THE EFFECT OF DOMINION IRRIGATION PROJECT ON HOUSEHOLD LIVELIHOODS IN SOUTH CENTRAL ALEGO LOCATION, SIAYA COUNTY, KENYA

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A Thesis submitted to the Board of Post Graduate Studies in Partial Fulfillment of the Requirements for the Award of Master of Arts Degree in Sociology (Community Development and Project Management) of Egerton University

EGERTON UNIVERSITY

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DECLARATION AND RECOMMENDATIONS

Declaration

This thesis is my original work and to the best of my knowledge has not been presented for the award of any degree in any university.

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Recommendations

This thesis has been submitted with our recommendations as university supervisors.

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DEDICATION

I dedicate this work to you my daughter Viola Owiyo. You pushed me on, encouraged me, prayed with me, and availed a laptop for my use – thank you dear daughter.

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Above all else, my gratitude goes to the Almighty God for the gift of life, good health, finances and courage without which I would not have come this far.

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Finally, I would like to thank the 160 respondents and the 6 key informants for giving me their time. You all received me very well when I visited your offices, in some instances without prior appointment. This thesis is complete because you willingly responded to my questions. I wish to particularly thank the area Chief for the support and valuable information he was always willing to avail to me during the period of proposal development, data collection and analysis and through to the period of report writing.

ABSTRACT

This study sought to explore the effect of Dominion Irrigation Project on the household livelihoods of the residents of South Central Alego. It was motivated by continued agitation on the part of the locals arising from claims of territorial space and unfulfilled promises on the part of the Multinational Corporation. The specific objectives of this study were to: determine the role played by Dominion Irrigation Project on the economic empowerment of the households in the location; establish the relationship between Dominion Irrigation Project and food security in the location; explore the effect of Dominion Irrigation Project on environmental conservation in the location. The study was informed by the sustainable livelihoods approach and the social exchange theories. A descriptive survey research design was used. There was a systematic random sampling of 160 head of households who prior to 2003 relied on the Yala Swamp Wetland directly or indirectly as a sole source livelihood. An additional 6 key informants were purposively identified and interviewed to provide information on pertinent issues affecting the community. Interview schedule and interview guide were used to collect data from respondents. Data collected from the field was analyzed qualitatively. Analyzed data was presented using frequency tables, pie charts, bar graphs and percentages. Findings of this study indicate that 72% of the respondents felt that Dominion Irrigation Project had not economically empowered the households; 83% were convinced the Project had not ensured food security for the households and 65% believed that Project activities have led to environmental degradation. The study concluded that although there were elements of contribution towards household livelihoods, it was very minimal and hence not effective. This in effect led to discontent on the part of the local community of South Central Alego. The study therefore recommends that households need to be included in decision making through an open process of discussion, negotiation and incorporation of different views and values, in order to secure legitimacy for a project.

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LIST OF ABBREVIATIONS AND ACRONYMS

DFID	**:**	Department for International Development (UK)
DRSRS	**:**	Department of Resource Surveys and Remote Sensing
EIA	**:**	Environmental Impact Assessment
FDI	**:**	Foreign Direct Investment
FAO	**:**	Food and Agriculture Organization (of the United Nations)
ILACO	**:**	Indian Life Assurance Company
IWMI	**:**	International Water Management Institute
LBDA	**:**	Lake Basin Development Authority
MNC	**:**	Multinational Corporation
NEMA	**:**	National Environment Management Authority
NGO	**:**	Non-Governmental Organization
SET	**:**	Social Exchange Theory
SLA	**:**	Sustainable Livelihoods Approach
SPSS	**:**	Statistical Package for Social Sciences
SSA	**:**	Sub-Saharan Africa
SWM	**:**	Sustainable Wetland Management
UNCED	**:**	United Nations Conference on Environment & Development
UNDP	**:**	United Nations Development Programme
WHO	**:**	World Health Organization
WCED	**:**	World Commission on Environment and Development

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

A wetland is a land area that is saturated with water, either permanently or seasonally, such that it takes on the characteristics of a distinct ecosystem. The Ramsar Convention on Wetlands described wetlands as areas of marsh, peat or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres (Ramsar Convention Secretariat, 2007). Wetlands provide valuable ecosystem services to society. Despite this, in many parts of the world, wetlands have been degraded or lost, and demand for development, particularly from agriculture is putting pressure on many of those that remain. Achieving environmental sustainability and at the same time satisfying the need for increased food production, enhanced economic growth and poverty reduction, is an issue of growing importance the world over (IWMI 2006).

While most developed countries have established controls restricting further wetland conversion, and even initiated habitat restoration, in many developing countries, wetland conversion is seen as a strategy to gain more land for agricultural purposes. Wetland drainage and associated changes not only reduce their total size, but also impact adversely on their water regimes, thereby altering the habitats with far-reaching consequences to the their floral and faunal biodiversity. Wetlands are also considered the most biologically diverse of all ecosystems, serving as home to a wide range of plants and animals. The purpose of Ramsar Convention was to stem the progressive encroachment on and loss of wetlands, recognizing the fundamental ecological functions of wetlands and their economic, cultural, scientific and recreational value – hence, wise use of wetlands. The Ramsar List of Wetlands of International Importance has 1,950 sties and the Yala Swamp Wetland in Kenya is one of the sites. The wise use concept applies to all wetlands and its application is crucial to ensuring that wetlands can continue to fully deliver their vital role in supporting biological diversity and human well-being. Kenya as a signatory of the Ramsar Convention is obligated to the wise use of the Wetland.

The Yala Swamp had been an important area of interest to the Government of Kenya for a long time. Efforts for the reclamation of the swamp date back to as early as 1954 when the colonial Government of Kenya assigned Sir Alexander Gibb and Partners to investigate the potentials of wetland reclamation in the Kenyan portion of the Nile Basin (Yala Swamp lies within the Nile Basin). The study recognized the high productive potential of Yala Swamp and its recommendation was to be implemented eight years later when in 1963 the Kenya Government requested the United Nations (UN) for assistance to execute the recommendations of the Commission Report to reclaim Yala Swamp as a realization of the development of the area. The request was granted and under the UN special fund, the Food and Agricultural Organization (FAO) implemented the reclamation of Area 1 (2,300 ha) in the period 1965-1970. The specific works carried out included the construction of: a diversion canal and protection dyke on River Yala; a feeder canal to Lake Kanyaboli; retention dyke at Lake Kanyaboli. Area II and Area III were left under water after reclamation of Area I. FAO construction activities started in 1967 under the United Nations Development Project (UNDP)/FAO project. Yala River diversion and protection dyke (7.25km) long, Lake Kanyaboli retention dyke (2.5 km long) and Lake Kanyaboli feeder canal (8.8km long) were constructed. By 1970 a total of 2,300 ha of the Yala swamp wetland had been effectively reclaimed. This reclaimed area (2,300 ha) remained idle for several years despite the structural works already partly done and it gradually developed into a good grazing land for the local communities (Abila, 2005).

In 1972 the Ministry of Agriculture commissioned a Dutch Consulting firm – the Indian Life Assurance Company (ILACO), to investigate the possible development options of the Yala Swamp. ILACO recommended the reclamation of a further 9,200 ha (Area II), bringing a total of 11,500 ha under development and leaving only 6,900 ha (Area III) to act as a buffer zone. Faced with a rapidly expanding population and the need to increase food production for national food self-sufficiency as well as improvement of earnings in foreign exchange, the Kenya Government revisited the issue of Yala swamp regarding its reclamation for agricultural activities. Between 1979 and 1982 another feasibility study was done by the Mehta Group International which revealed more potential for Area II. However, this was never implemented due to resource and management constraints. Hence, only the already reclaimed Area I was put under agriculture by the Lake Basin Development Authority (LBDA) on behalf of the Kenya Government. LBDA moved into Area I for an integrated development and utilization on a pilot basis and in

cognizance of sustainable use of the reclaimed area to boost food production and to raise the standard of living of the local community and the nation at large. This they did through intensive crop husbandry based on applied research principles for a holistic agricultural development. The agricultural activities included production of cereals, pulses, horticultural crops, seed bulking and massive upgrading of the local agricultural production technologies. Other programmes initiated by LBDA included the community based rehabilitation and conservation of the degraded areas (SIDA, 2002).

The Yala Swamp conflict – the motivation behind the present study - started in 2003 when regional government authorities granted a 25-year lease for rice cultivation to Dominion Farms (K) Ltd, a subsidiary of Dominion Group of Companies based in Edmond, Oklahoma, USA. The agreement as approved by the then local authorities of Bondo and Siaya County Councils was that Dominion would engage in rice production in part of the swamp known as Area I, covering about 2,300 ha. This is the land portion that had been reclaimed before 1970, and previously used by LBDA for agricultural activity. An environmental impact assessment (EIA) was commissioned by Dominion for large-scale rice production, for which a license was issued in 2004, specifically for rice irrigation. (LBDA and JICA, 1992)

However, instead of the originally intended rice cultivation in the 2,300 ha once owned by the LBDA, Dominion embarked on other additional agricultural and development activities in the swamp that went beyond rice cultivation. These included construction of irrigation dykes and weirs, water-drilling, an airstrip and road. The Project also engaged in a major aquaculture venture which included fish farms, a fish processing and fish mill factories. These new activities undertaken by Dominion Farms Ltd elicited mixed reactions with a number of stakeholders voicing various concerns ranging from issues of economic empowerment, food security and environmental conservation. The locals voiced a number of complaints including non-inclusion in the negotiations, compulsory acquisition of land, inadequate compensation and threat of environmental degradation (Okemwa and Ochieng, 2006). It is in light of this acrimonious nature of co-existence in Yala Swamp since 2003 that the current study sought to explore the effect of the activities of Dominion Irrigation Project on the household livelihoods of the residents of South Central Alego Location.

1.2 Statement of the Problem

The Yala Swamp Wetland had been a sole source of household livelihood for the riparian community of South Central Alego for generations. The arable land, the rivers and lakes, the forests, papyrus, wood, roofing grass and green pastures ensured sustainable household livelihoods for the residents. However, the quiet, easy and productive lifestyle came to an end when in 2003 the local political leaders leased 2300 ha (Phase I) of the swamp to Dominion Farms (K) Ltd for large-scale production of rice. This in effect meant the loss of territorial space for the residents of South Central Alego and by extension, the loss of a sole source of livelihood. The households soon realized they could not meet their basic needs since they no longer owned the arable swampland that they previously used for floodplain farming; the cottage industry that once ensured economic power started to diminish; the rivers and lakes could no longer produce enough fish for domestic use and for commercial purposes; the forests were cleared and so herbal medication, roofing grass, edible birds, wild vegetables, honey and fruits disappeared; hunting and logging came to a stop. Unable to cope with the stresses and shocks brought about by this kind of social change, the residents of Kadenge and Obambo resorted to demonstrations and even open confrontations with the management of Dominion Irrigation Project. However, the effects of Dominion Irrigation Project on household livelihoods in South Central Alego Location, Siaya County are not known, thus, the need for this study.

1.3 Objectives of the Study

1.3.1 Broad Objective

The broad objective of the study was to explore the effect of Dominion Irrigation Project on household livelihoods in South Central Alego Location, Siaya County, Kenya.

1.3.2 Specific Objectives

This study was guided by the following specific objectives:

i. To determine the role played by Dominion Irrigation Project on the economic empowerment of the households in the location;
ii. To establish the relationship between Dominion Irrigation Project and food security in the location;

iii. To explore the effect of Dominion Irrigation Project on environmental conservation in the location.

1.4 Research Questions

This study was guided by the following set of research questions:

i. Is Dominion Irrigation Project playing any role towards economic empowerment of the households in the location?
ii. How has Dominion Irrigation Project affected the status of food security in the location?
iii. What is the effect of Dominion Irrigation Project on environmental conservation in the location?

1.5 Justification for the Study

The study was conducted at a time when natural resources like forests and wetlands were facing much threat in the form of population migration. As populations move into these natural resource bases, there is a growing outcry over degradation and depletion of the environment. It is expected that the results of this study will help policy makers review policies that govern transformation of wetlands and use of natural resources.

Following a series of peaceful demonstrations and sometimes open confrontations between the local community and the management of Dominion Irrigation Project since 2004 (when Dominion Project activities started in Yala Swamp), it became necessary to conduct a study of this nature in order to establish the truth behind the continued agitation by the locals, with a view to suggesting possible solutions.

The initiative to carry out this study was an attempt to contribute to theory. It tackles the issues of sustainable livelihoods and also the dynamics of social exchanges between parties. The whole content of it contributes to the two theoretical frameworks: the Sustainable Livelihoods Approach (SLA) as compounded by the DFID (2002) and the Social Exchange Theory (SET) as expounded by George Homans (1974). The study set out to determine whether the Project is ensuring sustainable livelihoods for the households, a role previously played by the Wetland. It also investigated the intricacies of an imbalanced social exchange arrangement that transpired in Yala Swamp in 2003.

1.6 Scope and Limitations of the Study

The study was conducted in South Central Alego Location and restricted to members of the riparian communities of Obambo and Kadenge Sub-Locations. It focused on Dominion Irrigation Project and household livelihoods. The area of interest was the effect of Dominion Irrigation Project on household livelihoods.

Data was collected from head of households whose members directly or indirectly relied on the Wetland for household livelihoods. The accuracy of the information given exclusively depended on the genuineness of the interviewed household heads. However, since the study involved an aggrieved local community that has been agitating for recompense, some respondents took advantage of the interview platform to exaggerate issues or give false information. As Barbier and Strand (2011) observe, interviews may be prone to deceptions and exaggerations and when this happens, the data accuracy may be limited by the respondents' dishonesty. However, the study addressed this through multi-source of evidence. Separate interviews with key informants helped in backing up or discrediting the data collected from the head of households.

1.7 Definition of Terms

Economic Empowerment: Refers to the role Dominion Irrigation Project is playing (or not playing) to uplift the financial status of the households in South Central Alego Location.

Environmental Conservation: In Yala Swamp environmental conservation involves the practice of protecting the Wetland for the benefit of the ecosystem and the residents of South Central Alego Location, and also from the pressures of large scale rice irrigation technology.

Food Security: The households of South Central Alego Location would boast of achieving food security when all the households have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs at all times.

Household Livelihoods: In this study 'household' was used synonymously with 'family'. Household livelihoods therefore refer to the ability or non ability of families residing in South Central Alego to cater for their basic needs like food, clothing and shelter.

Project: Dominion irrigation project is a set of interrelated farming activities that are being undertaken in Yala Swamp, using resources to achieve specific objectives for the Dominion Group of Companies and within a given period of 25 years.

Riparian Community: Refers to a group of people (in this study the local community of South Central Alego) who reside in the area that forms the interface between land and a river or stream.

Sustainable Household Livelihoods: The residents of Kadenge and Obambo can be said to have sustainable household livelihoods when it can cope with the social change brought about by the loss of the Yala Swamp, and maintain or enhance its capabilities and assets both in the present and in the future, while not undermining the natural resource base – the wetland.

Wetland: The Yala Swamp Wetland in Kenya, consists of a very wide range of ecosystems, the formation of which has been dominated by water and the processes and characteristics of which are largely controlled by water. It is an area of marsh, mangroves, wet meadows, papyrus reeds and peat.

CHAPTER TWO

LITERATURE REVIEW AND THEORETCAL FRAMEWORK

2.1 Introduction

This section presents a review of literature, theoretical and conceptual frameworks of the study. The growing need for a paradigm shift in wetland use by rural communities, governments and investors has witnessed the push by world commissions, policy makers, as well as other development agents to stress on the need for sustainable development through sustainable wetland management. Various scholars have responded to this need by writing a considerable amount of literature on the above. This section therefore presents a review of some of these works based on the following headings:

2.2 Multinational Corporations (MNCs) and Foreign Direct Investment (FDI)

Foreign direct investment (FDI) is the most desired form of capital flow and MNCs are taking a long-term equity position as they invest in developing (or host) countries. If the investment does well, both the MNC and the host country are better off - the MNC receives profits and the host country receives jobs, an expanded tax base, and capital formation.

According to Atencio (2010), advocates of MNCs believe these international investors create jobs and wealth, and improve technology in countries that are in need of such developmental initiatives. They believe that MNCs extend opportunities for earning higher incomes as well as the consumption of improved quality goods and services to people in poorer regions of the world. These views probably originate from the general belief that MNCs have the ability to tap financial, physical, and human resources around the world and also the ability to combine these into economically feasible and commercially profitable activities. One cannot of course forget that MNCs have the capacity to develop new technology and skills and they also boast of a productive and managerial ability to translate resources into specific outputs. The question is, do MNCs always work for the good of host communities?

The above views by Atencio (2010) are in support of sentiments previously expressed by Havnevik (2007) who says that the economic role of MNCs is to channel physical and financial capital to countries with capital shortages and that as a consequence, wealth is created, which

yields new jobs. In addition, new tax revenues arise from MNC generated income, allowing developing countries to improve their infrastructures and to strengthen their human capital. Here Havnevik (2007) seems to imply that through free market initiatives, MNCs create wealth, which in turn provides the income flow necessary for welfare improvements. Both Atencio (2010) and Havnevik (2007) have in mind an ideal situation. However, the above scholars do not discuss the negative ramifications that global investments sometimes have on local communities. Also, and contrary to their views, in developing economies like Kenya, on most occasions the host countries are drained of their wealth as raw material is exported to the home country of the MNC, processed and the end product exported back to the developing country at exorbitant prices. Also, at times the global investors fail to transfer technology and instead opt to import skilled manpower from home countries. Indeed in some instances what local communities get out of a global venture may be too minimal as compared to what they give out or give up.

The present study appreciates the intricate linkages between socio-economic aspects, wetland development and environmental components. Wetland development projects significantly impact on their ecological productivity and economic output and more often than not generate conflicts pertaining to control of the resources between different users. Income generating activities that sustain households in the Lake Victoria Basin include floodplain agriculture, floodplain fishing, clay mining for pottery, livestock herding, papyrus and roofing grass harvesting, cottage industry, firewood collection and selling, logging, hut and granary construction, and beekeeping. These form the traditional livelihood activities in floodplain wetlands, the main ones being subsistence farming, fishing, livestock herding, papyrus harvesting, and cottage industry. Adams (1995) argues that such floodplain projects need to be sustainable and also be in the interest of the rural poor. This study relates with the views of Adams (1995) and upholds that sustainable development should be directly concerned with increasing the living standards of the poor, and must address the issue of equity and extent to which costs and benefits of development are unequally borne by different stakeholders. Indeed the current study would go further and encourage making sensible and effective use of natural ecosystems, such that the benefits derived from these are optimized over long periods and by the various stakeholders equitably.

2.3 Wetland Transformation: Aspects of Poverty and Population Migration

Transformation of wetlands largely lead to losses to the wildlife and well-being of human communities especially in developing countries where many people continue to depend on wetlands and other natural resource base for maintenance of traditional subsistence activities - like in the case of the residents of Yala Swamp in Siaya County, Kenya. In more than half of the wetlands listed under the 'Ramsar Convention' to be of international importance, agriculture is considered to be a major cause to their conversion. While most developed countries have established controls restricting further wetland conversion, and even initiated habitat restoration, in many developing countries wetland conversion is seen as a strategy to gain more land for agricultural purposes. Kenya like many other countries in Africa faces similar problems and challenges regarding wetlands. Although endowed with abundant natural resources and a wide range of ecosystems which support a high diversity of species and habitats, the disparity in the potential of the different natural resources has encouraged agriculture and human settlements in new and often productive areas, including wetlands (Kairu, 2001).

Prossor (1995) and Landberg (1994) hold that traditional societies have for centuries based their economic systems upon the natural rhythms of river regimes, especially in regions with long, dry spells and single, erratic wet seasons. The two did a study on population, economic development and poverty and concluded that the dependence of poor countries on their natural resources such as soil, water, wetlands, forests, animals and fisheries is self-evident. Indeed an environmental resource base gives a rural community a platform for its productive activities and sustainable household livelihoods. The current study was a response to discontent arising from a breakdown (take-over and transformation of Yala Swamp) in the productive activities of the residents of South Central Alego Location.

Due to population growth, poverty, and development efforts, wetlands are increasingly being utilized and transformed. Maltby (2009) thinks that while rural communities have long recognized the value of wetlands as a resource for household livelihoods, the more economically ambitious world has seen them as wastelands to be filled and drained. Terer et al. (2004) Gichuki (2003) and Thenya (2006) hold that despite the realization and wide documentation of the importance of wetlands for biological, hydrological, economic and socio-ecological functions, wetlands are some of the most threatened ecosystems in the world. These scholars

probably had in mind the sentiments expressed at The Ramsar Convention of 1971 - an international treaty for the conservation and sustainable utilization of wetlands.

On the global scene, Asia leads as a continent where the poor have discovered that wetlands are not wastelands. According to Sarre and Blunden (1996), Asia produces 90% of the world's rice and 80% of this is associated with exploitation of wetland resources. In Sub-Saharan Africa (SSA), where most economies are largely agrarian-based, the demand for arable farmlands continues to be a thorny issue for many countries. The scarce arable land faces competition as soils are becoming exhausted and water increasingly scarce. Poverty among the poorest proportion of the world's population leads to increased pressure on protected areas to supply land, water and other resources. Olson (2001) says poverty has been identified by scholars as one of the factors that drive communities into wetland resource exploitation for livelihood. This sentiment by Olson depicts the common scenario in SSA. Examples are: the occupation of natural resources like the Hadejia-Nguru Wetlands, (Nigeria), the Mau Forest, the Yala Swamp, the Nyando Basin, the Tana River Delta and the Turkwel Riverine (all in Kenya) among others. In their fight for survival, households exploit natural habitats for their livelihoods.

Adams (1995) holds that the growing populations in Sub-Saharan Africa, competition for fertile farming lands and limited access to resources has led to populations and investors invading wetlands and other marginal areas for agricultural and other transforming activities. In this fight for survival, they often engage in unsustainable use of these natural resources, causing degradation and other adverse effects. As expected, such a scenario would place the SSA governments in a position where they have to deal with growing populations as well as local and global investors determined to occupy and extract value from wetlands. This is because the value attached to wetlands would mostly be determined by the climatic and demographic factors prevailing in that particular area. In Kenya there are a number of communities that are drawn to settle in estuarine and riparian regions by the rich alluvial soils and enough water for their household use as well as their crops and livestock. One such community is the Lokapel in Katilu Division of Turkana County. The National Environment Management Authority (NEMA) (2005) observes that the riverine system provides the community members with both water and fodder for livestock, especially during the dry season. This estuarine community cultivated the floodplains for food using both rain-fed and irrigated

farming. In as much as the study by NEMA does not mention whether the agricultural activities yield surplus produce for the Lokapel that can be sold and proceeds directed at other livelihood needs, it is the assumption of this study that wetland cultivation secured the community from hunger.

Swallow (2004) shares the same sentiments expounded by NEMA (2005) when he acknowledges that the high population on the Lake Victoria Basin of Kenya relies heavily on the wetlands in the region for their household livelihoods. Whereas Adams (1995) links poverty and population growth to invasion of wetlands by communities for agricultural and other income generating activities, Swallow (2004) does not attempt to link either the dense population or poverty level to the exploitation of wetlands. It is the view of this study that population expansion and the need for fertile agricultural land is a major factor that leads to population migration towards wetlands. Also, whereas Adams (1995) confines his discussion on wetland degradation to population migration, the current study does not however limit the unsustainable use of natural resources to population migration but includes unsustainable investment approaches. It also holds the view that for investors, it is the desire to extract as much as they can of the natural resource that drives them to occupy and transform wetlands.

2.4 Food Security and Floodplain Irrigation

Food security means increasing food production and addressing the root causes of vulnerability through a range of interventions, including rural development, agricultural research and building livelihoods. Food security is achieved when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 2012; Kiome, 2009).

According to Ngigi (2002), food shortages in Kenya pose a recurrent crisis, which cannot be solved through rain-fed agricultural production alone. Ngigi goes on to say that Kenya has only about 17 percent of its area classified as medium to high potential land with rainfall higher than 700mm per year and thus suitable for rain-fed agriculture. Thus the remaining arid and semi-arid land cannot reliably support agriculture unless technologies such as irrigation and water harvesting are employed. This thought clearly implies that supporting Kenya's rapidly

increasing population would require the use of technologies such as irrigation to support agricultural intensification.

Global food security is a worldwide concern and the challenge is how to feed a growing population which currently is estimated at 7.165 billion and projected to reach 9.2 billion by the year 2050. Barbier and Strand (2011) believe that food security can be made possible through more proactive and progressive policies and investments in both rural and agricultural productivity enhancement measures, and innovative safety nets that ensure access to food and reduction in the number of the hungry. The study saw the natural and human capital in South Central Alego as appropriate for subsistence and commercial agriculture as well as agricultural intensification for increased production for a variety of food crops. This would contribute to enhanced rural livelihoods and poverty reduction. However, it is necessary to add that for optimal success, especially with the human capital, all stakeholders must be given a chance to fully participate in the planning and implementation, and outputs must be seen to benefit all parties. Local participation would ensure that transformation of wetlands into large agricultural investments benefit the community.

FAO (2012) offers a suggestion that as efforts are made towards achieving food security, technological advances or expansion of cultivated area would boost production sufficiently to meet rising global food demands. The developing world, while effecting their development programmes, lacks the necessary requisite skills and hence ends up inviting foreign investors with advanced agricultural technology to effect development on wetlands and other fragile natural resources. While most of these are directed towards minerals and oil prospecting (due to encouraging high prices), farmlands and remaining wetlands have also been targets to produce cereals, horticultural crops and vegetables for export. According to DFID (2002), the challenge for governments and investors has been how to best effect these development programmes without interfering with the flow of traditional agricultural methods used by the local communities in floodplain areas. Additionally, the current study believes another challenge would be how to best effect these development programmes in wetlands without necessarily plundering the latter and destroying the environment. It becomes a challenge for the host government and local communities when the aspect of technology transfer is ignored, land is depleted and the environment polluted by the investor. Indeed in Yala Swamp the hard reality is

that with the transformation of the Wetland, the flow of traditional agricultural methods and destruction of the environment was bound to happen. However, in spite of this, there is also the need to understand that in every social setting, there must be varied opinion and interests, hence the need to harmonize these views and have a compromised position. It is the conviction of the current study that the above challenges can be addressed using the DFID Sustainable Livelihoods Framework that promotes a participatory approach to sustainable community development. The current study is partly grounded on this theoretical framework.

Digby (2000) did a study on the Fulani community of northern Nigeria who have settled in and are cultivating the Hadejia-Nguru wetlands for food production. He states that the Fulani are self-sufficient in terms of food for domestic consumption and for commercial purposes. Digby here seems to imply that population migration to floodplain alluvial land leads to food security. The current study established that this was the case in South Central Alego before Dominion took over the Wetland - the residents boasted of food security. A study by Department of Resource Surveys and Remote Sensing (DRSRS) (1992) found that the swampy areas within the River Nyando estuary are potentially good agricultural land with rich alluvial soil. The study recommended that the Nyando Delta region should be developed by the estuarine community occupying the land. However, the DRSRS study does not give suggestions on how this potentially good agricultural land should be developed. It seems to imply that the more privileged in the region should apportion themselves large tracts of land and thereby 'develop' it. In a developing country like Kenya this happens too often, and mostly to the disadvantage of the less privileged in society. For instance in the case of Dominion Project in Yala Swamp, the local community members claim the entrepreneur disregarded the signed agreement and 'apportioned' himself more land by displacing the villagers from their homes in Area II.

2.5 Sustainable Development through Sustainable Wetland Management

A discussion on sustainable household livelihoods for a riparian community would not be complete without mention of sustainable development and by extension, sustainable wetland management.

Literature review revealed that the term sustainable development is conceptualized differently by different scholars. The Brundtland Report of the World Commission on Environment and

Development (WCED) (1987) defines sustainable development as development that meets the needs of the present without compromising the ability of the future generation to meet their own needs. In this definition, 'sustainable development' is used to imply continued improvement in the living standards of households. This study believes that to attain sustainability, an integrated approach is essential as all the different aspects of development should be considered simultaneously.

Landberg (1994) defines Sustainable Wetland Management (SWM) as management of a wetland system with sustainable technology options, which ensures the sustainability of its ecosystem functioning and contribution to livelihoods with adequate institutional and economic options. The scholar observes that degradation of the environmental resource base such as excessive resource extraction and severe land use not only affects the quantity and quality of the services that are produced by ecosystems, it also challenges their resilience, their sustainability. The Ramsar Convention on Wetlands held in Iran in 1971 stipulates that national governments formulate and implement national land use planning to include wetland conservation considerations and also to promote the wise use and management of all wetlands within their territories. The convention also emphasized the need for the integration of human and natural systems in which human socio-economic activities compatible with conservation objectives may occur while at the same time promoting the practice of sustainable development (Ramsar, 2007; Lockwood et al, 2006). From the above sentiments expressed at the Ramsar Convention, it is apparent that planning therefore becomes an integral aspect of sustainability in natural resource use for development.

Maltby (2009), like all the other scholars mentioned earlier in this study, does not share the perception that wetlands are wastelands and that wetland related economic activities are too meager to account for anything. It is regrettable that the above mentioned perception has led to people not appreciating the socio-economic and socio-cultural importance of wetlands as a resource Ong'ang'a (2005) posits that despite the threats to wetlands, livelihoods of neighbouring communities appear to continue to depend largely on the wetland resources. This study supports the vie expressed by Ong'anga (2005) and holds that in riparian and estuarine communities we find a people who refuse to give up on the ability of the wetland to provide

livelihoods for them, and so they continue to extract the little (or much) that they can get out of these resource bases, even after transformation of the same.

Pearce (2012) notes that wetlands or floodplains can continue to be used to achieve sustainable development provided that clearance of natural ground cover, swamp drainage and use of agro-chemicals are carefully controlled. This study has conceptualized sustainable development to imply engaging in activities that serve to improve the lives of the riparian community without destroying the resource base, the wetland – hence the relationship between sustainable development and sustainable wetland management. DFID (2002) adds that the wisdom of integrating environment and development is on the notion that variables, such as economic and social factors cannot be simply ignored by individuals, governments or investors in their drive to protect the natural environment. Actually, the natural environment cannot be sustained if development policies do not consider the need for change in people's access to natural resources and the distribution of costs and benefits. This study shares the view propounded by DFID (2002) and holds that protected area managers need to work with communities in ensuring that conservation actions that cause or increase impoverishment are avoided. Also, the use of natural resource bases (like wetlands) by international companies should be strictly guided by the existing institutional frameworks in order to enable sustainable utilization of the resource.

2.6 The Aspect of Participatory Development

Bhartnagar and Williams (1992) conceptualizes participation as the process by which people, especially disadvantaged, influence decisions that affect them. They see participation as influence on development decisions and not just involvement in implementation or enjoying benefits of development projects. The current study shares the sentiments above and hastens to add that non-inclusion of all parties in a social exchange arrangement leads to those groups excluded feeling left out and eventually to conflict among competing interests.

According to a study by FAO (2007), direct conflicts, including wars over resources also contribute to the household livelihood insecurity of the rural poor as they have the least resources to cope with loss and recover from conflicts. Although FAO mentions only conflict among rural communities, it should be remembered that there is also an increasing rate of conflict between communities and governments or investors.

According to Jones (2007), it is essential to include the public in decision making through an open process of discussion, negotiation and incorporation of different views and values, in order to secure legitimacy for a project. Indeed when people are listened to, paid attention to, treated politely and with respect, the legitimacy for the final decisions is increased. Going by this line of argument, it suffices to hold that the local communities of Kadenge and Obambo would have approved the Irrigation Project had they been given an opportunity to influence decision making and have their values incorporated. However, public participation the way Jones views it could lead to a setback and delay progress of a project cycle as the different groups take time to discuss and reach a compromised position. It could also lead to rifts when people or groups take hardline positions and also when opposing groups compete for a common interest. This is an aspect of public participation that has not been discussed by Jones (2007).

Beierle (1999) argues that public participation is a way of strengthening the legitimacy among the public for the Project. According to Beierle, public participation can be seen as an example of a democratic process. Some people would be skeptical as to whether public participation actually secures legitimate decisions or if it is only a way of disarming troublemakers! The inclusion of the public might hence only be symbolic in a case where the Project does not intend to take the comments from the public into account. Involvement or empowerment of local societies is by many considered to be a pre-requisite for sustainable household livelihoods as it gives people an opportunity to take responsibility in the planning of their localities. The current study shares the same sentiments as Ribot (2004) who holds that to get meaningful contribution from the local people, it is essential that the participation is built up by the concerned groups and not imposed by outside agendas, as has often been the case in developing countries. In this study it has been established that for a project to be socially legitimate it is important that the public that is affected is able to have a voice in the project process and that their values are incorporated into decisions. In a capitalist state like Kenya, public participation still favor the economically influential interests, which often coincide with the socially powerful forces in a community, thus ruling the debate. Problems with public participation may hence develop when the decision represents the views of the most vocal interest groups (like politicians) rather than the general public.

2.7 Theoretical Framework

The study sought to explore the effect of Dominion Irrigation Project activities on household livelihoods in the Yala Swamp Wetland – hence the use of the Sustainable Livelihoods Approach (SLA). SLA emphasizes the need for communities, governments and investors to properly manage their natural resources as they continue to draw livelihoods from the same. The study used the SLA framework to probe the ability of the households to cope with and recover from the shocks and stresses that came with the take-over and transformation of the Wetland. Also, the study used the framework to investigate if the activities carried out by Dominion Irrigation Project in Yala Swamp are geared towards maintaining or enhancing the capabilities and assets of the households.

However, the SLA framework lacked the capacity to explain the nature of exchange relationship that exists between the two main stakeholders in Yala Swamp – hence the need for a second theory. This gap was filled by the Social Exchange Theory (SET). The central concept of SET is that of actors exchanging resources via a social exchange relationship, which is a process of negotiated exchanges between parties. SET informed the study by explaining the nature of the exchange relationship that took place in Yala Swamp in 2003 between the community of South Central Alego and Dominion Farms (K) Ltd.

2.7.1 Sustainable Livelihoods Approach (SLA)

DFID (1998) notes that a livelihood is sustainable when it can cope with and recover from stresses and shocks, and maintain or enhance its capabilities and assets both in the present and in the future, while not undermining the natural resource base. In the case of this study, the SLA postulates that a natural resource base like the Yala Swamp, while being tapped for large scale rice cultivation, must also be helped to regain its natural biodiversity and retain the same for future generations.

The concept of sustainable livelihoods was initially introduced by two globally significant documents, namely: 'Our Common Future' (1987) by the Brundtland Commission on Environment and Development (WCED) and Agenda 21 (1992) by United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil. The Directorate for

International Development (DFID) later took to employing the framework in an effort to address development efforts in rural areas (Rakodi and Lloyd, 2002).

SLA is a people centered approach to development. It aims to identify means to meet local needs (FAO, 2007). Sustainability is considered by the DFID to be the core concept of SLA when applied to rural areas. Without it development efforts are wasted (Rakodi and Lloyd, 2002). The approach emphasizes the need for communities to properly manage the natural resources as they continue to draw livelihoods from the same, all the while remembering that sustainability promotes long-term utilization of resources. Sustainable livelihoods is a function of how men and women utilize assets and portfolios on both short and long term basis to enable them cope with and recover from shocks and stresses through adaptive coping strategies (UNDP, 2000). Central to it is the need to recognize that those who are poor may not have cash or other savings, but that they do have other material or non-material capital (assets) which include their health, their labour, their knowledge and above all - their natural resources around them. Development agenda that focuses on a rural community like the community of South Central Alego must therefore be pegged on the assets or capital that the residents of this location already possessed previously or can be facilitated to possess by the Project. These could be human, financial, natural, social, physical or political.

SLA is governed by the following principles which also form its strength:

(i) It is people centered: The framework focuses on what matters to the people. A people's primary concern is livelihoods and therefore efforts to improve their living conditions must focus on what provides them with their livelihoods. In the case of the riparian community of South Central Alego, their lives revolved around the Wetland and it concerns them that they have been deprived the use of this natural resource.

(ii) It is responsive and participatory: It encourages the poor people to be the key actors - the rural poor understand their problems better and solutions to their problems should be those that are home-grown. Stakeholders like governments and global investors are encouraged to pay attention to input from community members. This principle thus promotes a bottom-up approach to sociological issues. The agitation by the residents of South Central Alego has

been over claims of unresponsiveness on the part of the area leaders and the international investor.

(iii) It is multi-level in nature: The micro-level informs the development of policy while macro-structures and processes support people. This implies that policies must originate from below and the role of the top is to provide assistive organizational structures. It therefore becomes the business of Siaya County development agents to map natural resources within South Central Alego location and integrate these resources into the development plan of Alego-Usonga(or Siaya) District.

(iv) It promotes partnership: Development must be conducted in partnership with both the public and private sectors. The framework appreciates that poverty reduction requires a multi-sectored approach. In this case several groups can be identified and invited to play a role in community development initiatives. These could include NGOs and CBOs that are operating in South Central Alego to complement the efforts made by the county and national governments in a bid to eradicate poverty in this area.

(v) It is dynamic in nature: The approach recognizes the dynamic nature of livelihoods strategies and responds flexibly while at the same time developing long-term commitments. In this regard, the framework addresses macro-constraints while also responding flexibly to people's needs and supporting positive patterns of change where possible. In an ideal situation, this principle should allow the households in South Central Alego access to Yala Swamp Wetland despite the existence of institutional frameworks and policies.

Weakness attributed to SLA include:

SLA assumes the other party will always appreciate that the rural poor has various forms of capital within himself and that he can use these to improve his status, using an approach that best appeals to him. However, this is not always the case since at times the government or global agency patronizes the rural poor and extends 'aid' that is either not needed or using an approach that is unacceptable to members of that particular rural community.

2.7.2 Social Exchange Theory

A number of scholars have contributed to the Social Exchange Theory and all of them are driven by the same central concept of actors exchanging resources via a social exchange relationship. However, the crux of SET within Sociology is still best captured in George Homans' words when he defines social behavior as an exchange of goods – material and non material. Homans (1974) goes on to state that persons who give much to others try to get much from them, and persons who get much from others are under pressure to give much to them. He concludes by stating that for a person in an exchange relationship, what he gives may be a cost to him, just as what he gets may be a reward.

Homans' Social Exchange Theory (SET) is a sociological perspective theory that explains social exchange as a process of negotiated exchanges between parties. SET helps us understand the social behaviour of humans in economic undertakings. It also explores the nature of exchanges between parties, like the exchange that took place between the area councilors of South Central Alego and the Dominion Group of Companies. In this study the theory helped the researcher understand why the residents of Obambo and Kadenge have over the years been demonstrating and agitating against the management of Dominion Farms (K) Ltd.

SET factors include value, equity, profit, cost, rewards, approval, trust, flexibility, exchange relation, dependency and power. According to Homans (1974) people weigh the potential benefits and risks of social relationships. When the risks outweigh the rewards, people will terminate or abandon that relationship. This study is driven by a desire to know about the developments that have transpired after a give and take (exchange) agreement that was meant to benefit both the entrepreneurs (Dominion) on the one hand and the rural community of South Central Alego on the other. The framework includes some notion of a shared obligation in which both parties perceive responsibilities to each other. SET explains social exchange and stability as a process of negotiated exchanges between parties. It also explores the nature of exchanges between parties, like the exchange that took place between the political leaders of South Central Alego and Dominion Group of Companies. In the SET framework, both parties in a social exchange take responsibility for one another and depend on each other.

Dominion Farms (K) Ltd. entered into Yala Swamp through negotiated arrangements between them and the then officials of Siaya and Bondo County Councils – more specifically, the area councilors. SET hypothesizes that all relationships involve exchanges although the balance of this exchange is not always equal. Power is an essential theme within SET. Power differentiation affects social structures by causing inequalities between members of different groups, such as an individual having superiority over another. When this happens then there is bound to be the kind of mistrust that is existing in the relationship between the residents of South Central Alego and the Management of Dominion Farms (K) Ltd.

Evaluation of risks and rewards rests on two types of comparisons – a comparison of costs and rewards. These two form the basic concepts in SET and are defined as follows:

(i) Costs: These are the elements of relational life that have negative value to a person, such as the effort put into a relationship and the negatives of a partner. Costs may also be in the form of time, money, effort, land etc.). The theory posits that all human relationships are formed on the basis of cost benefit analysis and comparison of alternatives. If either actor perceives the consequences of the exchange as negative, meaning the exchange relation is unbalanced and the transactions of resources are not gratifying, the actor has the option to withdraw from future exchanges (Emerson, 1976). This study came face to face with a population that is asking to be released from the hold of an infamous MoU that they did not sign but is controlling their lives anyway.

Conversely, when the costs and benefits are equal in a relationship, then that relationship is defined as equitable. In an equitable relationship, both actors perceive the consequences of the exchange as positive and further exchanges are in both actors' best interest and hence continuation of the exchange behavior will generally transpire. The notion of equity therefore forms the central part of the social exchange theory. In sociology, SET focuses on reciprocated gratification people make available to one another in order to prolong relationships. At the cost of giving up their land to Dominion, the households that reside in South Central Alego expected a reciprocal attitude from the entrepreneur. When they failed to get this, they decided the relationship is unbalanced and therefore not gratifying. They are

now opting to withdraw from this and future exchanges with Dominion, hence the quest for a redrawing of the MoU.

(ii) Rewards: These are the elements of a relationship that have positive value. The social exchange perspective argues that people calculate the overall worth of a particular relationship by subtracting its costs from the rewards it provides. SET looks at what people feel they should receive in the way of rewards and costs from a particular relationship and also the lowest level of relational rewards a person or community is willing to accept given available rewards from alternative arrangements. As Kelly and Thibaut (1978) put it, people engage in behavioral sequence, or a series of actions designed to achieve their goal. Generally individuals tend to participate in a project out of a sense of mutual benefit rather than coercion. Indeed when persons are forced into action they tend to cease participation given that their motivation will be extrinsic and as a result unstable compared to those who have been self driven to participate in an activity. Emerson (1976) holds that with the emergence of needs dimension, certain exchanges must occur in order that individuals participate and maintain their engagement in projects. In relation to the current study, SET holds that when households are forced into giving up their land they may easily cease participation due to lack of intrinsic motivation. Indeed in the social exchange relationship that is under investigation in this study, the households of Kadenge and Obambo have weighed the costs vis-a-vis the rewards and come to the conclusion that they have given much more than they are receiving. This realization has culminated in disillusionment. They have turned into aggrieved on-lookers, engaging in demonstrations and confrontational behavior now and then as if to remind the world they are still here and still unhappy with the turn of events in their natural resource base, the Yala Swamp Wetland.

Homans (1974) developed a set of five key propositions that assist in structuring individual's behavior based on rewards and costs. In one of these propositions, the Aggression-Approval proposition, he posits that when a person's action does not receive the rewards as expected, or receives punishment he did not expect, he will be angry and becomes more likely to perform aggressive behavior. Further, in the Rationality Proposition, Homans (1974) conceived that in choosing between alternative actions, a person will choose that one for which, as perceived by him at the time, the value of the result, multiplied by the probability of getting the result, is the

greater. The riparian community of South Central Alego considered the likelihood that they would receive rewards for the cost of giving up their land, and so when the social exchange arrangement turned out to be un-balanced, they began to engage in confrontational behaviour against the management of Dominion Irrigation Project.

A critique could be done about the SET framework as follows:

(i) Strengths: SET helps us understand the cost and rewards of relationships; predict how to keep and sustain relationships by understanding that a relationship is about giving and taking in equal measure.

(ii) Weaknesses: SET reduces human interaction to a purely rational process; It favours openness, but there may be times when openness is not the best option in a relationship; It assumes that the ultimate goal of a relationship is intimacy when this might not always be the case; SET holds that the reward and cost part of relationships are the reasons relationships are started or stopped and yet there are some relationships that don't consider costs and rewards as reasons for their existence.

2.8 Conceptual Framework

The conceptual framework shown in Figure 2.1 below illustrates the relationship between variables of the study.

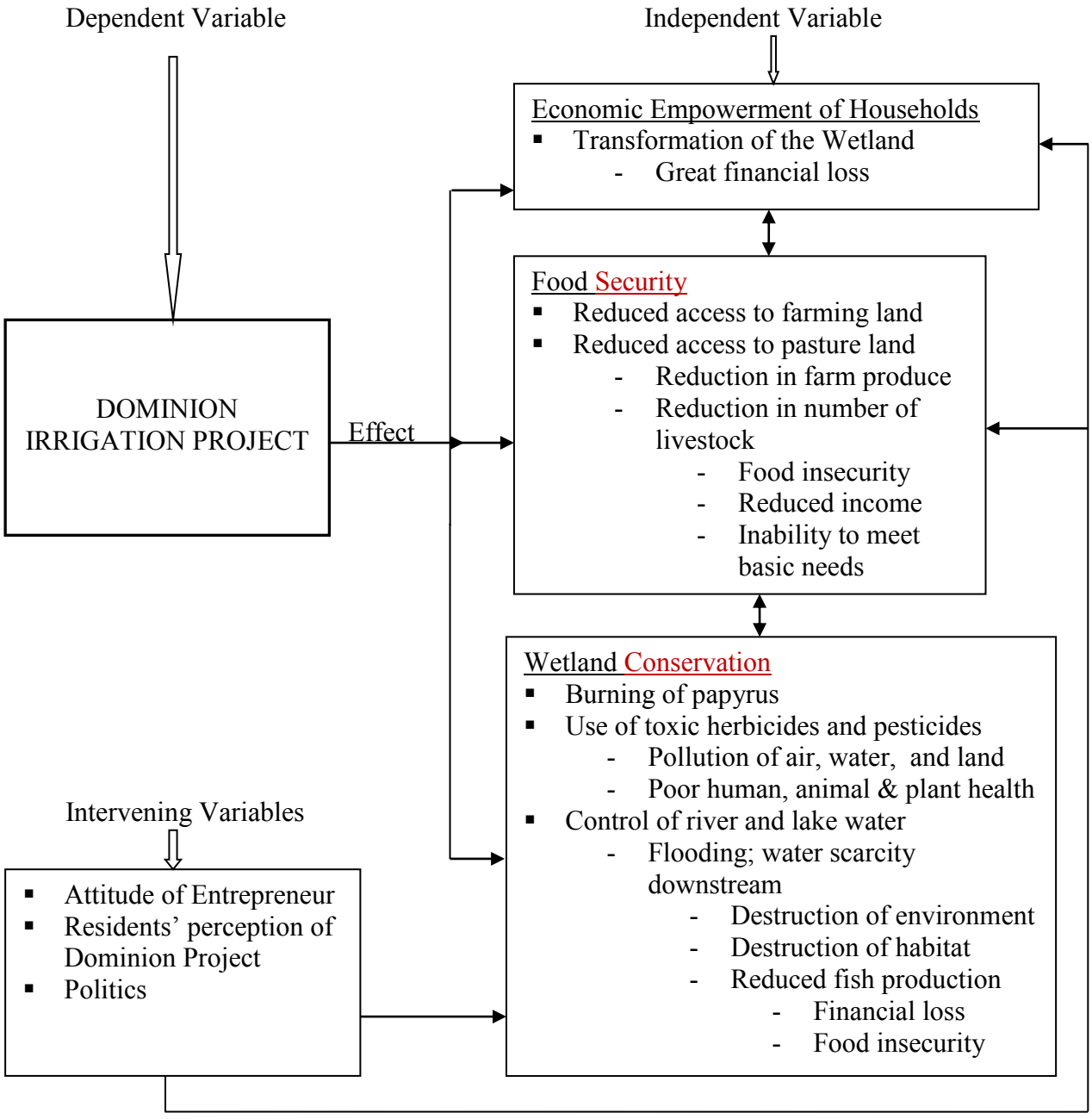


Figure 2.1: Conceptual Framework

It shows that Dominion Project activities influence the economic empowerment, status of food security and environmental conservation in the Yala Swamp Wetland. However, aside from the Project activities there are other factors at play like the attitude of the investor, the negative perception of the residents towards the Project and the role played by the local politicians in leasing out the Wetland.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

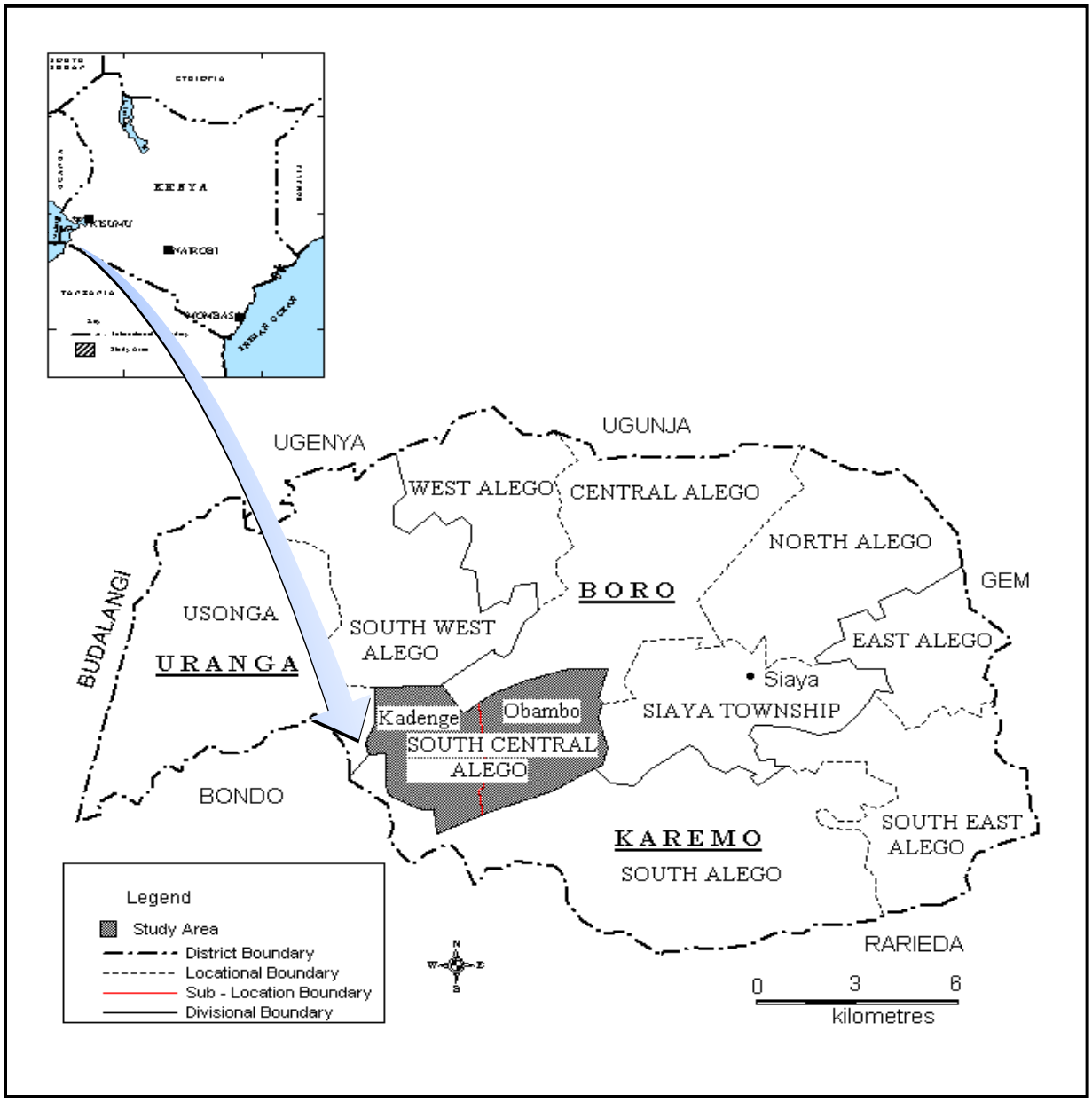
This chapter covers the various methodological procedures that the study employed during its execution. It presents the research design adopted for the study; the study area; unit of analysis; the target population; the sampling procedure employed; the sample size; the source of data and data collection methods and instruments; methods used in data analysis as well as the ethical considerations during the study.

3.2 Research Design

The study used a survey research design. This design is suitable where subjects are expected to respond to a series of statements or questions in a questionnaire or an interview. The choice of a survey method was pegged on its ability to help in identifying standards against which existing conditions can be compared and also to determine the relations that exist between specific events. As Orodho (2003) posits, survey is ideal for gathering information about people's perceptions, attitudes, opinions and feelings on a range of social issues. The design was very ideal in exploring the perception of the household heads and the key informants on the effect of Dominion Irrigation Project on household livelihoods in South Central Alego.

3.3 Study Area

The study was carried out in South Central Alego Location, Boro Administrative Division, Alego-Usonga District (also known as Siaya District), Siaya County, Kenya. This is as illustrated in Map 3.1. Siaya County comprises six districts which serve as constituencies. These are: Ugenya, Ugunja, Alego-Usonga (or Siaya), Gem, Bondo and Rarieda. Siaya County borders Busia County to the north, Kakamega County to the northeast, Vihiga County to the east, Kisumu County to the southeast, and with Lake Victoria to the south and west. Specifically the study was carried out in the two Sub-Locations of Kadenge and Obambo Sub-Locations. Phase I (or Area I), covering an area of 2300 ha, lies within South Central Alego Location.



Map 3.1: Map of Kenya locating Siaya District and the Study Area

Siaya County has an area cover of 2,530.5km^2. It has a population of 842,304 and a population density of 332 people per km^2 accommodating 199,034 households. The prevalent ailments are malaria, HIV/AIDS, TB, diarrheal and respiratory diseases. The main economic activities include subsistence farming, livestock keeping, fish trade and other trades, irrigation agriculture for the production of rice and the cottage industry. Resources for the County include agricultural land, fisheries, indigenous forests, rivers, timber, papyrus and other reeds. The main tourist attractions are Yala Swamp and Wetlands, Ndanu Falls, Lake Kanyaboli and Lake Victoria.

3.4 Population and Sampling Procedure

3.4.1 Target Population

The study targeted the head of households in each of the two Sub-Locations of Kadenge and Obambo who either directly or indirectly relied on the Yala Swamp Wetland for their livelihoods.

3.4.2 Sample Size and Sampling Procedure

The study used a sample of 160 respondents. First, the study population was stratified according to the two sub-locations of Kadenge and Obambo. There are 851 households in Kadenge and 724 in Obambo Sub-Locations. Proportionate random sampling technique was then used to pick the number of households needed from each of the two sub-locations. Based on a sample frame of 1575, the number of household heads to be interviewed in each of the Sub-locations were:

Furthermore, 6 key informants who included the Chief, two Sub-Chiefs, County Surveyor, District Environmental/Forestry Officer and District Agricultural Officer were purposively selected to provide additional and knowledgeable information pertaining to the study theme.

Table 3.1: Target Population and Sample Size

Sub-Locations	Target Population (No. of Households)	Proportion of Sample Size
Kadenge	851	86
Obambo	724	74
Key Informants	-	6
Total	**1575**	**166**

3.5 Sources of Data

The data used in this study was information collected directly from the respondents.

3.6 Unit of Analysis

The unit of analysis for this study was the head of household. It is assumed that these are households whose members previously relied on the wetland resources for livelihoods. They are persons who were, and maybe still are directly or indirectly engaged in wetland activities like

floodplain agriculture, papyrus harvesting, harvesting of roofing grass, cottage industry, mining clay for pottery, livestock herding, floodplain fishing; persons employed by the Project in different capacities; traders at the growth centres and civil servants.

3.7 Methods of Data Collection and Instrumentation

At the onset of every interview, the respondents were informed that the information they give would strictly be used for academic purposes. They were informed they had a right to skip giving answers to any question(s) they felt uncomfortable with. Respondents were engaged in discussions based on answers given and statements made, especially depending on their productivity. Data was collected using a semi-structured interview schedule for the 160 head of households and an interview guide for the 6 key informants. The questions covered a wide range of topics related to the thematic areas of study.

3.7.1 Interview Schedule for Household Heads (Appendix I)

This study used interview schedule to collect data from the randomly selected respondents. The choice of an interview schedule was informed by the ability of an interview approach to give respondents an opportunity to express their feelings on pertinent issues that affect their household livelihoods. Further, this tool is best suited to elicit accurate response from the subjects regardless of their level of education. To share the thoughts of Frankfort and Nachmias (2007), interview schedules are better suited in eliciting information from respondents with less or no formal education.

3.7.2. Key Informant Interview Guide (Appendix II)

Key informant interviews are qualitative in-depth interviews with people who know what is going on in the community and pertaining to the research themes. In this study the interview guide was used to collect information from six persons who have first-hand knowledge about the community on economic empowerment, food security and environmental degradation. The interviews gave the present study an opportunity to interact with the persons who guide decision making on the socio-economic/socio-cultural aspects within the community. These included the Chief and his Sub-Chiefs; the County Lands Officer, District Agricultural Officer and District Forest/Environment Officer. It is assumed that these are persons who understand the feelings of members of the community pertaining to Dominion Project activities and the effects of these on

the household livelihoods. These persons, with their informed knowledge and understanding, provided insight on the nature of effect that the activities of Dominion Irrigation Project has on the residents of South Central Alego. Further, they were able to suggest possible solutions to prevailing issues of concern.

3.8 Methods of Data Analysis

The study collected mostly qualitative data. After the data collection process, coding and entry techniques were employed for every item on the interview schedules. These items were categorized according to the specific objectives of the study. Data coding was a step towards the generation of a computerized code-sheet. Using the coded data, the Statistical Package for Social Sciences (SPSS) was used to facilitate analysis. Statistical percentages and frequency distribution methods such as tables, pie charts and bar graphs were used to display the various aspects of the statistical findings. Data collected from the key informants was compiled together and analyzed separately at the level of descriptive statistics and then triangulated with that obtained from the head of households.

3.9 Ethical Considerations

This study was conducted among the local community members of South Central Alego Location. As a first step, the researcher paid a courtesy call on the area chief and sought his permission to carry out the study in his area of jurisdiction. Prior to each interview, the consent of each respondent was sought and the nature of study explained to them. They were informed that the information gathered from them would be used only for academic purposes. The right to safeguard their personal identity and integrity was respected during data collection exercise. The key informants were also given the same assurance. Before visiting the study area and embarking on data collection, the researcher had sought for and received a research permit. This was important as it served to confirm to the respondents that indeed the research was authorized to be conducted within the location. A combination of all the above aimed at ensuring that the respondents gave correct and vital information.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents in detail the results based on the views collected from the respondents using interview schedules and key informant guides. The results are organized according to the objectives of the study and presented in the form of percentages, pie charts, frequency tables and bar graphs. The chapter also gives a discussion on the data. At the outset, the demographic characteristics of the respondents are presented.

4.2 Demographic Characteristics of Respondents

The study obtained information from respondents with diverse characteristics in terms of gender, age, marital status, occupation, level of education, size of households and main source of income.

4.2.1 Gender of Respondents

The unit of analysis for the study was head of households. Because of the patriarchal family system in the study area, it was necessary to start the study by first establishing the gender of the respondents as given in Table 4.1 below.

Table 4.1: Gender of Respondents

Gender	Frequency	Percentage
Male	113	70.6
Female	47	29.4
Total	160	100

Source: Field Data (2014)

The study interviewed a total of n=113 (70.6%) males and n=47 (29.4%) females. It is evident that more men were interviewed compared to female respondents. This confirms the patriarchal family system in South Central Alego which also agrees with the view held by Mwakubo et al (2003) that the traditional family set up in Kenya is that of male headed households.

4.2.2 Age of Respondents

After establishing the gender of the respondents, the study sought to know their age distribution. This is presented in Table 4.2 below.

Table 4.2: Age of Respondents

Age Group	Frequency	Percentage
25-35	16	10.0
36-45	31	19.4
46-55	35	21.9
56-65	42	26.2
Over 65	36	22.5
Total	160	100

Source: Field Data (2014)

The study found that 22.5% of the respondents were over 65 years; 26.2% were aged between 56 and 65; 21.9% between 46 and 55; 19.4% between 36 and 45 and 10.0% between 25 and 35 years. These figures show that many of the household heads interviewed were above 46 years of age. The study also revealed that the mean age of the head of households interviewed was 48 years which represents the age group between 46 to 55 years.

The study aimed at understanding the effects of Dominion Project on household livelihoods and this involved a comparison of status of livelihoods for these households for the periods before and after the transformation of the Wetland. In this context therefore, it was necessary to target persons above 46 years. This study believes that age represents experience and that persons above 46 could make informed comparison and evaluate the socio-economic status of their livelihoods for the period before and after the transformation of the Wetland in 2003.

4.2.3 Education Level

After knowing the age of the respondents, the study sought to establish their educational level. This is as shown in Table 4.3.

Table 4.3: Education Level

Education Level	Frequency	Percent
Primary (including KJSE)	73	45.7
O' Level (Secondary)	54	33.8
A' Level (Advanced)	2	1.2
College and above	31	19.3
Total	160	100

Source: Field Data (2014)

From Table 4.3 above, it can be seen that a big number (45.7%) of those interviewed attained only primary education and did not proceed further. However, the study established that despite the low level of education, these persons were very informed about what was going on around them and especially when it touched on the takeover of the wetland by Dominion Project.

4.2.4 Occupation

The occupation of the respondents is illustrated in Table 4.4 below.

Table 4.4: Occupation

Occupation	Frequency	Percent
Security guards/watchmen	2	1.4
Farm Labourers (bird chasing, weeding, planting, etc)	14	8.8
Messenger / Cleaner	9	5.4
Clerical / Secretaries / Drivers	13	7.7
Section Supervisors	3	2.0
Fish trader (fishermen, fish monger, owning fish ponds)	26	16.3
Subsistence Farmer	24	15.0
Civil servant (teachers, medical staff, ministry staff etc)	16	10.0
Traders at the growth centres	35	22.0
Cottage industry (the papyrus trade, pottery)	11	6.8
Engaged by CBOs/NGOs/FBOs	3	2.1
Factory Workers/Mechanics	4	2.5
Total	**160**	**100**

Source: Field Data (2014)

The findings showed that only about 28% of the respondents stated that they (or members of their families) are engaged by Dominion Project in various capacities; 22% of the respondents stated they are traders at the growth centres; 6.8% are in the cottage industry; 15.0% are subsistence farmers; 16.3% are in the fish business either as fishermen, fish mongers or owning fish ponds; 6.8% are in the cottage industry. It is therefore evident that a majority of the residents of South Central Alego do not draw their household livelihoods from the Project. The above data shows a determination on the part of the residents of Kadenge and Obambo to survive through the social change brought about by the loss of the wetland.

4.2.5 Marital Status

Also related to the gender and age distribution is the marital status of the respondents. This is presented in Table 4.5 below.

Table 4.5: Marital Status

	Single		Married		Divorced		Widowed		Total
	F	%	F	%	F	%	F	%	
Male	4	3.5	103	91.2	1	0.9	5	4.4	113
Female	8	17.0	15	32.0	2	4.3	22	46.8	47
Total	12		118		3		27		160

Source: Field Data (2014)

A majority (71.9%) stated they were married, 13.6% were widows, 7.5% single and 3.1% were widowers. From this we see that most of the respondents interviewed were married people. As already stated under 4.2.1, the family system in South Central Alego is patriarchal and it was therefore expected that the highest number of the head of households in this study would be married males.

4.2.6 Size of Households

In chapter one the study conceptualized the term 'household' to mean 'family'. The study sought to know the size of families in the two Sub-location of Kadenge and Obambo and the information received is as tabulated in Table 4.6.

Table 4.6: Size of Households

	Frequency	Percent
1-3	12	7.5
4-7	56	35.0
8-11	58	36.2
12-15	24	15.0
Over 15	10	6.3
Total	160	100

Source: Field Data (2014)

The figures above show that in some households there were only between 1-3 (7.5%) persons. The study reveals that these were headed by either single mothers, young couples with only one child or young widows while 35% of the households consisted of between 4-7 members. The majority in this category were monogamous marriages but with a few single women (including widows and divorced women). The age bracket in this category was mainly between 25-35 years. The study revealed that those households with between 8-11 (36.2%) members were also monogamous but with a few polygamous marriages. The findings showed that 21.3% of the respondents headed households with over 12 members. The study learnt that the majority of the male head of households in this category were polygamists and the age bracket here was mostly over 56 years. The female respondents in this category were widows. The study further learnt that some of these older citizens, especially the widows were the most affected by the transformation of Yala Swamp. These are the persons who had lived through times of plenty when the Wetland was practically a sole source of household livelihood.

4.3 Role of Dominion Irrigation Project on Economic Empowerment of Households

The first study objective was on the role played by Dominion Irrigation Project towards economic empowerment of households. The research question guiding this objective sought to find out if Dominion Irrigation Project is playing any significant role towards economic empowerment of households in the location.

4.3.1 Source of Household Income

Further to establishing the occupation of the residents as illustrated in Table 4.4, the study sought to get a summary of the main source (s) of income for the households. See Table 4.7 below:

Table 4.7 Source of Household Income

	Frequency	Percent
Other income generating activities (Informal employment)	64	40.0
Salary from employment other than Dominion	17	10.6
Salary from Dominion	46	28.7
I am a Dependant – Support comes from town	33	20.6
Total	160	100

Source: Field Data (2014)

A majority (40.0%) of the households have their income coming from sales made from subsistence farming, sale of livestock, fish trade, cottage industry and other trades at the growth centres; 10.6% earn income from employers other than Dominion such as working with the government, NGOs and CBOs; 20.6% depend on financial support they receive from family members who stay and work in urban centres while 28.7% are employed by Dominion. The above information shows that the number of locals engaged by Dominion Project is minimal, hence the outcry.

4.3.2 Informal Employment

After the revelation that 40% of the respondents or members of their households were engaging in other income generating activities, it became necessary for the study to establish what these income generating activities were, hence the follow-up question to this effect. Responses were as varied as captured in Table 4.8.

Table 4.8: Informal Employment

	Frequency	Percent
Subsistence farming and keeping livestock	29	18.1
Cottage industry (mats, baskets, pottery etc)	6	3.8
Trader at the market centre	17	10.6
Fish trade (fishermen, fish mongers, owning fish ponds)	12	7.5
None Response (those who stated they: work for Dominion; are on other salaried employment; receive support from family members and relatives working and residing in urban centres)	96	60
Total	160	100

Source: Field Data (2014)

The respondents (10.6%) who stated they are traders at the market centre included shopkeepers, hawkers and small-scale traders in the market dealing in a variety of domestic items; 18.1% stated they are subsistence farmers dealing in farm produce and livestock; 7.5% said they are in the fish trade while 3.8% confirmed they are still continuing in the cottage industry.

The study was informed that the residents engaged in trading at the growth centres and more especially at the centres along the Siaya-Ratuoro road. Although this road was rehabilitated by the Project, the respondents claimed it was still impassable in some sections during rainy seasons, thus hampering trade. The feeling was that generally the level of trading activities had considerably declined following the transformation of the wetland. The explanation to this was that with the loss of the wetland came the loss of papyrus and other reeds, reduced fish production in the lakes and rivers, reduced farm produce and reduction in number of livestock, among others.

4.3.3 Dominion Farm Produce and Economic Empowerment for Households

Dominion Irrigation Project is an agricultural venture basically for the production of rice although it produces bananas as well. Also, Dominion engages in aquaculture and poultry in addition to keeping livestock. After establishing the main source of household income as shown above, the study sought to find out if there is any farm product/produce from Dominion Project that economically benefits household livelihoods. The views of the respondents are shown on Figure 4.1.

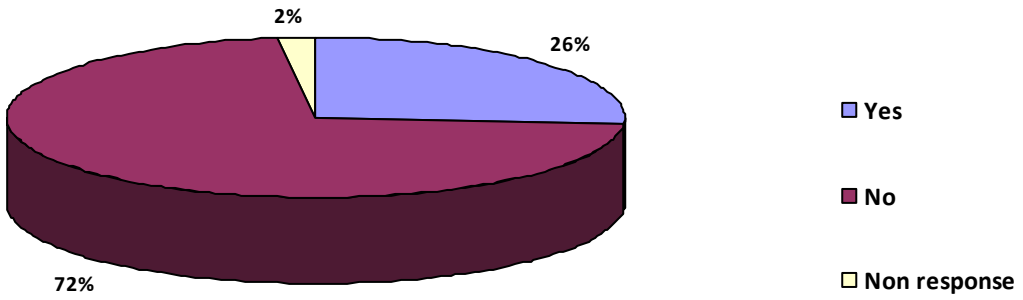


Figure 4.1: Dominion Farm Produce and Economic Empowerment for Households
Source: Field Data (2014)

As can be seen from Figure 4.1 above, a majority (72%) of the respondents indicated that Dominion farm produce and products are of no economic value to them. This high majority can be explained by the responses given to a different question on what the household members consume on a daily basis - to which they stated that maize is their staple food. The number (26%) that responded in the affirmative mentioned the following: they trade in Dominion Project rice, fish, beef, fish, bananas, and poultry projects. However, they were quick to add that the above gives minimal returns compared to what they got from the sale of farm produce before they lost the wetland. The study learnt that previously the locals harvested enough for domestic use and for commercial purposes, and hence made enough money to take care of all their household needs. They explained further that the fish and livestock trade coupled with the cottage industry ensured sustainability.

4.3.4 Employment by Dominion Project

Other than the economic value that a few households get from Dominion farm products and produce, there is also the issue of employment opportunities that the Project offers to households. The study sought to find out if the respondents or any member of their households are on either wage or salaried employment at Dominion Project. Table 4.9 shows the numbers.

Table 4.9: Employment at Dominion Project

	Frequency	Percent
Yes	46	28.7
No	114	71.3
Total	160	100

Source: Field Data (2014)

A majority (71.3%) of the respondents stated that they do not work for Dominion Project and no member of their households is engaged by the Project. This was seen to be a cause for concern for the respondents who feel the Project should employ more of their sons and daughters. They decried the use of chemicals to kill the weeds in the rice fields and suggest that Dominion has opted to use chemicals in the rice fields so as to avoid engaging more farm workers to do the weeding.

4.3.5 Job Description

The study sought to find out the nature of jobs that the persons (n=46) who are employed by Dominion Project perform. Table 4.10 gives the various job categories.

Table 4.10: Job Description

Job Description	Frequency	Percentage
Security guards/watchmen	2	1.2
Farm labourers (bird chasing, weeding, planting, etc)	14	8.8
Messenger / cleaner	9	5.7
Clerical officers	3	1.9
Drivers	8	5.0
Factory workers / mechanics	5	3.1
Secretary	2	1.2
Section Supervisors	3	1.9
Those who stated that neither they nor any member of their households work at Dominion Project	114	71.2
Total	**160**	**100**

Source: Field Data (2014)

Only 28.8% of the respondents interviewed work at or have members of their households working at Dominion. A majority (71.2%) of them stated that neither they nor any member of their households work at Dominion. It was evident that this was eliciting bad feelings among the residents of South Central Alego as can be seen from a statement attributed to one respondent as shown in Box 4.1.

Box 4.1	**Respondent's view on Dominion Project Jobs**
	"... tije gimiyo jooko to nyithindwa giweyo..." (… they have given the jobs to outsiders and left out our sons…)"

Further, the respondents expressed their frustration about the long working hours they are subjected to, the low wages and unfavourable working conditions in the rice fields. Some of the key informants also felt it is only fair that more people from the location should be engaged by Dominion Irrigation Project and that working gear like boots and overall should be provided by the Project.

4.3.6 Wage / Salary Received by Workers at Dominion

After establishing that some household members work at Dominion and also after establishing the job cadres, the study sought to find out the remuneration packages that they take home. Table 4.11 shows the salary brackets for the residents (28%) engaged by Dominion Irrigation Project.

Table 4.11: Wage / Salary Received by Workers at Dominion

Wage/Salary Per Month	Frequency	Percent
	Lower Cadre	
Less than Kshs 10,000	28	16.7
Kshs 10,000 – 15,000	8	5.0
Kshs 15,001 – 20,000	5	3.1
	Middle Level	
Kshs 20,001 – 25,000	1	0.6
Kshs 25,001 – 30,000	-	-
Kshs 30,001 – 35,000	3	1.9
Kshs 35,001 – 40,000	-	-
	Senior	
Over Kshs 40,000	1	0.6
None response	114	72.1
Total	**160**	**100.0**

Source: Field Data (2014)

The figures in Table 4.11 indicate the study findings on the wage and salary rates paid by Dominion Farms (K) Ltd to either the respondents or members of their households who are engaged by the Project: 16.7% earn less than Kshs 10,000; 5.0% between Kshs 10,000 – 15,000; 3.1% between Kshs 15,001 – 20,000; 0.6% between 20,000 – 25,000; 1.9% between Kshs 30,001 – 40,000 and with another 0.6% earning over Kshs 40,000.

The figures above indicate that 60% of the workers engaged by Dominion Project earn less than Kshs 10,000 while 89% earn below Ksh. 20,000. The indication is that even for those households with members working at Dominion, the wages are quite low and thus unable to empower the respective economically. There is also a general sense of frustration with regards to the conditions of work. This includes long working hours (5.00 a.m. to 5.00 p.m.) and poor working conditions like working in the rice paddies and in the fish ponds without proper gear (such as boots, overalls and caps).

4.3.7 Financial Status of Households after Wetland Transformation

As mentioned earlier in this chapter, exploring the effect of Dominion Irrigation Project on household livelihoods involved comparing the status of household livelihoods in the periods before and after the transformation of the Wetland. Figure 4.2 below summarizes the information that head of households gave in response to a question on whether their financial status is better or worse after the transformation of Yala Swamp wetland.

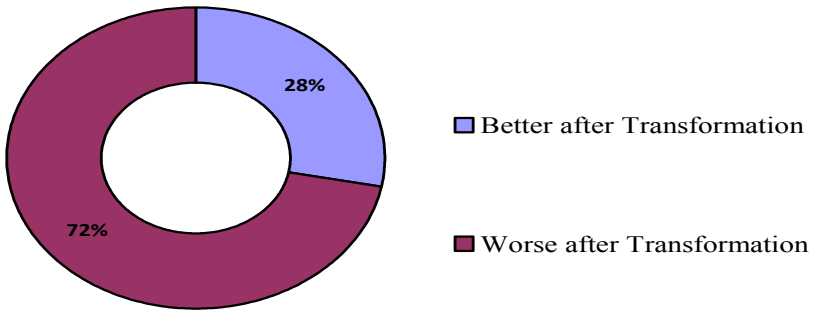


Figure 4.2: Financial status after transformation wetland
Source: Field Data (2014)

A vast majority (72%) of the respondents stated that their financial position has deteriorated with the take-over and transformation of the Wetland. However there was a percentage (28%) who thought their financial status had improved since Dominion began work in Yala Swamp. The varied explanation given by these two categories are as follows:

a) Better after Transformation of Wetland

For those residents who stated that their financial status had improved with the takeover of the Wetland by Dominion Irrigation Project, the explanation given is captured in Table 4.12 below.

Table 4.12: Financial Status Better after Transformation of Wetland

	Frequency	Percent
Number that felt their financial status is worse after transformation	115	71.8
Can access Dominion farm produce (specifically rice) for resale	12	7.5
Floods under control	15	9.4
Opened up job and trade opportunities	18	11.3
Total	160	100

Source: Field Data (2014)

Information received from the respondents showed that out of the number (28.1%) that felt the Project had improved their financial status, 9.4% were grateful the perennial floods that previously posed a threat to livelihoods in the Swamp had been brought under control by the Irrigation Project; 7.5% stated they can access Dominion farm produce (specifically rice) for both domestic and commercial purposes; 11.3% of them believe the Project has served to open up job and trade opportunities. The study learnt that the job opportunities that the residents talked about included indirect jobs like supply of construction materials and uniforms.

b) Worse after Transformation of Wetland

A majority (71.8%) of the respondents stated their financial status had taken a downward turn with the entry of Dominion Irrigation Project into Yala Swamp. Table 4.13 gives their perception.

Table 4.13: Financial Status Worse after Transformation of Wetland

	Frequency	Percent
Number that felt their financial status improved after transformation	45	28.1
Fruit trees and other vegetation destroyed by chemical pollution	9	5.6
Reduction of fish in Lake Kanyaboli and surrounding rivers	20	1.9
Reduction in livestock numbers due to degradation of pasture	3	16.3
Reduction in farm crop production resulting from loss of farms and land degradation – hence household have no crop for sale	57	35.6
No more forests and no more papyrus – hence no income from forest products and a crippled cottage industry	26	12.5
Total	160	100

Source: Field Data (2014)

While 35.6% of the respondents attributed their lack of financial well being to the loss and degradation of farmland and hence reduction in food production, 16.3% of the them were convinced they can no longer keep big herds of livestock due to the contamination and loss of grazing fields, 1.9% mentioned reduction of fish in lake Kanyaboli and surrounding rivers while 5.6% lamented that they previously sold fruits (oranges, mangoes, bananas etc) but not anymore – reason, the fruit trees in their homesteads and farms have all dried up due to effect of chemical toxins from herbicides and pesticides contaminating the air, water and land and 12.5% said that

with the destruction of the natural habitat, they lost whatever contribution wetland forest and swamp gave to the community, but more especially death of the cottage industry . These included activities like hunting (including bird hunting), collection of herbal medicine, wood for fuel, wild vegetables, papyrus and roofing grass harvesting and finally the cottage industry etc.

The figures above indicate that with the takeover and transformation of the wetland, the economic status of the residents of South Central Alego has deteriorated because of the destruction of the ecosystem by chemical toxins used in the rice fields. Land availability is an important aspect of economic empowerment and development. Some key informants believe that the curse of poverty in Yala Swamp started in 2003 with the transformation of the wetland.

4.4 Dominion Irrigation Project and Food Security

The second study objective was on the relationship between Dominion Irrigation Project and food security for households. The research question was: how has Dominion Irrigation Project affected the status of food security in the location. A number of questions touching on the aspect of food security were posed to the head of households, starting with one on the main foods consumed by their households.

4.4.1 Main Foods Consumed

Dominion Irrigation Project is basically a rice irrigation venture. It was therefore crucial that the study gets to know if rice is the staple food in this location. As a first question on food security, the respondents were asked to inform the study on the main foodstuffs consumed by their households. Table 4.14 gives information on this.

Table 4.14: Main Foods (staple foods) Consumed by Households

	Frequency	Percent
Maize, vegetables and fish	92	57.5
Maize, vegetables, fish and beans	18	11.3
Millet/cassava, fish, beans, and vegetables	2	1.3
Maize, beans, vegetable, fish and sorghum	9	5.6
Maize, sweet potatoes, vegetables and fish	39	24.3
Total	160	100

Source: Field Data (2014)

When asked about their main foods it became clear that maize, fish and vegetables are indeed the staple foods for this community as stated by 54.4% of the respondents. The implication is that rice and bananas from Dominion Farms are not actively boosting food availability for the households but rather they act as supplements.

Table 4.15: Food Production per Household (bags per main harvest season)

Food Item	Production Before	Production After
Maize	14	4
Sorghum (bags)	8	1
Sweet Potatoes (bags)	18	3
Beans (bags)	16	2
Millet	7	3
Cassava	8	4
Fish (*osero* or basket)	10 (baskets a month)	4 (baskets a month)

From Table 4.15 above it is evident that there has been a reduction in food production for the households of South Central Alego. This in effect means that the households are currently not getting enough harvest to cater for subsistence and commercial use.

4.4.2 Source of Daily Food

After establishing what the main foods consumed by the households in Kadenge and Obambo were, the study sought to find out the source of these foods. Figure 4.3 below gives a summary of the information received.

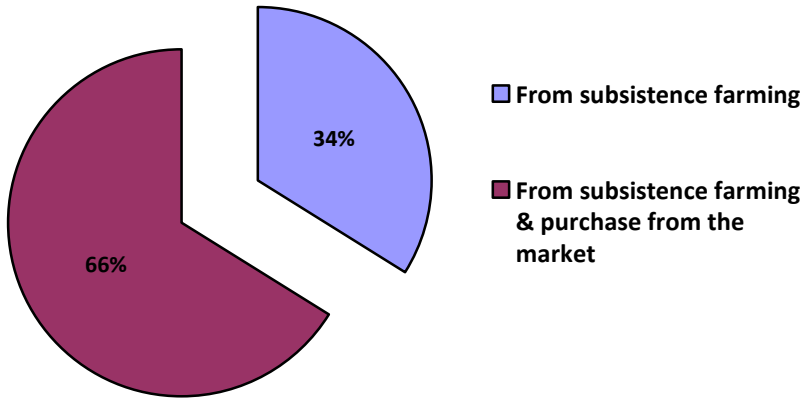


Figure 4.3: Source of Daily Food
Source: Field Data (2014)

On the question of source of foodstuff, a minority (34%) stated that they get their foodstuff from subsistence farming while 66% stated they get their foods from subsistence farming but supplement with what they purchase from the market. According to the local administration, this is very much unlike in the previous years when households got their foodstuff from the farm and even had excess to sell and meet other household needs. One 69 year old retired female teacher who is in a polygamous marriage recalled the previous years and expressed herself as shown in Box 4.2.

Box 4.2 **Respondents Views on the Source of Daily Food**

"... idalaka wan mon ariyo gi nyithindo apar gachiel - to kech ochwe mak okawa, kendo nyithindwago osomo te nikech fis ne wuok e ndalo. Obaro ne chiegonwa cham moromowa uso mwauyud fis. To kara dinebed nu sani eka koro wanyuol to wawach nu nyithindwagi dakosomo?..." (In this homestead we are two wives and eleven children - but we never experienced hunger and our children all went through school because we were getting school fees from the farm. The land was producing foodstuff enough for us to sell and get school fees. And by the way were we to be giving birth now then does it mean our children would not have gone through school?).

It was evident from the statements of some respondents like the lady whose words are recorded in Box 4.2 that the household livelihoods of this rural community revolved around the wetland. To them, the wetland was everything.

4.4.3 Availability of Land for Subsistence Farming

The study asked the respondents if there is enough land for subsistence farming for their households. Figure 4.4 illustrates the view of the head of households on the question of availability of land for subsistence farming.

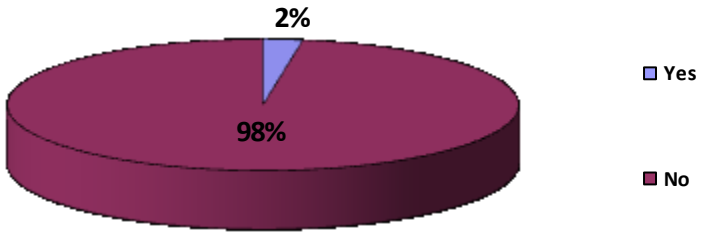


Figure 4.4: Availability of Arable Land for Subsistence Farming
Source: Field Data (2014)

A vast majority (n=157, 97.5%) of the household heads lamented they do not have enough land to plough. The study was able to confirm from the key informants that indeed the households get poor harvest. They also attached this deficiency to reduced farmland and to chemical degradation of the land. The study received information that about 190 and 60 homesteads lost their farms in Kadenge and Obambo Sub-Locations respectively. The study was informed that the Project had allocated some 400 acres of arable farmland to individuals. However, there is claim that most of these individuals are not the common villager but rather affluent businessmen residing in urban centres. These leaders believe the problem of food insecurity in the location could be effectively addressed if the Project could release more acres and reallocate the same to cater for the small scale subsistence farmers in the villages.

4.4.4 Availability of Pasture

Closely linked to the question of land for subsistence farming is the issue of availability or non-availability of grazing land. The study sought to know if the households have adequate land for grazing their livestock. Figure 4.5 captures their responses.

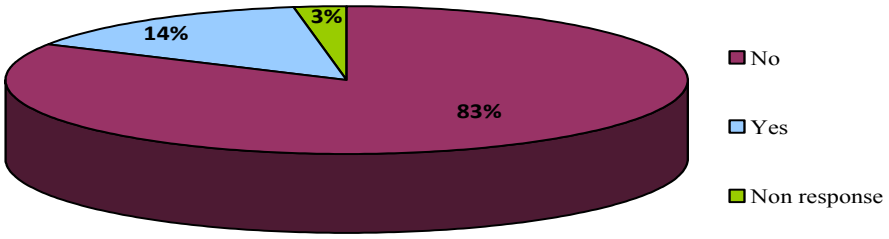


Figure 4.5: Availability of Pasture
Source: Field Data (2014)

Eighty three (83%) of the household heads did not think the land they have was enough for pasture while 14% are satisfied with the amount of pasture available to them. When asked to elaborate on their answers, some said Dominion has fenced off the land they previously used for grazing livestock, while others blamed the lack of pasture on chemical contamination.

4.4.5 Land Ownership

After establishing that the households do not have enough land for farming and for pasture, the study asked follow-up questions pertaining to land ownership in Yala Swamp before 2003 when Dominion Group of Companies took over the Wetland. The first of these was on whether Yala Swamp was trust or ancestral land. Figure 4.6 illustrates the responses received.

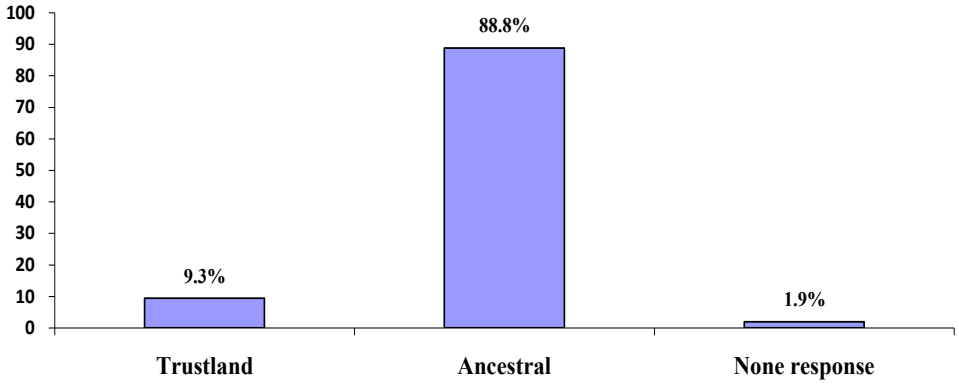


Figure 4.6: Ownership of Land

Source: Field Data (2014)

The study sought to know if the land leased to Dominion was trust or ancestral and a majority (88.8%) of the respondents were convinced it was ancestral land while 9.3% stated it was trust land. Indeed the majority of locals believe that the land taken over by Lake Basin Development Authority and later handed over to Dominion Farms (K) Ltd. by officials of the Siaya County Council belonged to their forefathers and so is presently theirs by right. This majority fault Dominion Project for not respecting their cultural attachment to the forefathers. In fact one of their concerns with the Project is that in the process of preparing the land for rice growing, the Project dug out graves belonging to their ancestors.

Whereas four of the key informants held the same viewpoint as the head of households that the land leased to Dominion Farms (K) Ltd was ancestral land, two of these leaders had a different perspective and informed the study that it was trust land held on behalf of the people by the then County Councils of Siaya and Bondo. Either way, this study believes the two main stakeholders could be assisted to co-exist and sustainably use the wetland for the good of both.

4.4.6 Physical Accessibility of Dominion Rice

Dominion Farms (K) Ltd is a large scale irrigation venture employing mechanized farming for the production of rice. After exploring the question of main foods consumed, source of daily foods and availability of land for subsistence farming, the study sought to find out if Dominion rice can be physically accessed by the households. Table 4.16 illustrates the responses received.

Table 4.16: Physical accessibility of Dominion Rice

	Frequency	Percent
Yes. for domestic consumption	135	84.4
Yes, for both domestic and commercial purposes	22	13.7
Number that stated they cannot physically access Dominion rice	3	1.9
Total	160	100

Source: Field Data (2014)

A majority (84.4%) of the respondents interviewed stated they can physically access Dominion rice for domestic consumption while 13.8% stated they can access it for both domestic and commercial purposes.

4.4.7 Financial Accessibility of Dominion Rice

After establishing that the residents have physical access to Dominion rice, the follow-up question then became that of affordability of the same rice and also if it is therefore boosting food security for households. Figure 4.7 gives the perception of respondents on affordability of Dominion rice.

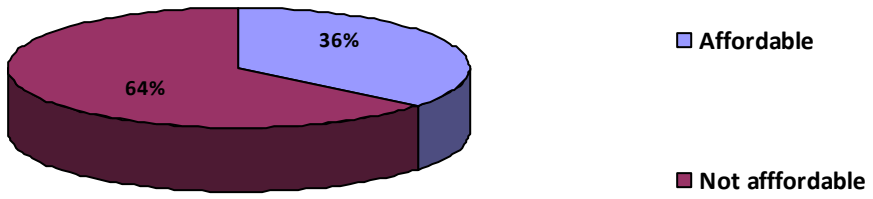


Figure 4.7: Financial Accessibility of Dominion Prime Harvest Rice

Source: Field Data (2014)

4.4.8 Rice Types and Pricing

Regarding the issue of affordability of Dominion Prime Harvest rice, the respondents (36%) who stated that the rice is affordable hastened to explain their response. This gave the impression that it was very important to them that they were not misunderstood. As can be seen in figure 4.7 above, 36% stated yes the rice is affordable and is boosting food availability while 64% stated the contrary. Table 4.17 below gives the varying prices vis-à-vis the different rice grades. It is worth noting that the price of tips is about half that of good quality rice.

Table 4.17 Breakdown of Dominion Rice Prices

Rice Type	Price per 1 Kg
Tips	50
Broken	60
Quality Rice	90

Source: Field Data (2014)

It is important to mention at this point that all those who responded in the affirmative (that Dominion rice is affordable and is boosting food availability hastened to explain that 'Prime Harvest Rice' per se is not affordable but the lower qualities – 'broken' and 'tips' are. 'Broken' derives its name from the pellets that break during processing and 'tips' are the tips of the pellets (smaller than 'broken'). 'Tips' was previously meant for chicken but on discovering that the locals feed on this, Dominion started selling the same to traders for re-sale to the locals for household consumption. Also, it was noted that this response was received mainly from the female head of households. The explanation could be that female headed households are not too rigid about the availability of maize meal in their kitchens but easily supplement with other foods including rice.

4.4.9 Modern Farming Technology Transfer

Dominion Farms (K) Ltd is a large scale irrigation venture employing mechanized farming for the production of rice for local consumption and also for export. It is therefore practical that the Project would be expected to pass some of this technical knowledge to the local community. Asked if the Project gives any form of training on modern farming, the respondents' perspectives were as shown on Table 4.18.

Table 4.18: Modern Farming Technology Transfer

	Frequency	Percent
Number that stated there is no technology transfer	73	45.6
Increased knowledge on irrigation farming methods (on-the-job)	35	21.9
Knowledge on aquaculture – on the job	23	14.4
On-the-Job training on machine operation etc	29	18.1
Total	160	100.0

Source: Field Data (2014)

The study findings indicate that 18.1% of the respondents said there is training on farm machinery operations but went further to explain that this training is 'on-the-job'. According to this category of respondents, the training gives technical skill to the workers – some of whom can thereafter secure employment elsewhere – hence the training they receive while engaged by Dominion benefits the households. A further 21.9% felt the Project had served to ensure

increased knowledge on irrigation methods. For this group, their wish was that Dominion should assist them (with finances in the form of loans as well as technical know-how) practice irrigation on the semi-arid land they occupy presently. They claim the water from the river and lake should be enough to irrigate their small farms that lie on the periphery of the Project. The number (14.4%) that appreciated the on-the-job knowledge they get as workers in the Dominion farms stated that they are able to tap increased knowledge on modern farming methods.

4.4.10 Food Situation before Transformation of Wetland

Having explored the aspects of main foods consumed by the households in South Central Alego, availability of land and the place of Dominion rice in this study objective, the study sought to finalize by asking the respondents to make a comparison and give their assessment of the food situation in their households before and after the transformation of the Wetland. They were asked to explain what they thought contributed to food availability before Dominion took over and transformed the Wetland. Their perspectives on this are summarized in Table 4.19.

Table 4.19: Food situation before transformation of wetland

Food Availability	Frequency	Percent
Number that stated it was equally bad prior to transformation	5	3.1
It was good: there was enough pasture for livestock	52	32.5
It was good: there was enough arable land for farming food crops	103	64.4
Total	160	100

Source: Survey Data, 2014

A majority (64.4%) of the respondents explained that previously they had more than enough land for subsistence farming and for grazing their livestock while others (32.5%) explained that because there was adequate grazing land, they kept large herds of livestock which translated into income and food for the households. The study thus established that the households of South Central Alego enjoyed food security in the period before the transformation of Yala Swamp.

4.4.11 Current Food Situation in the Wetland

Having received the views of the respondents concerning the food situation in their households before Dominion took over the Wetland, the study went further to ask what they thought about

the current food situation in their households. Table 4.20 gives the views of the household heads on the prevailing food situation in the study area.

Table 4.20: Current Food Situation

	Frequency	Percent
Good	5	3.2
Adequate	20	12.5
Bad	135	84.3
Total	160	100

Source: Field Data (2014)

A vast majority (84.3%) of the respondents felt the current food situation is bad. They explained that when Dominion started in 2003, the Project provided maize seeds to the farmers and even ploughed family plots, in addition to supplying the households with a sack of maize crop per household during the first harvest. They said all this stopped after the first year and the situation became dire. There are those (12.5%) who stated the prevailing food situation is adequate and other (3.2%) who stated it is good. These last two categories (15.7%) explained that: they had managed to get small plots within the Swamp; they are financially able to access organic fertilizer from Dominion and this improves their yield to a small extent; they supplement whatever foods they harvest from their farms with Dominion rice; some members of their households are engaged in trade and from the proceeds, they are able to purchase more food from the market to supplement for the food deficit within the households. However, 15.7% is a very small percentage compared to the majority (84.3%) who were categorical that the location is currently facing food insecurity.

Some key informants suggested that Dominion Project should provide maize seed and organic manure to the subsistence farmer at affordable rates while others are think that only the release of more land to the locals can alleviate food insecurity in the location. All of them believe only access to the fertile swampland will enhance food security in the location.

4.5 Effect of Dominion Irrigation Project on Environmental Conservation

The third objective of this study was to explore the effect of Dominion Irrigation Project on environmental conservation in the Location. The research question that guided this objective was: what is the effect of Dominion Irrigation Project on environmental conservation in the location? In order to determine this effect, the study sought to receive answers to a number of questions as follows:

4.5.1 The Aspect of Environmental Degradation

When questioned about what they think about the activities carried out by the Irrigation Project vis-à-vis the environment, respondents lamented on the air, water and land contamination and the effect of this on human, animal and plant life. Table 4.22 gives a summary of the cause and nature of environmental degradation as explained by the respondents.

Table 4.21: Type and Cause of Environmental Degradation

	Frequency	Percent	None response	
			F	%
Air Pollution				
Toxins from pesticides and herbicides used in spraying rice fields pollute the air.	142	89.0	18	11.0
Black soot from burning papyrus cause air pollution and is a threat to human life.	98	61.0	62	39.0
Water Pollution				
Chemicals used in rice spraying pause a threat to water quality in Lake Kanyaboli and River Yala	111	69.4	49	30.6
Burning papyrus cause water and air pollution and also destruction of the natural habitat.	133	83.0	27	17.0
Land Degradation				
Degradation of pasture by poisonous chemicals	108	67.5	52	32.5
Chemical toxins used in spraying rice fields result in land degradation – hence reduced harvest.	120	75.0	40	25.0

Source: Field Data (2014)

The frequencies in Table 4.21 indicate the number of respondents out of the sample size of 160 in each row and the percent indicated is consequently out of 100 in each row. It can be seen that n=142 (89.0%) complained about air pollution resulting from chemical toxins; n=133 (83.0%) lamented that burning the papyrus reeds to clear land for cultivation lead to destruction of the natural habitat and also water pollution; n=120 (75.0%) feel that use of poisonous chemical sprays has led to land degradation; n=111 (69.4%) said chemicals used in rice spraying pause a threat to water purity in Lake Kanyaboli and River Yala when there is a run-off of rain water and also during aerial spraying (sometimes Dominion extends spraying to cover the airspace above the village); n=108 (67.5%) stated that use of poisonous chemicals had degraded the pasture; n=98 (61.0%) complained about air pollution from black soot formed by burning papyrus reeds. Respondents who work in the Dominion farms mentioned the following chemicals as those that are used by the Project:

The study further learnt from the respondents that the Project sometimes extends the spraying right into their small farms and that the pesticides and herbicides (meant only for the rice farms) end up in their maize and vegetable farms, thus causing the crop and vegetables to turn yellow and wither. They claimed that even the birds in the bushes are not spared as the plane also sprays above the villages – the purpose is to reduce the bird population and save the rice in the fields. Also, in order to control water for irrigation of the rice fields, the Project constructed weirs, canals, dykes and dams. This, they claim, has led to reduced water levels downstream (of River Yala) and in Lake Kanyaboli. The local administration too voiced serious concerns with the irrigation practices of Dominion Project, including use of poisonous chemicals. One of them lamented as shown in Box 4.3.

Box 4.3 **Respondent's View on Environmental Conservation**

"... Bunge maneng'eny Kadenge tinde orumo. Siany tinde onge yiend nyaluo. Alur mane rawere makoga e bunge, lumb tado, togo, yiend gedo nyaka lop agulni tek yudo sani. Koro inuang'o nu ngima oridore nwa mokadho ..." (The forests are gone. The Swamp no longer provides herbal medicines extracted from wetland plants. The quails that young men previously hunted in the bushes, the roofing grass, papyrus, clay for pottery and wood for construction of huts are hard to find now. So you find that life is presently very hard).

All the key informants acknowledged that they have received claims of toxic effects on air, water and land. Some of them proposed that maybe the Project could employ more farm labourers to weed the rice fields so that less chemical is used. Some key informants feel that in as much as Dominion Project came to Yala Swamp purposely to engage in rice irrigation, the Project should also irrigate the semi-arid land on the periphery of the Swamp and also provide seed and organic manure to the subsistence farmer at affordable rates. Box 4.4 illustrates what one of them had to say concerning environmental degradation.

Box 4.4 **Key Informant's view on Environmental Degradation**

"... Dhano tuo, Jamni tho. Lum orumo. Ohendni mane jogi timoga tinde dhi ka lal. Parye apara nya thurwa nu musunguni nyaloga fuyo a wi mine ka riembo winy gu joma pudho lum e mchele ma gikir yath e wi ji. Ndekgino sechemoko ringo ka kiro yath e wi namb Kanyaboli nyaka e mier kumaji odakye. Mani miga rech tho, ji chako tuo, cham man ipuothe tho, olembe maji opidho tuo, nyaka winy modak e yien gu bunge tho. Bende sechemoko iwuoro nono..." (People are ill. Livestock are dying. Pasture is gone. The trades that these people engaged in are steadily coming to a halt. Just imagine my sister, the white man flies above the women in the farms as they are busy chasing birds away and weeding the rice fields - and then sprays the chemical right above the people. Also, the plane sometimes flies above Lake Kanyaboli and sprays over the lake and above the homesteads where people stay. This leads to death of fish in Lake Kanyaboli, villagers become ill, crops and vegetables in the gardens dry up, fruit tress dry up and even the birds on the trees and in the bushes die. Sometimes you just wonder)

The revelations from a respondent (Box 4.3) and key informant (Box 4.4) support the view upheld by the current study that wetlands have too often been lost for very limited benefits and more costs to the neighbouring communities.

4.6 Discussions

The broad objective of this study was to explore the effect of Dominion Irrigation Project on household livelihoods. This section presents a discussion of the research findings. The discussion will cover the three thematic areas of the study which are: the role played by Dominion Irrigation Project on the economic empowerment of households in South Central Alego Location; the relationship between Dominion Irrigation Project and food security for these households; the effect of Dominion Irrigation Project on environmental conservation in the location. The discussion below has attempted to harmonize the differing views of past study findings with an effort to bridge the identified gaps in the body of knowledge regarding wetland transformation vis-à-vis household livelihoods and community development. The views of the key informants have also been taken into account in these discussions.

4.6.1 Role played by Dominion Project on the Economic Empowerment of Households

In 2004 the population living within the Wetland had just been displaced from their homes and farms: the head of households had failed to bring in a good harvest of maize, millet and a variety of vegetables from the wetland farms; they could not access pasture for their livestock; those who had previously engaged in trade in wetland produce and products found themselves without a trade and an occupation. These were major life changing events. It was a period when the local communities of Kadenge and Obambo were struggling to adjust to the social change that came with the loss of a sole resource base. This study supports the view propounded by DFID (2002) - that a livelihood is sustainable only when it can cope with and recover from stresses and shocks without undermining the natural resource base. The study therefore holds that Swallow (2004) should not have included the Yala Swamp wetland in this categorization when he says that the Lake Victoria Basin supports the poorest rural populations in the world.

The situation in Yala Swamp confirms that the foreign direct investment that Atencio (2010) talks about does not always trickle down to the rural poor. The foreign direct investment that MNCs avail could be the most desired form of capital flow for any developing country. However, a capital flow from a developed to a developing country should be able to uplift the lives of those who need it. Also, it is highly probable that because of the differences prevailing in Yala Swamp between the two main stakeholders, Dominion Project may not be providing an

expanded tax base and capital formation for the country as was anticipated by the Government of Kenya in 2003. This then would be a message to governments that you can only get the most from foreign direct investment when all factors are properly addressed and contentious positions agreed upon. The view of this study would then differ from that held by Atencio (2010) that MNCs create jobs and wealth and improve technology in countries that are in need of such developmental initiatives. The scholar posits that MNCs extend opportunities for earning higher incomes as well as the consumption of improved quality goods and services to people in poorer regions of the world. However, from the study findings, it can be seen that this is not always the case

The study established (Table 4.9) that only 28.8% of the respondents are either engaged by Dominion Irrigation Project or have members of their households engaged by Dominion. Of this, 24.8% earn below Ksh. 20,000/= a month. This means that out of the n=46 of the respondents employed by Dominion Project, n=41 (89%) of them earn below Ksh. 20,000/= a month and n=28 (60%) of them earn below Ksh. 10,000 a month. The above data indicated that Dominion Farms (K) Ltd has not been a source of wealth and neither has it created adequate job opportunities for the residents. The above findings are however contrary to the view held by Havnevik (2007) who seems to agree with Atencio (2010) when he says that the economic role of MNCs is to channel physical and financial capital to countries with capital shortages. In an ideal situation this would be the case. However, and as can be seen from the findings of this study, there are cases when the activities of MNCs fail to create wealth which in turn would yield new jobs.

From the information given on size of households, some of these respondents are polygamists heading families of 12 and above while some of them are widows. If the study is to assume that the children in these households attend primary and/or secondary schools or even tertiary institutions, then a wage of below Ksh. 10,000 a month cannot adequately cater for the household livelihoods of these employees. In addition to this, the available land is degraded and unproductive, hence the need to purchase more food-stuff from the trading centres. From figure 4.3 elsewhere in this report, the study established that whereas 34% of the households depend entirely on farm produce (cereals and vegetables) for their daily foods, 66% of the households have to supplement the produce from their subsistence farms with extra purchases from the

market. Hence, an income of 10,000 and below is inadequate considering that some of the households are composed of 15 persons and above and some of these are headed by widows.

A majority (71.9%) of the respondents asserted that Dominion Irrigation Project has not served to economically empower the households. The view by DFID (2002) that households know their needs and how to meet those needs is supported by this study. Indeed the study believes that the riparian community of South Central Alego knew how to meet their needs solely from the Wetland resources. The respondents clearly explained that the Wetland was the only source of income prior to transformation, as all the trading activities revolved around its produce and products. Maltby (1991) says that rural communities (like the community of South Central Alego) will recognize the value of wetlands as a resource for household livelihoods but the economically ambitious world will consider wetlands as wastelands to be filled and drained. In the case of Yala Swamp it has been much more than just filling and draining, but rather plundering to destruction.

The residents of South Central Alego believe their financial status was much better before Dominion took over the Wetland. A majority (72 % - Figure 4.1) believe that although Dominion is solely a large scale agricultural venture, the Project's farm produce has not served to economically empower them. An equal percentage (72%) asserted that their financial status after the transformation of the Wetland is worse compared to the period before 2003 (Figure 4.2). As Prossor (1995) puts it, traditional societies have for centuries based their economic systems upon the natural rhythms of river and lake regimes. Information received from respondents leads the study to hold the view that the lease of Yala Swamp to Dominion Farms (K) Ltd was a mistake and that global investors do not always improve developmental initiatives.

4.6.2 Relationship between Dominion Irrigation Project and Food Security

In order to establish the relationship between Dominion Irrigation Project and food security in the location, the household heads were asked a number of questions, all geared towards giving the study an informed perspective on this thematic area.

What Dominion is doing in Yala Swamp would have been quite noble had the management included in their programme the irrigation of the semi-arid land neighouring the swamp. This study shares the views held by Barbier and Strand (2011) and hold that food security can only be

made possible through proactive and progressive policies and measures that would ensure access to food and reduction in the number of the hungry. However, when a community that has been relying solely on a wetland for survival is asked to give up the only source of daily food, then alternatives should be given so as to ensure sustenance of livelihoods. According to Ngigi (2002), food shortages in Kenya pose a recurrent crisis, which cannot be solved through rain-fed agricultural production alone. Indeed the arid and semi-arid parts of Kenya cannot reliably support agriculture unless technologies such as irrigation and water harvesting are employed. According to Ngigi (2002), food shortages in Kenya pose a recurrent crisis, which cannot be solved through rain-fed agricultural production alone. Indeed the arid and semi-arid parts of Kenya cannot reliably support agriculture unless technologies such as irrigation and water harvesting are employed.

In Kenya land is the one most prized asset that no household wants to lose. Establishing the relationship between Dominion Irrigation Project and food security among households in South Central Alego would most certainly require answers to pertinent questions about the ownership, allocation and lease of the agricultural land known as Phase I. With 98% of the household heads stating that they do not have enough land to till for subsistence use; 83% revealing that they do not have adequate pasture for their livestock; 96.9% stating that the food situation in their households was better before the transformation of the Wetland as opposed to the period after the transformation – then all factors considered, this is a situation that calls for enforcement of measures that govern lease of wetlands to investors (local or foreign). Kenya being an agricultural country, there cannot be food security for the rural population if they do not have land to plough.

The aspect of food security is closely tied to that of availability of land. Land ownership is such an emotive issue in Kenya to the extent that a discussion on land requires sobriety and wisdom especially on the part of the person seeking information. When the study sought answers on matters pertaining to availability, ownership and lease of Phase I, the reactions were varied and all very disheartening: some respondents stared in silence at the rice fields, then their gaze seemed to go beyond the fields and back before finding words to explain their dilemma; some burst out, talking incoherently and almost endlessly - seemingly expecting the interviewer to

have some positive information; some were in control of their emotions and took time to explain their very deep feelings pertaining to the issue of Phase I and the lease period of 25 years.

A majority (84.3%) of them asserted that the food situation in their households is currently very bad. When asked to explain their response, this group apportioned blame on the irrigation activities carried out by Dominion Project in Yala Swamp since 2003. Only 34% of the respondents stated they get their foodstuff (cereals and vegetables) solely from their subsistence farms. The study learnt that a few households were allocated small pieces of arable land from the 400 acres left out by Dominion for use by the community members. 400 acres of arable land for a population of approximately 8000 would definitely the populace adequately. However, the respondents claimed that the 400 acres was allocated by Dominion mostly to rich powerful individuals who work and stay in urban centres. The vast majority of households have to depend on the semi-arid section of the location.

The current study saw the natural and human capital in South Central Alego as appropriate for subsistence and commercial agriculture as well as agricultural intensification for increased production for a variety of food crops. This would contribute to enhanced rural livelihoods as suggested by DRSRS (1992). However, it is necessary to add that for optimal success, especially with the human capital, all stakeholders must be given a chance to fully participate in the planning and implementation, and outputs must be seen to benefit all parties. Local participation would ensure that transformation of wetlands into large agricultural investments benefit host communities. Global food security is a worldwide concern and the challenge is how to feed a growing population. This study shares the concern of DFID (2002) that the challenge for governments and investors is how to best effect development programmes without interfering with the flow of traditional agricultural methods used by the local communities in floodplain areas. The traditional agricultural methods ensured a sustainable livelihood and it was up to the investor and government to find a way of helping the community maintain this while at the same time progressing the rice irrigation venture.

4.6.3 Effect of Dominion Irrigation Project on Environmental Conservation

From the information given by the respondents and recorded in the previous sections of this chapter, the study established that households in this community had sustainable livelihoods and

that the natural resource base behind this sustainability was the Yala Swamp Wetland. Asked to compare the financial status and food security situation of their households before and after the transformation of the Wetland, the residents were convinced they led better lives in the period before the transformation (Figure 4.2; Table 4.12; 4.13; 4.19; 4.20). The study linked the third thematic area – environmental conservation, to the first theoretical approach that the study was grounded on – sustainability. The study looks at the concept sustainability in the context of sustainable livelihoods, sustainable development and sustainable wetlands management and agrees with DFID (1998), that a livelihood is sustainable when it can cope with and recover from stresses and shocks, and maintain or enhance its capabilities and assets both in the present and in the future, while not undermining the natural resource base.

The study shares the DFID (2002) position that communities must be supported to manage the natural resources as they continue to draw livelihoods from the same. The findings have led the study to advance the view that natural resources like the Yala Swamp, while being tapped for human sustenance (by the local community, the government or the investor), must also be helped to regain their natural biodiversity and retain the same for future generations. The study was informed that for generations the residents of Kadenge and Obambo cultivated the Yala Swamp (or *Obaro* as they called it) and entirely depended on it for food, clothing, shelter, education and medication. This study holds that to maintain sustainability for the host community, it is necessary that foreign investors revise their policy on wetland transformation (and use of natural resources in general) in their projects. This will ensure development efforts by these entities achieve the intended objectives for the good of host communities.

The findings of this study showed that households in South Central Alego are not experiencing sustainable development. It shares the view propounded by WECD (1987) that sustainable development can only mean continued improvement in household livelihoods by use of the same natural resource base. The Brundtland Report of the World Commission on Environment and Development (WECD) (1987) defines sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Going by the WECD definition, it follows then that all activities that development agencies like MNCs (read Dominion Group of Companies) engage in should meet the needs of the host communities (read the riparian communities of Kadenge and Obambo) without

compromising the ability of future generations to meet their own needs, using the same natural resource base - the Yala Swamp Wetland.

Sustainable development for the households of South Central Alego depended upon maintaining the ecosystem undisturbed and un-degraded. From discussions with the respondents, it could be seen that most of them did not realize from the onset that in any large-scale mechanized rice growing venture, the use of chemicals cannot be avoided completely. It is the conviction of this study that a participatory approach right from the time of project inception period would have been ideal since environmental challenges that come with large scale rice irrigation would have been explained to the residents and the two main stakeholders would probably have reached a compromised position pertaining to environmental conservation.

Information gathered during the study showed that the wisdom of integrating environment and development is on the notion that variables, such as economic and social factors cannot be simply ignored by individuals, governments or investors in their drive to protect or extract from the natural environment. Actually, the natural environment cannot be sustained if development policies do not consider the need for change in people's access to resources and the distribution of costs and benefits. As Pearce (2012) notes, wetlands or floodplains can be used to achieve sustainable development provided that clearance of natural ground cover, swamp drainage and use of agro-chemicals are carefully controlled. For this reason, the political leaders needed to work with the local communities of Kadenge and Obambo in order to ensure use of the Wetland by the Project in a sustainable way.

This study observes that degradation of the environmental resource base such as excessive resource extraction and severe land use by Dominion Project has not only affected the quantity and quality of the services that are produced by the ecosystem, but has also challenged the resilience of the Wetland to ensure sustainable development for the households of South Central Alego. The study agrees with Landberg (1994) Sustainable sees Wetland Management (SWM) as management of a wetland system with sustainable technology options, which ensures the sustainability of its ecosystem functioning and contribution to livelihoods to conserve natural resources, with adequate institutional and economic options.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the study findings. It also gives the theoretical and empirical conclusions of the study as well as the recommendations derived from the conclusions drawn. The recommendations further outline how development policies could be revisited by policy makers to incorporate local communities in decision making so that both the entrepreneur and the host community benefit from the venture. Finally, in this chapter there are suggestions on areas for further research for scholars who may be interested in delving on studies pertaining to activities of multinational corporations vis a vis community development.

5.2 Summary

Transformation of wetlands largely lead to destruction of natural habitat and loss of livelihoods for the human communities especially in developing countries where many people continue to depend on wetlands and other natural resource base for maintenance of traditional subsistence activities. In as much as rural communities have long recognized the value of wetlands as a source of household livelihoods, the more economically ambitious world has seen them as wastelands to be occupied and drained. The takeover and transformation of Yala Swamp Wetland by Dominion Group of Companies for large scale irrigation was a social exchange process ostensibly meant to usher in a positive social change that would benefit the riparian community of South Central Alego Location. Many years down the line and the household livelihoods of the people of Obambo and Kadenge Sub-Locations remain unsustainable as disagreements continue to shroud the takeover. The economic empowerment of the households is low, residents are facing food insecurity and the Wetland that once ensured sustainable household livelihoods is now depleted.

5.3 Conclusions

5.3.1 Dominion Irrigation Project and Economic Empowerment of Households

The research question that guided the above objective was whether there is any significant role that Dominion Irrigation Project is playing towards economic empowerment of households in the

location. The findings of the study indicated that the main sources of income for the households are: support that they receive from family members who work and stay in urban centres; salary earned from other employers like civil service, NGOs, CBOs and FBOs; profits from a variety of trading ventures. It is evident from these findings that although the Project has engaged some persons from the location on wage and salaried employment, the number is minimal (28%). One would have expected the majority of respondents to state that Dominion Project is the main employer and hence the main source of income. Consequently, the study concludes that the Project has not achieved sustainable economic empowerment for this community.

It was further concluded that none of the farm produce from Dominion (specifically rice) greatly benefit the households as a source of income. In as much as there are a number of individuals from some of the households who trade in Dominion rice, the same is not a staple food in this region and hence the purchase and consumption is minimal. Also, the majority of households lack purchasing power to buy rice.

Also, most livestock farmers keep local animals as opposed to the grade ones that would require animal feeds from Dominion Project to boost their milk and beef production. Loss of pasture to Dominion and to chemical contamination has led to loss of livestock. Loss of farmland that previously provided residents with food enough for domestic use and extra for sale, coupled by loss of the forest land and swamp that offered opportunities for different forms of trade has combined to greatly weaken the economic empowerment for this community. The study learnt that some of the trading opportunities included: pottery; cottage industry; papyrus, other reeds and grass harvesting; hunting; logging, trade in farm produce, trade in livestock; fish trade; trade in herbal medicine; beekeeping; pottery.

The study therefore concluded that no farm produce or products from Dominion Project significantly benefit the households as a source of income.

5.3.2 Dominion Irrigation Project and Food Availability for Households

The second objective sought to establish the relationship between Dominion Irrigation Project and food availability in the area. The question that guided this objective was: how has Dominion Irrigation Project affected the status of food security in the location.

In many parts of rural Kenya it is mostly the womenfolk that work hard at subsistence farming although the men will readily say they are subsistence farmers, notwithstanding their lack of participation in farming activities at household level. These are the same women who are engaged by the Project to weed the rice and chase away birds from the rice fields. Added to the loss of arable land for farming and for pasture, the issue of women working on the Project farms from 5.00 a.m. to 5.00 p.m. has robbed them of time and energy that they would otherwise have spent on the subsistence farms. This has contributed to food insecurity in the location.

Prime Harvest Rice is the product of Dominion Farms Ltd and it is sold in shops within Kenya and outside. Unfortunately the households in South Central Alego (the host community to Dominion) cannot afford quality Prime Harvest Rice. They are therefore forced to settle for lower grades like 'broken' and 'tips' – notwithstanding that 'tips' was originally meant to serve as chicken feed. Also, rice is not a staple food for this community – leading the study to hold the view that maybe there would have been less agitation had Dominion continued with cultivation of maize in addition to the rice production.

From the findings of the study, it is apparent that with the loss of the arable swampland that the residents of Kadenge and Obambo previously depended on for subsistence agriculture, there was bound to be food insecurity for the households. The study supports the view of the vast majority (84.4%) that unlike in the previous years, the current food situation in South Central Alego is quite bad and that this is because of the transformation of the wetland. The study is of the view that the loss of the wetland was the first step towards food insecurity and that the project irrigation activities have led to sustained food insecurity in the location.

Dominion Irrigation Project has not ensured food security for the households of South Central Alego Location.

5.3.3 Dominion Irrigation Project and Environmental Conservation in Yala Swamp

The question that guided the above objective was: What is the effect of Dominion Irrigation Project on environmental conservation in the location? The findings of this study showed that the local community was crying foul over lack of environmental conservation on the part of the Project. The respondents claimed that the use of pesticides and herbicides in the rice farms is

degrading the environment. The toxins from the chemicals are causing land, air and water pollution and this is affecting plant, animal and human life. Also, as a result of wetland clearance and the loss of wetland products and produce that the locals previously used for different kinds of trade, the traditional way of life is changing and traditional wetland trades no longer provide the strong financial backing like in the previous years. These are trades like floodplain agriculture and fishing, pottery, hunting, logging, harvesting of papyrus and roofing grass, the cottage industry and trade in herbal medicine and wood for fuel. Destruction of the environment has therefore made the household livelihoods of these locals unsustainable. From the information received, the study concluded that the effect of toxins from pesticides and herbicides used by Dominion Project has contaminated land, water and air and thereby posed grave danger to man, animal and plant life.

Dominion Irrigation Project activities have affected environmental conservation in the Yala Swamp Wetland.

5.4.1 Empirical Conclusions

This study established that the takeover and transformation of Yala Swamp Wetland by Dominion Irrigation Project has led to economically unsustainable household livelihoods in South Central Alego. Promise of job creation had been welcomed by the local community. However, when the residents discovered that no jobs were forthcoming in the numbers that they expected, it became apparent that the Project had failed to ensure economic empowerment. For those who got engaged by Dominion Project, the issue of remuneration also became contentious. Trade in Dominion farm produce such as rice and bananas do not ensure economic empowerment as these are not the main foods in the location and hence the consumption rate is very low. Also the once thriving cottage industry has been brought on its knees as the papyrus and other reeds, roofing grass and forest trees have been burnt down to clear ground for rice production.

Considering that Dominion is an agricultural enterprise and that the Project started work in the Wetland, supposedly to ensure food security, it was necessary to find out if the Project had indeed ensured food security for the households. A majority (89%) of the respondents were categorical that if Dominion really wanted to ensure food security in the location then the

entrepreneur should surrender the wetland back to the locals or renegotiate the agreement that leased Phase I to Dominion Group of Companies for a period of 25 years and with a possibility of extension to 45 years.

In terms of its effect on the environment, the chemicals used by the Project have destroyed the ecosystem, thus threatening the household livelihoods of the residents. The chemical effect on land, air and water has been a threat to man, animal and plant life; land is degraded and hence unproductive.

Based on these expositions, it is evident that MNCs may not always work for the good of host communities.

5.4.2 Theoretical Conclusions

This study was guided by two theoretical approaches: the Sustainable Livelihoods Approach (SLA) as propounded by DFID (2002) and the Social Exchange Theory (SET) as propounded by George Homans (1974)

(a) The SLA Approach

The Sustainable Livelihoods Approach informed the study by probing the ability of the households to cope with and recover from the stresses and shocks that came with the take-over and transformation of the Wetland. The study used the framework to investigate if the activities carried out by Dominion Farms (K) Ltd. in Yala Swamp are geared towards maintaining or enhancing the capabilities and assets of the households living in Kadenge and Obambo, now and in the future. In 2003 the households in these sub-locations region may not have foreseen that a large mechanized rice irrigation project does come with obvious chemical effects on the environment. However, as the farming activities progressed and as they discovered that they were not just losing land but with it the natural biodiversity that the Wetland offered, it became apparent that both their livelihoods and that of future generations were being threatened by the giant project. The Sustainable Livelihoods Approach posits that natural resource bases, while being tapped for human sustenance must also be helped to regain their natural biodiversity and retain the same for future generations. SLA emphasizes the need for communities to properly manage their natural resources as they continue to draw livelihoods from the same. The study

established that indeed the households had totally depended on the Wetland for their livelihoods and that with its take-over and transformation these livelihoods are no longer sustainable.

When respondents maintained that the deal to accommodate Dominion Project was forced on them by their political leaders, it became apparent that the whole arrangement was not inclusive and lacked participation from the residents. The SLA framework encourages a people centred approach to development so that means to meet local needs are corporately identified. SLA talks of material and non-material capital that the poor people in developing nations have: these are health, labour, knowledge and natural resources around them. The households in Kadenge and Obambo had these and it is highly probable that if the concept of participatory development was conceived and a compromised lease agreement adopted, these households would have availed the above mentioned assets and more - then the Dominion story in Yala Swamp Wetland would be quite different today.

(b) The SET Approach

The central concept in the Social Exchange Theory is that of actors exchanging resources via a social exchange relationship, which is a process of negotiated exchanges between parties. The SET principle as used in this study explained the relationship that exists between the residents of South Central Alego and Dominion Farms (K) Ltd.

The political leaders of the then Siaya County Council engaged in a social exchange relationship with the entrepreneur. Purporting to act on behalf of the locals, the leaders gave up a wetland that was the local community's only source of household livelihoods. The findings of this study established that the residents were relegated in the background during the negotiations and this explains the feeling among them that they were shortchanged in the process. It is not surprising that from the onset, there has been discontent on the part of the host community in Yala Swamp. In this relationship, the SET factors of cost and rewards seem to work in favour of the entrepreneur and at the expense of the local populace.

One of the five propositions that assist in structuring an individual's behavior based on cost and reward is that of Aggression-Approval which holds that when a person's action does not receive the rewards as expected, or receives punishment he did not expect, he will be angry and is more likely to perform aggressive behavior (Homans, 1974). The residents of South Central Alego

weighed the potential benefits and risks involved in this social exchange relationship and came to the conclusion that they are receiving no rewards for their action of giving up the Wetland. They have therefore been on the war path from the onset of the Project activities. One of the aggressive behavior attributed to them includes cutting down the fence to the Project farm and driving their livestock into the rice fields - to which the entrepreneur retaliated by locking up both man and animal at the Siaya Police Station.

5.5 Recommendations

Based on the study findings, the following recommendations were made:

i. Management of Natural Resources and the Aspect of Participatory Development: This needs local knowledge, beyond that of outside experts, and the local communities have it. It is crucial, though, that the inclusion of local knowledge is done early in the process for participation to be effective. This would hence enable mitigations to be planned in an all-inclusive manner by the different parties so as to prevent rather than adjust impacts afterwards.

ii. Institutional Frameworks: Use of natural resource bases (like wetlands) by investors should be strictly guided by the existing institutional frameworks in order to enable sustainable utilization of the same. Also, there should be a requirement for MNCs to know their host communities (lifestyle) and to avoid activities that degrade the cultural inclinations of these communities (like digging out graves and destroying cultural/spiritual sites). The Kenyan citizenry on its part need to be sensitized by County Governments to know what to expect and what not to expect from local and international investors. This will assist residents to make informed choices.

iii. Leadership Approach: Political leaders need to change their attitude and approach on the vital role they are expected to play at the negotiation table on behalf of the populations they represent. Leaders need to provide democratic space and allow head of households to feely participate in discussions on issues that affect their everyday lives like economic empowerment, food availability and environmental conservations.

5.6 Areas for Further Research

Whereas this research has provided valuable insights on the issue of transformation of a wetland, it majorly focused on the effect of Dominion Irrigation Project on household livelihoods. Future researchers could tackle the 'impact' of Dominion Project on household livelihoods instead of simply determining the effects. This would delve more deeply on the social change the Community of South Central Alego has gone through over the years as a result of the transformation o Yala Swamp. For instance, a study on the impact of Dominion Irrigation Project on Environmental Conservation in Yala Swamp would give a better picture of the environmental situation in this wetland. Such a study could be done by an individual with a background in environmental studies or public health.

This study was conducted exclusively in a rural area in Siaya District and it gives insight on the reactions of a rural community to a situation they are not familiar with – like giving up a land they considered ancestral, watching the graves of their ancestors dug out and cultural sites and shrines destroyed. It is recommended that a similar research be carried out in a different wetland hosting a different community within Kenya. Such a study will bring out the differences or similarities in the reaction of the host communities in terms of acceptance and adaptation to social change or the resistance to change. It will hence give a comparison on the ability of different communities to cope with and recover from stresses and shocks brought about by a social change like the one encountered by the riparian community of South Central Alego.

The findings of this study point out, though not exhaustively, to the effect of the activities of a Multinational Corporation on the household livelihoods of a wetland community. It exposes the sad realities faced by a people who find themselves in an arrangement they did not bargain for. It is therefore recommended that future researchers analyze the role and technical capabilities of political leaders in mega negotiations like the one that took place in the Yala Swamp Wetland.

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APPENDICES

Appendix I: Interview Schedule for Households

Part A: Personal Details

A-01 Gender:

Male [ ] Female[ ]

A-02 Age of respondent:

25-35 [ ] 36-45 [ ] 46-55 [ ] 56-65 [ ] Over 65 [ ]

A-03 Education Level:

Primary [ ] O'Level [ ] A'Level [ ] College and above [ ]

A-04 Occupation: _____

A-05 Marital status:

Single [ ] Married [ ] Divorced [ ] Widow [ ] Widower [ ]

A-06 Size of Household:

1-3 [ ] 4-7 [ ] 8-11 [ ] 12-15 [ ] Over 15 [ ]

Part B: Dominion Project and Economic Empowerment

B-01 What are the main sources of income for your family? _____

B-02 Are you or any member of your household engaged in any informal employment (e.g. trade of any kind) If yes, please tick appropriately as shown below:

Income Generating Activity		**Tick appropriately**
Livestock keeping		
Harvesting and sell of roofing grass and papyrus		
Cottage industry (weaving of mats, baskets etc)		
Collection and sell of wood for fuel		
Pottery		
Lake and river fishing		
Fish farming		
Trade in Dominion rice (Prime Harvest)		
Others (specify)		

B-03 Is there any farm product/produce from Dominion Farms that is of economic benefit to your household? Yes [ ] No [ ]

If yes, give information by ticking appropriately as below?

Dominion Farm Product/Produce		**Tick**
Rice for resale		
Crop by-product for fertilizer and animal feed		
Fish fingerlings for local fish farmers		
Bananas for resale		
Others (specify)		

B-04 Are you or any member of your family employed by Dominion Irrigation Project?

Yes [ ] No [ ]

If yes, in what capacity and what is the monthly pay? Indicate appropriately as below:

Job Description	**Monthly Wage/Salary**
Security guards/watchmen	
Farm Labourers	
Messenger / cleaner	
Clerical officers	
Drivers	
Factory workers / mechanics	
Secretary	
Section Supervisors	
Others	
Those who stated that neither they nor any member of their households work at Dominion Project	

B-05 Please make a comparison between your household financial status now and what it was before Dominion took over the Yala Swamp Wetland - is it better or worse?

Better [ ] Worse [ ]

If better, explain? _____

If worse, explain? _____

Part C: Dominion Project and Food Availability

C-01 What foodstuffs does your household consume on a daily basis? _____

C-02 Where do you get the above foodstuffs from? _____

C-03 Is there enough land for subsistence farming for you and your household?

Yes [ ] No [ ] Explain _____

C-04 If there enough grazing land for your livestock?

Yes [ ] No [ ] Explain _____

C-05 The land that was leased to Dominion Group of Companies by the officials at the Siaya County Council, was it Trust land or Ancestral land?

Ancestral land [ ] Trust land [ ]

C-06 Did Dominion restrict themselves to the 2,300 ha (Area I) originally leased to them?

Yes [ ] No [ ]

If no, what happened and how did they finally end up with 11,500 ha?

C-07 Are you able to physically access Dominion rice? Yes [ ] No [ ]

Explain _____

C-8 Is Dominion rice affordable and is it playing a notable role towards the food security situation in your family? Yes [ ] No [ ]

Explain. _____

C-9 Does Dominion Irrigation Project organize for any form of training for farmers on use of modern technology in farming? Yes [ ] No [ ]

C-10 Have you or anybody from your village undergone any such training?

Yes [ ] No [ ]

If yes, did you benefit from the training and how?

Explain. _____

C-11 What was the food security situation in your household before Dominion took over the Wetland? Good [ ] Adequate [ ] Bad [ ]

Explain _____

C-08 What is the food availability situation now?

Good [ ] Adequate [ ] Bad [ ]

Explain _____

Part D: Environmental Degradation

D-01 Are there any environmental degradation issues associated with Dominion Irrigation Project that are of concern to members of your household? Yes [ ] No [ ]

If yes, which ones? Please tick appropriately the choices below?

Aspects of Environmental Degradation	**Tick**
1. On Air	
• Toxins from pesticides and herbicides used in spraying rice fields	
• Black soot in the air resulting from burning of papyrus to clear ground for rice fields	
2. On Water	
• Toxins from pesticides and herbicides pause a threat to water purity on Lake Kanyaboli and River Yala • Water control in the form of weirs, dykes, dams, canals lead to reduced water levels in Lake Kanyaboli, Lake Victoria and River Kanyaboli	
3. On Fish survival	
• Run-off of rain water carry toxins from the land and into the lake and rivers downstream – results in death and hence reduction of fish	
• Burning/Cutting the papyrus results in extinction of the fish varieties that can only survive among the papyrus reeds	
4. On Land:	
• Toxins used in spraying rice fields result in land degradation	
• Reduction of pasture and hence reduction of livestock.	

D-02 Are there any effects of the above cases of pollution and other environmental factors on plant and animal life and human? Yes [ ] No [ ]

If yes, provide information on the effects by ticking appropriately as below:

Effect of Environmental Degradation		**Tick**
Ailment of villagers caused by effect of chemical toxins and black soot (from burning papyrus) – pollution of air, water and land.		
Ailment and death of domestic animals from effect of toxins on water and land		
Reduced water levels in the lake and river because of water controls in the form of canals, dykes and weirs. Reduced fish production.		
Land degradation caused by chemical toxins has led to reduced crop production for the households.		
Destruction of natural habitat: The Wetland was host to unique trees and shrub species which the locals used for medicinal purposes. It was also home to the endangered sitatunga antelope.		
Reduced fish production due to chemical toxins in the run-off rain water.		
Others		

Appendix II: Key Informant Interview Guide

(For discussion with the Chief of South Central Alego; Sub-Chiefs for Kadenge and Obambo; County Surveyor; District Forestry/Environmental Officer; District Agricultural Officer)

A. Dominion Project and Economic Empowerment

A1 What role is Dominion Irrigation Project playing to economically empower the households in South Central Alego?

A2 Has Dominion Project provided any employment to the people of South Central Alego? If yes, what kind of jobs?

A3 In your opinion, are the locals comfortable with the jobs they are holding at Dominion as well as the terms of service? Please explain.

Dominion Project and Food Security

B.1 Has Dominion Project assisted in boosting food availability to household livelihoods in South Central Alego? Please explain.

B.2 In your opinion, did the area councilors have enough technical capacity to negotiate in a social exchange project the magnitude of Dominion Farms (K) Ltd.

B.3 Has Dominion Farms Ltd threatened or contributed to community livelihoods in any way? Please explain.

C. Dominion Project and Environment

C.1 Are there any environmental conservation related challenges in the community that are associated with the activities of Dominion Projects? Please explain.

C.2 Are there any air, water or land pollution related problems in the community and if yes, which ones?

C.5 What, in your opinion, should Dominion do differently in order to alleviate the above situation?

Way Forward

What do you think should be done to assist the Project play a role towards uplifting the household livelihoods in South Central Alego? Please respond with the following actors in mind: the local community; Dominion Irrigation Project; the County Government of Siaya; the Central Government.

Appendix III: Research Authorization Letter

NATIONAL COMMISSION FOR SCIENCE TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
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When replying please quote

9th Floor Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. NACOSTIIP/1417828/858

Date: 4th March, 2014

Patriciah Olwa Owiyo
Egerton University
P.O.Box 536-20115
EGERTON.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *"The Effects of Dominion Irrigation Project on Household Livelihoods in South Central Alego Location, Siaya County, Kenya,"* I am pleased to inform you that you have been authorized to undertake research in Siaya County for a period ending 30th April, 2014.

You are advised to report to the County Commissioner and the County Director of Education, Siaya County before embarking on the research project.

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

DR. M. K. RUGUT , PhD, HSC.
FOR: SECRETARY/CEO
Copy to:

The County Commissioner
The County Director of Education
Siaya County.

National Commission for Science, Technology and Innovation is 150 9007: 2008 Certified

Appendix IV: Research Permit

THIS IS TO CERTIFY THAT:
MS. PATRICIAH OLWA OWIYO
of EGERTON UNIVERSITY, NJORO,
0-30100 eldoret,has been permitted to
conduct research in *Siaya County*

on the topic: *THE EFFECTS OF DOMINION IRRIGATION PROJECT ON HOUSEHOLD LIVELIHOODS IN SOUTH CENTRAL ALEGO LOCATION, SIAYA COUNTY, KENYA.*

for the period ending:
30th April,2014

Permit No : NACOSTI/P/14/7828/858
Date Of Issue : 4th March,2014
Fee Recieved :KSH 1,000.00

.....
Applicant's Signature

.....
Secretary
National Commission for Science Technology & Innovation

CONDITIONS

1. **You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit**
2. **Government Officers will not be interviewed without prior appointment.**
3. **No questionnaire will be used unless it has been approved.**
4. **Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.**
5. **You are required to submit at least two(2) hard copies and one(1) soft copy of your final report.**
6. **The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice.**

REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No. A 1152

CONDITIONS: see back page

Appendix V: Plates

Prime Harvest Rice from Dominion Farms (left) and some project buildings (right)


Different faces of Yala Swamp Wetland


River Yala (Left and Lake Kanyaboli (Right)

Water control methods: A Dyke (left); A Canal (centre); A Weir (right)

River Yala at its entry into Lake Victoria, note the reduced volume (right)

River Yala water before (left) and after (right) contamination. (note the white particles)

A section of the swamp after the papyrus has been burnt in readiness for rice cultivation