

**THE EFFECTS OF DAM CONSTRUCTION PROCESS ON HOUSEHOLD  
LIVELIHOODS: A CASE OF THIBA DAM IN KIRINYAGA COUNTY, KENYA**

**BY**

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## DECLARATION

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## **DEDICATION**

I dedicate this work to to my parents, Mr. and Mrs. Charles Ndirangu for instilling the value of education in my early life, my husband John Macharia Mugi, Daughter Tamika Gathoni and Sons Jayden Mugi & Brian Kimani for their love and encouragement.

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## **ABBREVIATIONS/ ACRONYMS**

<b>ADB</b>	Asian Development Bank
<b>AHITI</b>	Animal Health and Industry Training Institute
<b>FPIC</b>	Free Prior and informed concert
<b>IDAM</b>	Integrative Dam Assessment Model
<b>ICMM</b>	International Council on Mining and Metals.
<b>ICOLD</b>	International Commission on Large Dam
<b>IRN</b>	International River Network
<b>JICA</b>	Japanese International Development Cooperative Agency
<b>MIDP</b>	Mwea Irrigation Development Project
<b>RAP</b>	Resettlement Action Plan
<b>SPSS</b>	Scientific Package for Social Studies
<b>UNEP</b>	United Nations Environmental Programme
<b>USA</b>	United States of America
<b>PAPS</b>	Project Affected Persons
<b>NIB</b>	National Irrigation Board
<b>ICOLD</b>	International Commission on Large Dams
<b>UNCTAD</b>	United Nations Conference of Trade and Development
<b>SPSS</b>	Scientific Program for Social Scientists
<b>WCD</b>	World Commission on Dams
<b>WWF</b>	World Wide Fund

## ABSTRACT

Development projects in Kenya are proceeding at an increasingly rapid pace as a strategy towards achieving vision 2030. Large scale projects can bring significant benefits to communities as construction of roads, health, educational facilities, creation of jobs and other economic opportunities. However, Dam construction projects have already affected the natural and social environments around them and threaten to cause further devastation for local livelihoods as the projects increase in size and number. The Thiba Dam is located in Rukenya, Gichugu constituency of Kirinyaga County in Kenya. The purpose of the dam was developed to improve irrigation facilities in order to improve rice crop production and also provide a stable supply of water required by agriculture in the Irrigation scheme. This study therefore investigated the influence of dam construction projects on household livelihood, a case of Thiba dam Kirinyaga County, Kenya. The study focused on the effects of; land acquisition by dam construction project, Social disruptions by dam construction project, provision of social amenities by dam construction project and compensation offered by dam construction project on the households' livelihood. The findings of this study will be significant to the government of Kenya in proving empirical information on the influence of Dam construction projects on the livelihood of households around the dam. The findings will help in the estimation of compensation for the PAPs. Further the findings will help the implementers as well as the donors to estimate the benefit of the projects against the costs incurred. Finally the findings of this study will be significant to future researchers in finding literature on dam construction and household livelihoods. This study will also act as a stepping stone to further research. The study employed a descriptive research design. The target population under study was 845 households that have been displaced by the construction of Thiba Dam however the study only sampled 271 PAPs by use of stratified random sampling. Data was collected by use of questionnaires. The data was analysed quantitatively and qualitatively and presented using frequencies, regression analysis. Statistical Package for Social Sciences (SPSS) version 21 aided in generating a summary of results which were represented in form of tables. The study found out that 51.3% of household livelihood can be explained by acquisition of land belonging to households living around the dam. The findings also showed that only 15.3% of household livelihoods can be explained by compensation offered to households by the dam constructors, while only 1.4% of the household livelihoods can be explained by social amenities provided by the implementers of Thiba dam construction project and finally 36.4% of household livelihood can be explained by social disruption caused by Thiba dam construction.

## CHAPTER ONE

### INTRODUCTION

#### 1.1. Background information to the study

Construction projects induce development in previously underdeveloped areas and they contribute positively to the socio-economic development of the rural areas where the projects take place. Large scale projects can bring significant benefits to communities as construction of roads, health, educational facilities, creation of jobs and other economic opportunities (ICMM, 2006). However, in recent years there has been a growing public outcry that African countries with potential resources benefit little from the growing constructions. Therefore as a result, poverty in African countries continues to deepen with the rural population being the mostly affected ones (UNCTAD, 2005) For instance, for all the positive aspects of large constructions there is a possibility of affecting the sensitive environments, lifestyles of indigenous people which can be responsible for both benefits and damage the existing balance between people and the environment (Darimani, 2005)

Construction of dams has been one of major construction projects in the rural areas, which has been proceeding at an increasingly rapid pace. The relatively small- scale hydropower projects that have been developed to date provide some insight into the expanding environmental and social impacts that can be expected as dams projects increase in number and scale (Friend, Arthur & Keskinen, 2009). Most of the dams are single-purpose dams, but there are now a growing number of multipurpose dams. Using the most recent publication of the World Register of Dams, irrigation is by far the most common purpose of dams. Among the single purpose dams, 48 % are for irrigation, 17% for hydropower (production of electricity), 13% for water supply, 10% for flood control, 5% for recreation and less than 1% for navigation and fish farming. With the large population growth expected for the next decades, irrigation must be expanded to increase the food capacity production. It is estimated that 80% of additional food production by the year 2025 will need to come from irrigated land. Even with the widespread measures to conserve water by improvements in irrigation technology, the construction of more reservoir projects will be required (ICOLD,

2007)

By the year 1949 about 5,000 large dams had been built worldwide, three-quarters of them in industrialized countries. By the end of the 20th century, there were over 45,000 large dams in over 140 countries. The period of economic growth following the Second World War saw a phenomenal rise in the global dam construction rate, lasting well into the 1970s and 1980s. At its peak, nearly 5,000 large dams were built worldwide in the period from 1970 to 1975. However, there has been a decline in the pace of dam construction over the past two decades in North America and Europe where most technically attractive sites are already developed. The average large dam today is about 35 years old (Asmal, 2000). Dams have been promoted as an important means of meeting perceived needs for water and energy and as long-term, strategic investments, which have many additional benefits. Some of these additional benefits are typical of all large public infrastructure projects, while others are unique to dams and specific to particular projects.

Regional development, job creation, and fostering an industry base with export capability are additional considerations for building large dams. Other reasons include creating income from export earnings, either through direct sales of electricity, or by selling cash crops or processed products from electricity-intensive industries such as aluminum refining. Water-rich countries such as Cameroon have developed large dams for hydropower generation where suitable sites were available. The majority of large dams in Cameroon are for power generation and irrigation and single-purpose hydropower dams are most common in the country. While dams can contribute to economic growth, the services they provide may come at a cost. This dilemma is exemplified by the Lagdo Dam. This dam made possible electricity production and irrigated rice-growing downstream in Cameroon (Canter, 2004).

Dams have a great deal of positive and negative effects on the environment besides their benefits in controlling stream regimes, consequently preventing floods, obtaining domestic and irrigation water from the stored water and generating energy. Dams hold possibilities of considerable harm for living beings besides their advantages such as meeting basic requirements of the society and increasing living standards (Canter, 2004). In addition, dam construction leads to displacement of human populations around the construction site. Usually, governments or agencies concerned

compensate the local people to facilitate their settlement elsewhere. The annual expenditure on large dams during the 1990s was between \$32 and \$46 billion. Throughout the twentieth century some \$2 trillion was spent on dams. Generally, there are various human impacts associated with dam construction and this formed the basis for this research study.

On the international outlook, the Yali Falls dam project in Cambodia on the Se San River has resulted in serious downstream socio- economic and environmental impacts due to dramatic changes in annual natural flows and sudden flooding caused by irregular, large-scale releases of water from the dam's reservoir. It also appears that water quality downstream of the dam has worsened considerably. Consequently, the thousands of indigenous people living along the Se San River downstream from the Yali Falls dam have experienced significant losses since 1996, when construction of the dam first required manipulation of the Se San River's flows. Studies have shown that the livelihoods of about 3,434 households (roughly 20,000 people) in this area have been severely affected by the dam (McKenny, 2001).

A major constraint to development in Kenya is the scarcity of water relative to the expanding population. Over 75% of Kenya is classified as semi-arid and most of the population is concentrated in the wetter areas. However, with the increasing growth severe land pressure is forcing the expansion into the semi-arid areas (Rowntree, 1990). Therefore in order to meet the water needs for the growing population, Kenya has embarked on the development of multipurpose reservoirs across the main rivers. The Tana River for instance has about 20% of the national population, a major portion of the agricultural potential and the highest hydroelectric power generation potential in the country (Maingi and Marsh, 2001).

Agriculture is the second largest contributor to Kenya's GDP and irrigation has been termed as the best way to address food security. This is in attainment with MDG (Millennium Development Goals) goals to eradicate extreme poverty and hunger by 2015. In order to streamline with the vision 2030 social pillar, multipurpose dams are being developed as a means of investing in Kenyans towards improving the livelihood of citizens (Newsletter, Vision 2030)

Thiba Dam was conceptualized in the mid 1980's by the Mwea Irrigation Development Project (MIDP) leading to the carrying out of a Feasibility Study for the Project in 1989. The Project



however did not move to construction due to donor conditions prevailing at the time. In 2008 the President of the Republic of Kenya revisited the issue of this project with the Government of Japan which resulted in re-engagement on the project with financing by Japanese International Development Cooperation Agency (JICA). JICA supported the updating of the project's feasibility analysis and the carrying out of environmental and social impact assessment through a Japanese Consultancy firm in 2009 (National Irrigation Board, 2013).

A Resettlement Action Plan (RAP) for the project was subsequently prepared in 2009/2010. On the basis of the updated project feasibility analysis, preparation of RAP and identification of potential resettlement sites, the Governments of Kenya and Japan signed a financing agreement for the project on 16th August 2010. The Project cost was estimated at 18,631 million Japanese Yen (Kshs.16,619 million) with 13,178 million Japanese Yen (Kshs.11,755 million) being contributed by the Japanese Government and The Kenya Government's contributing to approximately Kshs.5 billion (National Irrigation Board, 2013).

The Thiba Dam is visualized to improve irrigation facilities to provide a stable supply of water required by agriculture in the area and especially rice. The project is expected to enable double-cropping (two harvests per year) of rice and horticultural crops, as well as to improve the productivity of rice and other crops by expanding the total cultivated area from 7,860 ha to 16,920 ha in the project area. Through these efforts, the project aims to contribute to the improvement of food security in Kenya and to the livelihoods of farmers in the region, hence ensuring the country Kenya is secure in rice production, (National Irrigation Board, 2013).

## **1.2 Statement of the problem**

The environmental, social and health consequences of dam construction projects are receiving increasing international attention Baviskar and Singh (2004); McCully (1996) and World Bank (1997). Although dams are vital for flood management, water and energy supply, and irrigation, millions of people, mostly in less-developed countries, are exposed to their adverse health and social impacts Goldsmith and Hilyard (1984) In the industrialized world, river developments have resulted in substantial ecosystem damage.

During the last 10 years, more than 40 million people have been resettled involuntarily due to dam projects (World Bank 1997). In Africa, around 400,000 people have been displaced. This is a very low figure considering that a study commissioned by World Commissions on Dam focused on major instances of displacement in Africa as enumerated below (Warren & Rubin, 1968) Construction of Aswan dam in Egypt and Sudan led to displacement of 100,000 people between 1963 and 1969, construction of Cabora-Bassa in Mozambique led to displacement of 25,000 people in 1974, that of Kainji dam in Nigeria displaced 44,000 people between 1967-1968, that of Kariba dam in Zambia/Zimbabwe displaced 57,000 people in 1958, among other areas in Africa (Wet, 1999).

Various dams have been constructed in Kenya yet, the number of displaced people has not been documented. Such dams include Badasa dam in Marsabit County, Maruba dam in Machakos County, Chemususu dam in Nakuru County, Umaa dam in Kitui County, Masinga and Kamburu dams along Tana River. The Thiba Dam alone in Kirinyaga County has led to displacement of 845 households and covers an area of 542 acres. JICA adopted the world bank resettlement program on involuntary resettlement. There are two types of compensation program that either compensates the households with Land for land or Land for cash. Those who opted for the land compensation are to be resettled at Gathigiriri Prison 200 acres and at A.H.I.T.I Domba 150 acres in Kirinyaga County while the rest have cash compensation. The Government of Kenya Identified the two areas for resettlement and will provide Infrastructure to the Households. Infrastructure will include and not limited to, Houses, Roads, Water, Social Amenities, Police post, Electricity. A program called livelihood restoration program will monitor on the PAPs livelihood even after compensation. (NIB, 2013).

The benefits of globalization are distributed unevenly and economic growth often occurs at the expense of the poorest countries and communities. In the case of large dams, the benefits of dams and water usually are transferred long distances from the project site, to cities and industrial areas. Benefits to local populations may be limited to the provision of roads and temporary employment. Those living in large dam catchment areas can be left worse off than they were prior to construction (Soros, 1998). Therefore it is based on this past observation that this study investigated the effect of dam construction projects on household livelihood by

focusing on the Thiba dam in Kirinyaga County. Several studies have been conducted on the Impacts of Dam construction; however none has focused on the Thiba Dam that is based in Kirinyaga County. Consequently, this study focused on the perspective of the PAPs

### **1.3 Purpose of the study**

The purpose of this study was to investigate the effects of dams' construction projects on household livelihood a case of Thiba dam in Kirinyaga County, Kenya The study inclined on the influence of large construction dams by studying Thiba Dam.

### **1.4 Study objectives**

The specific objectives of this study were;

1. To examine the effects of land acquisition on household livelihood a case of Thiba dam in Kirinyaga County
2. To assess the effect of dam construction compensation on household livelihood a case of Thiba dam in Kirinyaga County
3. To investigate the effect of social disruption on household livelihood a case of Thiba dam in Kirinyaga County
4. To establish the effect of social amenities by dam construction projects on household livelihood a case of Thiba dam in Kirinyaga County

### **1.5 Research questions**

This study answered the following questions;

1. What is the effect of land acquisition on household livelihood a case of Thiba dam in Kirinyaga County?
2. How does dam construction compensation affect household livelihood a case of Thiba dam in Kirinyaga County?
3. How does social disruption by dam construction projects effect on household livelihood a case of Thiba dam in Kirinyaga County?
4. What is the effect of social amenities by dam construction projects on household livelihood a case of Thiba dam in Kirinyaga County

### **1.6 Significance of the study**

The findings of this study will be significant to the various departments of the government, and to the Kirinyaga County Government in understanding how the dam construction projects influence the livelihoods of residents living around the projects' sites; especially the ministry of energy and the ministry of agriculture, which are more likely to put up dams.

This study will be significant to the National Irrigation Board as well as the government of Kenya in proving empirical information on the effect that dams' construction have on the households around the dam. The findings will help in the estimation of compensation for the affected households. Further the findings will help the implementers as well as the donors to estimate the benefit of the dam against the costs incurred.

Finally the findings of this study will be significant to future researchers in finding literature on dam construction and household livelihoods. This study will also act as a stepping stone to further research.

### **1.7 Delimitation of the study**

This study focused on Thiba Dam in Kirinyaga County. During the commencement of construction of Thiba Dam, 845 households were displaced in order to pave way land for construction of the dam. Out of the 845 households, 316 have fully been compensated with cash for lands, 226 compensated with land for land, while the other 303, households have been resettled. The research was conducted in Rukenya, Kirinyaga County. Kirinyaga County is a county in the former Central Province of Kenya and its capital is in Kerugoya. Rukenya is a town in Kirinyaga County that is located 101 kilometers from Nairobi city. Thiba dam is located in Rukenya location, occupying 540 acres of land.

### **1.8 Assumptions**

There are assumptions in the study that: All the respondents would be well versed with the area of Thiba Dam and the effects of its construction on their livelihoods and that most of the respondents would be willing to contribute to this study. The assumptions of the study were that the sampled population would represent the general population of membership of the Project affected Persons, The researcher also assumed that the method of data collection used would be

accurate and valid to enhance acquisition of required data, the respondents would be truthful and available to give correct information.

### **1.9 Limitation of the study**

The sampling frame of the study covered Thiba dam in Kirinyaga County. The study focused on the households that had been displaced by the construction of Thiba Dam. The respondents presented some resistance in answering questions. To solve this, the researcher explained to the respondents that the study was wholly for academic purpose and assured them of confidentiality of their responses.

### **1.10 Definition of significant terms**

<b>Agriculture</b>	Rice production, Cultivation of animals, fishery and crops
<b>Compensation</b>	Money, land or other resource offered for a loss incurred.
<b>Dam</b>	Refers to a barrier that seizes movement of water that will mainly be used for water supply for Irrigation to the Mutithi Irrigation Scheme
<b>Health</b>	Refers to the Physical and well being of the residents
<b>Household</b>	Refers to a person or a group of people living in the same residence as a family
<b>Income</b>	Payment received from goods and services
<b>Livelihood</b>	Means of securing basic necessities
<b>Land acquisition</b>	This is the process of obtaining land from private owners for construction of projects
<b>Project affected Persons</b>	Refers to the Displaced persons that have been involuntary resettled
<b>Social amenities</b>	A service that offers quality service for individuals in a community e.g. hospitals, schools, market places

**Social disruption**

This is the process of inhibiting normal operations and activities of people.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

This chapter reviewed literature related to influence of dams construction projects and household livelihoods from a global perspective and narrowed it down to the Kenyan situation with a special emphasizes on Thiba Dam in Kirinyaga County. This captured both empirical and theoretical literature that had been written in regard to the area of this study. The study evaluated; land acquisition, social amenities, social disruptions and usage and adequacy of compensation.

#### 2.2 Theoretical framework: the Integrative Dam Assessment Model

The Integrative Dam Assessment Modeling (IDAM) tool is designed to integrate biophysical, socio economic, and geopolitical perspectives into a single cost and benefit analysis of dam construction. The model was designed as a decision-support tool that policy makers can use to understand holistically the impacts, costs and benefits of building a dam in any area. The dam assessment model measures the costs associated with a proposed dam development project and also measures the possible benefits. Each of the diagrams in the tool consists of 27 individual indicators of the effects of dam construction, divided into socio economic, geopolitical and biophysical themes. For example, factors such as habitat restoration costs can be weighed, along with loss of income to local people and access to clean drinking water. The idea behind this model is that whenever you put up a dam, it affects the whole ecosystems and whole communities (Wolf.*et.al*, 2009).

The Integrative Dam Assessment Modeling (IDAM) tool is designed to combine the three themes identified by the 1992 United Nations Conference on Environment and Development into two circle diagrams, one measuring the costs associated with proposed dam development and the other measuring the benefits. Each of the two diagrams consists of 27 individual impacts, or effects of dam construction, nine of which represent the biophysical theme, nine of which

represent the socio-economic theme, and nine of which represent the geopolitical theme. The same impacts appear on both the cost and benefit circles, and each impact comprises an equal portion (1/3) of the circle diagram that represent the IDAM tool (Wolf. *Et.al*, 2009).

### **2.3 Dam Construction Projects**

One of the poles of dam construction projects is the impacts of projects which are; social and environmental impacts. These impacts are the unnecessary price paid to secure those benefits especially in the social and environmental terms; by people displaced, by communities downstream, by taxpayers and by the natural environment. The extent and scale of the project impacts vary depending on location, size and other dam characteristics such as inundated area, and population density in the river basin (Sayboulava, 2004).

The issues and debates associated with constructions are not limited to the design of the project itself, the way it was constructed or built, as well as how the project is operated. The issues and debates of dam construction go beyond from these engineering aspects to the social and environmental dimensions of the constructions. At the heart of these debates, are the issues of equity, governance, justice and power. These are the issues that underlie the many intractable problems faced by humanity (ADB, 2000)

Dams and reservoirs have been constructed around the world as far back as 5000 years ago (Tortajada, 2001). Most of these dams were primarily constructed to accommodate water for farming and drinking purposes. However, over the past 60 years dams and other water related projects were built to supply the industrial development with cheap, in terms of operational cost and clean hydropower. From the 1930s to the 1970s, the construction of large dams became synonymous with development and economic progress (WWF Global, 2013). Viewed as symbols of modernization and humanity's ability to harness nature, dam construction accelerated dramatically. This trend peaked in the 1970s, when on average two or three large dams were commissioned each day somewhere in the world ( World Commission on Dams, 2000).

Thiba Dam was started in the mid 1980's by the Mwea Irrigation Development Project (MIDP) leading to the carrying out of a Feasibility Study for the Project in 1989. The Project however did



not move to construction due to donor conditions prevailing at the time. In 2008 the President of the Republic of Kenya revisited the issue of this project with the Government of Japan which resulted in re-engagement on the project with financing by Japanese International Development Cooperation Agency (JICA). JICA supported the updating of the project's feasibility analysis and the carrying out of environmental and social impact assessment through a Japanese Consultancy firm in 2009 (National Irrigation Board, 2013).

A Resettlement Action Plan (RAP) for the project was subsequently prepared in 2009/2010. On the basis of the updated project feasibility analysis, preparation of RAP and identification of potential resettlement sites, the Governments of Kenya and Japan signed a financing agreement for the project on 16th August 2010. The Project cost was estimated at 18,631 million Japanese Yen (Kshs.16,619 million) with 13,178 million Japanese Yen (Kshs.11,755 million) being contributed by the Japanese Government and The Kenya Government's contributing to approximately Kshs.5 billion (National Irrigation Board, 2013).

The Thiba Dam is visualized improve irrigation facilities to provide a stable supply of the water required by agriculture in the area. The project is expected to enable double-cropping (two harvests per year) of rice and horticultural crops, as well as to improve the productivity of rice and other crops by expanding the total cultivated area from 7,860 ha to 16,920 ha in the project area. Through these efforts, the project aims to contribute to the improvement of food security in Kenya and to the livelihoods of farmers in the region (National Irrigation Board, 2013).

#### **2.4 Land Acquisition and household livelihoods**

Dam construction projects often require the procurement of privately owned land which is always acquired by the government from its current owners. While sometimes it is possible to negotiate a price for voluntary sale of property, governments often have to use their rights to compulsory acquisition of properties for public projects. This exploration according to Carnea (1993) always causes economic loss, social and psychological disruption for the affected individuals and families. This current study therefore sought to find out whether these elements observed by Carnea (1993) were similar to those experienced by household living around the Thiba dam.

There are increasing global concerns surrounding compulsory land acquisition in the public interest (Kakulu, 2008). Acquisition may inflict many adverse impacts on populations whose lands are expropriated including loss of income and job opportunities (farm and non-farm jobs), a loss of livelihood assets such as land and common pool resources, as well as access to public services and the breaking-down of social networks. Land acquisition indirectly produces effects related to wealth redistribution; as farmers receive different levels of compensation, severe tensions arise between governments and farmers that burden the implementation of land policy and planning. Therefore this current study examined whether this is true to the construction of Thiba dam.

The indirect impacts of compulsory land acquisition also may be substantial. In some cases, food insecurity is a serious problem arising from compulsory land acquisition Kusiluka, *et.al* (2004). Social injustice arising from land acquisition is primarily related to inconsistencies in compensation policies in both horizontal and vertical dimensions. The former refers to variations that exist in the type and amount of land loss compensation received between different affected people whereas the latter implies differences in compensation types and amounts over time. In spite of formal protestations, most forcibly displaced people are left poorer than before displacement. As a result, the term “sustainable development” so often used to justify forced eviction may be challenged.

Land acquisition for hydropower dam construction is an example. Hydropower is viewed as an effective means to increase national energy security and thus within the public interest that can make use of the compulsory eviction mechanism. The recent survey in Vietnam showed that there are 1,237 hydropower projects; within this figure, 899 are large-scale hydropower dams generating 24,888 MW of electricity. Additionally, there are 452 small-scale hydroelectricity plants either operating or under construction across the country. The construction of hydropower dams has displaced 44,557 households or about 200,000 people and expropriated 133,930 hectares of land. Although hydropower dams have the potential to bring benefits in terms of power supply, flood control, and irrigation, their construction can harm ecosystems and uproot local communities. In fact, Scudder (1999) claimed that large dam construction continues to cause impoverishment for resettled

communities as well as and negatively affect millions of people living downstream. Also, a majority of studies revealed that the substantial losses in paddy land, sloping land, forests, grass fields, and water spaces lead to significant declines in farm outputs, as well as on-farm and off-farm income Bui (2011). A salient feature of these displacements is that some 90 percent of the affected people belong to minority ethnic groups living in mountainous areas. While these studies focused on hydropower generating dams, this study established whether the findings were replicable on dams constructed for other purposes such as irrigation on the Thiba dam.

Following negative experiences in the past, when some of its large-scale dam construction projects sometimes had negative social and environmental consequences, the World Bank has emerged as an authority in careful design of planning procedures. The revised involuntary resettlement objectives of the World Bank in 2013 state that “displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher” WB (2013) When compulsory displacement becomes inescapable, resettlement objectives must include minimized social risks and shocks, damage, and suffering; the protection of resettled people's well-being and rights; a facilitation of their rehabilitation among new hosts; and support for redevelopment and improved livelihoods at arrival sites. To avoid impoverishment, good policy, proper resettlement planning and adequate resource allocation are critical.

The principle of Free, Prior, and Informed Consent (FPIC) as a precondition for resettlement is just one step in developing a level playing field between local communities and government-sponsored, large-scale development projects. World Bank policy (OP 4.12) requires the application of the principle of FPIC in the case of indigenous communities. However, rights of members of majority populations should also receive reasonable protection in law and policy frameworks. The World Bank (2004) also specified that the level of participation in a resettlement programmed must be elevated to encompass collaboration and involvement in decision making instead of merely consultation and involvement in the execution of plans. In such cases, affected people are able to join a

resettlement committee and participate in decision making or in designing resettlement programmes. Therefore, this study assessed whether the resettlement of household in the construction of Thiba dam followed the directives as guided by World Bank (2004).

## **2.5 Compensation offered by dam construction projects and household livelihood**

Acquisition of land from its initial owners and users has everlasting effects on their lives especially if these people depend on the land for their livelihood. In the peripheral areas of many African cities, public land acquisitions deny these land owners their means of livelihood and hence change their lives forever. This is why there is a general reluctance and hostility when an attempt is made to interfere with established land rights because land is a peculiar institution, which occupies a central position in the social organization of the community (Ndjovu, 2003) Any attempt to change the existing land relations whether by expropriation or whatever means is likely to meet the strongest opposition even if such projects were implemented by the government itself. Numerous problems usually surface during the implementation of the expropriation, valuation and compensation procedures. Some of these problems are similar in countries but others are rather peculiar to the region and the country. Problems in relation to expropriation, valuation and compensation can be categorized into legal, technical, institutional and financial. This study therefore examined the problems experienced in the Kenyan situation.

There are many serious problems related to expropriation. Many of these problems include the inadequacy of compensation rates, inordinate delays, arbitrary compensation and lack of professional valuers. It is also noted that sometimes the government expropriates land without paying compensation or by giving very little compensation. For instance, as Addis and Associates draft report (2007), expropriation and compensation payments for reasons of township expansion including the zoning of industrial parks are expected to be handled by urban administration and municipalities from their own revenues. But this is mostly in theory. In practice only those municipalities which may have relatively better revenue collection pay compensation. For the most part, towns have been encroaching to rural land with little or no

compensation. This study therefore examined the problems that have faced the compensation of households during Thiba dam construction.

In the early days of urban expansion most farmers were left uncompensated. The problem is both legal and financial capacity. Due to the absence of real property valuation methods and qualified and professional valuers, absence of valuation provisions both in urban and rural areas of the country, lack of reliable valuation data, compensation is not assessed based on market value. As a result of these reasons, compensation payment does not satisfy the interest of both parties in general and the land holders and right users in particular. In return it has a long run negative impact on tenure security and economic development (Associates draft report, 2007).

The compulsory acquisition process implies that all activities of compensation and resettlement are designed and carried out by the responsible agencies of local government and then presented to affected people with details on losses, compensation values, and resettlement plan. When it comes to compensation for loss, it must not only be just or equitable, but also effective in benefiting the landowners (Carnea. *Et.al*, 2005) That is to say that compensation in cash or land may not be sufficient to ensure that displaced people can restore and improve their livelihoods in the long term. This may require additional assistance such as training. This current study therefore found out the compensation that had been extended to the households in Thiba by the dam constructors.

Compensation for land is often complicated, particularly the estimation of land values. The market value is one option that is often used. This is commonly defined as the estimated amount that the land might be expected to realize if sold in the open market at valuation date after proper marketing between a willing seller and a willing buyer and they had acted knowledgeably, prudently, and willingly (ADB, 2007) Fair market value might be used exchangeable with market value, but there is a distinction between them. The fairness of market value herein reflects the estimated price for the transfer of a property between willing parties who have the respective interests of those parties. It is necessary to carry out the assessment of the price that is fair for those parties taking consideration on the respective

advantages and disadvantages that each is able to obtain from the transaction. Meanwhile, market value entails the strong points that are not available to market participants generally to be ignored, and therefore the concept of market value is narrower than fair market value.

The International Valuation Standards (2011) also differentiates between price and value. Price is the amount asked, offered or paid for an asset, value reflects the opinion that the most probable price to be paid for an asset in an exchange or the economic benefits of owning an asset. Because of financial capabilities, motivations and special interest of a given buyer or seller, the price might not reflect the true underlying value. As a result, market price is quite distinct from market value; they are equal when the market must provide sufficient information, efficient marketing, and prevailing rational expectations.

In case of involuntary land acquisition, the government alone or in alliance with investors are willing buyers, but the affected landowners are often not willing sellers. As pointed out by Miceli and Segerson (2007) that the compensation paid to owners by using market price, whose land is taken, is systematically less than the amount owners would ask for their land in a consensual transaction because acquired land owners always response to compensation value by their subjective value or reservation price that reflects the market value. According to this understanding, compensation at market value often under-compensates unwilling sellers.

However, it is very difficult to know the owner's subjective reservation price because self-interest induces owners to quote highly inflated values. In addition, even landowners themselves may not know at what price they are prepared to sell. Another option is compensation at replacement cost. The replacement cost is equal to market value when the information about market value is reliable and comparable assets or acceptable substitutes are available for purchase. In most developing countries, however, conditions are insufficient to estimate market value and replacement cost, especially in remote and rural environment because the information on land prices is not reliable ADB (2007). Therefore, this study examined the valuation and replacement costs incurred by the construction of Thiba dam.

## **2.6 Social disruptions by dam construction projects and household livelihood**

During the past 20 years, a growing international movement against dams has emerged, rallying behind the charge that governments have notoriously ignored human and ecological costs when beginning large projects such as the hydropower projects. The International Rivers Network (IRN) reports that 60 percent of the world's major rivers are dammed and just under one percent of the world's land surface has been inundated by reservoirs worldwide (IRN, 2006). The detriment to rivers, wetlands and forests have been extensive, and led to irreversible loss of species and ecosystems.

The World Commission on Dams WCD (2000) found that between 40 and 80 million people have been physically displaced by dams worldwide. A World Bank review of projects between 1986 and 1993 estimated that 4 million people were displaced annually by the 300 large dams that were constructed each year. This scale of mass-displacement makes it imperative that the potential impacts on livelihood, health, and traditional cultures be carefully monitored and managed. The report found out that displaced communities are frequently indigenous people and other ethnic minorities whose voices have too often been silenced by existing power structures. This current study established the distribution of the displaced household by Thiba dam construction.

The WCD reports that most indigenous communities and other ethnic minorities faced with dam-based development projects have experienced dispossession and denial of their basic rights. Most obviously, the construction of dams and related infrastructure leads to the loss of considerable areas of agricultural land, forest, fishing grounds, grazing lands and other resources on which impacted communities rely for their livelihoods and cultural practices. Additionally, downstream communities may be intricately linked with the river system and surrounding wetlands. The WCD further notes that alongside other negative impacts, structural changes to river patterns are likely to adversely affect agricultural, grazing and fishing economies downstream and reduce land values. Subsequently, the ecological consequences of dam projects also have secondary effects on livelihood, food security and traditional practices in nearby communities (WCD, 2000). This study therefore sought to find

out the social disruptions that had been caused by the construction of Thiba dam.

Although safeguards exist in international treaties such as the International Labor Organization (ILO) Convention Nos. 107 and 169, as well as the WB's Operational Directive 4.20 on Indigenous Peoples, in practice these agreements are rarely binding. For instance, in direct violation of ILO Convention 107 (requiring states to recognize the right of ownership, collective or individual, of the members of the populations concerned over the lands which these populations traditionally occupy) (UNDP, 2006)

Cultural Alienation is yet another social impact of construction of large projects. The fertile soils of river valleys have always been densely populated, giving rise to some of the world's most ancient civilizations. Displacing these communities risks the loss of valuable traditional knowledge systems and destroys part of the world's cultural heritage. The World Bank has recognized that forced displacement threatens traditional kinship associations. Moreover, the abandonment of symbolic markers such as grave sites and ancestral lands can sever linkages with the past and undermine a community's cultural identity (Adams, 2000). The physical landscape of indigenous communities is often intimately linked to their social, cultural and political way of life. For example, Survival International notes that the Akawaio in India have invested the landscape with special significance that it is an environment transformed by their ancestors in conjunction with the mystic forces of the universe, thus the landscape is dynamic, every part is living, functional, has meaning and moral value. In its extreme form, the involuntary resettlement of indigenous groups as a result of large-scale projects has been deemed ethnocide. This study established the effect of Thiba dam construction on culture of the households.

The World Council of Indigenous Peoples in 1985 lamented that: Next to shooting Indigenous Peoples, the surest way to kill us is to separate us from our part of the Earth. Once separated, we will either perish in body or our minds and spirits will be altered so that we end up mimicking foreign ways, adopt foreign languages and build a foreign prison around our Indigenous spirits, a prison that suffocates rather than nourishes as our traditional territories of the Earth do. Over time, we lose our identity and eventually die, or are crippled



as we are stuffed under the name of ‘assimilation’ into another society (Adams, 2000).

The World Health Organization (WHO) reported that the reservoirs created behind dams are often breeding grounds for water-borne illnesses such as schistosomiasis, malaria, and cholera and other potentially toxic bacteria. Numerous studies have corroborated these health risks. For example, a study undertaken in the Cote d’Ivoire documented significant increases in schistosomiasis after the construction of two large hydroelectric dams around Lake Kossou. A study in Sri Lanka revealed that increased outbreaks of malaria seem intimately related to hydrological changes brought about by major irrigation and hydroelectric schemes on the Mahaweli river, exacerbated by the increased migration caused by resettlement. The report concluded that this story is a classic of health impacts overlooked in favor of agricultural and industrial development (WCD, 2000).

Elevated mercury levels in fish downstream of dam projects have also been documented, posing long-term health risks linked to fish consumption. One study in Brazil found fish mercury increases in Lago Manso, a hydroelectric reservoir. The authors expected mercury levels to return to normal within some decades, but warned that the reduced fish populations downstream from the dam would most likely be permanent because of decreased water flow. According to the study, the risk of elevated mercury concentrations in fish has become one of the most important issues in assessing the environmental impact of hydroelectric reservoirs (IRN, 2007). This study therefore established the health effects of construction of Thiba dam on the households living around the dam.

The stress of relocation and disruption of social networks is also known to adversely affect health and well-being of communities. Women may be particularly vulnerable to the resettlement process, as noted by the WCD report: Compulsory resettlement is stressful because of the way in which people are uprooted from homes and occupation and brought to question their own values. Gender is an important factor in resettlement. Women as marginalized entities within marginalized communities are often forced to shoulder the ordeal of displacement far more intensely (Adams, 2000).

## **2.7 Provision of social amenities by dam construction projects and household livelihood**

Large-scale projects operations invest substantially in local community development through providing training, public services such as education and health; public goods such as clean water, transport, energy and infrastructures such as schools, health centres, water supply systems. It is assumed that all projects can be accompanied by the growth of small and micro-enterprise activities, providing supplies and related services to the projects companies, miners and their families leading to generation of substantial further incomes (World Bank, 2005). Also, large projects' companies are expected to create employment for the adjacent communities directly in both, the construction and operating phases, indirectly through input demand, and even more indirectly through the multiplier effects of the demands for goods and services by their employees. Large projects also provide foreign exchange earnings and tax revenues at national, regional and local levels (Holden, 2007). Therefore, this study sought to find out the influence of construction of Thiba dam on social and economic environment in Thiba.

Dams have been promoted as an important means of meeting perceived needs for water and energy and as long-term, strategic investments, which have many additional benefits. Some of these additional benefits are typical of all large public infrastructure projects, while others are unique to dams and specific to particular projects (Asmal, 2000). Regional development, job creation, and fostering an industry base with export capability are additional considerations for building large dams. Other reasons include creating income from export earnings, either through direct sales of electricity, or by selling cash crops or processed products from electricity-intensive industries such as aluminum refining. Water-rich countries such as Cameroon have developed large dams for hydropower generation where suitable sites were available. The majority of large dams in Cameroon are for power generation and irrigation and single-purpose hydropower dams are most common in the country. While dams can contribute to economic growth, the services they provide may come at a cost. This dilemma is exemplified by the Lagdo Dam. This dam made possible electricity production and irrigated rice-growing downstream in Cameroon. Therefore, this current study found out whether the effects observed in Cameroon are replicable in Thiba.

The Thiba Dam is visualized to improve irrigation facilities to provide a stable supply of water required by agriculture in the area and especially rice. The project is expected to enable double-cropping (two harvests per year) of rice and horticultural crops, as well as to improve the productivity of rice and other crops by expanding the total cultivated area from 7,860 ha to 16,920 ha in the project area. Through these efforts, the project aims to contribute to the improvement of food security in Kenya and to the livelihoods of farmers in the region, hence ensuring the country Kenya is secure in rice production,. (National Irrigation Board, 2013).

## **2.8 Conceptual Framework**

The aim of this study was to investigate the effects of dam construction projects on household livelihoods. The independent variables of this study were; land acquisition, social disruptions, provision of social amenities and compensation. These values were assumed to have an influence on the dependent variable which is households' livelihood. The households' livelihood was measured by; agricultural production, health issues and income levels. (Figure 1 Conceptual Framework)

**Independent Variables**

**Moderating Variable**

**Dependant Variable**

**Dam Construction Projects**

**Livelihoods of Households**

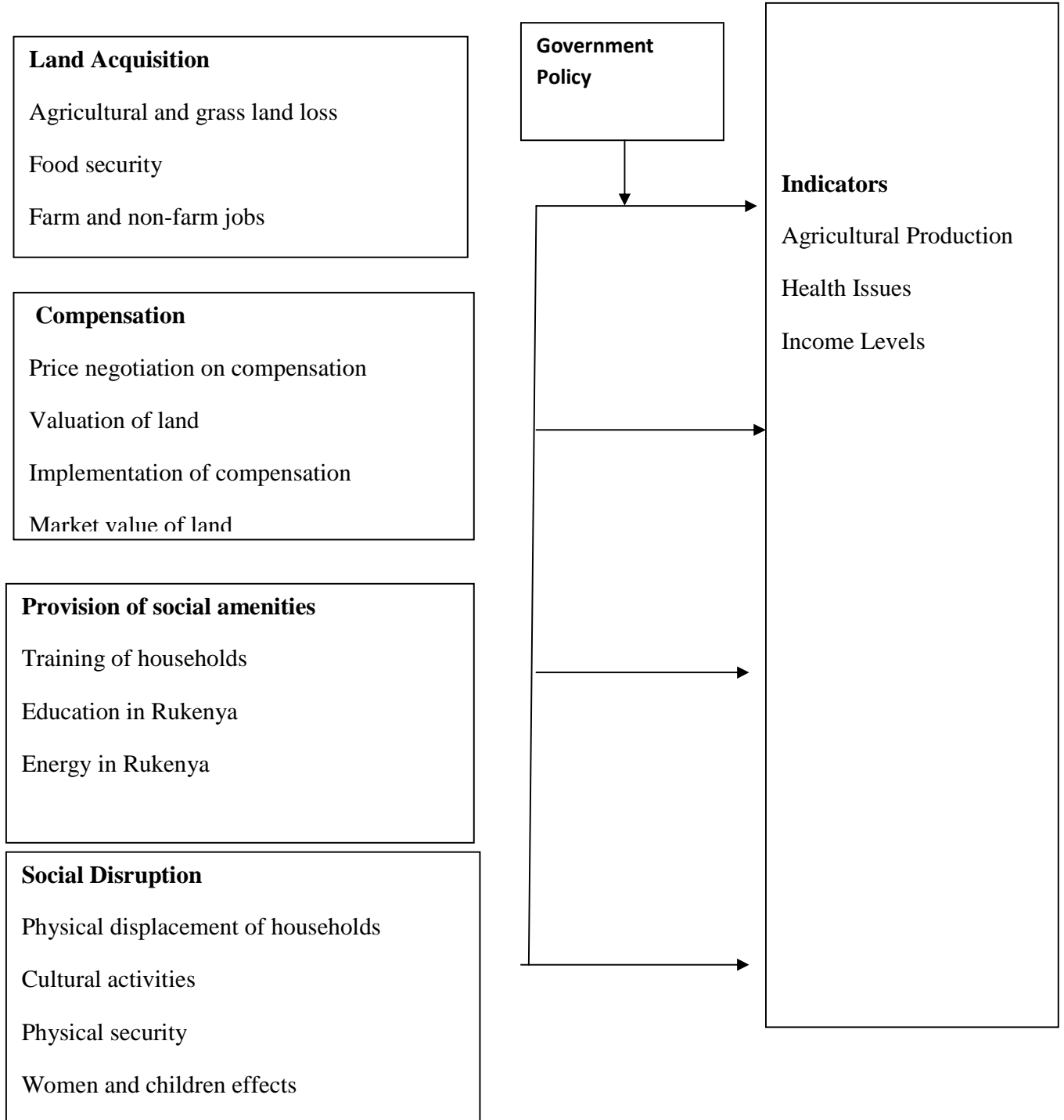


Figure 1. Conceptual Framework

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Introduction

This chapter presents the methodology used in this study. This included aspects such as the research design, the population targeted by the researcher, the population frame, data collection method as well as data analysis techniques used in the study.

#### 3.2 Research Design

The study adopted a descriptive survey design. Mugenda and Mugenda (1999) described descriptive survey as the process in which data is collected in order to test hypothesis or to answer questions concerning the current status of the subject under study. Descriptive study according to Kothari (1993) also engages an assessment of the situation of affairs describing, analyzing and reporting conditions that exist or that existed. The choice of this type of research design is because the study investigated the effect of large projects construction on households' livelihood a case of Thiba dam in Rukenya, Kirinyaga County.

#### 3.3 Target Population

This study targeted 845 households of Rukenya area. Out of the 845 households, 542 had fully been compensated either by cash for land, 316 households or land for land, 226 households. The other remaining 303, were resettled in the Gathigiriri and AHTI Domba area. The study item of this research was the household heads in the sample households. (NIB, 2013) The population was distributed as shown in table 3.1

Table 3.1 Population distribution

Target Group	Population size
Compensated Cash for Land Households	316
Compensated Land for Land Households	226
Resettled Households	303
Total	845

Source, (NIB, RIU, Masika, 2013)

### 3.4 Sample and Sampling technique

This study applied a stratified random sampling to estimate the sample size after which the researcher applied convenience sampling to select the sample items. The strata of this study were the category of households which were; compensated cash for land households, compensated land for land households and resettled households. Stratified random sampling was selected since it gives each sampling element an equal chance of being selected. This study applied proportionate stratified sampling to ensure that the elements selected are not clustered at one point and therefore the selected number of elements depended on the targeted population size of the strata.

Mugenda and Mugenda (1999) pointed out that where time and resources allow, a researcher should take a sample as big as possible. Therefore, the researcher adopted a formula from Israel (1992) below to select the sample size;

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

Where n = sample size

N = Target population

e = Acceptable error (5% for this study)

When substituted in the formula above, the sample for officers was;

$$n = \frac{845}{1 + 845 \times 0.05 \times 0.05}$$

$$n = 271$$

The sample was distributed as shown in Table 3.2.

Table 3.2 Sample size distribution

<b>Target Group</b>	<b>Population size</b>	<b>Sample size</b>	<b>Percentage</b>
Compensated Cash for Land Households	316	101	32%
Compensated Land for Land Households	226	73	32%
Resettled Households	303	97	32%
<b>Total</b>	<b>845</b>	<b>271</b>	<b>32%</b>

### 3.5 Data collection Instruments

The main data collection instrument for this study was the questionnaire. A questionnaire with both close ended and open ended questions was administered to the sample chosen for the study so as to be used in the collection of primary data. The researcher administered the questionnaire to the 271 household representatives with slight assistance from a research assistant who resided in the area. The 271 households were identified by use of a map of the area, from which the researcher selected the households with close proximity to the road; this was due to security reasons since the researcher visited the households in the evening. Assistance was offered to the household representatives who could not read clearly and who needed clarification and interpretation of some questions.

The open ended questions were used to collect in-depth responses from the respondents without feeling restricted or held back from revealing any information. An introductory letter from the University authorizing the research to be undertaken was used to assure the authenticity of the study which the researcher presented to every respondent. The researcher visited the respondents in their households in the evening. This was because most of the households representatives were out of their homes during the day, whenever the researcher missed a respondent, a call back was offered and the research assistant went back the following day. The researcher then waited for the questionnaire to be filled and carried it back the same day.

## **3.6 Validity and Reliability**

### **3.6.1 Reliability of research instruments**

Reliability of data is the consistency of measures in a study (Bryman and Bell, 2003). It is the degree to which research instruments yields consistent results of data after trials.

In this study reliability of data was tested by using pilot test method on the questionnaire. A pilot study comprising of Five (5) households that were not included in the initial sample, were selected randomly from the accessible population and used to carry out the pilot study of the questionnaire before the questionnaire was administered.

### **3.6.2 Validity of Data**

Data validity refers to the degree to which results obtained from analysis of data actually represents phenomenon under study, Mugenda and Mugenda (1999).

Validity shows whether the research items measures what they are supposed to measure. Instrument validity was ascertained through consultation with experts, supervisors and review of related literature. To augment face validity, the researcher critically ascertained whether the variables under study were reflected in the items that were in the instruments. The study also ascertained content validity by consulting with supervisors at the University of Nairobi. The researcher took the feedback given by the two supervisors and incorporated them in the study.

## **3.7 Data Analysis**

The data obtained from this study was explored on the basis of questions and specific objectives by use of both quantitative and qualitative techniques. The data was structured to answer set objectives in the study. Data was then analyzed using both descriptive and inferential statistics. For descriptive statistics, frequency distributions and percentages were used while for inferential statistics regression was used to analyze the quantitative data. The SPSS computer software (Version 21) aided the analysis. The results of the survey were presented using tables.



### 3.8 Operationalization of variables

Table 3.3 Table of operationalization

<b>Objective</b>	<b>Variable</b>	<b>Indicator(s)</b>	<b>Data collection method</b>	<b>Measurement Scale</b>	<b>Data Analysis</b>
Household livelihood	Dependent	Agricultural Production Health Issues Income Levels	Questionnaire	Ordinal Nominal Interval	Descriptive Percentages and mean Inferential Regression
To determine the effect of land acquisition household livelihood	Independent	Agricultural and grass land loss Food security Farm and non-farm jobs	Questionnaire	Nominal Interval Ordinal	Descriptive Percentages and mean Inferential Regression
To assess the effect of compensation on household livelihood in Kirinyaga	Independent	Price negotiation Valuation Implementation Market value	Questionnaire	Nominal Interval Ordinal	Descriptive Percentages and mean Inferential Regression

County					
To determine the effect of social disruption on household livelihood in Kirinyaga County	Independent	Physical displacement Cultural activities Physical security Women and children effects	Questionnaire	Nominal Interval Ordinal	Descriptive Percentages and mean Inferential Regression
To establish the effects of provision of social amenities on household livelihood in Kirinyaga County	Independent	Training Education Health Energy and infrastructure	Questionnaire	Nominal Interval Ordinal	Descriptive Percentages and mean Inferential Regression

### **3.9 Research Ethics**

This study observed research ethics by keeping the information gathered from respondents for the intended academic purpose and informing them of the same. The researcher maintained vigilance in areas the respondent did not wish to be probed on and practiced honesty in the presentation of findings.

## CHAPTER FOUR

### DATA ANALYSIS, PRESENTATION AND INTERPRETATION

#### 4.1 Introduction

This chapter provides summary of the data collected. The chapter is organized in sections; first the questionnaires response return rate, followed by the findings as per the objectives of the study. The findings are explained using percentages and figures in tabular form and in descriptions form. The questionnaires were divided into sections. Section A focused on respondents' personal information on demographic variables and Section B focused on the dependent variable while Section C focused on the independent variables.

#### 4.2 Questionnaire Return Rate.

The total number of questionnaires delivered to household representatives was 271 out which 270 (99.7%) were returned. This number is considered to be sufficient according to Dilliman (2000) who explained that researchers should aspire to achieve at least a 60% return rate of research instruments the distribution of questionnaires was as shown in Table 4.1

**Table 4.1 Questionnaire return rate**

---

Designation	Frequency	Percentage
Compensated Cash for Land Households	100	37.0
Compensated Land for Land Households	73	27.0
Resettled Households	97	36.0
Total	270	100.0

---

### 4.3 Demographic data of respondents

This section presents the findings on the demographic data of the households who participated in this study. The section is composed of; gender of the respondents, age of the respondents and the size of the households.

#### 4.3.1 Gender of the household

The study examined the gender of the respondents. This is important in order to ensure that the responses represent the both genders equitably.

**Table 4.2 Gender distribution of respondents**

---

Gender	Frequency	Percentage
Male	144	53.3
Female	126	46.7
Total	270	100

---

The findings showed that slightly over half 144 (53.3%) of the household were male while 126 (46.7%) were female. This shows that there was a fair distribution of male and female respondents in this study as shown in Table 4.2

#### 4.3.2 Size of the household

This study investigated the size of the households in Thiba surrounding. The assumption was that the effect of the dam construction process depended on the size of the household. The number of household members included parents and children combined. The findings are summarized in Table 4.4

**Table 4.4 Household size**

---

Household size	Frequency	Percentage
Two or less members	26	9.6
3-5 members	93	34.4
6-9 members	64	23.7
10-13 members	87	32.3
Total	270	100.0

---

The findings showed that an almost equal number of respondents had 3-5 and 10-13 household members at 34.4% and 32.2% respectively as shown in Table 4.4. The number of household members included parents and children combined.

#### **4.4 Household Livelihoods status**

The dependent variable of this study was household livelihoods; therefore this study investigated the household livelihoods of households living around Thiba dam. The study investigated effect of dam construction process on agricultural activity, income and health of the households.

##### **4.4.1 Involvement in agricultural activity**

The study investigated whether the household was involved in any agricultural activity, where agricultural activities included crop farming, fish farming and livestock keeping. The findings showed that 97% of the households were involved in agriculture. AFDB (2010) estimated that around 75% households in Kenya are involved in agricultural activities. This is a slight underestimation as compared to the findings of this current study. Therefore the researcher probed to find out what type of agricultural activity they were involved in. The findings are shown in Table 4.5

**Table 4.5 agricultural activity**

Agric activity	Frequency	Percentage
Rice	68	25.2
Maize	88	32.6
Coffee	22	8.1
Livestock farming	84	31.1
Not involved	8	3.0
<b>Total</b>	<b>270</b>	<b>100.0</b>

The findings showed that 32.6% of households were involved in maize farming while 25.2% were involved rice farming.

The researcher further asked the households their opinion on how agricultural activity had been affected since the beginning of the construction of Thiba Dam. The findings are presented in Table 4.6.

**Table 4.6 Cross tabulation of agricultural activity and effect on agriculture**

Involvement in agriculture	Affect on agriculture			Total
	Neutral	Very much	None at all	
Yes	24 (9.2%)	195 (74.4%)	43 (14.4%)	262 (100%)
No	1 (12.5%)	2 (25.0%)	5 (62.5%)	8 (100%)
<b>Total</b>	<b>225 (9.3%)</b>	<b>197 (73.0%)</b>	<b>48 (17.8%)</b>	<b>270 (100%)</b>

The findings in table 4.6 showed that almost three quarters ( 74.4%) of the households who said that they were involved in agricultural activities said that the agriculture in Thiba after the commencement of Thiba dam construction was affected very much while less than a quarter ( 16.4%) of them said that there was no effect at all.

#### 4.4.2 Income generating activity

The study wanted to establish the source of income of the households. Income was used as one of the variables to estimate the livelihoods of households living in Rukenya. The findings are shown in Table 4.7

**Table 4.7 Source of income of households**

---

Source of income	Frequency	Percentage
<b>N= 270</b>		
<b>Mean = 1.99</b>		
<b>Standard deviation = 0.739</b>		
Salaried employment	75	27.8
Small business	123	45.6
Temporary laborer	72	26.7
Total	270	100.0

---

The findings showed that slightly over a quarter of the households (26.7%) were temporary laborers while almost half of them (45.6%) owned small businesses. A report by UNDP (2012) explained that 50% of the self-employed Kenyans were in the agricultural sector which makes their businesses highly risky and unstable since they are dependable on the weather changes. The



findings also showed that the mean was 1.99 which shows that the average household in Rukenya depends on small business. There was a small deviation of responses with a standard deviation of 0.739.

The study further investigated whether the process of construction of Thiba dam had affected the income of the households in any way. The researcher conducted a cross tabulation to analyze the relationship between the source of employment of the households and the effect of Thiba dam construction to the households' income.

#### 4.8 Cross tabulation of source of income and affect of dam to income

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Has construction affected income?

Income generating activity	Yes	No	Total
Salaried employment	25 (33.3%)	50 (66.7%)	75 (100%)
Small business	123 (100.0%)	0 (0%)	123 (100%)
Temporary laborer	24 (33.3%)	48 (66.7%)	72 (100%)
<b>Total</b>	<b>172 (63.7%)</b>	<b>98 (36.3%)</b>	<b>270 (100%)</b>

---

The findings shown in table 4.8 showed that all of the households (100%) who said that they owned small businesses, agreed that the construction of Thiba dam had affected their income while only slightly over a quarter of the salaries employed households (33.3%) agreed that the construction of Thiba dam had affected to their income. A further probe showed that 50% of the small business owners said that the effect was well and 25% of the small business owners said that the effect of Thiba dam on their income was very well.

#### 4.4.3 Health of the households

The study wanted to find out whether any member of the households had experienced any frequent health complications since the commencement of Thiba Dam construction. The assumption was that Thiba dam construction process could have had an effect on health of households living in Rukenya. The findings are summarized in Table 4.9.

**Table 4.9 has family members experienced repeated health complication?**

Experienced health complication	Frequency	Percentage
<b>N = 270</b>		
<b>Mean = 1.91</b>		
<b>Standard deviation = 0.29</b>		
Yes	25	9.3
No	245	90.7
Total	270	100

The findings showed that almost all the respondents (90.7%) said that members of their families had not experienced any frequent health complications since the beginning of the dam. This therefore shows that the construction process of Thiba dam does not have an effect to the health of the respondents which negates the findings made on a study conducted by WCD (2000). On the other hand the rationale behind this observation could be since the construction of the dam is still at a young stage.

#### 4.5 Effects of land acquisition on household livelihood status

The study sought to examine the effect of land acquisition on household livelihoods in Thiba. This section presents findings on effect on agricultural land, effect on livestock and effect on access of food.

#### 4.5.1 Loss of agricultural land

The study wanted to find out whether the households living around the Thiba dam had lost any agricultural land due to the construction process of Thiba dam. The findings are summarized in Table 4.10

**Table 4.10 did you lose any agricultural land?**

---

Lose agric land	Frequency	Percentage
Yes	170	63
No	100	37
Total	270	100

---

The findings showed that over half of the households (63.0%) lost agricultural land to the construction of Thiba dam. This finding is supported by Bui (2011) who found that one of the main effects of dam construction is the loss of agricultural land by the people living around the dam. He estimated from his study that at least 90% of the households living around the dams lost their agricultural farms. This shows that since Thiba dam is still at young stages of construction, it is likely that more people could lose land as the project matures.

#### 4.5.2 Effect of construction of Dam process on livestock

The study sought to investigate the effect of the Thiba Dam construction process on livestock. The findings are as shown in Table 4.11

**Table 4.11 Effect of construction of Dam process on livestock**

---

Effect on livestock	Frequency	Percentage
<b>N =270</b>		
<b>Mean = 2.66</b>		
<b>Standard deviation = 1.56</b>		
<hr/>		
Very big	72	26.7
Big	98	36.3
Neutral	25	9.3
None at all	75	27.8
<hr/>		
Total	270	100
<hr/>		

The findings showed that a quarter of the households said that Thiba dam construction process had no effect on livestock at all while another quarter of the households said that the effect was very big. The findings also showed that the mean was 2.66 which show that the average households had a neutral opinion on the effect of livestock. However, the deviation of responses was a bit dispersed with a standard deviation of 1.56. When the researcher probed further on the effect on livestock, majority of the households claimed that they had to sell their livestock since they did not enough land to keep the livestock

#### **4.5.2 Effect of Thiba dam construction on access of food**

The study investigated whether the Thiba dam construction process had an effect on access of food for the households. The study showed that slightly over a quarter of the households (27.8%) said that the construction process did not affect their access to food while the rest (72.2%) said that it did affect their access to food. This supports the findings made by Kusiluka *et. al* (2004)

when he found out that food insecurity is a serious problem arising from compulsory land acquisition

The study further probed to find out the degree of effect of dam construction process on access of food. The findings are summarized in Table 4.12

**Table 4.12 how much food was affected by dam construction process**

---

How much food access was affected	Frequency	Percentage
<b>N= 270</b>		
<b>Mean = 3.19</b>		
<b>Standard deviation = 1.534</b>		
Very much	49	18.1
Much	74	27.4
Slightly	72	26.7
Very slightly	75	27.8
Total	270	100

---

The findings showed that less than a quarter of the respondents (18.1%) said that access of food was affected very much while slightly more than a quarter (27.4%) said that access to food was affected much. The mean was 3.19 which show that the average households felt that food access was affected slightly by the Thiba construction process.

### 4.5.3 Effect of land acquisition and household livelihoods status

The study conducted a regression analysis to examine the relationship that exists between land acquisition by Thiba dam implementers and the household livelihoods status of people living in Rukenya. The findings are in Table 4.13.

**Table 4.13 Regression of land acquisition and household livelihood**

R	0.716	
R2	0.513	
Standard error of estimate	0.361	
Significance	0.000	
	<b>Beta</b>	<b>Significance</b>
Loss of land	0.108	0.000
Effect on livestock	-0.798	0.000
Effect on food access	0.610	0.000

The study found that 51.3% of household livelihood can be explained by acquisition of land belonging to households living around the dam. This therefore means that 48.7% of household livelihoods are explained by other variables. This finding is in line with the observation of Kakulu (2008) who explained that acquisition may inflict many adverse impacts on populations whose lands are expropriated including loss of income and job opportunities, a loss of livelihood assets such as land and common pool resources, as well as access to public services and the breaking-down of social networks.

The study further estimated the relationship between the various variables of land acquisition and household livelihoods. The findings showed that acquisition of land is statistically significant in explaining household livelihoods. This is because; the p-value of all land acquisition variables

was 0.000 at 0.05 confidence level. A statistic is statistically significant, when the P- Value is less than the confidence interval. The study further revealed that there was a strong negative relationship (-0.798) between effect on livestock and construction process of Thiba dam.

#### **4.6 Effect of dam construction compensation on household livelihood**

The study wanted to examine the effect of compensation offered to households during the Thiba dam construction process and the adequacy of the compensation. This section examined compensation, participation in negotiations for compensation, valuation of land and adequacy of compensation.

##### **4.6.1 Compensation of land acquired for Thiba dam construction**

Acquisition of land from its initial owners and users has everlasting effects on their lives especially if these people depend on the land for their livelihood. Therefore, compensation is quite significant. The study investigated whether the households living around Thiba dam were compensated for their lands that were acquired for the dam construction. The findings are summarized in Table 4.14.

**Table 4.14 Compensated for land acquired**

Compensated	Frequency	Percentage
Yes	123	45.6
No	147	54.4
Total	270	100

The findings demonstrated that over half of the households (54.4%) were not compensated for the acquisition of their land. This finding supports the observation made by Ndjovu (2003) that normally; government expropriates land without paying compensation or by giving very little compensation.

#### **4.6.2 Participation in compensation negotiations**

The study sought to establish from the household whether they were involved in the negotiation process of compensation. The findings showed that more than half of the households (73%) were not involved in the negotiation process while only about a quarter of them (27%) were involved. This shows that the compensation negotiation was not participative and therefore implying that compensation payment does not satisfy the interest of both parties in general as claimed by (Associates draft report, 2007).

The study further conducted a cross tabulation of participation in negotiation of compensation and gender, in order to investigate whether the participation was gender inclusive. These findings are in Table 4.15.

**Table 4.15 Cross tabulation of gender and participation in negotiation of compensation**

Gender	Involvement in negotiation for compensation		Total
	Yes	No	
Male	36 (25%)	108 (75%)	144 (100%)
Female	37 (29.3%)	89 (70.7)	126 (100%)
<b>Total</b>	<b>73 (27%)</b>	<b>197 (73%)</b>	<b>270 (100%)</b>

The findings illustrated that there was an almost equal distribution of male and female household representatives in the negotiations of compensation at 25.0 % and 29.3 % respectively.



#### 4.6.3 Valuation of lands by developers of Thiba dam

The Associates Draft Report (2007) explained that due to the absence of real property valuation methods and qualified and professional valuers, absence of valuation provisions both in urban and rural areas of the country, lack of reliable valuation data, compensation is not assessed based on market value. Therefore, this study sought to investigate whether the lands of the households living around Thiba dam had been valued in the process of acquisition of land for dam construction. The findings are shown in Table 4.16.

**Table 4.16 Valuation done on land**

---

Valuation done	Frequency	Percentage
<b>N = 270</b>		
<b>Mean = 1.55</b>		
<b>Standard deviation = 0.499</b>		
Yes	122	45.2
No	148	54.8
Total	270	100

---

The findings showed that over half of the household representatives (54.8%) said that their lands had not been valued as illustrated in table 4.16.

#### 4.6.4 Compensations worth to lands market price

The researcher asked the household representatives whether they felt that the compensation paid to households was worthy the lands market price. Market price is the estimated amount that the land might be expected to realize if sold in the open market at valuation date after proper marketing between a willing seller and a willing buyer and they had acted knowledgeably,

prudently, and willingly (ADB, 2007). The findings of this observation are illustrated in Table 4.17.

**Table 4.17 Compensation worthy lands market price**

Worthy market price	Frequency	Percentage
Yes	74	27.4
No	196	72.6
Total	270	100

The findings showed that almost three quarters of the household representatives (72.6%) said that the compensation was not worthy the lands market price. This finding seconds the claim made by Miceli and Segerson (2007) that the compensation paid to owners by using market price is systematically less than the amount owners would ask for their land in a consensual transaction because acquired land owners always response to compensation value by their subjective value or reservation price that reflects the market value.

#### **4.6.5 Effect dam construction compensation on household livelihood**

The study wanted to establish the effect of dam construction compensation on household livelihood. The findings are shown in Table 4.18

**Table 4.18 Regression of dam construction compensation on household livelihood**

---

R	0.391	
R <sup>2</sup>	0.153	
Significance level	0.000	
	<b>Beta</b>	<b>Significance</b>
Were you compensated	0.154	0.037
Valuation conducted	0.156	0.035
Worthy market price	-0.371	0.000

---

The findings of the study showed that only 15.3% of household livelihoods can be explained by compensation offered to households by the dam constructors. This could be since, only a few of the households said that they received compensations and for those who received, majority said that it was not enough.

The study further found out that compensation given to households was statistically significant in explaining the households' livelihood. This is because; the p- values of the variables representing compensation of households are all less than 0.05 which is the confidence level of the study. From the study it was evident that worthiness of compensation to market price had a weak negative relationship (-0.371) with construction process of Thiba dam while compensation had a weak positive relationship with Thiba dam (0.154).

#### **4.7 Effect of social amenities by dam construction projects on household livelihood**

This study sought to establish the effect of social amenities by dam construction projects on household livelihood. This section comprises of contribution of dam to; education, road network and energy

#### 4.7.1 Contribution of Thiba dam construction process on education

The researcher asked the household representatives whether Thiba dam construction process had improved education in Rukenya. (Table 4.19)

**Table 4.19 Has Thiba Dam construction process improved education in Rukenya**

---

Education improved	Frequency	Percentage
<b>N = 270</b>		
<b>Mean =172</b>		
<b>Standard deviation = 0.449</b>		
Yes	75	27.8
No	195	72.2
Total	270	100

---

The findings showed that almost three quarters of the household representatives (72.2%) said that Thiba dam construction process did not improve education in Rukenya area. The study further showed that the mean responses were 1.72 which shows that the average households were of the opinion that Thiba dam construction process had not improved education in Rukenya, with a standard deviation of 0.449 which shows that responses were closely clustered around the mean. However, further probing shows that sensitization trainings had been conducted by JICA in Rukenya however this did not improve on education.

#### 4.7.2 Contribution of Thiba dam on energy provision in Rukenya

The study wanted to investigate whether Thiba dam construction process had contributed to energy in Rukenya. The findings are shown in table 4.20.

*Table 4.20 Contribution of dam construction process on energy provision*

---

Contribution to energy	Frequency	Percentage
<b>N = 270</b>		
<b>Mean = 1.81</b>		
<b>Standard deviation = 0.389</b>		
<hr/>		
Yes	50	18.5
No	220	81.5
<hr/>		
Total	270	100
<hr/>		

The findings showed that almost all of the respondents (81.5%) said that the construction process of the dam had not contributed to energy provision in Rukenya. The rationale behind this observation is since the dam construction process is still at a young stage

#### 4.7.3 Effect social amenities provided by dam constructors on household livelihood

The study wanted to establish the effect of social amenities provided by dam constructors on household livelihood. Therefore the study conducted a regression analysis and the findings are shown in table 4.21

**Table 4.21 Regression analysis of social amenities provided by dam constructors on household livelihood**

---

R	0.117	
R <sup>2</sup>	0.014	
Significance level	0.157	
	<b>Beta</b>	<b>Significance level</b>
Education improves	0.089	0.155
Energy provision improves	0.058	0.354

---

The findings demonstrated that only 1.4% of the household livelihoods can be explained by social amenities provided by the implementers of Thiba dam construction project. This is due to the fact that from the study it was evident that Thiba dam construction process had contributed very minimally to the social amenities in Rukenya.

The study further found out that a social amenities offered by Thiba dam implementers were not statistically significant in explaining the households' livelihood. This is because; the p- values of the variables representing social amenities of households are all more than 0.05 which is the confidence level of the study (95%). The findings revealed that; improvement in education had a weak positive relationship with Thiba dam construction process (0.089) while energy provision also had a weak positive relationship (0.058)

#### **4.8 Effect of social disruption on household livelihood**

The study wanted to find out the social disruptions caused by Thiba dam construction process in Rukenya. This section presents finding on the effect of Thiba dam construction process on; culture, physical security of Rukenya and effect on women and children.

#### 4.8.1 Effect of Thiba dam construction process on religion

The study sought to investigate whether the dam construction has an effect on the culture of households in Rukenya, where culture was measured using religion as the variable. The findings are shown in Table 4.22

**Table 4.22 Effect of Thiba dam construction process on religion**

---

Effect on religion	Frequency	Percentage
<b>N = 270</b>		
<b>Mean = 1.55</b>		
<b>Standard deviation = 0.499</b>		
Yes	122	45.2
No	148	54.8
Total	270	100

---

The findings showed that slightly over half of the household representatives (54.8%) said that Thiba dam construction process had not affected the religion of the people in Rukenya as shown in table 4.19. This finding negates from the findings of Adams (2000) who explained that construction of dams led to cultural alienation due to dispersion of people as well as the emergence of workers from different backgrounds.

#### 4.8.2 Effect of Thiba dam construction process on physical security of Rukenya

The study sought to find out whether the construction process of Thiba dam had an effect on the physical security of Rukenya. The findings are shown in Table 4.23.

**Table 4.23 effect of dam construction process on physical security of Rukenya**

Affect physical security	Frequency	Percentage
Yes	98	36.3
No	172	63.7
Total	270	100

The findings demonstrated that slightly over half of the household representatives (63.7%) felt that the physical security of the area had not changed at all.

#### **4.8.3 Effect of Thiba dam construction process on women and children**

The study sought to find out whether the construction process of Thiba dam had an effect on women and children in Rukenya. The findings showed that over half of the households (72.2%) said that construction process of Thiba dam had an effect on women and children. This finding supports the findings made by WCD (2000) when he claimed that the stress of relocation and disruption of social networks is known to adversely affect health and well-being of communities and women may be particularly vulnerable to the resettlement process. Further Adams (2000) observed that women as marginalized entities within marginalized communities are often forced to shoulder the ordeal of displacement far more intensely. The study investigated to find out how much the women and children were affected and the findings are in Table 4.24



**Table 4.24 Effect of Thiba dam on women and children**

Effect on women and children	Frequency	Percentage
Very much	97	35.9
Slightly much	123	45.6
Very slightly	25	9.3
n/a	25	9.3
Total	270	100

The findings showed that almost half of households felt that women and children were affected slightly much by Thiba construction process. A further probe, showed that women were involved in the re location more than the men, hence felt the effect more. Others said the reason was due to poor road network hence they had travel further to look for water and food as compared to before the relocation, some said that it took time for their families to diffuse in the new community.

#### **4.8.4 Effect of social disruption caused by Thiba Dam on household livelihoods**

The study sought to investigate the effect of social disruption caused by Thiba dam construction on household livelihood. The findings are shown in table 4.25

**Table 4.25 Regression analysis of social disruption caused by Thiba dam construction on household livelihood**

---

R	0.603	
R <sup>2</sup>	0.364	
Significance level	0.000	
	<b>Beta</b>	<b>Significance level</b>
Dam affected religion	-0.412	0.000
Physical security	0.106	0.066
Effect on women and children	-0.324	0.000

---

The study found out that 36.4% of household livelihood can be explained by social disruption caused by Thiba dam construction. The social disruption includes; effect of Thiba dam construction on culture of people in Rukenya, effect on security and the effect on women and children.

The study found out that a social disruptions caused by Thiba dam were statistically significant in explaining the households' livelihood. This is because; the p- values of the variables are less than 0.05 which is the confidence level of the study. However the effect on physical security is not statistically significant at  $p = 0.066$  which is more than 0.05 confidence level. The rationale behind this is since majority of the households said that physical security had not been affected by the construction process of Thiba dam. The study found out that effect on religion has a weak negative relationship with the construction process of Thiba dam (-0.412) while effect on physical security of Rukenya area had a weak positive relationship with the construction process of Thiba dam (0.106)

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, DISCUSSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

The overall aim of this study was to investigate the effects of dams' construction projects on household livelihood a case of Thiba dam. This chapter presents the summary of the findings, conclusions of the study, recommendations of the study and suggestions for further research on effects of dam construction. The chapter presents findings according to the objectives of the study which includes: To examine the effects of land acquisition on household; to assess the effect of dam construction compensation on household livelihood; to investigate the effect of social disruption on household livelihood and to establish the effect of social amenities by dam construction projects on household livelihood.

#### **5.2 Summary and discussion of findings**

This section presents the summary and discussion of the findings of this study according to the objectives of the study. The objectives of this study were; to examine the effects of land acquisition on household livelihood; to assess the effect of dam construction compensation on household livelihood; to investigate the effect of social disruption on household livelihood and to establish the effect of social amenities by dam construction projects on household livelihood.

##### **5.2.1 Effect of land acquisition on household livelihood**

This study wanted to examine the effects of land acquisition on household livelihoods. The study found out that 63.0% of households lost agricultural land to the construction of Thiba dam. One of the main effects of dam construction in various areas is the loss of agricultural land by people living around the dam as explained by Bui (2011). This is true according to Canter (2004) who

added that dam construction leads to displacement of human populations around the construction site. Although usually, governments or agencies concerned compensate the local people to facilitate their settlement elsewhere.

The findings demonstrated that 27.8% of the households said that Thiba dam construction process had no effect on livestock at all while 26.7% of the households said that the effect was very big. These meant that the average households had a neutral opinion on the effect of livestock. The WPNQ (2006) report explained that one of the effects of dam construction is the barriers created, which limits free movement of livestock. These barriers come in form of fences built around dams and restriction on areas where people can herd. However according to this current study, the major barrier was due to the selling of lands and hence households have less space to keep livestock. This was deduced from a further probe on the effect on livestock which showed that majority of the households claimed that they had to sell their livestock since they did not enough land to keep the livestock.

The study further showed that 27.8% of the households said that the construction process did not affect their access to food while 72.2% said that it did affect their access to food. This finding is in line with the observation made by Kusiluka et. al (2004) when he found out that food insecurity is a serious problem arising from compulsory land acquisition. The study further revealed that 18.1% of the households said that access of food was affected very much while slightly more than a quarter (27.4%) of the households said that access to food was affected much.

The study found that 51.3% of household livelihood can be explained by acquisition of land belonging to households living around the dam. This therefore means that 48.7% of household livelihoods are explained by other variables. This finding supports the claim made by Kakuku (2008) that acquisition of land is one of the biggest effect of dams since it may inflict many adverse impacts on populations whose lands are expropriated including loss of income and job opportunities (farm and non-farm jobs), a loss of livelihood assets such as land and common pool resources, as well as access to public services and the breaking-down of social networks. The findings of the study also showed that acquisition of land is statistically significant in

explaining household livelihoods. This is because; the p-value of all land acquisition variables was 0.000 at 0.05 confidence level.

### **5.2.2 Effect of dam construction compensation on household livelihood**

The findings revealed that 54.4% of the households living around Thiba dam were not compensated for the acquisition of their land. This finding is in line with the findings made by Ndjovu (2003) that usually the government seizes land without paying compensation or by giving very little compensation. In addition, this study negated the claim made by Canter (2004) that usually governments or agencies concerned compensate the local people to facilitate their settlement elsewhere since it is evident that most households in Rukenya were not compensated for the acquisition of their lands. The findings further showed that 73% of the households were not involved in the negotiation process while only 27% of them were involved. This indicates that the compensation negotiation of Thiba dam was not participative. The findings further showed that there was an almost equal distribution of male and female household representatives in the negotiations of compensation.

The findings also revealed that 54.8% of the households said that their lands had not been valued. The study further demonstrated that 79.7% of the households who were compensated had their lands valued by the developers of Thiba Dam while 83.7% of the households that were not compensated did not have their lands valued. A report by Associates draft report (2007) explained that one reason why valuation was not usually conducted was due to lack of professional valuers. More over due to the absence of real property valuation methods and qualified and professional valuers, absence of valuation provisions both in urban and rural areas of the country, lack of reliable valuation data, compensation is therefore not assessed based on market value

The findings of the study showed that 72.6% of the households said that the compensation was not worthy the lands market price. Market price is the estimated amount that the land might be expected to realize if sold in the open market at valuation date after proper marketing between a willing seller and a willing buyer and they had acted knowledgeably, prudently,

and willingly (ADB, 2007). The finding of this current study is supported by Miceli and Segerson (2007) who found out that that the compensation paid to owners by using market price is systematically less than the amount owners would ask for their land in a consensual transaction because acquired land owners always response to compensation value by their subjective value or reservation price that reflects the market value.

The findings of the study showed that only 15.3% of household livelihoods can be explained by compensation offered to households by the dam constructors. This explains that compensation explains only less than a quarter of the households' livelihood, hence leaving around 85% to be explained by other factors. However compensation given to households is statistically significant in explaining the households' livelihood. This is because; the p- values of the variables representing compensation of households are all less than 0.05 which is the confidence level of the study

### **5.2.3 Effect of social amenities by dam construction projects on household livelihood**

The study revealed that 72.2% of the households said that Thiba dam construction process did not improve education in Rukenya area. However, further probing showed that sensitization trainings had been conducted by JICA in Rukenya; however this did not improve on education. The study further revealed that 81.5% of the households felt that the construction process of Thiba dam had not improved the road network in Rukenya. Further, the study showed that 81.5% of the households said that the construction process of the dam had not contributed to energy provision in Rukenya. These findings disputes the claim made by ICM (2006) that large scale projects can bring significant benefits to communities such as construction of roads, health, educational facilities, creation of jobs and other economic opportunities.

The findings also demonstrated that only 1.4% of the household livelihoods can be explained by social amenities provided by the implementers of Thiba dam construction project. The study also found out that a social amenities offered by Thiba dam implementers were not statistically significant in explaining the households' livelihood. This is because; the p- values of the variables representing compensation of households are all more than 0.05 which is the

confidence level of the study. Therefore we can conclude that this current study does not support the claim made by World Bank (2005) that large-scale projects operations invest substantially in local community development through providing training, public services such as education and health; public goods such as clean water, transport, energy and infrastructures such as schools, health centres, water supply systems which uplifts the living standards.

#### **5.2.4 Effect of social disruption on household livelihood**

The findings showed that 54.8% said that Thiba dam construction process had not affected the culture of the people in Rukenya. The findings further demonstrated that slightly over half of the household representatives (63.7%) felt that the physical security of the area had not changed at all. Therefore this disputes the claim risen by UNCTAD (2005) that for all the positive aspects of large constructions there is a possibility of affecting the sensitive environments, lifestyles of indigenous people which can be responsible for both benefits and damage the existing balance between people and the environment. In addition Adams (2000) explained that cultural alienation was another social impact of construction of large projects. He explained that the fertile soils of river valleys have always been densely populated, giving rise to some of the world's most ancient civilizations. Displacing these communities risks the loss of valuable traditional knowledge systems and destroys part of the world's cultural heritage. This is not the case with the people living in Rukenya since according to this study majority agreed that they had not been affected culturally.

The study showed that 72.2% said that construction process of Thiba dam had an effect on women and children. This finding supports the observation made by WCD (2000) when they claimed that the stress of relocation and disruption of social networks is known to adversely affect health and well-being of communities and women may be particularly vulnerable to the resettlement process. Further Adams (2000) observed that women as marginalized entities within marginalized communities are often forced to shoulder the ordeal of displacement far more intensely. This is true in Rukenya, since women play one of the major roles in homes and therefore any form of relocation impacts on them more than on men.

The study found out that 36.4% of household livelihood can be explained by social disruption caused by Thiba dam construction. This is supported by the report filed by WCD (2000) that dam construction caused a large scale of mass-displacement which makes it imperative that the potential impacts on livelihood, health, and traditional cultures need to be carefully monitored and managed. The report found out that displaced communities are frequently indigenous people and other ethnic minorities whose voices have too often been silenced by existing power structures. This study further found out that a social disruptions caused by Thiba dam were statistically significant in explaining the households' livelihood. This is because; the p- values of the variables are less than 0.05 which is the confidence level of the study. However the effect on physical security is not statistically significant at  $p = 0.066$  which is more than 0.05 confidence level.

### **5.3 Conclusion of the study**

The following conclusions were made from this study;

Land acquisition is one of the major effects of dam construction process on the livelihood of households living around the dam. The main reasons behind this are due to the loss of agricultural land, loss of livestock since the households have limited land to store the livestock and effect on the access of food. The study showed that some people had lost farm jobs due to the acquisition of land for the dam construction.

While compensation paid to households is necessary in improving the livelihood of households, the effect is not as big as the one caused by land acquisition. This observation can be explained by the fact that most of the households in Rukenya were not compensated by the government or the implementing agency (JICA). In addition, it was imperative that even for those who were compensated, the compensation was not worthy the market price of the lands. It was raised that the compensation was lower than the market price. Further, most of the household were not involved in the negotiation process of the compensation and therefore their interests were not put into consideration. Another issue that rose from this study is that most of the lands were not



valued before compensation and hence it was not possible to compensate then according to the market value of the lands.

While many scholars explained that dam construction led to an improvement of social amenities in the area, this was not true in Rukenya, since education, road network and energy had not improved with the beginning of dam construction process. However, the people living in Rukenya had been taken through sensitization trainings sponsored by JICA prior to the commencement of the dam construction.

The study found that social disruption caused by Thiba dam construction process had a large effect on household livelihood. However, the culture and religion of the households were not affected majorly by the dam construction. What stood out was the massive effect Thiba dam construction process had on women and children who are believed to carry the massive burden of relocation.

#### **5.4 Recommendation of the study**

The study recommends the following;

1. The government and the implementers of Thiba dam need to ensure that the resettlements programs are effective. They need to ensure that the lands where they relocate the households is equally fertile and enough for the households to continue with their agricultural activities and have enough spaces for livestock keeping. A policy needs to be developed on the resettlement of people in order to ensure that the households get fair dues for their lands.
2. The study recommends that a professional valuation should be carried out before any compensation is offered to households living around dam construction sites. This is to ensure that the amount compensated is equal to the market price of the land. In addition household representatives should be included in the negotiation process of the compensation in order to ensure that both the implementers' and the households' interests are considered. The government needs to adopt a policy on compensation of households due to displacement by large projects such as the one adapted by the Government of Ethiopia. This will ensure fair compensation of people by implementers of large projects such as Thiba dam construction.

3. The study recommends that the implementers of Thiba dam need to improve the social amenities in the area especially the road network and energy which impacts directly on their project. This not only will make their work more efficient but it will win the acceptance of the project by the local community which is vital for the successful implementation of Thiba dam construction.

4. The implementers of Thiba dam construction should come up with a strategy to ease the burden impacted on women and children in the process of relocation. They need to include women in the stakeholders meetings in order to understand the effect of the dam construction process on women.

### **5.5 Suggestion for further research**

We would suggest a similar study to be carried after the completion of the dam process to find out the effect of the Thiba dam on household livelihoods. This will shed light as to whether the effects that occurred during the construction process are any different from the effects occurred after the completion of the Dam. We would also suggest a similar study to be conducted in a different area other than Rukenya, to find out whether the findings that rose from Rukenya area are replicable in other areas.

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## APPENDICES

### APPENDIX 1: QUESTIONNAIRE

Kindly tick where appropriate.

#### SECTION I Demographic Characteristics

1. What is your gender? Male [ ] Female [ ]

2. What is your age?

Below 25 yrs [ ] 26-35 yrs [ ] 36-45 yrs [ ] 46-55 yrs [ ] Above 55 yrs [ ]

3. What is the size of your household (parents and children)

Two or less [ ] 3-5 [ ] 6-9 [ ] 10-13 [ ] Above 13 [ ]

4. Who is the household held at your home?

Mother [ ] Father [ ] Child [ ]

5. What group best describes you?

Displaced and resettled person [ ]

Displaced and Compensated person [ ]

Remaining Household [ ]

#### SECTION 2 Household livelihoods

1. Are you involved in any agricultural activity?

Yes [ ] No [ ]

2. If yes which activity? (*tick where applicable*)



Rice [ ] Maize [ ] Beans [ ] Coffee [ ] Tea [ ] Livestock farming [ ] Fish farming  
[ ] Other [ ]

3. If other, please specify?

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4. How has agricultural production improved since the construction of Thiba dam?

Very well [ ] Well [ ] Neutral [ ] Not well [ ] None at all [ ]

5. Explain your answer\_\_\_\_\_

6. What is your income generating activity?

Employed [ ] Self Employed [ ] None of the above [ ] Other [ ]

7. Has the construction of the Thiba Dam contributed to your income in any way?

Yes [ ] No [ ]

8. If yes, how?

Very well [ ] Well [ ] Neutral [ ] Slightly [ ] Not well at all [ ]

9. Have you been involved in any unskilled labor during the construction of the dam?

Yes [ ] No [ ]

10. Have you been involved in any skilled labor during the construction of the dam?

Yes [ ] No [ ]

11. Has any member of your family experience any repeated health complication?

Yes [ ] No [ ]

12. If yes, do you think that the construction of Thiba Dam is to blame?

Yes [ ] No [ ]

**Section 3: Land acquisition**

13. Did you lose any agricultural land due to construction of Thiba Dam?

Yes [ ] No [ ]

14. How would you explain the effect of your livestock by the construction of Thiba Dam?

Very big [ ] Big [ ] Neutral [ ] Not big [ ] none at all [ ]

15. Please explain your answer

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16. Has the construction of Thiba dam affected your access to food?

Yes [ ] No [ ]

17. If yes how much?

Very much [ ] Much [ ] Neutral [ ] Slightly [ ] Very slightly [ ]

18. Do you feel that Thiba dam has made you lose any farm jobs?

Yes [ ] No [ ]

19. If yes, which one? \_\_\_\_\_--

20. Do you feel that Thiba dam has made you lose any non-farm jobs?

Yes [ ] No [ ]

21. If yes, which one? \_\_\_\_\_--

#### **SECTION 4 Adequacy and usage of compensation**

22. Were you compensated in way in the process of setting up Thiba dam?

Yes [ ] No [ ]

23. If yes, how would you describe the compensation?

Very adequate [ ] Adequate [ ] Neutral [ ] Inadequate [ ] Very inadequate [ ]

24. Justify your answer\_\_\_\_\_

25. Were you involved in compensation negotiations?

Yes [ ] No [ ]

26. Was any valuation for your land done by the implementers of Thibs dam?

Yes [ ] No [ ]

27. Do you think that the compensation offered for the land is worthy the land's market price?

Yes [ ] No [ ]

#### **Section 5: Social amenities**

28. Have you undergone through any form of training sponsored by the implementers of Thiba dam?

Yes [ ] No [ ]

29. Has the education in Rukenya improved with the construction of Thiba dam?

Yes [ ] No [ ]

30. If yes, explain\_\_\_\_\_

31. Has the implementers carried out any health related initiatives?

Yes [ ] No [ ]

32. If yes, how would you rate the initiatives?

Very well [ ] Well [ ] Neutral [ ] Unwell [ ] Not well at all [ ]

33. Has the Thiba improved the road network in Rukenya?

Yes [ ] No [ ]

34. Has Thiba dam improved energy provision in Rukenya?

Yes [ ] No [ ]

35. Which other social amenities in Rukenya, do you feel has been brought about by construction of Thiba dam? \_\_\_\_\_

**Section 6: Social disruptions**

36. Did construction of Thiba dam cause any form of physical disruption?

Yes [ ] No [ ]

37. If yes, explain \_\_\_\_\_

38. Has Thiba dam affected any of your cultural or religious activities?

Yes [ ] No [ ]

39. If yes, which ones?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

40. Has construction of Thiba dam affected your area's physical security?

Yes [ ] No [ ]

41. Do you think that women and children were more affected by the construction of Thiba dam?

Yes [ ] No [ ]

42. If yes, how much?

Very much [ ] slightly much [ ] Neutral [ ] slightly [ ] Very slightly [ ]

43. Add any other comment

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**Thank you for your contribution**

**APPENDIX TWO: Transmittal Letter**

Sarah Ndirangu  
P.O Box 586 10300,  
Kerugoya

11 March 2014

Dear Respondent,

**RE: REQUEST TO FILL THE QUESTIONNAIRE**

I am a student of University of Nairobi, currently conducting a research study as a complement for the requirement of Masters of Arts in Project Planning and Management. I am therefore requesting that you provide the required information as it will only be used for academic reasons.

Thank you for your co-operation

Yours Faithfully,

Sarah M Ndirangu