities, provide adequate agricultural raw materials for domestic, agro-based, export industries, create sufficient employment opportunities in the agricultural sector, and conserve the natural resource base. The fisheries sector contributes about 3% to the GDP of Uganda and Tanzania and 0.5% to the GDP of the Kenyan economy. Fish is an important source of revenue and an important export commodity (SEDAWOG, 1999b). The fishing

industry provides employment for between 0.5 and 1 million Ugandans, more than 0.5 million Tanzanians and 0.8 - 1.5 million Kenyans. There is, therefore, no doubting the value of the fisheries to the economies of the riparian countries and there is need to have a plan to ensure that this benefits stream is sustained (Bwathondi, 2001).

In Kenya, although there is official support for aquaculture development, it is scarcely mentioned in planning documentation. The only stated strategy for aquaculture development in the National Development Plan (Republic of Kenya 1989) is the introduction of fish breeding farms for restocking and supplying fish farms (Elizabeth Harrison, 1993). The Government of Kenya recognized the critical role that fisheries play in food security, creation of employment, and other economic benefits to those engaged in the industry and created a Department of Fisheries. In 1979, the Kenya Marine and Fisheries Research Institute (KMFRI) was established by the Science and Technology Act (CAP 250), with the mandate for marine and fisheries research. The Government successfully implemented the Economic Recovery Strategy for Wealth and Employment Creation with economic growth rising from 0.6 % in 2002 to 7.1 % in 2007. At the end of that period, the Government developed the Kenya Vision 2030, which is the long term development blue-print expected to transform the country into a rapidly industrializing middle-income nation enjoying a high quality of life by the year 2030. The Vision aims at transforming the agricultural sector into an “innovative, commercially-oriented and modern Agriculture, Livestock and Fishery Sector” (Ministry of Fisheries Development Strategic Plan, 2008-2012).

Kenya is endowed with numerous aquatic resources with aquaculture potential. In the 1960s rural fish farming was popularized by the Kenya Government through the “Eat More Fish” campaign. As a result of this effort, tilapia farming expanded rapidly, with the construction of many small ponds, especially in Kenya’s Central and Western Provinces. However, the number of productive ponds declined in the 1970s, mainly because of inadequate extension services, lack of feeds, a lack of quality fingerlings, pond management techniques, bad marketing and insufficient training for extension workers. Until the mid 1990s, fish farming in Kenya followed a pattern similar to that observed in many African countries, characterized

by small ponds, subsistence-level management, and very low levels of production (Ministry of Fisheries Development Strategic Plan, 2008-2012).

Today, following the renovation of several government fish rearing facilities, the establishment of research programs to determine best practices for pond culture, and an intensive training program for fisheries extension workers, there is renewed interest in fish farming in Kenya. Farmers in suitable areas across the country are again turning to fish farming as a way of producing high quality food, either for their families or for the market, and as a way of earning extra income. Because of recent locally conducted research and on-farm trials, farmers are learning that the application of appropriate techniques and good management can result in high yields and a good income. The department of fisheries developed the Sagana Fish Culture Farm with the main objective of promoting more efficient and effective exploitation of aquaculture resources available in the country. The Sagana Fish Farm is located in Central Kenya in Kirinyaga County. It is about 110 km North of Nairobi. The farm was established in 1948, and occupies 20.5 Hectares of land close to the Sagana Township. On the 20.5 Hectares of land, there are 73 fish ponds covering 2.5 Hectares, a reservoir covering 1.5 Hectares and cultivated area covering about 4 Hectares among other things. The farm gets its water by gravity via an open canal from the Ragati River that is a tributary of river Sagana. The aim of the farm at its inception was to demonstrate warm water fish culture, produce fingerlings for supply to farmers in the region, and conduct research, test and on-farm trials on warm water aquaculture technology before they are recommended to producers and to train fisheries personnel and fish farmers (Mbugua 2008).

Youth represent 30 percent of Kenya's population and their unemployment is twice the country's average. Almost one third of Kenyans are between 15 and 29 years, and the total reached almost 11 million people in 2006 compared to 8.5 million in 1999 (KPIA2009). According to the Kenya Poverty and inequality Assessment, this age cohort is now at a historical high (in absolute and relation terms). Youth in Kenya face serious challenges, including high rates of unemployment and underemployment. Extreme poverty was estimated at 19 percent of the population in 2006. Almost one in three of Kenya's poor population was between 15-29 years of age. The country Social Analysis (World Bank,

2007) found that youth unemployment, especially among males, is a major contributor to frustration and tension, particularly in urban areas. Clearly, unemployment among the youth has now become a matter of serious policy concern in the country. The recent financial and economic crisis has prompted the Government of Kenya (GoK) to renew its commitment to addressing youth issues and youth unemployment has emerged as a top priority. The GoK developed a strategy to address youth unemployment in 2007. The GoK successfully launched “Kazi Kwa Vijana” (KKV) programme in 2009 aiming at employing youth in rural and urban areas in labour –intensive public works projects implemented by different line ministries. In addition to the KKV, the GoK continues to support the Youth Enterprise Development Fund (YEDF), established in 2006, by providing youth with access to finance for self employment activities and entrepreneurial skills development (GoK Esmf, 2010). Despite the government interventions to address youth unemployment and the numerous aquatic resources with aquatic potential, there exists a gap, where most youth appear not to have taken full advantage of these opportunities. A majority of the youth remain unemployed. This has prompted the researcher to carry out a study to examine the role of aquaculture entrepreneurship in youth economic empowerment in Sagana Fisheries in Kirinyaga County, Kenya.

1.2 Statement of the Problem

East African countries are amongst the poorest in the world. Their economies depend mainly on agriculture, which includes fisheries. The countries are harnessing their agricultural resources to improve the welfare of their citizens (SEDAWOG, 1999). Ngugi, Bowman, & Omolo (2007) in their research to determine best practices for pond culture in Kenya found that the application of appropriate techniques and good management can result in high yields and a good income. This study however did not assess aquaculture opportunities that arise from fish farming activities. In a study conducted by Kamla-Raj (2010) in Nigeria, it was found that fish production in the study area is capable of creating employment, augmenting income and improving the standard of living of the people. Therefore, the study recommended government participation in fish farming to boost the quantity of fish available for consumption.

In a research project conducted by Okechi (2004) of Kenya Marine and Fisheries Research Institute (KMFRI), Kisumu Research Centre, focus was mainly on development of a profitability assessment tool for the purposes of evaluating the feasibility of fish farming investment and operations. The study however leaves a vacuum on the socio-economic benefits derived from fish farming activities. In his study on contribution of aquaculture to sustainable livelihoods of the poor, Edwards (2000) identifies the actual and potential contribution of aquaculture as a knowledge gap that needs to be addressed. Even though his research was conducted in Asia, Edwards (2000) indicates that the above knowledge gap exists even in most rural settings in Africa. Atieno (2011) investigated the impact of fish farming on the economy of Kisumu County in Kenya. This study is important because it gives an insight into the potential benefit of fish farming to the community around Kisumu County and reveals a gap on how fish farming plays a key role in youth economic empowerment in other areas in the country. Based on this, it is imperative that economic interventions be found that can sustain the community by providing employment and, possibly, alleviating the debilitating and undignified effects of poverty. Focusing on the youth therefore, in programs that stimulate sustainable agricultural development, could improve social capital, reduce risk, and stimulate economic growth, Gonne, (2008). In this regard, the study sought to demonstrate that aquaculture can be a lucrative business opportunity which can address the problems of poverty and frustrations particularly among the youth within Sagana Fisheries Centre.

1.3 Purpose of the Study

The purpose of the study was to examine the role of aquaculture entrepreneurship in youth economic empowerment in Sagana Fisheries in Kirinyaga County.

1.4 Objectives of the Study

The specific objectives of the study were:-

1. To assess the extent to which employment opportunities in aquaculture influence youth economic empowerment in Sagana Fisheries.
2. To examine the contribution of training opportunities in aquaculture on youth economic empowerment in Sagana Fisheries.

3. To investigate the extent to which aquaculture-generated income influences youth economic empowerment in Sagana Fisheries.

1.5 Research Questions

The study aimed at answering the following questions:

- i. To what extent do aquaculture employment opportunities influence youth economic empowerment in Sagana Fisheries?
2. How do training opportunities in aquaculture entrepreneurship contribute to youth economic empowerment in Sagana Fisheries?
3. To what extent does aquaculture-generated income influence youth economic empowerment in Sagana Fisheries?

1.6 Significance of the Study

The findings generated by this research will be used to make recommendations to the government and donors on appropriate measures necessary for promoting aquaculture entrepreneurship in Kenya. The millennium development goal No. 1 focuses on eradication of extreme poverty. The youth form the largest segment of the world population and majority of them are unemployed despite having attained basic education. There are interventions by the government to empower the youth. These include 'kazi kwa vijana' initiative, the Youth Enterprise Development Fund, Constituency Development Fund or the Innovation Fund for Agriculture and Agribusiness. It is envisaged that with fish farming activities, there will be added economic benefits and activities related to fish farming such as demand for fertilizer, packaging and transport and employment opportunities. In this study, the researcher will only focus on aquaculture entrepreneurship as one of the alternative means of empowering the youth economically in Sagana Fisheries, Kirinyaga County. The study will contribute to furtherance of knowledge on the viability of aquaculture in addressing the needs of communities living near perennial and seasonal water bodies.

1.7 Limitations of the Study

Inconsistency of information gathered arose due to respondents varied levels of knowledge. Some of the respondents had to fill the questionnaires with the help of the research assistant as they were unable to fill the questionnaire and the research assistant had to fill for them. The findings of the study are limited to Sagana Aquaculture Centre in Kirinyaga County and cannot be easily generalized to other similar projects.

1.8 Delimitation of the Study

The study was conducted in Kirinyaga County and covered Sagana Fisheries. The study focused on Sagana fisheries team and the youth who traded in fish related business activities and those engaged in fish farming.

1.9 Assumptions of the Study

The researcher assumed that the sample chosen was adequate to help in drawing valid conclusions and that the respondents would be honest in giving the reliable information. The other assumption was that variables in the study would not change in the course of the research period. The researcher also assumed that the respondents would be co-operative and willing to give information.

1.10 Definition of Significant Terms

Aquaculture Entrepreneur:	One who is engaged in fish farming or fish trading activities. A person who is ingenious and creative in finding ways that adds to their own wealth.
Economic Empowerment:	Process through which the youth acquire confidence in themselves as a result of being involved in gainful fish related business activities which in turn enable them live better lives.
Employment:	A situation in which an individual has work to do especially to earn money.
Entrepreneurship:	Business opportunities arising from fish farming and fish trading activities.
Income:	Net earnings from fish farming and other aquaculture business activities.
Training:	Process of teaching and equipping fish farmers and traders with knowledge, skills and providing on-farm demonstrations to improve aquaculture entrepreneurship.
Youth:	Any individual within 15 and 35 age bracket. This age limit has been set to accommodate primary school dropouts who are engaged in aquaculture related businesses

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter, the researcher reviewed literature related to aquaculture and youth economic empowerment. The chapter outlines the empirical review and conceptual framework of the study and focuses on youth economic empowerment criteria in relation to fish farming which includes: employment opportunities in aquaculture, contribution of training opportunities in fish farming on youth economic empowerment and income generating activities in aquaculture in Sagana fisheries in Kirinyaga County.

2.2 Historical Development of Aquaculture

Aquaculture entails the growing of aquatic organisms including fish, molluscs, crustaceans and aquatic plants in a controlled environment. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc. Farming also implies individual or corporate ownership of the stock being cultivated. The Philippines is ranked eleventh among the important fishing nations in the world. As a major economic sector, fisheries contribute 4.5 % to the Philippine Gross National Product (GNP). Directly dependent to the fishing industry are more than one million Filipinos deriving their livelihood from fisheries. Aquaculture sector on the other hand refers to culture of fish both in fresh and brackish waters and along the coastal areas popularly known as mariculture. The Philippines with a total coastline of 17,460 km has its coastal areas teeming with people with a growth rate of 2.49%, one of the highest among the ASEAN Member countries since 1991. About 55% of the people are residing on some 10,000 coastal barangays or villages. At present, there are some 700,000 marginal fishermen concentrated mostly in protected bays which are also considered to be the lowest income groups. The large number of fishermen living below the poverty line has very little option except to exploit fishery resource to which they have access. The domestic and economic activities of the coastal population put stresses on the marine environment that served to further aggravate the wanton use of coastal resources. The present situation has then exposed a two-fold problem. First, there is a need to decongest and reduce pressure on the coastal

zone and to alleviate poverty among marginal fishermen. Second, there is a need to encourage exit of fishermen and to promote economic diversification of fishing communities if it is desired to maintain valuable coastal resource within the limits of sustainability. The Philippine government has taken several steps addressed to these problems such as the development of appropriate aquaculture to play a role in resolving the three-pronged dilemma of over-exploited stocks, over extended fleets and lack of alternative employment opportunities. The creation of fishery-based employment outside the traditional fishery can lead to voluntary transformation of fishers to fish farmers (Reyes, De Sagun and Munoz, 2008).

Ornamental fish keeping is one of the most popular hobbies in the developed countries and is gaining popularity in many developing countries. The growing interest in aquarium fishes has resulted in steady increase in aquarium fish trade, globally. According to Food and Agriculture Organization (FAO) (2006), export earnings from ornamental fish trade is US \$ 251 million and more than 60% of the production comes from households of developing countries. The wholesale value of the global ornamental fish trade is estimated to be US \$ 14 Billion. More than 2500 species of ornamental fishes are traded and some 30-35 species of fresh water dominate the market. The trade with an annual growth rate of 8 percent offers a lot of scope for development. India's share in global ornamental fish trade is negligible and at present the ornamental fish export from India is dominated by the wild caught species. The top exporting country is Singapore, followed by Hong Kong, Malaysia, Thailand, Philippines, Sri Lanka, Taiwan, Indonesia and India. The largest importer of ornamental fish is USA. Europe and Japan, China and South Africa are the emerging markets of ornamental fish trade. Ornamental fishes market in the world for public aquaria is less than 1% at present and over 99% of the market for ornamental fish is still confined to hobbyist. The brilliant, flamboyant colour and exotic appearance of the fish appeal to one and all children and aged alike. As the day passed, ornamental fish keeping become an interesting activity for many, in the process, generating income for the unemployed youth and farmers. The concept of entrepreneurship development, through ornamental fish farming is gaining popularity day-by-day. Many numbers of people are entering into this business of culturing, breeding and

farming. In India, out of total export of ornamental fish, 95% is based on wild collection (Sankaran and Selvarasu, 2009).

In Kenya, resources have been spent to promote aquaculture development through various aquaculture projects over the last few decades. The promotion started in the early 1920s as a means of supplementing protein sources in the rural areas. This was a non-commercial approach and it was promoted only as a family subsistence activity. This has however changed over the years and many investors have now invested in commercial aquaculture. Majority of aquaculture activities in Kenya involves the production of various species of tilapia (mainly *Oreochromis niloticus*) and the African catfish (*Clarias gariepinus*) and Rainbow trout (*Onchorhynchus mykiss*). The tilapines and catfish production is mainly done as mono or polyculture of the two under semi-intensive systems using earthen ponds while the Rainbow trout production is done in intensive raceways and tank systems. The Tilapine species constitute about 90% of aquaculture production in Kenya. Although most of the production targets the food fish market, there has been an increasing demand for baitfish for the Nile Perch capture of Lake Victoria. Several entrepreneurs are producing the catfish juveniles for this market. Ornamental fish production is also gaining interest and several producers are engaged in the production of gold fish and koi carp among other ornamental species (Mbugua, 2008).

The Fisheries Act, Cap 378, the Maritime Zones Act, Cap 371 and other subsidiary legislation such as the Exclusive Economic Zone (foreign fishing craft) regulations 1990 and the Fish Quality Assurance regulations 2000 are the main legal instruments governing the development, management, exploitation, utilization and conservation of fisheries in Kenya. Besides these legal documents, policies relevant to the fishing industry can be found in various government planning documents. The government policy for this sub-sector has been to maximize production by proper utilization of available resources. The Government policies regard the role played by fish farmers. It has continuously promoted aquaculture as an alternative cheap source of protein and income (Agricultural Sector Development Strategy 2010–2020).

Aquaculture refers to the farming (propagation and rearing) of aquatic (water dwelling) organisms that include fin fish, molluscs, crustaceans and aquatic plants in controlled or semi controlled environments. The farming activities involve interventions such as stocking, feeding and protection from diseases and predators to enhance productivity. However Aquaculture is used interchangeably with other terms like fish farming, pisciculture, pond fisheries and pond culture. Some examples of aquaculture include: algaculture which is production of seaweeds and other algae and fish farming which refers to farming of fin fishes (such as tilapia), shrimps, shellfish and cultured pearls (Mbugua, 2002). The fisheries sector in Kenya consists of three major sub-sectors, namely inland fisheries, marine fisheries and aquaculture. Aquaculture has remained at subsistence level since independence in 1963, but has recently been boosted when the government listed fish farming as one of the key activities in the Economic Stimulus Programme (Aloo, 2010).

The government hopes that this programme will provide employment, provide income to farmers as well as provide a source of protein to many Kenyans. The decline of fish stock in the country over the past decade has rekindled efforts geared towards revamping the sector. And in what is seen as a paradigm shift from over reliance on fresh water fish, the government is now implementing an elaborate programme under the Economic Stimulus Programme (ESP), which aims at increasing aquaculture productivity and raising the income of farmers and other stakeholders. The ESP sponsored fish farming enterprise programme however comes in the backdrop of grim statistics which show significant reduction in fish and fish species diversity in Lake Victoria, which provides 90 percent of the annual national production. This has largely been attributed to the degradation of the fish habitat, and the spread of aquatic weeds, such as the water hyacinth, which have been cited as the major causes of the decline in per capita supply of fish. In addition, over-fishing caused by an influx of fishermen to the country's lakes because of unemployment has been blamed for the bad state of affairs. A recent report on Lake Victoria released by the Kenyan Ministry of Livestock and Fisheries Development indicates that the Kenyan part of the lake, which is only 6 percent of the lake's area, has 199,242 fishermen, which is more than double the recommended figure. Overfishing and illegal fishing carried out in the Lake are adversely affecting the resource. That is why the fish farming enterprise program under the ESP is

highly anticipated, as it is likely to ease pressure on the lake. Currently 13,444 fish ponds have been constructed in the first phase of the program which is anticipated to boost fish production in the country to 7,560 Metric Tonnes from the current 4,250 Metric Tonnes. This, analysts said, was poised to raise the profile of the aquaculture sector in the national landscape and allow it to compete effectively with other key sectors of the economy. The timely launch of the fish project has guaranteed prolific results and was set to increase farmers' earnings with a significant margin. A total of Ksh 1.134 billion was anticipated at the initial phase where each of the 28,000 newly constructed fish ponds was likely to produce at least 270Kgs of fish. The government was expected to save an equivalent amount in imports. Farmers who had ventured into fish farming prior to the launch of the ESP were reaping highly from the project. A majority of these farmers were by then supplying fingerlings to the newly established ponds (The Link Journal, April 2010).

There had been a lot of interest in fish farming in the previous few years and indicators were that the potential was very high and production figures were expected to grow exponentially in the coming years. Currently around 7,000 farmers are under aquaculture and the number is expected to go up to 28,000 with the ESP program. The government also intends to increase production of fingerlings at the Sagana Aquaculture center. The Ministry of Fisheries is encouraging establishment of private fingerling production and fish production enterprises as a way of addressing the limitations currently being experienced in the stocking of fish ponds. Rift Valley Province leads in the number of completed ponds with 2,731 followed by Nyanza province which has a total of 2,561 completed ponds while Central comes third with 2,546. Western Province has 2,336; Eastern Province has 1,640 ponds while Coast has the least with 319 ponds complete (Ministry of Fisheries Development Strategic Plan, 2008-2012)

Table 2.1: Number of fish farmers in Kenya by province

Province	Number	Percentage
Coast	200	4
Eastern	400	8
Rift Valley	780	16
Central	1100	23
Nyanza	1170	24
Western	1200	25
Total	4850	200

Source: Mbugua, 2008

Aquaculture production is what is produced from aquaculture activities meant for harvest and human use. Compared to conventional livestock and crop farming, aquaculture is much more diverse. There are many different species cultured. The different species have different biology and therefore different ecological requirements. They will therefore have different feeding, breeding and water quality requirements. Coupled with different management and intensification levels used, aquaculture production is very varied and diverse. The main objective of setting up Sagana Aquaculture Centre was to promote fish farming for socio-economic benefits by formulating high fish feeds, training farmers and carrying out integrated farming by way of recycling nutrients in various agricultural activities (Mbugua, 2008).

2.3 Status of Youth Economic Empowerment in Kenya

While poverty has declined since 1997, both poverty and inequality continue to be serious concerns. The youth form a large share of the poor. According to the KPIA (Kenya Poverty and Inequality Assessment) there was a decline in poverty from the late 1990s until 2006, from 51 percent in 1997 to 47 percent in 2006. Extreme poverty was estimated at 19 percent of the population in 2006. Almost one in three of Kenya's poor population was between 15-29 years of age. Half of these were youth between 15-19 years of age and who had a poverty rate of 51% - which was larger than the national average. The economic slowdown and the

series of different crises have negatively affected the population. Poverty levels are expected to start increasing again. Youth represent 30 percent of Kenya's population and their unemployment is twice the country's average. Almost one third of Kenyans are between 15 and 29 years, and the total reached almost 11 million people in 2006 (compared to 8.5 million in 1999). According to the KPIA this age cohort is now at a historical high (Gok Esmf, 2010).

Youth in Kenya face serious challenges, including unemployment which is the most critical. As a result, some youth get lured into antisocial and risk taking behaviors leading to HIV and AIDS, drug abuse and crime. Most unemployed youth lack (appropriate) skills and access to capital to enable start businesses. Most of the unemployed youth reside in urban slums making them vulnerable to all forms of anti-social activities. The overall unemployment rate for youth is double the adult average, at about 21 percent. Statistics on joblessness suggest that the magnitude of the unemployment problem is larger for youth with 38 percent of youth neither in school nor work (aggregating the rates of reported unemployment and inactivity). The violence in early 2008 highlighted the critical importance of addressing the problem of poverty and inequality, and in particular the increasing problem of idle youth. In addition, the country Social Analysis (World Bank, 2007) found that youth unemployment, especially among males, is a major contributor to frustration and tension, particularly in urban areas. Clearly, unemployment among the youth has now become a matter of serious policy concern in the country. Evidence from previous analytical work shows that lack of action on the challenges that affect youth will escalate both social and economic costs of development in Kenya. This situation became clear during the crisis that erupted after the disputed December 2007 elections. Youths were the main group involved in the unrest and violence and they were identified by both the Government of Kenya (GoK) and Development Partners as a high priority target group for addressing some of the major challenges facing the country. The recent financial and economic crisis has prompted the Government of Kenya to renew its commitment to addressing youth issues and youth unemployment has emerged as a top priority (Gok Esmf, 2010) Aquaculture entrepreneurship is therefore an initiative of the government to address youth unemployment problem.

According to ILO Report (2011), the Government of Kenya developed a plan in 2007, emphasizing the importance of a coordinated and multi-sectoral approach to addressing the problem of youth unemployment. In April 2009, the “Kazi Kwa Vijana” (KKV), the Work for Youth programme was launched. It was aimed at the employment of youth in rural and urban areas in labour intensive public works projects, focusing on smaller projects that can be implemented rapidly. Examples are road maintenance sub-projects, small-scale water supply and sanitation, fish farming, water harvesting, afforestation and waste collection. In addition to the KKV, the GoK continues to support the Youth Enterprise Development Fund (YEDF), providing young people with access to finance for self-employment and entrepreneurial skills’ development. The programmes have made several achievements in their short period of existence such as improving income generation potential for the local youth through the sale of tree seedlings, the planting of trees and the pruning of forest plantations and rearing of fish. The KKV Programme has provided employment opportunities for youth and this has evidently reduced the incidence of crime and poverty. In 2009/10, the KKV employed between 200,000 and 300,000 Kenyans, primarily youth, enabling them to buy food and other basic items and to support their families, thus escaping from direct poverty (ILO, 2011).

2.4 Employment in Aquaculture and Youth Economic Empowerment

Fish is a popular diet all over Africa. A report conducted by the Food and Agriculture Organization (FAO) on ‘The State of World Fisheries and Aquaculture’ (2008) states that the fish sector is a source of income and livelihood for millions of people around the world (FAO, 2008). Employment in fisheries and aquaculture has grown substantially in the last three decades, with an average rate of increase of 3.6 per cent per year since 1980. It is estimated that, in 2008, 44.9 million people were directly engaged, full time or, more frequently, part time, in capture fisheries or in aquaculture and at least 12 per cent of these were women (Foeken and Owuor, 2008). Africa is in an area of the world where chronic poverty and malnutrition continues to be widespread (Aguilar and Shree, FAO, 1998, CIFA Technical Paper 32) (Manjarrez, 1998). (Olale, and Cranefield 2010) state that in Africa, there is strong evidence of high and increasing poverty levels among fish workers.

GoK Report(2010) in its Agricultural Sector Development Strategy 2010–2020, indicated that the youth will be sensitized on lucrative ventures in the agricultural sector, and processing plants for value addition will be established in rural areas to provide employment opportunities for the youth and to allow them to produce agricultural raw materials. Linkages between the Ministry of Youth and Sports and the agricultural sector will be established to offer incentives to the youth in farming either through the Youth Enterprise Development Fund, Constituency Development Fund or the Innovation Fund for Agriculture and Agribusiness. These facilities will provide the means and motivation for the youth to engage in farming. Measures will be taken to make rural areas more attractive to the youth by offering facilities like information and communication technology and resource centres to stem the rural–urban migration.

There has recently been a surge of interest in entrepreneurship in developing and emerging economies. This has been partly motivated by remarkable private sector driven growth in emerging countries such as China and India. It has also been motivated by the growing number of women entrepreneurs in developing countries (Minniti and Naudé, 2010) and the need to create employment opportunities for a predominantly youthful population in the world's poorest continent, Africa (Africa Commission, 2009). As far as entrepreneurship is concerned, one definition of entrepreneurs is that they are "persons who are ingenious and creative in finding ways that add to their own wealth, power, and prestige" (Baumol, 1990).

A farmer considering culturing fish needs to consider a number of factors that may affect the success and profitability of the enterprise. Surveys for suitable sites or evaluations of specific sites should first identify strengths and weaknesses of physical characteristics such as the suitability of the soil, the topography of the land, and the availability of good quality water. Evaluations should also consider market demands, proximity to markets, and the availability of needed inputs such as fertilizers and feeds. Farmers in suitable areas across the country are again turning to fish farming as a way of producing high quality food, either for their families or for the market, and as a way of earning extra income. Because of recent locally conducted research and on-farm trials, farmers are learning that the application of appropriate

techniques and good management can result in high yields and a good income (Ngugi, Bowman and Omolo 2007).

2.5 Fish Training Opportunities and Youth Economic Empowerment

The provision of continuous and relevant business development services to youth entrepreneurs is key to the success of enterprise development initiatives in creating long term employment. Youth Enterprise Development Fund Status Report (2009) states that the provision of entrepreneurship training to sensitize and inculcate entrepreneurial culture among the young people is crucial to identifying emerging business talents. The scale and the complexity of youth employment problem is no doubt a daunting task which needs the joint efforts of all. The magnitude of the youth unemployment requires the engagement of all partners in crafting joint approach to tackling the problem. The development and wider adoption of aquaculture can be seen as a significant basis for improving economic empowerment and other needed welfare for the youth at Sagana Fisheries.

Adoption of technologies of different enterprises is affected by certain factors. According to Goswami, Ziauddin and Dutta (2010), annual income, land holding, extension contact, innovative proneness, risk orientation and economic motivation of fish farmers had positive significant relationship with their scientific fish culture practices. The study by Rousan (2007) showed that attitude towards change, educational level, farm income, farmers exposure, income level are the important socio-economic factors influencing adoption of farm innovations and technology. Farmers' changes of technology use are usually influenced by need based and location, specific technical training programmes and demonstrations followed by group discussion and field visits. Men usually use technologies for rice, fruit and fish production, and women use technology for pig and chicken production (Truong and Ryuichi, 2002).

The BOMOSA hub and plot systems are unique in Eastern Africa. BOMOSA has established and disseminated the technical know-how and the requirements for economic viability, social acceptance and a supporting institutional environment. BOMOSA has supported technical know-how and institutional capacity building processes at governmental Fish Farms in

Kenya and Ethiopia. BOMOSA utilizes a participatory approach to enhance social acceptance of aquaculture products and supports the development of local markets, so that fish production generate maximum benefits at community and regional levels (BOMOSA, 2009).

The renovation of several government fish rearing facilities, the establishment of research programs to determine best practices for pond culture, and an intensive training program for fisheries extension workers and fish farmers has renewed interest in fish farming in Kenya. Lack of technical training has been cited as a major reason for the low output of fish ponds in Kenya (Veverica, Muchiri, Ngugi et al, 2001). Farm production can be increased through putting more land into use or applying new technology. However, given the scarcity of land, application of a new technology remains the best option for increasing farm production. Putting more land into use cannot be the better option because of land scarcity in Kirinyaga County. Applying new technology in fish farming would therefore help increase farm productivity.

The lack of technical know-how was observed at all levels, from the lowest level extension agent through university levels. The training program undertaken by the Africa Project in Kenya seeks to improve training and to provide a cadre of trainers who have extensive practical fish production experience. Knowledge and skills are essential for any meaningful aquaculture. Farmers who have acquired knowledge on fish farming are more likely to adopt it than those who have not acquired the knowledge (Wetengere, 2009). Scarborough (1999) observed that sustainable increases in agricultural productivity could be obtained even with the available land, only through technological and managerial innovations. One of the ways for achieving that goal is to integrate fish farming technology into the existing farming system (Wetengere, 2010). The Africa Project's training program in Kenya seeks to improve training and to provide a cadre of trainers who have extensive practical fish production experience. This activity was originally planned to include training only for university students and Fisheries Officers at all levels, but has been expanded to include farmer training as well. Objectives of the training programme include; to increase the pond management skills of fisheries personnel currently involved in aquaculture extension activities in Kenya

and to enhance the research and extension capabilities of Kenyan university students likely to be employed in the aquaculture sector. A further effect of the training has been the creation of a cadre of individuals experienced in the teaching of pond construction and pond management (Veverica et al, 2001).

A significant percentage of fishers in the lake are young people who have dropped out of school after primary education. Regionally, 63% of fishers have had primary school education but only 22% of the people have secondary education. This shows that fishing communities are becoming more literate which contradicts earlier perceptions. This change is welcome for management in terms of information flow to the fisher communities who are now able to receive, understand and act. The increase in education levels may also reflect that people are currently finding fisheries as the only alternative for earning a living (SEDAWOG 1999b). It is generally hoped that the trickle-down effect of this programme has borne fruit especially among the youth of Sagana area.

2.6 Income Generation in Aquaculture and Youth Economic Empowerment

Income security is one way of youth empowerment. Income security can be defined as a condition of being protected from irregularity of income generation. Fish farming can contribute to offset income irregularities if farmed fish can be sold to generate income on regular basis. The contribution of fish farming is analyzed by assessing the size of income, number of times income is generated and a time period when income is earned relative to other competing activities (Wetengere, 2010). The agricultural sector's human resource base is being eroded not only by malaria and the HIV and AIDS pandemic, but also by the continuous migration of youth from rural to urban areas. This migration is caused by a number of factors such as the drudgery of agricultural work under current agricultural practices and the lack of attractive alternative employment in rural areas. The Government of Kenya hopes to review and produce an appropriate youth development policy that outlines measures to reduce youth migration in order to sustain the agricultural human resource requirement and empower the youth. Being dynamic and energetic, the youth are impatient and need quick and tangible results to be attracted to any business. To attract the youth into

agriculture, attitudes must change among rural communities to perceive it as a business and make it commercially viable (GoK Report, 2010).

Millennium Development Goal Number 1 calls for a reduction of 50% between 1990 and 2015 in the number of people who suffer from extreme hunger and whose income is less than US\$1 per day. The number of people living in poverty is estimated to have risen from 11 million or 48% of the population in Kenya to 17 million or 56% in 2001. Consequently, urban poverty is rising fast. As a result, new strategies for coping with poverty have to be devised to cope with the dire situation (Foeken and Owour 2008).. Aquaculture is one of the government strategies to overcome the rising poverty levels especially among the youth. In a paper published for the Overseas Development Institute, Edwards (2000) supports the view that aquaculture contributes to the livelihoods of the poor through improved food supply, employment and income.

2.7 Conceptual Framework

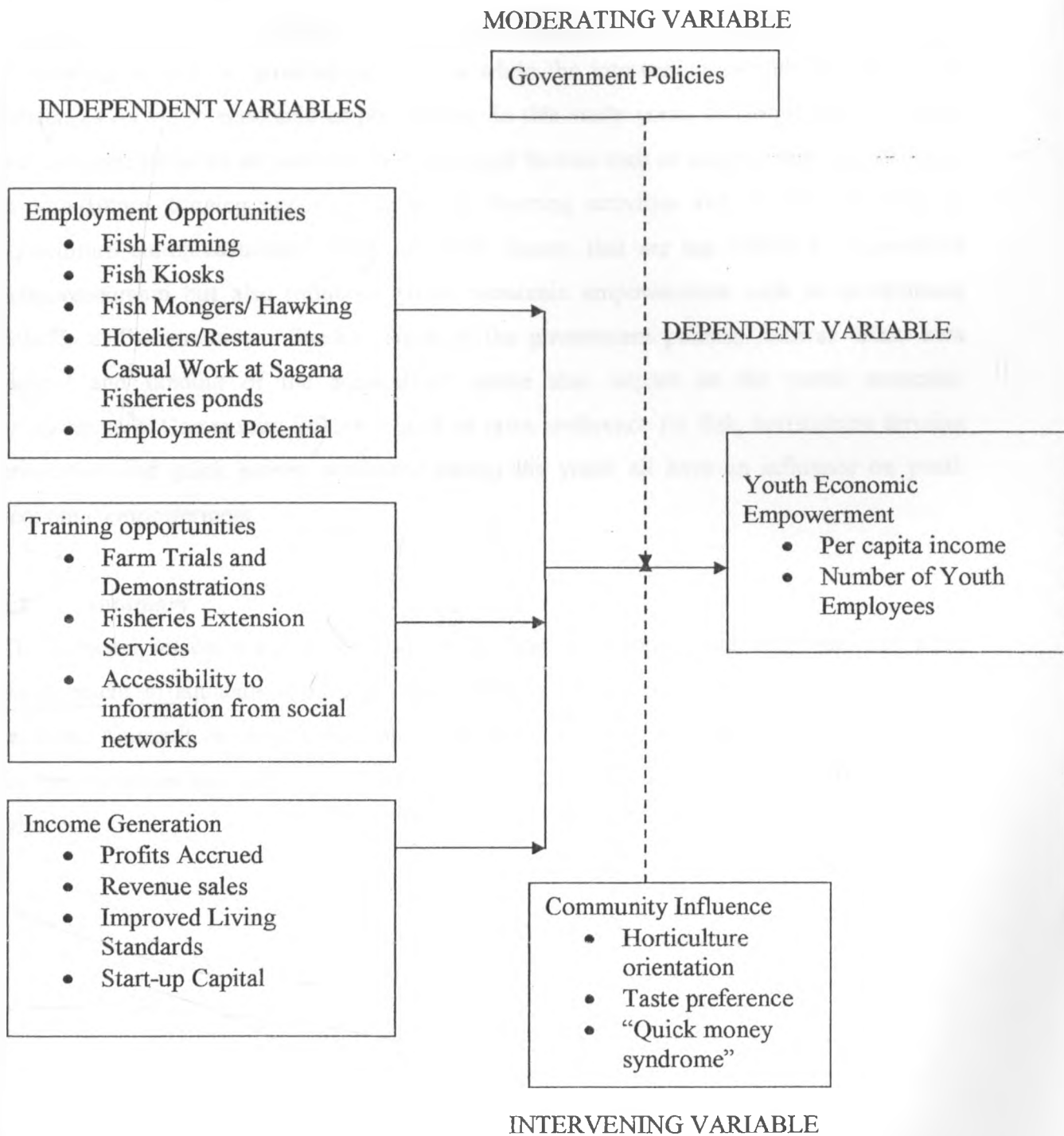


Fig.1: A Diagrammatic Illustration showing Interaction between Employment Opportunities, Training Opportunities and Income Generating Variables and Youth Economic Empowerment in Sagana Fisheries, Kirinyaga County

The conceptual framework is developed to provide clear links of dependent and independent variables as they relate to each other in this research. The independent variables indicate the various aspects of fish farming. The dependent variable is youth economic empowerment. Moderating variable is government policies while the intervening variable is community influences on youth economic empowerment. In this study youth economic empowerment was conceptualized as an outcome of interrelated factors such as employment opportunities in aquaculture, training opportunities in fish farming activities and income generated in aquaculture entrepreneurship. There are other factors that are not related to aquaculture entrepreneurship but also influence youth economic empowerment such as government policies and community influence. Some of the government policies such as “Kazi kwa vijana” and funding of the aquaculture centre also impact on the youth economic empowerment. Community influence such as taste preference for fish, horticulture farming orientation and quick money syndrome among the youth all have an influence on youth economic empowerment.

2.8 Summary

The literature reviewed has shown that the application of appropriate techniques and good management in aquaculture business can result in high yields and a good income. The resultant Aquaculture employment opportunities that arise from such interventions in fish farming activities are analysed. The actual and potential contribution of aquaculture has been addressed.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter outlines the research design and methodology that was used in this study to answer the research questions. It gives details on the research design, target population, the sample and sampling procedure, data collection instruments, data analysis and presentation.

3.2 Research Design

Descriptive survey design was used to examine the role of Sagana aquaculture centre in youth economic empowerment. This design describes events as they are. It facilitates rapid data collection and ability to understand population from a sample. It helps answer the questions of the current and past status of the subject once data is collected (Oso and Onen 2009). Descriptive design allows the researcher to generate both numerical and descriptive data that can be used in measuring the relationship between variables (Orodho, 2004;Kothari, 2003).

3.3 Target Population

The target population interest consisted the youth who were engaged in aquaculture entrepreneurship such as fish farming, fish kiosks, fish mongering, hotels and restaurants and Sagana Fisheries centre. The study targeted a population of 200 with main focus being the youth who formed the majority of the respondents. The scope of the study focused on aquaculture businesses in fish farming and trading activities

3.4 Sampling Procedure

This section describes the procedure used in sampling and gives the sample size of the youth and Sagana Fisheries team.

3.4.1 Sampling Design and Sampling Procedure.

The study utilized both probability and non-probability sampling techniques to create a sampling frame. In probability sampling, stratified sampling was used whereby different categories of stakeholders were included in the survey. In this study the target population was

stratified into the youth engaged in fish farming and trade-related activities and Sagana fisheries team. Having identified the strata, non-probability sampling was used, which included convenient sampling and snowball technique where the respondents were asked to identify other youth they know to have been in aquaculture entrepreneurship in the area. Convenient sampling is a sampling technique that allows a researcher to select cases or units of observation as they become available to the researcher (Mugenda and Mugenda, 2003). For the traders, only those fish traders who were registered by Sagana local authority and were in active trade were included in the research. Snowball technique would help to locate respondents who are difficult to trace. The researcher used social networks to locate such individuals.

Table 3.1: Sampling Frame

Strata	Number
Youth (Fish Farmers and Traders)	150
Sagana Fisheries Centre	50
Total	200

3.4.2 Sample Size

A sample is part of the target population that has been procedurally selected to represent it (Oso and Onen, 2009). According to Cochran (1977), a sample of 30% of the population is sufficient for the study. It is large enough to give adequate information and will be easy to analyze within a short period of time. The researcher will target 33% of the target population. Therefore, a total of 67 respondents, who comprise 33% of the accessible population, will be used.

Table 3.2: Sample Size based on 33% of Target Population

Category/Strata	Number	Population Proportion	Sample Size
Youth (Fish farmers and traders)	150	33%	50
Sagana Fisheries Centre	50	33%	17
Total	200	33%	67

The 67 respondents have been chosen in the ratio 1:3 of the target population.

Yamane (1967) provides a simplified formula to calculate sample sizes which gives a similar sample size of 33% as follows:

$$n = \frac{N}{1+N(e)^2}$$

Where:

n- Sample Size

N-Population Size

e- Level of Precision at 90% Confidence Level

Thus, the sample size will be:

$$n = \frac{200}{1+200(0.1)^2} = 66.6666 \text{ which translates to } 67 \text{ Respondents.}$$

To obtain a sufficient sample size for each stratum, the following proportionate stratification formula by Stattrek (2012) applies:

$$n_h = (N_h/N) * n$$

Where:

n_h - Sample Size for stratum h

N_h - Population Size for stratum h

N-Total Population Size

n-Total Sample Size

Hence, sample size for the Youth will be:

$$n_h = (N_h/N) * n$$

$$n_h = (150/200) * 67 = 50.25$$

Applying the formula to the other strata, the sample size will be as shown in Table 3.3 below.

Table 3.3: Sample Size based on Stattek's Formula

Category	Number	$n_h = (N_h/N) * n$	Sample Size
Youth (Fish farmers and traders)	150	50.25	50
Sagana Fisheries Centre	50	16.75	17
Total	200	67.00	67

The sample will therefore consist of 67 respondents selected from the target population of 200.

3.5 Methods of Data Collection

This study gathered data required to achieve the required objectives. Both primary and secondary data was gathered.

3.5.1 Research Instruments

Data was collected using questionnaires. The questionnaire was appropriate because the targeted respondents were assumed to be literate as well as to ensure uniformity in the way questions were asked. Equally, respondents feel free to answer sensitive questions because they are not required to disclose their identity (Mulusi, 1998) as cited by Mugambi (2006). The questionnaires used both open-ended and close-ended questions. Close-ended questions aimed at collecting quantitative data while open-ended questions provided qualitative data. Three types of questionnaires were used for the Youth (Traders and Fish Farmers) and Sagana Fisheries team. Questionnaires were administered by the researcher and the research assistant. They were dropped and collected later as agreed upon which enabled the

respondents to complete the questionnaires at their convenience hence assuring adequate and accurate information was obtained.

3.5.2 Data Collection Procedure

The researcher collected data over a period of about two months under the guidance of the supervisor. The data collected was then analyzed and presented.

3.6 Pilot Study

The instruments were piloted in Kabaru Fisheries in Kiganjo (Nyeri County). The area was selected because it had similar characteristics with the target population. Piloting was conducted to check the questionnaire content, structure, sequence, meaning and ambiguity of questions. The questionnaire was pre-tested by administering it to a sub-sample of seven respondents, which was 10% of the sample population. According to Mugenda & Mugenda (2003), content validity is determined by a professional or expert. The researcher therefore amended the questions in consultation with the supervisor to ensure they accurately addressed all the possible areas of the study.

3.6.1 Instrument Validity

Validity was measured by content validity test. This ensured that the measures included an adequate and representative set of items which contained the dimension and elements of concepts under study. This was assured through consultations between the researcher and the supervisor. Simple language was used in the research instrument to avoid any ambiguity since explanation given is true test for validity. Making of necessary amendments was then carried out to ensure questions got the right responses.

3.6.2 Instrument Reliability

Reliability is important because it enables the researcher to identify the ambiguities and inadequate items in the research instrument. This was measured through test retest technique where the same test was given to a group of seven respondents in similar characteristics as the actual sample. The tests were repeated after one week interval and scores obtained were correlated to get the coefficient of reliability. A coefficient of 0.8 was obtained which

implied that the instrument was 80% reliable. A coefficient of above 0.8 implies that there is a high degree of reliability of the instrument (Mugenda & Mugenda, 2003). Therefore the instrument was reliable and consistent to answer the research questions of the study. Ambiguous words and irrelevant items were edited to enhance reliability of the instruments.

3.7 Data Analysis

Raw data was first cleaned and scrutinized by ensuring completeness, accuracy and consistency of information with other facts at the point of collection by detecting and addressing the noted errors and omissions. It was then coded in order to reduce the responses to small number of classes. The data was then organized (classified) into different categories based on common characteristics and attributes. The researcher then analyzed the data by use of descriptive statistics of mean, mode and median which was done through use of Statistical package for social sciences (SPSS). The data was finally presented by use of frequency tables and percentages.

3.8 Ethical Issues

The researcher consulted the Executive Secretary, National Council for Science and Technology for authority to collect data. The University of Nairobi, Nyeri Extra Mural Centre, provided the researcher with a letter of approval before proceeding to the Study area for data collection. The researcher also consulted the Head of Centre, Sagana Fisheries and the Clerk to Sagana County Council for permission to collect data from the respondents. Before administering the questionnaire to the respondents, informed consent was obtained by equipping respondents with information on the purpose of the research, assuring them of privacy and confidentiality of all information they would disclose as well as asking them to respond to the questions voluntarily. Those not willing to participate in the study were under no obligation to do so. Participants were not deceived with false promises in order to participate. The researcher ensured that the respondents' names were not indicated anywhere in the data collection tools for confidentiality and also reassured them that information gathered would only be used for the purposes of this study.

3.9 Operationalization of Variables

Objective	Variable	Indicator(s)	Measurement	Level of Scale	Type of Data Analysis
To examine the role of aquaculture entrepreneurs hip in youth economic empowerment	Dependent Variable Youth Economic Empowerment	Improved Lifestyles Per Capita Income Potential/ sustainability of Aquaculture	No. of employees Monthly income	Interval	Mean Mode Median
To assess the extent to which employment opportunities in aquaculture influence youth economic empowerment in Sagana Fisheries.	Independent Variables Employment opportunities	No. of employees in Fish farming, Fish kiosks, Fish Mongering, Hoteliers, Casual labour in Fisheries and ponds	No. of employees	Ordinal	Mean Mode Median
To examine the contribution of training opportunities in fish farming on youth economic empowerment in Sagana Fisheries	Training Opportunities	Qualification of the Entrepreneur Farm trials and demonstrations Accessibility to information	Grades Frequency of farm trials and Demonstrations	Nominal	Mean Mode Median
To investigate the extent to which aquaculture generated	Income Generation	Monthly income Availability of credit Profits	Revenue sales Loans borrowed Profits	Ordinal	Mean Mode Median

income influences youth economic empowerment in Sagana Fisheries.	Moderating Variable Government Policies	Availability of government laws	Availability of government laws	Nominal	Mode Mean
	Intervening Variable Community influence	Willingness to raise farmed fish Preference for other activities Quick cash syndrome	Level of risk taking	Interval	Mode Mean

3.10 Summary

In this study a descriptive survey research design was used. Stratified sampling was done in order to give every respondent an equal chance of being selected. Questionnaires were used as the instruments of data collection, which were pre-tested to assure their validity and reliability. The raw data collected was processed and then analyzed by the use of descriptive statistics using Statistical Package for Social Sciences (SPSS).

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents the summary of the analyzed data. The results are presented based on the objectives of the study, which aimed at examining the role of Aquaculture entrepreneurship on youth economic empowerment in Sagana fisheries in Kirinyaga County. The findings were first organized under quantitative and qualitative results and then organized under the following categories: demographic, employment opportunities in aquaculture, income generation and training opportunities in aquaculture in relation to youth economic empowerment process. The data was analyzed using descriptive statistics with the help of statistical package for social sciences. The analyzed data is presented using frequency tables and graphs.

4.2 Response Rate

Out of the sample of 67 questionnaires, 60 duly completed questionnaires were returned. In particular, 40 questionnaires were obtained from the youth fish-farmers and traders and 20 from Sagana fisheries team. This constituted 89.5% return rate which was considered high enough to proceed with data tabulation, coding, analysis and presentation. A return rate above 50% is considered good for a study according to Peil (1995).

4.3 Demographic Information of the youth engaged in Aquaculture Enterprises

4.3.1 Age

Table 4.1 indicates that a large proportion (60%) of the youth surveyed was aged between 21 to 30 years while 30% were between 31 to 40 years of age and 10% between 41 and 50 years of age. The results also show that none of the respondents involved in aquaculture enterprises were below 20 years or over 50 years of age.

Table 4.1: Ages of the Respondents

Age Group	Number	Percentage
<20 Years	0	0
21-30 Years	36	60
31-40 Years	18	30
31-40 Years	18	30
41-50 Years	6	10
>50 Years	0	0
Total	60	100

The high number of youth in the 21-30 age groups could be a result of the high rate of unemployment in the formal sector. Majority of the educated youth cannot secure employment in this sector despite the high level of education and qualification because the rate of job creation does not tally with the number of youth leaving schools and colleges every year. This is in line with (KPIA2009) findings, that almost one in three of Kenya's poor population was between 15-29 years of age. This situation can be further explained by the fact that those below 20 years cannot afford the start-up capital due to lack of collateral required in securing bank loans while those above 50 years may have passed over the business to their children or grown old with little enthusiasm to do aquaculture related businesses.

4.3.2 Gender Distribution

The study examined the gender distribution between males and females engaged in the aquaculture enterprises. The results revealed that 70% of the respondents were males while 30% were females.

Table 4.2: Gender Distribution of the Youth

Gender	Number	Percentage
Males	42	70
Females	18	30
Total	60	100

Most of the males were married and heads of households. They have turned to aquaculture businesses as a means of earning livelihood. In this region, young boys and married men are socialized and grow up to believe that men are the bread winners thus the high number of youthful men in the fish farming and trading activities. On the other hand, women especially the married have extra duty of having to both run a business and also undertake domestic chores. This reduces the participation of women in aquaculture entrepreneurship.

4.3.3 Education and Professional Skills

It was considered necessary to find out the level of education attained, on average, by the youth engaged in aquaculture related businesses.

Table 4.3: Level of Education Attained

Level	Number	Percentage
Primary	3	5
Secondary	38	63
Tertiary	12	20
University	7	12
Total	60	100

Table 4.3 shows that only 5% of the respondents had attained primary level of education while the highest number of youth engaged in aquaculture entrepreneurship (65%), were educated to secondary school level. On the same vein, 20% had tertiary level of education while 10% had university education. This concludes that the majority of the youth entrepreneurs in aquaculture businesses in the country are secondary school leavers who may not be trained in any form of skill. The university graduates are given casual labour at the fisheries to supervise other casuals in various operations.

4.4 Employment Opportunities in Aquaculture Entrepreneurship

The study set out to find the average number youth workers engaged in aquaculture entrepreneurship. The findings revealed that the youth are involved in fish farming, fish mongering as well as running kiosks. The results also indicated that the youth are employed in hotels and restaurants where fish is sold. Apart from being a centre for farm trials and demonstrations, Sagana Fisheries is also a source of casual labour for the youth in this area.

Table 4.4: Number of Youth Employed in Aquaculture Enterprises

Cluster	Number	Percentage
Fish Farmers	13	22
Fish Mongers	23	38
Hoteliers/Restaurants	6	10
Casual workers at the Fisheries	18	30
Total	60	100

The results indicate that majority 38% of the respondents are engaged in fish mongering. This group of the youth sells fish to passersby. It does not require heavy capital investment to start hence it attracts most of the young people. However, 30% were engaged in some activities within the fisheries in each month. The centre serves as a major source of employment for the otherwise unemployed youth in Kirinyaga County. This group of the youth is engaged in dredging the canals, feeding and catching fish, fishponds' caretakers among other tasks which do not require skilled labour.

4.4.1 Employment Potential in Aquaculture Entrepreneurship

The study further sought to assess whether the present aquaculture entrepreneurs would encourage and recommend other people to enter into the business. The outcome of their responses was as shown below.

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Table 4.5: Employment Potential in Aquaculture Entrepreneurship

Response	Number	Percentage
Yes	39	65
No	21	35
Total	60	100

Table 4.5 indicates that 65% of the respondents would recommend others to venture into the fish-farming and other related businesses. However, 35% indicated they would not. This shows that the youth entrepreneurs in aquaculture business are satisfied that apart from earning extra income they are occupied instead of being idle.

4.5 Training Opportunities in Aquaculture

4.5.1 Technical Skills Required to Run Aquaculture Enterprises

The study intended to find out whether the entrepreneurs had the prerequisite technical skills and abilities to professionally and profitability run the aquaculture related businesses. The findings revealed that only 2% admitted that they possessed the technical skills in fish-farming and 10% somehow had some basic skills while the 88% majority had no training in aquaculture entrepreneurial skills.

Table 4.6: Possession of Skills required to Run Aquaculture Enterprises

Response	Number	Percentage
Yes	51	88
Somehow	6	10
No	3	2
Total	60	100

The level of entrepreneurial activity is low possibly due to inadequate dissemination of extension services and poor accessibility of information in aquaculture entrepreneurship.

4.5.2 Methods of Acquiring Knowledge and Skills

The study also sought to examine the methods which farmers and traders used to acquire knowledge and skills in aquaculture businesses. The results indicated that 32% of the aquaculture entrepreneurs obtained information from the media while over 10% accessed vital information from training courses, literature, social network and non governmental organizations. The other sources were of little importance to fish farmers and traders.

Table 4.7: Methods of Acquiring Knowledge and Skills

Response	Number	Percentage
Attend Farm Trials & Training Courses	8	13
Read Literature	9	15
Information from N.G.Os	11	18
Social Network	7	12
Local Authority	4	7
Media	19	32
Information from Family	2	3
Total	60	100

Table 4.7 shows that learning from regular radio and television programmes was considered to be of great importance in regard to training and empowering the fish farmers and traders. The poor accessibility to information in aquaculture entrepreneurship is a major constraint hindering growth and expansion of aquaculture enterprises in this region.

4.6 Aquaculture Enterprise as the Main Source of Income

The study aimed at determining whether the existing fish-farmers and traders relied mainly on their business as the prime source of their livelihood. The results indicated that

aquaculture enterprise was not the main source of income for about 85% of the youth while 15% depended on aquaculture as the main source of income.

Table 4.8: Aquaculture Enterprise as the Main Source of Income

Response	Number	Percentage
Yes	9	15
No	51	85
Total	60	100

This implies that fish farming and trading activities was not a serious business to many youth in Kirinyaga County. Aquaculture is practiced as a part time activity by majority of the farmers to earn extra income. This is in agreement with the findings of Mbugua (2008) that farmers in suitable areas across the country are again turning to fish farming as a way of earning extra income.

4.6.1 Profitability of Aquaculture Business

In a business environment, the focus is on the profits made in relation to the amount of investment made and expectations of the entrepreneur. The respondents were asked whether the aquaculture enterprise was profitable.

Table 4.9: Aquaculture as a Profitable Venture

Response	Number	Percentage
Yes	40	67
No	20	33
Total	60	100

The findings show that 67% of the respondents considered aquaculture entrepreneurship as a profitable venture while on the contrary, 33% indicated it was a loss making enterprise. Fish farming provides extra income to majority of the farmers. This may be attributed to the fact that people in this region are changing their cultural attitude towards fish farming as well as taste preference for fish. Majority of the respondents agreed that rearing of fish in ponds is stress free hence it can be carried out alongside other economic activities. This concurs with Edwards (2000), who supports the view that aquaculture contributes to the livelihoods of the poor through creation of employment and income generation.

4.6.2 Source of Enterprise Financing

The study examined the sources of business finance used to start and sustain aquaculture enterprises. From the data, 7% of the respondents indicated that their major source of capital was own saved money, 20% drew finances from other enterprises, 35% from Bank loans and 28% from the Government support for fish farming. In addition, 10% indicated that Saccos provided the bulk of the initial capital.

Table 4.10: Main Source of Start-up Capital

Sources	Number	Percentage
Own Money	4	7
From other business	12	20
Bank Loan	21	35
Government Support	17	28
Saccos	6	10
Total	60	100

Majority of secondary school leavers cannot secure jobs in the formal sector of employment. They lack skills and training which are required for placement in this sector. Moreover, youth entrepreneurs have difficulties financing the start up and growth of their business because of lack of collateral, for example, title deeds which serve as security for bank loans. The terms

and conditions for borrowing loans tend to be prohibitive and very costly for the youth. This is because of the fact that the youth have limited land ownership which restricts their access to credit. This explains why majority of the youth suggested that inadequate financial support is a major hindrance to expansion of their businesses.

4.6.3 Improved Life-styles

It was considered necessary to establish the opinion of the aquaculture entrepreneurs regarding whether their livelihood improved after entering into the aquaculture business. This in turn would help to determine the role played by the business in empowering the youth economically.

Table 4.11: Improved Life-styles

Comment	Number	Percentage
Yes	15	25
Somehow	29	48
No	16	27
Total	60	100

According to Table 4.11, varied opinions were observed. Those who indicated that their livelihood improved were 25%, and those who stated somehow were 48% while those who stated that their livelihood did not improve were 27%. Majority of the aquaculture entrepreneurs were of the opinion that their lifestyles had improved despite the feeling that the change was minimal. Thus, aquaculture entrepreneurship has contributed to economic empowerment of the youth in Kirinyaga County.

4.7 Summary

The findings indicate that the youth are employed in fish farms, fish mongering, kiosks, hotels and restaurants. Aquaculture enterprises offer employment to many youth in Kirinyaga County. The results also show that the present aquaculture entrepreneurs would encourage and recommend other people to enter into the business. Fish farming provides extra income to majority of the farmers. Majority of the aquaculture entrepreneurs concurred that their livelihood improved after entering into the aquaculture business. Majority of the respondents agreed that rearing of fish in ponds is stress free hence it can be carried out alongside other economic activities. The findings also indicate that inadequate financial support is a major hindrance to expansion of aquaculture businesses.

CHAPTER FIVE
SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND
RECOMMENDATIONS

5.1 Introduction

The study aimed at examining the role of aquaculture entrepreneurship in youth economic empowerment in Sagana Fisheries in Kirinyaga County. This chapter therefore highlights the research outcomes under various headings that includes summary of major findings, conclusions drawn and recommendations derived from the study. The findings and conclusions are drawn in line with the specific objectives of the study. Finally are suggestions for further research

5.2 Summary of the Findings

5.2.1 Employment Opportunities and Youth Economic Empowerment.

The results of the study indicated that aquaculture entrepreneurship provides employment to the youth in form of fish farming, fish mongering, kiosks and casual labour in Sagana fisheries. The study found out that the entrepreneurs did not give up other economic activities to venture into aquaculture business. The study further found out that the enterprises were profitable and the farmers would recommend others to join into the fish farming business. To a significant level, fish related businesses improved the livelihood of the farmers.

5.2.2 Training Opportunities in Aquaculture on Youth Economic Empowerment

The study results indicated that most of the fish-farmers did not have technical skills (training) in the field of fish-farming. The study found that attending training sessions was considered an important method of imparting skills to the farmers. In addition the media, reading relevant literature, and obtaining professional information from NGO's were considered an important method of imparting skills to the fish farmers.

5.2.3 Income Generation in Aquaculture Entrepreneurship

The study found out that fish farming was not the major source of income to many despite having supplemented their income and protein sources. The findings show that 67% of the respondents considered aquaculture entrepreneurship as a profitable venture while on the

contrary, 33% indicated it was a loss making enterprise. Fish farming provides extra income to majority of the farmers.

5.3 Discussion of the Findings

The findings revealed that the youth are involved in fish farming, fish mongering as well as running kiosks as their daily occupation. The results also indicated that the youth are employed in hotels and restaurants where fish is sold. Apart from being a centre for farm trials and demonstrations, Sagana Fisheries is also a source of casual labour for the youth in this area. This concurs with Mbugua (2008) findings, that farmers in suitable areas across the country are again turning to fish farming as a source of employment. The study revealed that 65% of the respondents indicated that they would recommend others to venture into the fish-farming business thus confirming that aquaculture entrepreneurship influenced their lives positively. It can therefore be seen as an alternative means of livelihood for majority of the unemployed youth.

The results clearly indicate that most of the fish-farmers (88%) did not have technical skills (training) in the field of fish-farming hence attending training sessions and frequent visits by extension officers were considered as important methods of imparting skills to the farmers. It is important to continuously provide fish farmers with technical skills to enhance their capacity building effort. The study carried out by Rousan (2007) showed that attitude towards change, educational level, farm income, farmers exposure, income level are the important socio-economic factors influencing adoption of farm innovations. Relevant information on marketing strategies would also help aquaculture entrepreneurs sell their products locally and abroad. Information is power when utilized for the right purpose and empowers an individual to make informed and timely decisions. It enables the seller to improve quality of products so as to have added advantage over his competitors. Inaccessibility to such information and lack of know-how render aquaculture entrepreneurs incapable of making an edge for themselves in the wider market and hence lose out on potential customers. To attract the youth into agriculture, attitudes must change among rural communities to perceive it as a business and make it commercially viable (GoK Report, 2010). Fish farming should be benchmarked with the best practices outside the county where

a lot of fish are harvested per pond. Research should be enhanced to find out the best fish species that gives the highest level of output. The community should be sensitized about the importance of fish as an alternative source of protein and be encouraged to eat more fish. This would increase local market for fish.

The study indicates that fish farming is not the major source of income to many despite having supplemented their income and protein sources. The findings show that 85% of the youth indicated that aquaculture enterprise was not their main source of income. To venture into the business, the study found that the entrepreneurs did not give up other economic activities and the owners largely run the enterprises although with assistance mostly from the spouses. Majority of the youth are engaged in other businesses such as horticulture and dairy farming. This is in line with Mbugua (2008) findings that many fish farmers are engaging in fish farming as a viable source of income and daily livelihood.

5.4 Conclusions

Based on the findings of the study, it is observed that majority of the aquaculture entrepreneurs engaged in fish farming and related business activities improved their livelihood and the study therefore concludes that aquaculture is a source of employment and a profitable venture in the area. The demand for fish was considered high and that is why majority of the youth entrepreneurs were ready to recommend others to join them in this business.

Secondly, majority of the fish farmers and traders felt that they did not possess adequate technical skills required in the fish industry. Attending farm demonstrations and training courses was considered as an important method of acquiring skills. Therefore, youth entrepreneurs lacked support service not only in farm demonstrations and fish farming but also in entrepreneurial training and marketing.

Thirdly, the study concludes that alternative sources of income existed and fish farming was therefore not the major source of income to many despite having supplemented their income and protein sources. This is attributed to various constraints that hinder the development of

aquaculture enterprises which include limited access to finance, technical support and other interventions such as government requirements and cultural traditions and practices which are not conducive to fish farming and related business activities in this region. However, the aquaculture entrepreneurs are ambitious and optimistic that their businesses will grow despite these challenges.

5.5 Recommendations

In order to enhance youth economic empowerment through aquaculture entrepreneurship in Kirinyaga County, a number of recommendations have been developed based on the conclusions.

1. It is observed that there cannot be economic development without participation of the youth. This is an important segment of the population and vital in driving forward the economy of the country. To address the problem of unemployment among the youth, the government and donors should create conducive business environment for the youth by providing supportive infrastructure and capital to start and run aquaculture operations. The youth should be made aware of the business opportunities in aquaculture entrepreneurship instead of relying on business ventures in horticulture, dairy farming or hawking. A feasibility study should be undertaken to establish whether a fish processing unit would add value to the fish-business chain.
2. The project management teams and donors should benchmark fish farming with the best practices outside the county where a lot of fish are harvested per pond. Research should be enhanced by the government to find out the best fish species that gives the highest level of output. The community should also be sensitized about the importance of fish as an alternative source of protein and be encouraged to eat more fish. In addition, regular forums and capacity building workshops should be undertaken by the government and donors to provide the fish farmers and traders with skills and competencies to run their aquaculture businesses professionally. Open farm trials and demonstrations should be encouraged to keep the farmers and traders updated on the business.

3. In order to make aquaculture a more viable source of income, access to credit to expand the aquaculture business ventures should be enhanced by the government and other development partners. Aquaculture entrepreneurs should be encouraged to form business associations in form of Saccos or self-help groups to share ideas, experiences and suggestions. It is through such forums that the Government, donors, NGOs and supporting organizations can be able to meet and address needs of the youth and some of the emerging challenges experienced by the entrepreneurs. There is need to formulate better and more appropriate methods of accessing credit, repayment procedures and provision of technical personnel. Inadequate finances may be solved through resource mobilization and seeking additional cheaper loans from the Youth Fund, Innovation Fund for Agriculture and Agribusiness or Economic Stimulus Programmes, which charges the lowest interest rates. Commercial banks should identify youth aquaculture entrepreneurs as potential business customers and market their services widely. They should make loans affordable to the youth. Similarly, efforts should be made to reduce the cost of operating the fish ponds so that break-even level would be surpassed. The fish mongers should be supported by the local authorities in setting up stalls from where they can comfortably run their businesses.

5.6 Suggestions for Further Research

Based on the results of the study, this research suggests further research on the following areas:

1. To investigate the factors affecting the growth of aquaculture entrepreneurship in other areas in Kenya.
2. To assess the impact of the quick-cash syndrome among the youth on the growth of aquaculture entrepreneurship.
3. To investigate the impact of the economic stimulus programme on the growth of aquaculture entrepreneurship.
4. To evaluate the challenges facing government's efforts to establish fish farming projects in the rural areas.

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APPENDIX 1: LETTER OF INTRODUCTION

Date:

JOSEPH MWENDA MANDANIA
P.O. BOX 41-10101
KARATINA
EMAIL: mandaniajoseph@yahoo.com

Dear Respondent,

I am a Postgraduate student at the University of Nairobi, pursuing a Masters degree in Project Planning and Management. As part of partial fulfillment for the degree I am conducting a research study on: The Role of Aquaculture Entrepreneurship on Youth Economic Empowerment, Sagana Fisheries, Kirinyaga County.

For this reason I would appreciate if you would kindly spare a few minutes of your time to answer the following questions in regard to Aquaculture and Youth Empowerment in Sagana Township. The information you give will be treated with confidentiality and in no instance will your name be mentioned in this research. In addition, the information will not be used for any other purpose other than for this research

Your assistance and co-operation will be highly appreciated.

Thank you in advance.

Yours Faithfully

Mwenda Joseph
Reg. L50/66850/2010

APPENDIX 2: INFORMED CONSENT FORM

Mwenda Joseph,
P.O Box 41
Karatina

Dear Respondent,

RE: ACOUISITION OF CONSENT FROM PARTICIPANTS

I am a final year student pursuing a degree in Master of Arts in Project Planning and Management at the University of Nairobi. This questionnaire is aimed at examining the role played by Sagana Aquaculture Centre in youth empowerment within Sagana Township. In this regard, please take some time to complete this questionnaire.

Your accurate and frank response will be highly appreciated. You do not need to write your name or your business identity in this questionnaire. All information will be treated with confidentiality. The findings of this study will be used only for research purposes.

Thank you for your co-operation.

Yours faithfully,

Mwenda Joseph
Reg. L50/66850/2010

Witness

Name.....

Sign.....

APPENDIX 3: LETTER OF INTRODUCTION

Mwenda Joseph,

P.O. Box 41,

Karatina

Date.....

The Town Clerk

Sagana Town Council

Dear Sir/Madam,

RE: DATA COLLECTION AUTHORITY

I am a final year student pursuing a degree in Master of Arts in Project Planning and Management at the University of Nairobi. I am undertaking a research aimed at examining the role played by Sagana Aquaculture Centre in youth empowerment within Sagana Township.

In this regard, please grant me permission to collect the required data from Sagana Town Council staff and the people involved in fish business related activities. All information will be treated with confidentiality. The findings of this study will be used only for research purposes.

Your assistance in this case will be highly appreciated.

Thank you.

Yours Faithfully,

Mwenda Joseph

Reg. L50/66850/2010

APPENDIX 4: LETTER OF INTRODUCTION

Mwenda Joseph,

P.o Box 41,

Karatina

Date.....

The Head of Centre,

Sagana Aquaculture Centre.

Dear Sir/ Madam,

RE: DATA COLLECTION AUTHORITY

I am a final year student pursuing a degree in Master of Arts in Project Planning and Management at the University of Nairobi. I am undertaking a research aimed at examining the role played by Sagana Aquaculture Centre in youth empowerment within Sagana Township.

In this regard, please grant me permission to collect the required data from your staff and employees. All information will be treated with confidentiality. The findings of this study will be used only for research purposes.

Your assistance in this case will be highly appreciated.

Yours Faithfully,

Mwenda Joseph

Reg. L50/66850/2010



UNIVERSITY OF NAIROBI
COLLEGE OF EDUCATION AND EXTERNAL STUDIES
SCHOOL OF CONTINUING AND DISTANCE EDUCATION
DEPARTMENT OF EXTRA MURAL STUDIES
P O Box 598 - NYERI : Tel : 061-2030460

7June 2012

TO WHOM IT MAY CONCERN .

SUBJECT : CONFIRMATION LETTER
JOSEPH MWENDA MANDANIA - REG. NO.L50/66850/2010

This is to confirm that the above named is a bona fide student of University of Nairobi pursuing a **Master of Arts Degree in Project Planning and Management - in the School of Continuing and Distance Education – Department of Extra Mural Studies.**

He has completed course work and is currently writing the **Research Project** which is a requirement for the award of the **Masters Degree.**

His topic is *"Role of Aquaculture Entrepreneurship in Youth Economic Empowerment in Sagana Fisheries, Kirinyaga County, Kenya"*.

Any assistance accorded to him will be highly appreciated.

UNIVERSITY OF NAIROBI
C. E. E. S. F. E. S. D. E. M. S.
NYERI & MT. KENYA AREA
P. O. BOX 598, NYERI TEL 2148

Dr. L. Otieno - Omutoko
RESIDENT LECTURER
NYERI & MT. KENYA REGION

MINISTRY OF FISHERIES DEVELOPMENT

TEL: +254 -202042391
E-mail: nardtc@gmail.com

When replying please quote

Ref: FISH/SAG/REP/4/6
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For:

Please address your reply to
AG.DIRECTOR



NATIONAL AQUACULTURE RESEARCH
DEVELOPMENT & TRAINING CENTRE
P.O. BOX 26
SAGANA
KENYA


11th July, 2012

Mwenda Joseph
P. O. Box 41
KARATINA

RE: DATA COLLECTION

This is to inform you that your request to collect data at National Aquaculture Research Development & Training Centre has been accepted.

You are therefore free to report as soon as possible to carry out activities related to your data collection.


Dr. Harrison Charo
AG.DIRECTOR

REPUBLIC OF KENYA



NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telephone: 254-020-2213471, 2241349

254-020-310571, 2213123, 2219420

Fax: 254-020-318245, 318249

When replying please quote

secretary@ncst.go.ke

P.O. Box 30623-00100

NAIROBI-KENYA

Website: www.ncst.go.ke

NCST/RCD/14/012/939

6th July 2012

Our Ref:

Date:

Joseph Mwenda Mandania
University of Nairobi
P.O. Box 30197
Nairobi

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Role of aquaculture enterprenuership in youth economic empowerment in Sagana fisheries, Kirinyaga County, Kenya*" I am pleased to inform you that you have been authorized to undertake research in Kirinyaga County for a period ending 31st August 2012.

You are advised to report to the District Commissioners and the District Education Officers, Kirinyaga County before embarking on the research project.

On completion of the research, you are expected to submit two hard copies and one soft copy in pdf of the research report/thesis to our office.


DR. M. K. RUGUTT, PhD, HSC.
DEPUTY COUNCIL SECRETARY

For: DISTRICT EDUCATION OFFICER
KIRINYAGA WEST.
DATE: 23/07/2012

Copy to:
District Commissioners
District Education Officers
Kirinyaga County

DISTRICT COMMISSIONER
KIRINYAGA WEST
23/07/2012

APPENDIX: 8 QUESTIONNAIRE FOR FISH MONGERS/TRADERS

INSTRUCTIONS

The purpose of this questionnaire is to collect data on the role of aquaculture entrepreneurship in youth economic empowerment in Sagana Fisheries in Kirinyaga County. The information provided through this questionnaire will be purely and exclusively for academic purpose and will be treated with top most confidentiality. There is no right or wrong answers. All answers will be considered right and you need not write your name. Please feel free to give your answers. Your co-operation and assistance will be highly appreciated. Please tick in the spaces provided.

SECTION A: BACKGROUND INFORMATION

- (1) Gender Male () Female ()
- (2) Head of the household Yes () No ()
- (3) Age group
- 20 years and below () 21-30 years ()
- 31-40 years () 41-50 years ()
- Above 50 years ()
- (4) Marital Status: Married () Single ()
- (5) Family Size: Below 3 () 3 -5 () Over 5 ()
- (6) What is your highest level of Education?
- Primary () Secondary () Tertiary () University ()

SECTION B: OCCUPATION/EMPLOYMENT

(7) Regarding the trade in fish, who is in charge of the following activities?

Activity	Father	Mother	Children	Hired	Others specify	How long it takes per day (Hours/Minutes)
Selling fish						
Packing the fish						
Taking to other markets						
Others: specify						

(8) How many hired workers do you engage in fish trading activities?

- One () 2-3 workers () Over 3 workers ()

(9) How much is a hired worker paid daily?

Below Ksh 200 () Ksh 200-500 () Above Ksh 500 ()

(10) For how long have you been trading in fish?

Less than 1 year () 2-5 years ()

6-10 years () More than 10 years ()

(11) Which of the following is/are reasons why you practice the trade in fish? Please indicate by ticking:

Reason	
The buying price is affordable	
It's easy to manage	
Provides money for family needs	
Provides meat for domestic consumption	
Others (specify)	

(12) Which other economic activities do you practice?

.....
.....

(13) In your own opinion, are there advantages of trading in fish over other economic activities?

Yes () No ()

(14) If yes, which ones?

(15) Do you employ anyone to assist you?

Yes () No ()

(16) If yes, how many people?

1-3 () 4-5 () More than 5 ()

SECTION C: INCOME

(17) To whom do you sell the fish?

Hotels () Individuals ()

(18) What motivates you to sell the fish?

To buy food () School fees () medical care ()

Others, specify

(19) Indicate by a tick the range of income obtained (per month) from the sale of fish:

Below Ksh 1000 ()

Ksh 1000-3000 ()

Ksh 4000-6000 ()

Above 6000 ()

(20) Has income from fish farming changed the standards of living of your household?

Yes () No ()

(21) If yes, put a tick against each item and indicate if the change is positive or negative

	Tick	Positive or negative
Household's daily expenditure		
School fees		
Medical care		
Home structure		
Savings		

SECTION D: GOVERNMENT POLICY

(22) Indicate your level of agreement with the following statement regarding government policy on fish farming

	Strongly agree	Agree	Disagree	Strongly disagree
We have enough storage facilities				
The market conditions for our fish are properly organized				
We have enough roads linking the fish farms and market				
We have regular visits by Health officers				
The government offers loans to fish traders				

(23) What other assistance do you require from the government to improve your trade in fish?

Thank you for your assistance.

APPENDIX: 9 QUESTIONNAIRE FOR FISH FARMERS

Title: Role of Aquaculture Entrepreneurship in Youth Economic Empowerment in Sagana Fisheries, Kirinyaga County.

I am currently undertaking a study to examine the role of aquaculture entrepreneurship in youth economic empowerment in Sagana Fisheries, Kirinyaga County. Apart from regular fishing and other socio-economic benefits, fish farming can contribute to the job creation, provide income for the families and ensure food security for the community around Kirinyaga County.

Please take a few minutes to answer the following questions as honestly as possible. Please tick where it is appropriate or answer the question according to the given instructions.

1. What age group are you in?

- 20Yrs and below 21-30 31-40
 41-50 Above 50Yrs

2. Are you Male or Female?

3. What is your highest level of education?

- Primary Secondary Tertiary University
 Other (please specify).....

4. What is your marital status?

- Single Married Other

5. How many children do you have?

6. How many others do you directly support?

7. Is fish farming your main source of income?

- Yes No

If not, please state if you have other sources of income apart from fish farming.

8. What is your involvement in the fish farming?

- Run the operations by myself My spouse assists me
 I have employed people to look after the fish farm

9. Did you have to give up another business to start your fish farm?

- Yes No

10. How did you raise money to start your fish farm?

- Own money Bank loan Cooperative – microcredit scheme)
 Government support Other (please specify)

11. What is your objective for doing fish farming?

- Own consumption To sell to customers locally and for export

Own consumption and to sell

12. Which two main species do you deal with on your fish farm?

a..... b.....

13. At what level of the fish farming are you involved in?

Supplier of seed Supplier of fingerlings

Farming fingerlings to maturity

14. Which method of fish farming do you use?

Cage Ponds Tanks

15. If you use the pond method, is the land on which you do your fish farming,

Own land? Leased?

16. How long have you been involved in farming fish?

0-5 years 6-10 years 10+ years

17. How much fish catch in a month?

18. How do you set the price for the fish that you sell?

Prevailing market prices i.e. there is general agreement from farmers on fish prices

Arbitrary Other (please specify)

19. In your opinion, the demand for fish in your area compared to your catch is

Very high High Moderate Low Very low

20. On average, how much income do you generate from sales every month?

21. Are you aware of the spending patterns of your customers?

Yes No

22. Do some customers buy on credit or always pay cash?

Credit Cash

23. Do you consider fish farming to be a profitable business i.e. is the income generated enough to meet you and your family's monthly monetary requirements?

Yes No

24. What is the size of your pond?

25. Is fish farming a seasonal or all year round activity?

26. Is credit readily accessible from creditors?

Yes No

27. Are the fingerlings/seed readily available?

Yes No

28. Do you have enough technical information to successfully take care of your fish farm?

Yes No

29. Would you recommend fish farming to other members of the community who are not yet involved in fish farming?

Yes No

If no, why not?

30. What are the extents of some of the challenges you face as a fish farmer? Please tick

Issue	not a problem	minor problem	some problem	Major problem
Lack of finance				
Acquiring land on which to farm				
Farming inputs				
Technical support from government/local authorities				
Pollution				
Environmental/Climate change				

31. How can the authorities assist you in overcoming these challenges?

.....

32. Does the government/ local authorities provide any support to fish farmers in the area?

Yes No

If so, what kind of support do they provide?

Monetary (credit) Technical advice (extension services) Market to sell fish

Other (specify).....

33. How do you acquire knowledge and learn new things about fish farming?

	Not at all important	A little important	Some importance	Important	Extremely important
Attend training courses					
Read relevant literature					
Information from NGO's					
Information from family					
Information from wider social network					
Information from local authorities					
Radio/TV					

34. Are you aware of the laws governing fish farming in your area?

- Yes No

35. Do you feel well informed about the future of fish farming?

- Yes No

36. If not, state your reason

- No resources to read from
 Not literate
 Not computer literate
 Resources not readily available in area
 Lack of support from government

Thank you for your assistance

APPENDIX: 10 QUESTIONNAIRE FOR SAGANA FISHERIES TEAM

INSTRUCTIONS

The purpose of this questionnaire is to collect data on the role of aquaculture entrepreneurship in youth economic empowerment in Sagana Fisheries in Kirinyaga County. The information provided through this questionnaire will be purely and exclusively for academic purpose and will be treated with top most confidentiality. There is no right or wrong answers. All answers will be considered right and you need not write your name. Please feel free to give your answers. Your co-operation and assistance will be highly appreciated. Please tick in the spaces provided.

SECTION A: BACKGROUND INFORMATION

- i) Gender: Male Female
- ii) Age
 - a) Below 20 years b) 21-30 years c) 31-40 years
 - d) 41-50 years e) Over 50 years
- iii) Marital Status
 - a) Married b) Single c) Other.....
- iv) Family size
 - a) Less than 3 b) Between 3 and 5 c) More than 5
- v) Religion
 - a) Christianity b) Islam c) Other (Specify).....
- vi) Highest level of education attained
 - a) Primary b) Secondary
 - (c) Tertiary d) University
 - (f) Others (please specify).....

B: GENERAL INFORMATION

1. (a) How many ponds are found within Sagana Aquaculture Centre?

.....

(b) What is the approximate area under water within the Centre?

.....

2. (a) What species of fish do you culture in your ponds?

.....

.....
(b) Please state the reason for the choice of the preferred species.
.....

3. (a) How much do you catch in a month?
.....

(b) How many fish do you take out of your ponds on each occasion?

Below 50 () 50-100 () 100-150 () Above 150 ()

4. (a) How frequently do you take fish out of your ponds?

Daily () Weekly () Fortnightly () Monthly ()

Other, please specify.....

(b) How do you set the price for the fish that you sell?

Prevailing market prices Arbitrary Other Specify

5. Does the water source normally supply enough water to permit you to practice fish farming all year round?

Yes () No ()

If not, state the effect of water shortage on fish farming activities.
.....

C: ROLE OF SAGANA AQUACULTURE CENTRE

6. For how long have you been working at the Sagana Aquaculture Centre.

0-5 years 6-10 years Above 10 years

7. Specify the nature of work you do at Sagana Fisheries.
.....
.....

8. To what extent does your job meet your basic requirements?

Tick your opinion on a scale of 1-4, where 1=Very High; 2=High; 3=Low; 4=Very Low.

Aspect	1	2	3	4
Household daily Expenditure				
Home structure				
Medical Expenses				
School Fees				
Savings				

9. Regarding the fish farming, who is in charge of the following activities?

Activity	Hired workers	Technical Personnel	Head of Centre	Others specify
Running operations				
Training programmes				
Feeding the fish				
Catching the fish				
Packing the fish				
Securing the feeds				
Ensuring safe environment for fish				
Preservation of the Catch				
Others specify				

10. How many hired workers do you engage in fish farming activities each month?

Less than 10 () 10-20 () 20-30 () Over 30 workers ()

11. How much is a hired worker paid daily?

Below Ksh 200 () Ksh 200-500 () Above Ksh 500 ()

12. Indicate your level of agreement with the following statements regarding the contribution of Sagana Aquaculture Centre to the welfare of the youth in Sagana Township. Please tick on your level of agreement.

	Strongly Agree	Agree	Disagree	Strongly Disagree
The Centre offers employment opportunities to the youth				
There are improved living standards owing to fish farming				
The Centre offers training opportunities in fish farming to the youth				
Cultural values and attitudes greatly influences fish farming & fish eating habits among the youth				

The Centre contributes to provision of cheap source of protein to local households				
There are government initiatives aimed at promoting youth adoption of fish farming activities.				

13. In your own opinion, are there benefits enjoyed by the community around arising from the presence of Sagana Aquaculture Centre?

Yes () No ()

14. If yes, please list three benefits in order of priority.

.....

.....

15. Do you intend to build more fish ponds in the future?

Yes () No ()

If yes, what is the motivation?

.....

16. Would you recommend fish farming to other members of the community who are not yet involved in fish farming?

Yes () No ()

If not, please explain.....

.....

17. What are the some of the challenges you face at Sagana Fisheries?

	Not a Problem	Minor problem	Some problem	Major problem
Lack of finance				
Availability of Land				
Farming inputs				
Inadequate Technical personnel				
Support from government/local authorities				
Pollution				
Environment/Climate change				

18. How can the authorities assist you in overcoming these challenges?

.....
.....

19. How would you consider the future of fish farming?

Will decline () Is sustainable () Will grow ()

Thank you for your assistance