



LINKÖPINGSS UNIVERSITET

Department of Water and Environmental Studies

**Wetland Conversion to large-scale agricultural production;
implications on the livelihoods of rural communities, Yala
Swamp, Lake Victoria basin, Kenya.**



**A Thesis Submitted in Partial Fulfilment for the Award of a Master of
Science degree in Water Resources and Livelihood Security at
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ABSTRACT

Wetlands in most parts of the world are under threat of over-exploitation, loss and/or degradation partly due to agriculture and urban land uses.

Yala swamp, the largest fresh water wetland in Kenya measuring about 17,500 ha supports a large biodiversity and is source of livelihoods to communities around it. This study addresses the situation where part of this wetland is converted into large-scale agriculture by a multinational company, Dominion Farms (K) Ltd resulting into a conflict and controversy amongst key stakeholders. The study was undertaken to explore and seek an understanding of the controversy and investigate the livelihood impacts this wetland transformation has for the local community in order to generate relevant data for managing the wetland. This paper gives the status of the wetland using the concepts Stakeholder Analysis (SA) and Sustainable Livelihood Approaches (SLA) to assess the livelihood situation in terms of the socio-economic conditions, rural infrastructure, income diversification, food security and environmental management issues.

Data and information have been obtained from primary and secondary sources through field survey in the Yala wetland, in which randomly sampled small-scale farmers, fisher folk, Dominion employees, local leaders and informants, traders and other stakeholders were interviewed using questionnaire and other participatory methods. The main questions were designed to gain information about historical use of the wetland, changes in livelihoods and wetland before and after entry of Dominion Company into the area.

From the study, it is evident that assessment of the key stakeholders and their relation to this natural resource is of utmost importance for mapping out an acceptable management strategy for the wetland. Besides being cause to a conflict and controversy over control of and access to the swamp, the conversion of part of this wetland has resulted into both negative and positive short-term and long-term livelihood impacts to the local community. The wetland is a contested resource with multiple users who claim a stake on it requiring a holistic approach to its management that integrates divergent needs and views of key stakeholder groups. Through such a mechanism the planners and policy-makers can identify and fairly address trade-offs therein between large-scale agriculture and sustainable ecosystem utilization, while maintaining the benefit flow to the local community. The study identifies management issues and proposes a vision for the future that will help minimize conflicts and food insecurity in the area. General recommendations for planning as well as suggestions for specific research needs that should form the basis of action are given.

Key words: Wetlands, large-scale agriculture, livelihoods, stakeholder analysis, Dominion Farms (K) Ltd, Yala Swamp, Kenya

Declaration

I, the undersigned, hereby declare that this thesis, submitted for the award of Master of Science degree in Water Resources and Livelihood Security at Linköping University (LIU), is my own work and has not previously been submitted to any other institution of higher education for award of any degree. All sources that I have used or quoted have been indicated or acknowledged by means of a comprehensive list of references.

Signature.....Date.....
(Zachary Omambia Kinaro)

Dedication

My dedication goes to

My Parents,

Billiah Nyamusi Kinaro

And

The late Mr. Kinaro Ondari,

*My wife,
Stella Kemunto Osinde,*

And my children,

Charles Gwaro,

Keith Kinaro,

And

Wayne Ondari

*For their inspiration, support and encouragement that always
made me to keep hope alive.*

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Above all Glory is to God.

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List of Acronyms and Abbreviations

CBOs: Community-Based Organization(s)

DFID: Department For International Development (UK)

EIA: Environmental Impact Assessment

EMCA: Environmental Management and Coordination Act

FAO: Food and Agriculture Organization of the United Nations.

GoK: Government of Kenya

IDS: Institute of Development Studies (UK)

IMF: International Monetary Fund

IWMI: International Water Management Institute

KLA: Kenya Lands Alliance

KWF: Kenya Wetlands Forum

LBDA: Lake Basin Development Authority

LVB: Lake Victoria Basin

MDGs: Millennium Development Goal(s)

NEMA: National Environment Management Authority

NGOs: Non-Governmental Organization(s)

SA: Stakeholder Analysis

SAPs: Structural Adjustment programme(s)

SL: Sustainable Livelihoods

SLA: Sustainable Livelihoods Approach

SSA: Sub-Saharan Africa

WB: World Bank

WTO: World Trade Organization

CHAPTER ONE

INTRODUCTION

Due to population growth, poverty, and development efforts, wetlands are increasingly being utilized and transformed, not least so in Sub-Saharan Africa (SSA). Wetland development projects significantly impact on their ecological productivity and economic output and more often than not generate conflicts concerning control of the resources between different users for instance pastoralists and farmers or small-scale farmers and large-scale capitalist farmers.

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 (IWMI 2006). Achieving environmental sustainability and at same time satisfying the need for increased food production, enhanced economic growth and poverty reduction, is an issue of growing importance the world over.

Global food security is a worldwide concern and the challenge is how to feed a growing population which currently is estimated at 6.2 billion and projected to reach 9.2 billion by the year 2050. The population increase over the coming decades will be absorbed mostly by less developed regions, whose population is projected to rise from 5.4 billion in 2007 to 7.9 billion in 2050 (UN, 2007).

Three quarters of the world's poorest people, the 1.2 billion who live on less than a dollar a day, live in rural areas where in one way or another their livelihoods depend on agriculture. They are however, faced with many challenges that include limited access to arable land, finances, skills, markets and increasing competition for resources such as water and arable land (DFID, 2002). The challenge here is to assure that everyone has access to sufficient food to live a healthy and productive life by eliminating food insecurity, hunger and malnutrition in a manner consistent with an ecologically sustainable management of the natural resource base (Pinstrup-Andersen, 2002).

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, soils are becoming exhausted and water becoming increasingly scarce. The growing populations, competition for fertile farming lands and limited access to any available farmland for many in SSA has led to people 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 (Adams, 1995).

The developing world while effecting their development programmes, lacks the necessary requisite skills and hence end up inviting foreign investors with advanced technology and related resources to effect such 'developments' on wetlands and other

fragile natural resources. While most of these are directed to minerals and oil prospecting due to encouraging high prices, farmlands and remaining wetlands have also been targets to produce horticultural crops and vegetables for export, and also biofuels as many people now find it hard to afford oil due to increasing prices (Havnevik *et al.*, 2007).

Despite the realization and wide documentation of their importance for biological, hydrological, economic and socio-ecological functions, they are some of the most threatened ecosystems in the world (WRI, 2002; Terer *et al.*, 2004; Gichuki *et al.*, 2001; Thenya 2005)

Transformation of wetlands largely lead to losses to the wildlife and well-being of human communities especially in developing countries where many continue to depend on them and other natural resource base for maintenance of traditional subsistence activities that include livestock herding, hunting, fishing and farming which form their main sources of livelihoods. This fact is strongly supported by Maltby (1991) who says:

“while rural communities have long recognized the value of wetlands in producing food, water, transport and building materials, the more economically ambitious world has seen them as wastelands to be filled and drained” (Maltby: 7).

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. 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. 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 (McNeely, 2003).

The dilemma is how to attain best use of these wetland resources and be able to address trade-offs adequately. This remains a general problem and a challenge for the developing world and SSA in particular. In Africa very little scientific research has addressed wetland ecosystems, especially swamps, compared to other ecosystems such as forests in spite of the increasing awareness of their role in supporting livelihoods, and their high diversity of flora and fauna, which forms the base for a wide range of wetland services and products (Thenya, 2006).

Wetlands have more often been valued as potential agricultural land and over time undergone massive conversion around the world with far reaching ecological and socioeconomic consequences with most studies estimating half of the wetlands of the world have been lost in the 20th century (WRI, 2002; McNeill, 2000). Adams (1995) argues that flood plain agriculture is the most economically important use of floodplain wetlands in Africa because they support a continuous cropping in both wet and dry seasons. Other livelihood activities in floodplain wetlands include grazing, fishing and fish production. These activities are to a large extent integrated with surrounding

activities thereby resulting in diversification of incomes and risks for the rural communities most of whom depend on natural resources for their livelihoods. He further argues that such projects need to be sustainable and to the most in the interest of rural poor:

“Sustainable development should be ‘directly concerned with increasing the living standard of the poor, and must address the issue of equity and extent to which costs and benefits of development are unequally borne by different people. It further means making sensible and effective use of natural ecosystems, such that the benefits derived from them are optimized over long periods” (Adams:17).

However, according to Abebe and Geheb (2003), when wetlands are completely transformed, the major winners are those who are able to develop their preferred economic activities, whereas most of the community loses out except poorer women who obtain wage labor opportunities in wetland drainage and land preparation.

The realization and appreciation of the intricate linkages between socio-economic aspects, wetland development and environmental components is crucial for their sustainable utilization, especially in SSA where rural livelihoods and economies are highly dependant on the natural resources, including wetlands. Studies on livelihoods, especially knowledge on alternative resource base for generating income, have been scarce. In his research on Lake Victoria wetlands, Gichuki argues:

“the contribution of wetlands to the employment sector in the Lake Victoria basin needs to be studied in detail and the results used in developing a management plan” (Gichuki, 2003: 38).

In Africa large areas of natural floodplains traditionally used for dry season grazing and important fisheries have been lost to regulated river-flow and large-scale irrigation as was in the irrigation project in the Senegal river-delta which later collapsed (Maltby, 1991). In the Ethiopia’s Borkena wetland, development interventions to solve conflicts amongst warring wetland users resulted in the enhanced livelihoods of the farmers while the pastoralists were adversely affected (Tolossa and Baudoum, 2004).

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 (Crafter *et al.*, 1992; Kairu, 2001; Gichuki, 2003; Abila, 2005).

In Kenya wetlands cover approximately 14000 square kilometers, which is about 3% of the country’s surface area. These wetlands are important aquatic ecosystems that provide many ecological and socio-economic goods and services that include water supply, food

production and agriculture, construction material and products for cottage industry, tourism and recreation. Ecological services include flood control, water recharge and discharge, filtration, nutrient storage and re-cycling, support rich biodiversity and wildlife habitats as well as livelihoods of many communities (GoK, 2005; Gichuki, 2001; 2003, Schuijt 2002; KLA, 2006; Owino and Ryan, 2007; Terer *et al.*, 2004; Mwakubo *et al.*, 2007; Abila and Othina 2006; Kairu, 2001). Despite their valuable functions, wetlands are often regarded as ‘wastelands harboring disease vectors.

It has also been argued that most studies conducted on Kenyan wetlands have laid much emphasis on natural sciences largely on nutrient dynamics, water quality, aquatic ecology and fisheries, hydrology and catchment’s modelling and vegetation dynamics with very little to do with human welfare and utilization impacts. On the same note these studies have not explored much into details of livelihood strategies for the local communities with respect to their utilization, conservation and management (Gichuki, 2003; Thenya, 2006, Ong’ang’a *et al.*, 2001; Ong’ang’a, 2005).

Yala swamp, the main focus of this study, is a place where most of the above conditions prevail though at a local scale. The area is experiencing population growth, low literacy levels, escalating poverty, ecological stress and limited productive resource base. The main natural resource available, the wetland, is increasingly becoming scarce as competition for control and access to, and its utilization increases amongst multiple and contested uses by various stakeholders within the local community. The latest incidence is the entry of big-scale investment in agricultural activities, which has elicited new reactions, challenges, opportunities and constraints, conflict over use and control, dislocation and threats to traditional livelihoods and environmental destruction. The impact of these activities on the livelihoods of the local community is a case at hand.

Wetlands of lake Victoria basin including the Yala swamp have and continue to be under pressure for conversion to other uses that include agriculture, settlement, potential for tourism amongst others due to changes in demographic trends and increasing need for more food security. The potential for the swamp to accommodate many uses has attracted a lot of interest groups including the large-scale agriculture company, Dominion Farms (K) Ltd, environmentalist and Government agencies all of whom are putting a claim to the wetland’s resources.

1.1 Food security versus Food sovereignty

The importance of agricultural production for socio-economic growth has led governments and development agencies to design strategies to address the increasingly complex risks to food security, unsustainable livelihoods and escalating poverty, especially in SSA. Efforts are being made to facilitate either the provision of resources through which households can eventually provide for their own food security or emphasis on making food available at affordable prices irrespective of source, including imports and exports and having the appropriate safety nets in place well ahead of crisis. This is possible through more proactive and progressive policies and investments in both rural and agricultural productivity enhancement measures, innovative safety nets that ensure minimum access to food and reduction in the number of hungry (FAO, 2005).

Food security is also a livelihood security issue and eradicating world hunger is a key to achieving the millennium development goals. Governments at the 1996 World Food Summit (WFS) defined food security as existing ‘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 2005). However, the summit never said how countries and regions could source for such food requirements for their citizen. This remains an open debate.

Since the summit, fighting hunger has been within the World Food Programme (WFP) as a target of the WFS and MDG1 and as an essential condition for achieving other MDGs. Addressing food insecurity means increasing food production and addressing the root causes of vulnerability through a range of interventions, including rural development, agriculture research, building livelihoods and social protection (Livelihoods connect, 2005).

As efforts are made towards achieving food security, there are suggestions that technological advances or expansion of cultivated area would boost production sufficiently to meet rising global food demands. Africa in particular, will need increased food production from existing agricultural land thorough ‘modern’ agricultural development initiatives. There are also new opportunities for sustainable agriculture with emphasis on productive values of natural, social and human capital, all assets that Africa either has in abundance or that can be regenerated at low financial cost (Pretty, 1999).

This approach echoes calls for a ‘Green Revolution’ for Africa that embraces commercial agriculture and trade, adaptive technology and agricultural intensification for increased production for a variety of food crops that are important in Africa, thereby contributing to enhanced rural livelihoods and poverty reduction. According to proponents of an African-style green revolution, the approach which goes beyond technology, it is a state-driven, market-mediated and small-farmer based strategy to increased national self-sufficiency in food grains (Djurfeldt *et al.*, 2005; Holmen, 2004a; Holmen, 2006; Braun 2005).

On the other hand, food sovereignty has been suggested as an alternative to the conventional approach of production. These approaches to food security emphasize local food production for local consumption without external inputs (often referred to as organic agriculture). Proponents for food sovereignty argue that every people must have the right and ability to define their own food, farming and agricultural policies; to protect domestic markets against dumping and subsidized exports, and liberalized free trade on agricultural commodities (Rosset, 2006; Grain, 2005).

While giving his views for food sovereignty, Rosset (2006) challenges the role of World Bank (WB), International Monetary Fund (IMF) and World Trade organization (WTO) regarding trade in agricultural commodities. He argues that ‘agriculture is special’, and has a multifunctionality role with respect to rural regions and hence should not be treated like any other tradable commodity as it plays many functions to peoples’ livelihoods, particularly the rural poor populations. He further argues that the introduction of

structural adjustment programs (SAPs) by IMF in the 1980s to African countries led to flooding the domestic markets of cheap food imports. This, combined with internal political and economic weaknesses favored few farmers and hence a net loss of markets for smaller, poorer farmers in more remote areas thereby aggravating poverty.

There are also arguments that green revolution saves some land and nature reserves in Africa, but may exhaust others, while food sovereignty means intensive use of land and nature reserves (Holmen 2004b). Therefore there is need for new strategies that focus on rural areas development where the world's most poor live and with estimates to the effect the next four decades will witness more populated rural areas (Windfuhr and Jonsen, 2005).

Notwithstanding this debate, efforts need to be made towards food production either through food security or sovereignty approaches to meet increasing food demands, for enhanced livelihoods, poverty reduction and maintenance of environmental integrity. It is not however, within the scope of this study to engage in the debate on food security versus food sovereignty. What is clearly evident though is the need for strategies geared towards increased food production for the growing global food demands both for present and future generations.

1.2 Purpose of the study

The purpose of this thesis is to closer understand the insights, views and perceptions of key stakeholders when a wetland, Yala Swamp, is transformed from small-scale agriculture to large-scale agriculture. The impacts on livelihood strategies of the rural community are in focus of the thesis. This is done by gathering information related to livelihoods of the local community and the perceptions of other key stakeholders.

By using the tools stakeholder analysis and sustainable livelihoods with respect to a natural resource management this study seeks to identify the project's key stakeholders, an assessment of their interests, and the ways in which these interests affect project's role towards the people's livelihood strategies. Variability and sustainability is very crucial and a reason why increasing value is being placed on involving stakeholders in project design and implementation.

This study puts cognizance to these views in planning, designing and carrying out the study objectives based at the Yala swamp, Lake Victoria basin, Kenya

Based on the concepts of Stakeholder Analysis (SA) and that of Sustainable Livelihoods (SL), and their interlinkages to natural resources management, the study sought to investigate and assess the impacts made to livelihoods of rural communities when a natural resource (wetland) is converted to large-scale agricultural production.

Key research questions addressed in the study include:

1. How has large-scale agriculture affected the livelihoods of the local community?

2. How do the various stakeholders (Local community, Dominion company management and employees, Government agencies, NGOs/CBOs) perceive this change of the wetland ecosystem?
3. What is the impact of wetland transformation upon those who have traditionally used the wetlands?

Research objectives to answer the above questions include:

- To assess how large-scale agriculture has affected the standard of living of the local community in both a positive & negative perspective
- To assess the views of the different stakeholders regarding the project in terms of short and long-term benefits.
- To identify and document findings and knowledge gaps when a private investment company takes over the ownership, access and use of a natural resource with a view to suggesting probable future planning and sustainable development strategies in the region.

1.3 Description of the study area

Yala swamp contributes significantly to the ecological and hydrological functions of the basin as well as to the economy of the rural communities, especially in subsistence farming, grazing and macrophyte use for building and commercial products like mats, crafts and furniture. The swamp is a highly productive ecosystem as characterized by the diverse growth of macrophytes and its general biodiversity richness and provides habitat for certain species of animals that have disappeared from the main Lake Victoria including invertebrates, birds and fish. The natural vegetation at the edges of the wetland is heavily affected by human settlement, widespread cultivation and cutting of trees for fuel-wood and construction. Despite this recognized importance and value of the Yala swamp, there is increasing pressure to reclaim the swamp, mainly to ensure food security, diversify livelihoods and employment in the area.

1.3.1 Geographical location

Yala swamp, (Fig.1.1) a floodplain wetland along Lake Victoria Basin, with an area of 17,500 ha (175 square kilometers) is the largest freshwater wetland in Kenya and it is a vital life support to the surrounding local people who have traditionally extracted water, fish, medicinal plants, transport and building material amongst others for their livelihood and subsistence economy (Gichuki 2003, Abila *et al* 2004, Nilsson 2006).

The swamp is located at the mouth of River Yala in Western Kenya and is part of the larger lake Victoria Basin (LVB) being an ecotone zone between the uplands and the deep water aquatic system of Lake Victoria. Administratively, the swamp is found in both Siaya and Bondo Districts, in Nyanza, and extends into Busia District of Western Province. The altitude in the area ranges between 1,140 and 1,500 m above sea level (GoK, 1994, cited in Thenya 2006). The long rains occur in the months of March-May while most short rains fall in October-December.

Yala swamp was formed through the backflow of water from Lake Victoria and the flooding of the Rivers Nzoia and Yala. The swamp is mainly fed by the River Yala, which flows through the swamp, while the contribution from the River Nzoia is mainly small, flooding only a small section in the north-eastern part of the swamp. Yala swamp is one of the few habitats in Kenya where the threatened Sitatunga antelope (*Tragelaphus spekeii*) is found (Abila 2002). Within the swamp are three lakes, namely Kanyaboli (1,500 ha), Sare (500 ha) and Nyamboyo (1 ha) all of which contain some of the endangered fish species and even some of which have become extinct in Lake Victoria (Aloo 2003, Abila 2005, Thenya 2006).

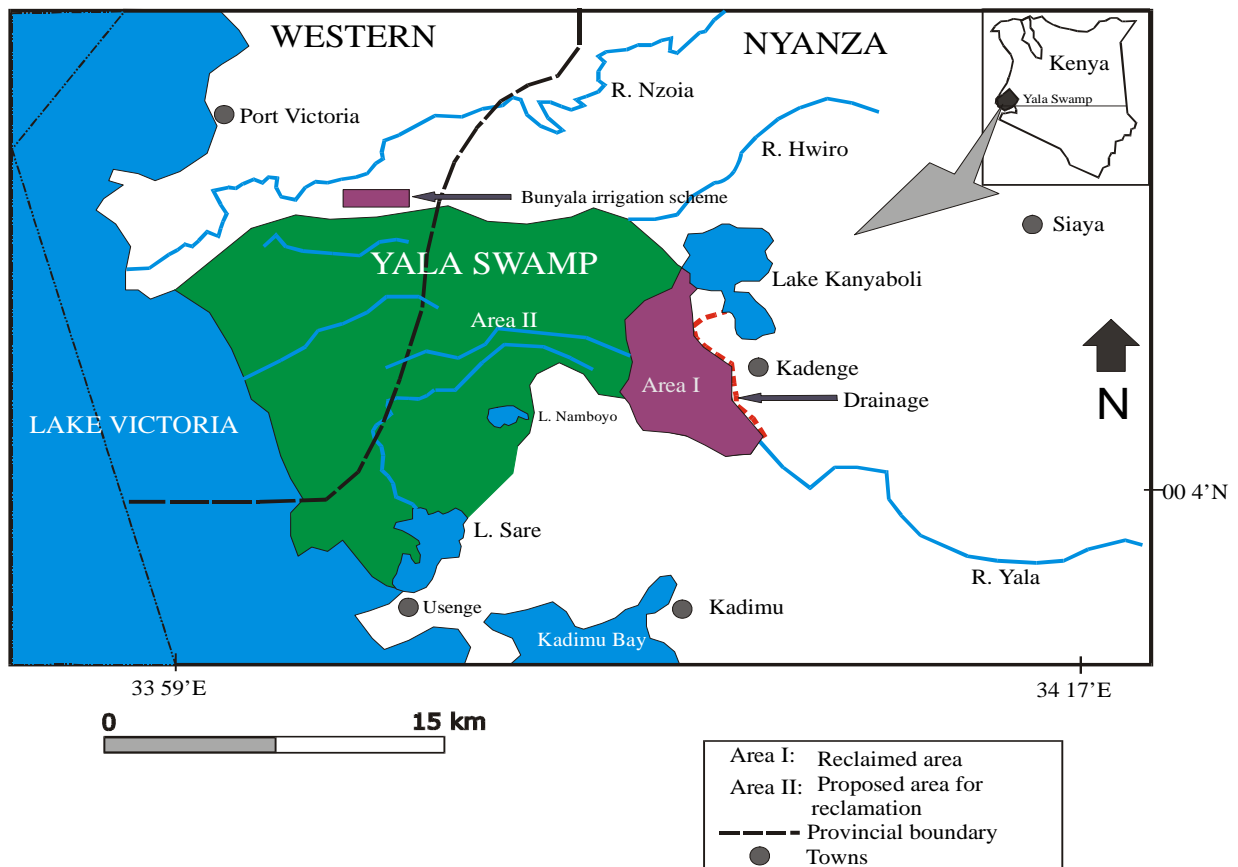


Figure 1.1: A map of Yala swamp in Kenya. Showing the area where the large-scale agricultural project is situated. **Source: Abila et al (2004).**

A substantial portion of the swamp (6,900 hectares) out of the 17,500 hectares has been converted into large-scale agricultural farm by a private investment company called Dominion Farms (K) Ltd, a subsidiary of Dominion group of companies based in Edmond (Oklahoma USA), who moved into Yala in 2003

1.3.2 Population

The area around Yala swamp has an estimated average population density of 240 persons per square kilometer. However, the area is characterized by high out-migration to urban centres in search of Jobs (Thenya 2006). According to the 1999 Kenya government population census, the total population per location was estimated to be 103, 040 people. Considering the villages¹ closest to the wetland and which are mostly affected by the conversion of the wetland to large-scale agriculture, their population is estimated to be in excess of 35,000 persons. It is, however, difficult to estimate the number of people that utilize the wetland as the population statistics are based on old data. What is central though is the fact that there is increasing population pressure in the area as more people search for fertile land for farming and livestock keeping.

1.3.3 Historical changes in the Yala swamp ecosystem

In 1954, 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 is one of the wetlands in this basin). The study recognized the high productive potential of Yala swamp (LBDA 2003). The Gibb et al study and recommendation were to be implemented eight years later when after 1963 the Government of Kenya requested the United Nations Development Programme (UNDP) to facilitate a pilot irrigation scheme. In 1965, the request was granted for the reclamation of Yala swamp with a plan of operation between the Government of Kenya and UNDP drawn up.

The support of FAO for the reclamation programme for agricultural production was enlisted in 1967, construction activities started under the UNDP/FAO project. Yala River diversion and protection dyke both measuring 7.25km long, Lake Kanyaboli retention dyke (2.5 km long) on the western part, and L. 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 but stalled later the same year on the realization that the envisaged works to reclaim the entire swamp area were grossly under-estimated and adequate funds could not be secured from donors.

This reclaimed area (2300 ha) remained idle for several years despite the structural works already partly done. This area gradually developed into a good grazing land for the local communities, especially during the dry seasons. 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 Kenyan government revisited the issue of Yala swamp regarding its reclamation for agricultural activities.

In 1975 ILACO (a Dutch consultant company), using hydrodynamic and topographic criteria sub-divided the wetland into three main development sites. These areas still remain the christened references of the development units of the Yala swamp wetland area (Fig.1):

- Area I (2,300 ha) is already reclaimed;
- Area II (9.200 ha) is proposed for reclamation by gravity;

¹ Villages in Central, South Alego and Yimbo Locations Locations-Kadenge, S. Alego, Gendro, Kanyamaji, Kanyango, Yimbo, Khajula, Gange, Bar Olengo, Nyadorera A/B.

- Area III (6,000 ha) is considered uneconomical and environmentally unsound to reclaim and it includes the open water surfaces (LBDA, 2003).

Between 1979 and 1982 another feasibility study was done by the Metha Group international which revealed more potential for area II. However, this was never implemented due to resource and management constraints (LBDA, 2003; Thenya 2006). The Lake Basin Development Authority (LBDA)² moved into the area for an integrated development and utilization of the reclaimed area I, on a pilot basis in cognizance of sustainable use of the reclaimed area to boost food production and to raise the standard of living of the local community as well as the nation at large. Through intensive crop husbandry based on applied research principles for a holistic agricultural development including the neighborhoods of the swamp. These include production of cereals, horticultural crops, seed bulking and massive upgrading of the local agricultural production technologies as a principal focus of the Yala swamp complex. Other programmes initiated by LBDA included the community based rehabilitation and conservation of the degraded areas.

In 2003 Dominion Farms (K) Ltd, part of the Dominion Group of companies, Oklahoma USA, entered into an agreement with the Government of Kenya through both the Siaya and Bondo County councils to develop 6,900 ha of the swamp under the Yala swamp integrated Development Project. The lease period is for 25 years with a possibility of extension. Dominion Farms (K) Ltd entered into the Yala swamp through an arrangement with LBDA (The latter has been carrying out agricultural activities in the swamp on behalf of the Government before the lease agreement). The initial proposal for the project was for rice production, in part of the swamp known as Area I. This is the land portion that had been earmarked for reclamation even before the 1970s and later used by LBDA for production of cereals, pulses and horticultural crops.

An environmental Impact Assessment (EIA) was commissioned by the National Environment Management Authority (NEMA) for large-scale rice production, for which a license was granted in 2004 in accordance with section 58 of the Environmental Management and Coordination Act (EMCA) NO-8 of 1999 of Kenya. Presently the leased area, under Dominion Farms (K) Limited is carrying out the development of that part of the swamp for agricultural production for a variety of cereals and other crops.

1.3.4 Controversy

The entry, expansion and development of new activities by Dominion Farms Ltd elicited mixed reactions from a number of stakeholders voicing various concerns that either support the initiatives or disagree with the entry into the area of the company. These issues include access to the swamp, wetland use and ownership amongst others. While the government and local authorities are in approval of the Company's activities, most people in the community together with a number of environmentalists and NGOs are and

² Lake Basin Development Authority (LBDA) is a quasi-government institution, established by an Act of Parliament in 1979 with the mandate to utilize the resources of the Lake Victoria Basin (Kenya), to meet regional needs and enhance the achievement of surplus production for export to other areas and foreign exchange earnings thus contributing to national economic development.

have been against the new large-scale project. The ensuing conflict between the two antagonistic groups has led to protests and demonstrations for and against the project, and thus caused mistrust and suspicion amongst them thereby threatening the smooth operations of various socio-economic activities in the area.

It is on this basis that this study was undertaken to assess the swamp in relation to activities by Dominion Farms (K) Ltd and how this has impacted on the livelihood situation of the rural community by observing and getting views of key stakeholders in the area. This study laid special emphasis on the stakeholder perspectives regarding the conversion of part of the swamp into large-scale agricultural activities and the ensuing controversy.

CHAPTER TWO

METHODS AND MATERIALS

Since the aim of this research was to assess livelihood contributions to people in the Yala swamp out of large-scale agriculture, their views and those of other key stakeholders were collected and analyzed using both quantitative and qualitative research methods. The method employed involved use of a structured survey questionnaire (Appendix II) with questions on the local people's views about the uses and status of Yala swamp before and after the entry of the Dominion farms Ltd into the area with regard to livelihood impacts on the rural community where a total of 122 people filled the questionnaire. There were also individual interviews and focus group discussions.

2.1 Data collection

During data collection at the Yala swamp, open-ended one-to-one interviews (Appendix III-V) were conducted with forty five (45) respondents representing the community, Dominion Farms (K) Ltd, Non-Governmental Organizations (NGOs), Community-Based Organizations (CBOs), Government Agencies, Local County Councils representatives in both Siaya and Bondo, and Researchers working within the community. The guiding questions (Appendix III, IV, and V) were all in relation to livelihoods with respect to Yala swamp uses, before and currently under the ownership of Dominion Company and also on future prospects with regard to socioeconomic and ecological aspects.

There were three (3) focus group discussions with the number of participants ranging from 10-15 persons consisting of both male and female members all drawn from the community that included the youth, women, fishermen, peasant farmers, papyrus collectors, village elders, local administrators and community informants.

Qualitative research methodology produces descriptive data as it is people's own written or spoken words and observable behavior (Bogdam *et al.*, 1975; McNeill, 2005). The analysis of livelihood situation in the Yala swamp is without doubt a case that fits into this description. Their views on sources of living whether from the intact wetland portion

or from the new agriculture project can fairly be obtained from such means of data collection as qualitatively as possible.

Open-ended unstructured questions and probes facilitate the gaining of more in-depth responses from the people about their experiences, perceptions, opinions, feelings and knowledge about life and activities around them (Berg, 2004; Drew, 2006). Through this means detailed information about their general sources of living and broad view of life and society was illuminated thereby helping to indicate whether it was as a result of the new project or from other sources. This type of methodology gave the respondents the opportunity to freely express their opinions regarding the emerging issues about the project and their reactions to them. This was to assist in identifying other resultant impacts of the new project and their effects on their livelihoods, whether positively or negatively. According to Yin (2003), a case study about human affairs is best done by use of open-ended conversational interviews for good evidence in data collection, whereby leading questions are avoided while probing questions are appropriately used. This is important because in the process the interviewer may get to learn more from the respondent in terms of unspoken gestures and feelings.

During the data collection, interviews were conducted with local people and different stakeholders either as individuals or as groups. The latter means were largely by focus group discussions. By having a small informal group of 10-15 people, there were benefits of group interaction and greater participation to spark ideas that could not have come from the one-on-one interactions. This also helps a researcher to get more respondents within the short period of field work (Mcneill, 2005).

Whereas the use of interviews in research targets and focuses directly on case study topic and provides perceived causal inferences, there exist weaknesses in its use. The interviews may yield biased outcomes due to poorly constructed questions; the response may be equally biased; inaccuracies due to poor recall and a situation where an interviewee gives what the interviewer wants to hear. In a situation like the case at the Yala swamp with mixed reactions regarding the use of the wetland, it was possible to encounter such problems.

In focus groups, it was possible there were peer pressures to remain silent or readily agree to dominant views while the presence of others in the group may inhibit full and frank participation of other members. It is possible this could have influenced some of the responses obtained. However, these drawbacks may have been overcome as more than one type of participatory research methods were employed in data collection and which complemented each other during analysis.

Another qualitative research method this research employed in data collection was the researcher's direct observations on the activities and physical environment. This was because relevant behaviors and environmental conditions were available for observation. The daily activities of the people in the Yala community in relation to earning a living for their livelihoods provided supplementally information on the topic and questions under study. For example, observable physical indicators in connection with livelihoods and

their sources: wetland, small-scale farms, self-employment or the activities and employment at the large scale agriculture farm. These were in the form of condition of buildings, work, farms, and impoverishment amongst others. It therefore became necessary that some digital pictures were taken that help illustrate physical conditions and changes that were actually observable at the time of data collection. Direct observations offer additional information about the study and what takes place in the real world, therefore they are valuable and worth considering and may require use of photographs as impressionistic evidence to outside observers (Yin, 2003). As much as direct observation offers reality and covers context of events they were equally time consuming, could have been selective and an event may have taken place without being noticed.

Secondary data relevant to the study were obtained from documents, publications and libraries of County Councils and Government offices of Siaya and Bondo Districts, local and regional offices of NGOs/CBOs, Dominion Farms (K) Ltd and also from the print and electronic media, and also from literature reviews. It is however important to note that for high quality data, mixing of data collection approaches is recommended to thoroughly investigate a research question. This research endeavored to combine interviews, observations, focus group discussions, and secondary data and thereafter triangulate the gathered information to enhance data reliability and convergent validation for use in analysis and interpretation of results.

2.2 Selection of Respondents

The data for this study was collected from the field at the Yala swamp, Kenya, in the period June to August 2007. The focus was to interview the key stakeholder groups: Local people, Dominion Farms (K) Ltd, Local Government and other interested groups within the wetland. Most of the respondents were however, selected from the local community given they are the most affected by the project.

During the first two days, a reconnaissance survey was done to map and identify villages most appropriate for selecting the respondents. Assistance was sought from the village elders and local administrators who readily provided the list of all households in their areas. Five out of the eight villages were given priority owing to their closeness to the swamp. It was assumed they were directly affected by the large-scale project.

An appointment was made with the village elders where the aim of the research was explained and approval sought from them for the interviews to be conducted in their areas to which permission was granted. The names of all members of each village were provided by the elders from whom 98 respondents (it was assumed they represented households) were randomly selected while considering age, gender and occupation to ensure a fair representation of all the different stakeholder groups within the local population. They were interviewed using the structured questionnaire (Appendix II) on wetland utilization. Two local enumerators, familiar with the local dialect, and with the locality, were trained and used as interviewers. The researcher administered the same questionnaire on Dominion employees, both permanent and part-time workers and also on residents of the nearby market-centre including immigrants. This procedure made maximum use of the interview time. In total 122 respondents filled the questionnaire. It is

worth mentioning here that majority of respondents were from the community since they are most directly affected by the activities of the company, though views of other respondents are also considered in this study.

For individual interviews, the researcher used the list of names provided by the village elders to select respondents from the community not participating in the survey questionnaire. The interview guide was written in English but interviews done in the local Dholuo for those who could not speak and understand English. An interpreter translated the questions. It is important to note that it is possible that some of the results were largely dependent on the interpreter particularly on how he could explain the questions to the respondents. Individual interviews with the company management, employees, some local people, representatives of Government, NGOs and researchers, were administered in English. In total there were 45 individual interviews.

Members for focus group discussion were selected on consultation between the researcher, local administrative officials, village elders and informants. Like before, emphasis was put on occupation, gender and age. Three focus group sessions were conducted at different sites with different set of respondents. The first meeting took place at Bar Olengo that involved village elders, informants and local assistant chief. The second group meeting took place at Ratuoro dispensary hall involving members of the community including the women and the youth. The final group discussion took place at Gange beach and involved mostly fisher folk, farmers and papyrus collectors. It was assumed there was fair representation of the community in the three meetings which lasted for not less than two hours.

These different groups of respondents for the study were selected in order to increase the validity of the results for a comprehensive and representative analysis and presentation of results.

2.3 Data treatment and analysis

Data collected from this study was analyzed quantitatively and descriptively using the SPSS and Excel computer programmes. Frequency distribution tables and computation of percentages were used in the analysis of socio-economic variables as provided by the various stakeholders. Descriptively, analyzed data was used to compare and correlate stakeholder views regarding the wetland conversion into large-scale agriculture and its impacts on the local people's livelihoods. Connections and reflections between theory and practice were sought using the SA and SLF conceptual frameworks to guide in the drawing up of final conclusion and recommendations regarding the livelihood status at the Yala swamp based on the research questions.

2.4 CONCEPTUAL FRAMEWORK

Wetlands like other ecosystems are organized in systematic interactions where relationships do exist between various components within, and also with externalities including human society in a socio-ecological circle. They are integrated systems with

complex and dynamic relationships between the resources (water, soil and biodiversity) and human beings. With increasing use pressures on wetlands, the various users need to be coordinated and integrated into the overall wetland management through participatory and multidisciplinary planning, including wetland surveys, stakeholder analyses, socio-economic studies, data collection, monitoring and evaluation for efficient and effective sustainable resource utilization with long term objectives of enhancing peoples livelihoods, poverty reduction and environmental health.

It is worth to note that in any system there exists both independent and dependent variables, both of which are always interconnected. Hence it is important that a framework to illustrate this is in place to help visualize the interrelations more clearly (Oso *et al.*, 2005). Two interlinked concepts were found appropriate in the study of rural livelihoods with respect to Yala swamp. The SA and SLA were applied in addressing the complexity of dealing with a natural resource with multiple competing users who are all striving to build on their assets to enhance their livelihoods.

2.4.1 Stakeholder Analysis

Stakeholder Analysis is an approach and procedure for gaining an understanding of a system by means of identifying the key actors in the system, and assessing their respective economic interests in that system, and has had a lot of application for understanding the conflicts of interest and trade-offs that may threaten the success of a project or policy (Grimble *et al.*, 1995). Yala swamp is a natural resource with multiple contested claims by various user groups acting competitively, and hence is an arena for struggle. Therefore identifying and understanding all the groups, their interests, discourses and power relations are crucial for planning and sustainable management of the swamp. According to Grimble *et al* most projects do not meet their stated objectives because their impacts are perceived to be adverse by one or more stakeholder group, and therefore lead to non-cooperation or even open opposition by those stakeholders, whereas many projects that have been perceived successful have achieved their success only at the expense of certain stakeholder groups, in particular local people.

DFID defines stakeholders as any person, group or institution that has an interest in a development activity, project or programme including intended beneficiaries and intermediaries, winners and losers, and those involved or excluded from decision-making process. According to Start and Hovland (2004), a stakeholder has something to gain or lose through the outcomes of a planning process or project, who in many circles is called interest groups and includes organizations, groups, departments, structures, networks or individuals whether in the private sector, public sector or civil society. According to Solesbury (2003), stakeholders are all people whose interests are affected by a system (project, etc) as well as those whose activities significantly affect the system. While Grimble *et al* (1995) define stakeholders to include all those who affect and/or are affected by the policies, decisions, and/or actions of the system; they can be individuals, communities, social groups or institutions of any size, aggregation or level in society. The term thus includes policy-makers, planners and administrators in government and other organizations, as well as commercial and subsistence user groups. In view of the situation

at the Yala swamp, this definition is considered appropriate for adoption because it basically captures all stakeholders involved in the study.

It is often beneficial to identify and analyze the needs and concerns of different stakeholders, and their ability to influence the operations and/or outcome of projects, particularly with respect to natural resource and land-use management. This fact is strongly supported by Grimble *et al* (1995) who say thus:

“Use of SA would allow policy makers to base their decisions on a real understanding of how different stakeholders might benefit or lose from a project, to highlight potential problems that could be expected to threaten the success of (or add support to) a project, and to focus on ways of minimizing these potential problems and conflicts of interest” (p 114)

Depending on their position in a stakeholder analysis grid (Fig. 2.1), with varying powers and interests, stakeholders can be affected or influence a process in different ways. All stakeholders do not have the same power/influence and all stakeholders are not treated in the same way by project/policy implementers. Depending on their importance (e.g. numbers and/or political and economic resources) they will meet different attitudes and be assigned different roles by project/policy management as shown in figure 2.1.

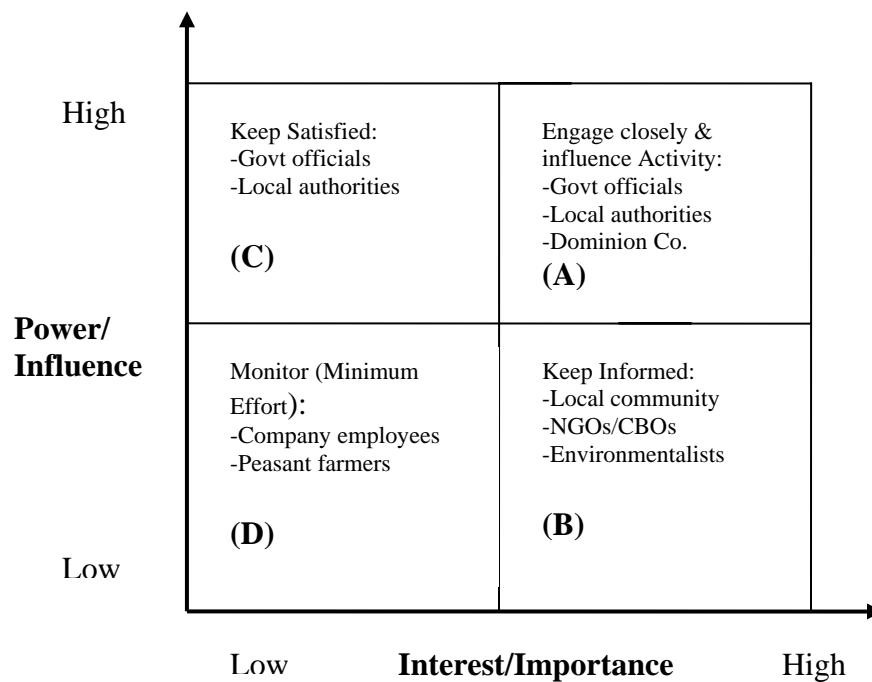


Figure 2.1: Stakeholder Analysis ‘influence-interest’ matrix/grid (Modified from Start D. and Hovland I. 2004).

Key:

‘Interest/importance’: measures to what degree they are likely to be affected by the project or a process, and what degree of interest or concern they have in or about it.

‘Power/influence’: measures the influence they have over the project or policy, and to what degree they can help achieve, or block, the desired change.

All boxes show how stakeholders of a project and/or a process are placed. The implications of each box is summarised below:

Box A (High influence/importance)

These are stakeholders appearing to have a high degree of influence on the project, who are also of high importance for its success. This implies that the implementing organisation will need to construct good working relationships with these stakeholders, to ensure an effective coalition of support for the project. At Yala swamp and with respect to the large-scale agricultural project, these were identified mostly as Government officials, politicians and local county councils who were comfortable with the activities of Dominion Farms (K) Ltd.

Box B (High importance but low influence)

These are stakeholders of high importance to the success of the project, but with low influence. This implies that they will require special initiatives if their interests are to be protected. The NGOs/CBOs, environmentalist, researchers and majority of the local people fall into this group, who might be beneficiaries of a new project, but who have little ‘voice’ in its development.

Box C (High influence but low importance)

These are stakeholders with high influence, who can therefore affect the project outcomes, but whose interests are not necessarily aligned with the overall goals of the project. The local authorities and other government officials fall into this category.

Box D (Low influence/Importance)

The stakeholders in this box, with low influence on or importance to the project objectives, may require limited monitoring or evaluation, but are of low priority. Most company employees, some local people and peasant farmers felt neglected and that they were not considered as very important stakeholders.

Stakeholder participation outlines the reasons and scope for participation. Effective strategies for stakeholder participation must be based on good analysis of individuals, groups, and institutions with an interest in a project; hence stakeholder analysis is advisable for all projects. Stakeholder analysis is here employed to help assess in practical terms who would be the ‘winners’ and ‘losers’ after the entry of the new investment project so as to help decide among alternative proposals for solutions and way forward.

By applying these tool primary stakeholders, secondary and others are easily identified and relative importance and influence of each group is thus assessed. It further takes into account the interests of the whole range of stakeholders who can influence or be

influenced by the project or policy for the use of the common resource. It also acknowledges the fact that multiple and competing interests are always present and for any intervention there will always be losers. Through this way the various interests of each group are considered with the aim of assessing the extent to which each stakeholder group is positively or negatively affected by the project, and which proposal best suits most interests for adoption, support and implementation.

While taking into consideration the various positions of the multiple stakeholders and interests in resource management, Stoll-Kleemann (2004) argues that it is worth taking a more integrative, interdisciplinary and participatory approach to environmental related research as strategies involving stakeholders (including communities in natural resource management) depend on people's perception, value system and use of those resources. Human activity is a primary threat to wetlands and thus effective solutions on their management lie in understanding how individuals, social networks or indigenous communities value wetlands, especially those who directly utilize them for their well being (Terer *et al.*, 2004; Stoll-Kleemann, 2004).

Stakeholder analysis is, in such cases, essential for identification of their relative positions in terms of power and importance within the influence-interest matrix in order to appropriately bring them on board for an optimal, wise and sustainable utilization of a contested resource.

During data collection at Yala swamp various stakeholders were identified and their interests collected through interviews and this tool of analysis is readily being applicable for their analysis. It is important to note that the position of stakeholders within the influence-interest grid greatly affected the interviews for instance those in box (D) were reluctant in their responses as they felt neglected in decision-making processes regarding Yala swamp. On the other hand those in Boxes (A) and (C) actively participated in the interviews.

2.4.2 Sustainable livelihoods (SL)

The livelihood situation in the study area was analysed using the concept of 'sustainable livelihoods' as a guiding tool to help improve the understanding of livelihoods, achieved through access to a range of livelihood resources/assets (natural, economic, human and social capitals). These are combined in the pursuit of different livelihood strategies (agricultural intensification or extension, livelihood diversification and migration) under a range of formal and informal organizational and institutional factors that influence livelihood outcomes, particularly those of the rural poor, and which are largely dependent on a natural resource base (Scoones 1998).

According to the Institute of Development Studies (IDS), a livelihood comprises the capabilities, assets (including both material and social resources, stores, claims and access) and activities required for a means of a living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets, while not undermining the natural resource base, and which contributes net benefits to other livelihoods at the local and global level and in the short

and long-term (Scoones, 1998; see also Asley and Carney, 1999; Knutsson, 2005). For purposes of this study this description of SL appears relevant and applicable for the Yala swamp scenario as it takes cognizance of the pertinent issues revolving around livelihoods of the local people. It touches well on people's well-being and poverty issues, capabilities and resilience of livelihoods and the natural resource base upon which they are dependent. This concept, operationalized in the Sustainable Livelihoods Approach (SLA) and often presented and illustrated as Sustainable Livelihood framework (SLF), (Fig. 2.2), is central to the debate about rural development, poverty reduction and environmental management.

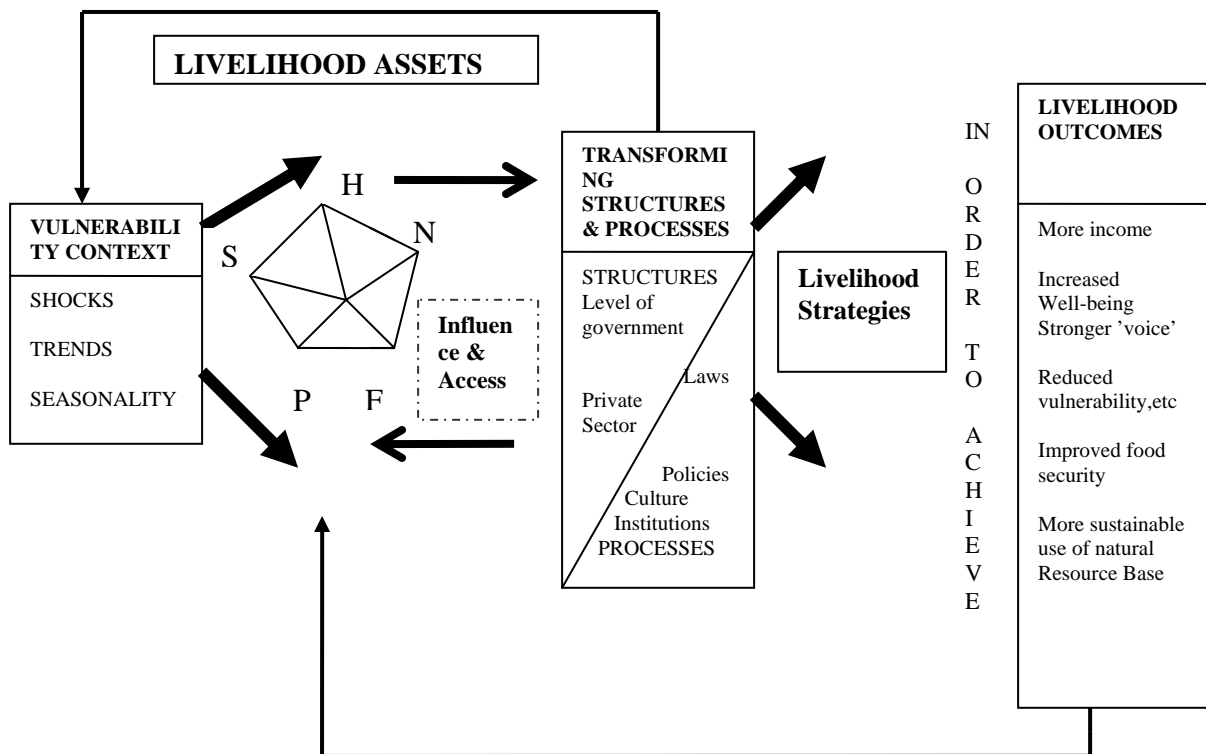


Figure 2.2: An illustration of the Sustainable Livelihoods Framework (SLF), adapted from Farrington *et al.* (1999). The letters **H**, **N**, **F**, **P** and **S** stand for Human, Natural, Financial, and Physical and Social capital. **Source: Asley and Carney 1999** (c.f.; Bauman 2002; Hajdu, F. 2006).

As illustrated in Figure 2.2, Sustainable livelihoods are achieved through access to a range of livelihood resources (natural, economic, human, and social capital), which are combined through different strategies (agricultural intensification/extension, diversification, migration), through mediation by both informal and formal institutions and organization to achieve sustainable livelihood outcomes. This framework therefore helps in the identification and analysis of rural development, poverty issues and environmental management as it helps in the understanding of the complex local realities

by presenting the main factors that affect people's livelihoods and typical relationships between these, including core influences and processes and the multiple interactions therein.

This tool focuses on the dynamism and interrelationships of the main factors affecting peoples' livelihoods. For example how do a project's existing activities contribute to livelihoods in an equitable and sustainable manner? How do peoples' capitals of Human, Natural, Financial, Social and Physical forms interrelate with each other through various structures and processes to become strategies to affect livelihood outcomes with respect to a natural resource base? How does this apply for the case of Yala swamp?

The Yala swamp scenario fits into such an analysis in assessing what combination of livelihood resources that exist there, and which result in the ability to follow what combination of livelihood strategies, with which outcomes? What structural and institutional processes are in place to mediate the ability to achieve (or not) such livelihood outcomes for the people? Has, for instance, the new project provided an environment for sustainable or unsustainable livelihoods that could even undermine the company's own existence? It is important that social institutions and people's capacities to generate new livelihood activities are sustained as well as the natural resource base.

The concept of SLA centred on people including all stakeholders, their relative importance and the way they interact (their perspectives) on anticipated or expected livelihood outcomes. However, it is worth noting that a framework is not intended to depict reality in any specific setting but rather is 'an analytical structure for coming to terms with the complexity of livelihoods, understanding influences on poverty and identifying where interventions can best be made' (Samantha *et al.*, 2004) given the prevailing conditions in each location.

SLA has been widely used and is increasingly being used and applied in rural appraisals on development programmes especially those dealing with livelihoods and poverty, by shifting focus from problems, constraints and needs to perceived strengths, opportunities, coping strategies, and local initiative. Since the 1990s this approach has been adopted for use in appraising development programmes and research aimed at poverty elimination by a wide range of institutions, NGOs, donors, policy makers and development aid agencies (Samantha *et al.*, 2004; Knutsson, 2004; Hajdu, 2006). Solesbury (2003) provides a detailed account on the development and principle events of the evolution of SL framework, particularly as adopted into the DFID policy. Further, the framework readily finds application in assessing livelihood contributions with respect to projects that touch on resources and assets upon which people rely for their existence.

According to Bauman (2002), SLA emerged as a result of the re-thinking on the poverty-environment linkages with respect to the poor people's access to natural resources and has since contributed significantly towards an understanding of poverty, vulnerability and livelihood issues related to access to natural resources. The principle behind this framework is that livelihood assessment and outcomes not only are dependant on monetary values but also on the peoples' empowerment and access to make better and informed choices on their livelihood strategies (Hajdu 2006). This includes highlighting

the trade-offs that people make between the different assets they combine for their livelihood activities that result in different outcomes. According to Hajdu (2006) and Scoones (1998) people will tend to focus on their own needs firstly, which leads to livelihoods and the means of meeting them becomes naturally important and hence anybody interested in researching or analyzing rural development seldom avoids the concept of livelihoods.

Ellis (1999) further argues that the LS framework provides a checklist by which constraints on livelihoods success can be prioritized for action to remove them, and the links between them identified. He further stresses that in pursuing livelihood strategies composed of activities, both the access to assets and the use to which they can be put are mediated by social factors that include institutions and organizations and also by exogenous trends (e.g. economic trends) and shocks (drought, disease, food, pests).

It is important for data collection in respect to rural livelihoods be gathered by probing local thinking and perspectives around issues on available assets/resources available and accessible to the people and how they employ various strategies at different times including difficult moments in order to achieve certain outcomes including coping and adapting to changing ecological and social conditions over time. At the Yala swamp, there has been ecological, social and institutional changes including population growth and the entry of a multinational investment company, and it is interesting to find out how this has impacted on the local peoples' livelihood choices.

As an inspirational tool of analysis, the SLF allows for assessment of livelihood diversification (if any), changes and transitions and sustainability. It is also worth mentioning that the framework guides in understanding the concept of multiple livelihood strategies and the relationships that exist between poverty and vulnerability and how these can act as a barrier to securing a sustainable livelihood. The tool includes non-material aspects of well-being, empowerment, entitlements, and is dynamic owing to the fact that local livelihood options are continuously changing including seasonal fluctuations and variability, recurring sudden and unique changes that may take place. This encompasses a holistic inclusion and an understanding of poor peoples' situations in their daily lives. In supporting SLF as a tool of assessment of rural livelihoods, FAO says:

“A sustainable development approach, aims to promote development that is sustainable, not just ecologically, but also institutionally, socially and economically and to produce genuinely positive livelihoods” (FAO livelihoods homepage, 2007).

Such programmes should embrace the pentagon of five capital assets that are available to rural people which include; Human, Natural, Financial, Physical and Social capital (Fig. 2.2). Any such projects should enhance the sustainability of these assets (FAO, 2007).

2.4.2.1 Livelihood Components

The key components of livelihoods constitute peoples' basic needs including food and environmental security. For example there is need for arable land for food production (including wetlands), shelter, money for school fees, good health, etc. which also form peoples' basic needs.

Vulnerability context

Based on the SLA, there is need for a sustainable livelihood to encompass possibilities for creating work and employment, reduce poverty, enhance well-being and capabilities, and improve on adaptability, vulnerability and resiliencies to enable people to cope with and recover from stress and shocks. This means people who are unable to cope and adapt are inevitably vulnerable and hence unlikely to achieve sustainable livelihoods. This may lead to migrations to and from an area depending on coping capabilities of the people as those with requisite skills, entitlements and power will favorably cope while those without move elsewhere for survival and/or seek alternatives for their well-being.

Diversification, migration and multiple livelihood strategies are central and important for rural livelihoods as there is need to seek other ways of meeting peoples' needs in lives which in most cases need to be combined. Other challenges that people face include natural and economic shocks and conflicts, demographic and technological trends as well as seasonality in terms of prices, employment opportunities and food availability. Some of these shocks may be out of control of the local people but, nevertheless influence their livelihood options.

According to Ellis (1999), rural livelihood diversification is the process by which households construct a diverse portfolio of activities and social support capabilities for survival and in order to improve their standard of living. Livelihood diversification is also supported by Hajdu (2006) who, in reference to over reliance by developing countries on agriculture for their rural economies:

“Farming in its own does not provide a sufficient means of survival in rural areas and hence most households are found to depend on a diverse portfolio of activities and income sources amongst which crop and livestock production feature alongside many other contributions to family well-being” (Ellis:60).

On the other hand, Scoones (1998) extends the need for diversification in developing a wide income portfolio to cover possible shocks and stress that may arise in search of livelihood. He is, however, quick to point out that while this may create opportunities for some people's livelihood enhancement, it may equally undercut others' strategies by, for example, inhibiting their access to production resources like land, labor, credit and market in cases where agricultural intensification is an option.

Capital assets pentagon (N, H, P, F, S)

In general terms, the ability to pursue livelihood strategies is dependent on the basic material and social tangible and intangible assets that people have in their possession; the “capital” base from which different production forms of livelihoods are constructed, viz:

- Natural capital (**N**): The natural resource stocks like land, soil, water, air, genetic resources, wildlife, biodiversity etc and environmental services (hydrological cycle, pollution sinks, etc from which resources flow and services are derived).
- Economic or Financial (**F**): The financial resources which are available to people (whether in form of cash, credit/debt, savings, pension, and remittances) and other economic assets which provide them with different livelihood options.
- Human capital (**H**): Skills, knowledge, ability to labor, good health, physical capability vital to successful pursuit of different livelihood strategies.
- Physical capital (**P**): The basic infrastructure (transport, shelter, water, energy and communications), the production equipment and technologies that enable people to pursue livelihoods;
- Social capital (**S**): Social resources including networks, social claims, social relations, affiliations, associations upon which people draw when pursuing livelihood strategies requiring coordinated actions.

These capitals are all central in the overall livelihood strategies in pursuit of better outcomes, bearing in mind possibilities for trade-offs and substitution, and on a vulnerability context, in responding to shocks, stress and trends with respect to varying local priorities.

Transforming structures and processes

Within one area there may exist different resource types and people usually make use of them alongside each other, for example in a wetland there can be cultivation of crops, irrigation, grazing livestock, fishing, aquaculture, papyrus harvesting at different levels with varying benefits for the local community.

Therefore, there is need for appropriate structures and processes (formal and informal), that mediates the complex and highly differentiated process of achieving sustainable livelihoods. Scoones (1998) argues that institutions are the social cement which link stakeholders to access to capital of different kinds to the means of exercising power and so define the gateways through which they pass on the route to positive or negative [livelihood] adaptation. This allows for identification of barriers and opportunity (gateway to sustainable livelihoods, e.g., land tenure regimes, market networks, credit arrangements). Institutions and processes do mediate access to livelihood resources and link them to livelihood strategies for realization of SL outcomes. This also includes social relationships like the power dynamics, contestations, negotiations and trade-offs at every turn of livelihood portfolio for SLs. According to Bauman (2002) the creation of an enabling institutional environment is critical for changing the terms on which the rural poor can access the natural resources.

Livelihood strategies and outcomes

These include the range and combination of activities and choices that people make and undertake in order to achieve their livelihood outcomes. The success often depends on access to capital assets and entitlements, though the vulnerability context, constraints and opportunities presented by institutions or organizations do also offer considerable impacts. The bottom line therefore focuses on the appreciation that development is about

trade-offs and choices at all levels for attainment of possible livelihood outcomes. However, depending on how the above components are put into use, livelihood outcomes vary for different people and may either be positive or negative.

2.4.2.2 Key strengths and weaknesses of the SLA

The aim of SLA is to promote development that is sustainable not just ecologically but also institutionally, socially and economically and to produce genuinely positive livelihood outcomes, while focusing people at the centre of the development process.

Cleary D (2003) identifies key strengths of the approach to include:

- Broad analysis of development problems
- Focus on livelihood outcomes instead of project objectives
- Analysis of complexity
- Clear identification of livelihood principles
- Enables a more realistic production of potential outcomes and impacts

Cleary further points out that notable weakness of the approach include:

- Fails to deal with politics and rights
- Difficulty to quantify information on capital assets gathered through SLA

While coping with some of the SLA weaknesses within the Yala swamp context, this study considered politics and rights as part of both informal and formal institutional processes that help mediate livelihood strategies while loss of grazing land was treated as a loss of access to a natural capital, Land. SLA is both an approach to livelihood and poverty assessment and a framework for the analysis of livelihoods. This study considers its analytical aspects. During data collection most respondents from the local community and NGOs appeared to focus more on issues to do with the capital assets pentagon while the local authority, Dominion Farms (K) Ltd and government officials discussed more on transforming structures and processes, and also on livelihood outcomes as reflected within the SLA.

CHAPTER THREE

RESULTS AND DISCUSSION

Analysis of stakeholders, livelihoods and their changes with respect to the farming activities at Yala swamp is based on collected and observed data on bio-physical, water and land-use changes. Integration with other studies/literature relevant to the study was also used for analysis and discussion of results.

3.1 Yala Swamp stakeholders

The field investigation at the Yala swamp confirmed the existence of different stakeholders with varying levels of claim and interest over the wetland. The different

groups of stakeholders gave out varying views on the study questions regarding the use of the wetland and largely in support of their perceived interests.

Dominion Farms (K) Ltd has assumed full control of the leased land of the swamp (Area I, fig 1.1) including the parcels acquired from the community. The company used part of this area to construct a reservoir as an alternative source of water for the community. The dam is also stocked with fish and its water is abstracted both for domestic use and for the animals to drink. The company manages the reservoir which it occasionally uses to supply water to the farm.

The local community forms the largest stakeholder group in the wetland where they have used it for small-scale farming, fishing, collection of building materials and medicinal herbs both for subsistence and small-scale trading in the domestic market. They also obtain water and graze animals in the wetland. They are connected to the area under Dominion Company by the reservoir.

The other key stakeholder at the Yala swamp is the local Government authority (Siaya and Bondo) who are custodians of the whole wetland as a trust land on behalf of the Government of Kenya. They benefit from the swamp in terms of revenue they get from the leased land to the Dominion Farms (K) Ltd. The company has also set aside 150 acres each for both Siaya and Bondo councils for agricultural purposes.

The other stakeholder with interest in the swamp include environmentalists who include both local and international NGOs and also both local and international researchers interested in wetlands and natural resources research.

Table 3.1: Yala swamp stakeholders according to their use benefits of the wetland

Direct Users	Benefits	Indirect users	Benefits
Dominion Company	Intensive agriculture Water abstraction	Researchers	Educational use, research
Small-scale farmers	Extensive agriculture, Livestock grazing, water abstraction	National Government	Foreign exchange and Improved rural infrastructure
Fishermen	Fishing, food and income	Conservationists/ NGOs	Nature/biodiversity conservation
Papyrus collectors	Building, furniture, Artifacts, income	Tourists	Tourism, ecosystem preservation
Local Government	Agricultural activities, revenue	Surrounding community	Recreation, cultural sites, less flooding
Surrounding community	Settlement, hunting, water &recreation, medicinal herbs		

It is important to note that the part of the wetland that is now leased out to Dominion Farms continues to generate lot of concern from these different stakeholders. The remaining part of the swamp is still a trust land (including all the satellite lakes) under the local government, with open access to the community and other stakeholders.

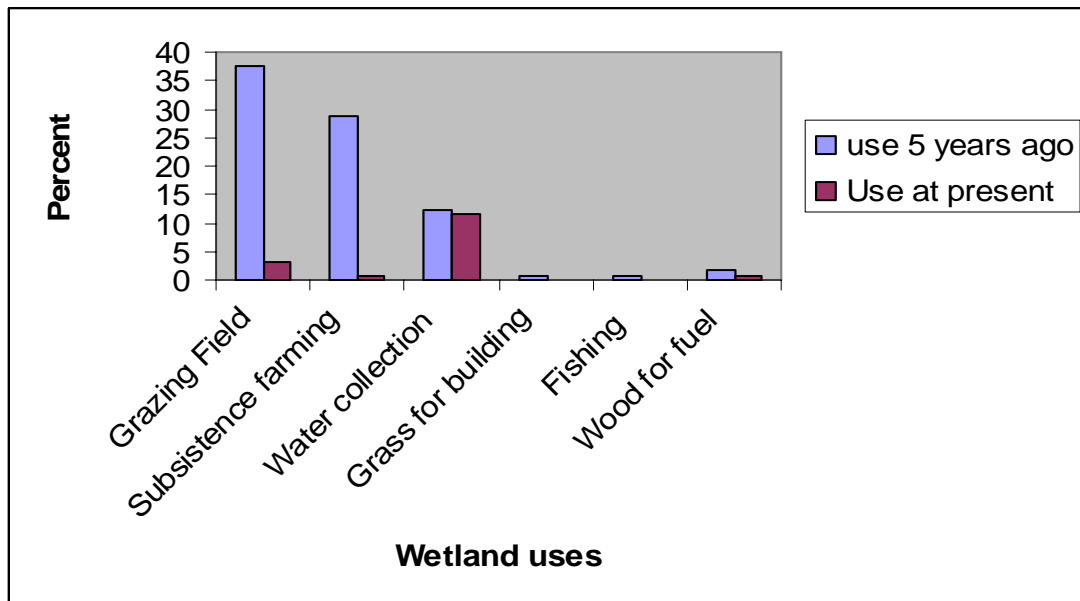
3.2 Wetland benefits to stakeholders

From field results there were both direct and indirect benefits derived from the wetland by the different key stakeholders as may be shown in Table 3.1.

3.3 Community use of the wetland

The survey managed to interview a total of 122 respondents where 77 respondents (63%) were males and 45 respondents (37%) were females (Appendix I). The majority of the respondents were found to be between the ages of 25-49 (Appendix I). The age group represented the people who are mostly affected impacted by the changes taking place at the Yala swamp. There were also 45 individual interviews and three focus groups who actively discussed about the wetland uses before and after the entry of the Company into Yala Swamp.

Figure 3.1: Comparing wetland uses before coming of Dominion Farms (K) Ltd (5 years ago) and after their entry into Yala swamp (present) (n=122)



A comparative assessment of field results (Fig.3.2) shows that before the entry of the Company, the community had various uses of the wetland including use as a grazing field (46.5%), subsistence farming (35.4%), water collection (15.2%), while collection of grass for building, collection of wood for fuel and fishing contributed 1%. Other uses included hunting wild animals, collecting medicinal herbs and pottery (Appendix I). Most

respondents said they could derive more than one of these wetland uses as a way of enhancing livelihood sources. They further said most of the uses were for household subsistence use with few options open for sale in the local markets, particularly with respect to fish, papyrus products, medicinal plant and materials for building. However, with the entry of Dominion farms into the Yala swamp, water collection appeared to be the most important resource available to the local community with 65% of those interviewed using the wetland water both for domestic needs and for their animals, while 23% of the respondent placed grazing field as the second most important activity done in the wetland. Other wetland uses include papyrus collection (6%), subsistence farming (6%). From these results their use of the wetland had greatly reduced thereby jeopardizing their livelihoods base. These sentiments have also been captured in other studies done by Abila (2003), Thenya (2007) and Mwakubo *et al.*, (2007).

Responses from individual and focus group interviews echoed similar views with more than 50 percent of the respondent saying that they benefited more on a multiple use basis before the company took over. They now claim they have not much access and hence their livelihood level has drastically decreased. However, more than half of those working with the company had divergent views as they appraised the new investment which has for them provided wage employment and diversified sources of income including opportunities for credit/loans that they put into other economic ventures to enhance their livelihoods. These results indicate a major change in wetland use from grazing and subsistence farming to water collection and large-scale agriculture after the entry of Dominion Farms (K) Ltd respectively. According the SLA framework (discussed in chapter two), people's livelihoods decrease and become unsustainable when they lose claims and access to a natural resource like in this case the Yala swamp. This group of stakeholders is therefore adversely affected by the activities of the Company. On the other hand the livelihood strategies of those with gainful employment for instance the company employees are positively enhanced in achieving positive livelihood outcomes.

3.4 Land use changes

Land issue featured during the study particularly during individual and focus group sessions in terms of ownership, access to, control of, and use purposes. In all the sessions all the respondents narrated the history of the Swamp dating as far back as the 1960s. The Yala swamp land is a 'trust land' under the custody of the Siaya and Bondo County councils on behalf of Government. For a long time, the local people accessed it and used it in their various daily activities on a free access basis. This continued to be case with the reclaimed area under LBDA which still allowed them access to supplement their daily incomes. With entry and take over by Dominion, this came to an abrupt halt, a condition that resulted in a conflict situation. As a result the community lost one of the most important capital assets for building on their livelihoods, land.

This is clearly reflected in their responses during both individual and group interviews where more than half of the respondents accused local politicians for allegedly colluding with the investor and the local authorities in depriving them their source of livelihood, thereby effectively perceiving them as the net beneficiaries of the development project, though at their expense. This is one of the reasons they claimed had led to increasing

poverty in the area. However the local authorities and more than 50 percent of company employees disagreed with this view.

There were also cases of private land acquired from private people who were compensated accordingly by the company. However, some of those to be compensated protested against the amount of money arguing it was not enough. The present study did not come across anybody evicted completely and without compensation as widely believed and quoted in the media. The last seven cases of land compensation had been sorted out by the company by the time of the field study.

According to the findings of the study, the Yala swamp has undergone tremendous changes over time ranging from communal extensive uses for natural resource extraction to conversion into agricultural use through Government of Kenya initiatives, culminating into the present status where a private investment company carries out large-scale agricultural activities. Over all those changes, the local community has favorably adapted and coped fairly well with little harm. However the entry of Dominion seems to have caused a major impact that has elicited the present controversy over ownership and use of the swamp.

While most respondent from the community who traditionally had direct uses of the wetland expressed resentment, those who had indirect uses and not very close to the swamp felt the former stand to benefit from the new venture through increased employment opportunities, improved rural infrastructure, increased food production. On the other half of the responses from those around Lake Kanyaboli, most of who depend on fisheries resources of the lake, fear that the lake is in danger of 'pollution' and hence loss of the biodiversity including the fish, their main source of livelihood.

There was evidence of over-exploitation of Lake Kanyaboli that lies adjacent to and borders the Company farm as the newly launched beach management units (BMUs), a co-management strategy between the community, fisheries department and local leaders for fisheries resources management, was busy working out modalities of effort control and regulation for Lake Kanyaboli. The fishers interviewed said that because some members of community no longer do subsistence farming at the swamp any more, they have resorted to fishing, hence the increased effort at the Lake.

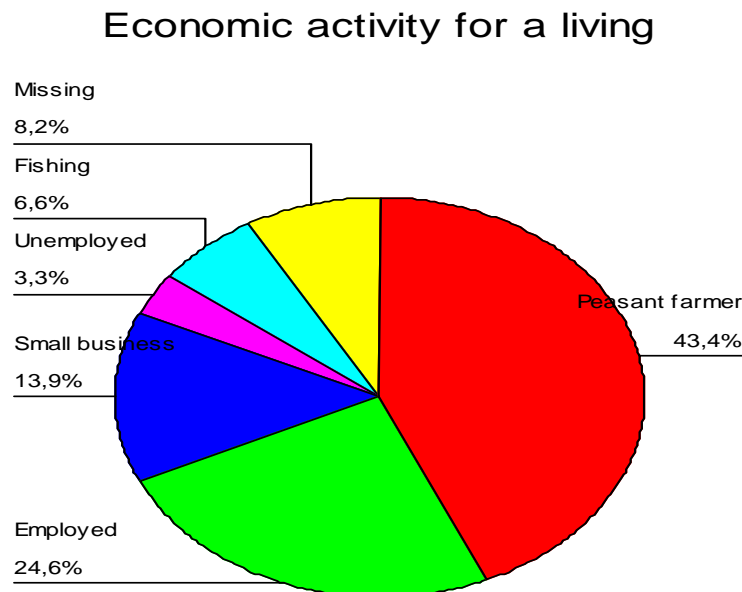
At the large-scale farm however, more land use changes within the swamp were going on with new activities being initiated that included the new and operational fish farm, cereals milling plant, horticulture and poultry gardens, agricultural research in collaboration with the Kenya Agricultural Research Institute (KARI), Ministry of agriculture and the Kenya Agricultural Productivity Project (KAPP). The research work involves development and trials of new crop varieties for cereals (maize, millet, rice, and sorghum) and root crops (potatoes, yams, and groundnuts), sunflower, Artemisia and many others that could be adapted to the local conditions. The objective being improved crop outputs and seed development for the community and region at large. A bee farming program for honey production has been rolled out and the community already participating in an outreach venture.

3.5 Governance and natural resources management

The issue of Yala swamp governance featured throughout the investigation period with respondents in all stakeholder groups giving varying ownership positions. According to government officials the wetland is a trustee land under the custodian of the local authorities on behalf of the government of Kenya. The swamp including the satellite lakes has been used on a free open access by the community for exploitation of its goods and services. However, the part under contestation has been under cultivation under the LBDA management on behalf of the Government for agricultural purposes. Most respondents agreed though, that they never gained much from the regional development authority except for dry season animal grazing while some could be allowed to carry out subsistence cultivation on the farm.

In the year 2003, Dominion Farms Ltd secured approval from both Siaya and Bondo district to lease part of the Yala swamp to develop an irrigation rice project and related crops. Since then ownership and management of that section changed suddenly with no more free access for the local community. More than half of the respondents from the community indicated they never understood the whole transition process of change of governance of the wetland. It came out clearly that the land ownership issue of the swamp still remains controversial and unresolved. There was evidence of silent opposition and conflict, though few respondents said they have developed change of attitude on opposing the activities of the company following emerging benefits they now realize from the company. Further probes revealed that most respondents put a lot of blame to the local authorities and local political leaders for the current stalemate in the area.

Figure 3.2: Pie chart to showing respondent's economic activity done for a living (n=122)

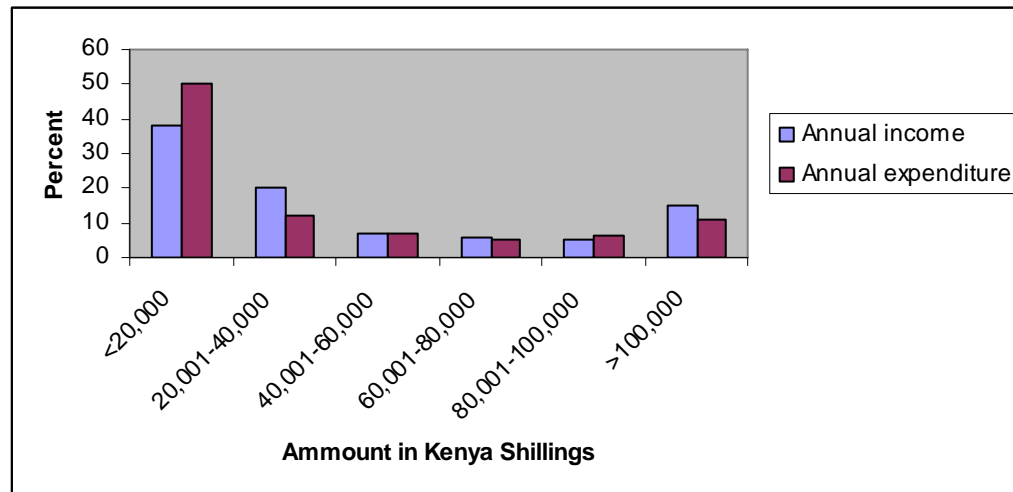


3.6 Economic Activities done for a living

On assessing the main socioeconomic activities done for a living, results indicate that, traditionally the Yala swamp has been used as a source of water, subsistence farming and papyrus harvesting, fishing and medicinal herbs collection amongst others.

However the prominence of these activities has been changing in response to demographic trends. The most prominent economic activities presently carried out by the local people (Fig. 3.2), were peasant farming³ (43.4%), employment (24.6%), small businesses (13.9%), fishing (6.6%) and 11.5% of the respondents said they didn't have a consistent economic activity for a living. According to SLA livelihood strategies that provide or promote the performance of these types of activities will in effect be positively contributing to the rural peoples' livelihoods while those suppressing them will have adverse impacts on livelihoods and food security for the Yala wetland community. The company and in the short term has not adequately directly promoted such livelihoods through peasant farming, but has greatly created employment opportunities and supplemented food production on a large scale. It is however, possible that in the long-term basis more opportunities to enhance peasant farming may be possible in form of technology transfer to the local farmers and indirectly by the multiplier factor by company employees re-investing in farming through savings in cash and credit facilities offered by the company.

Figure 3.3: Comparing total annual income and expenditure of Respondents in Kenya Shillings (Ksh)* (n=122).



*1 US\$= Ksh 63 (Based on Central Bank of Kenya 3rd December 2007)

Despite the fact that most respondents were not willing to provide information on their annual incomes and expenditure, comparative results in Figure 3.3 indicates there are

³ Peasant farming involves small-scale food production both for household consumption with surplus for domestic market. Subsistence farming involves food production for household consumption and only sold under pressing conditions while large-scale farming is production for commercial purposes.

little or no savings made. As illustrated by the SLA (Chapter 2) this situation makes people more vulnerable to shocks and seasonality and may not effectively influence and access available livelihood assets in achieving desired livelihood outcomes with an exception of those in gainful employment either in government or Dominion Company. This shows high poverty levels in the area. Studies conducted on Lake Victoria basin by Aseto *et al* (2003) and Ong’ang’a (2005) had similar observations.

3.7 Changes in Livelihoods

According to the study results peoples’ livelihoods had changed either positively (Yes) or negatively (No) since entry of Dominion Farms Ltd into the swamp. There is evidence that people are now seeking alternative sources for a living as others put more pressure on fishing at Lake Kanyaboli and/or seek gainful wage employment at the farm. Other livelihood changes now involve engagement in self-employment and small-scale businesses due to the multiplier effect of new markets and trade opportunities opening up from the large-scale agricultural activities.

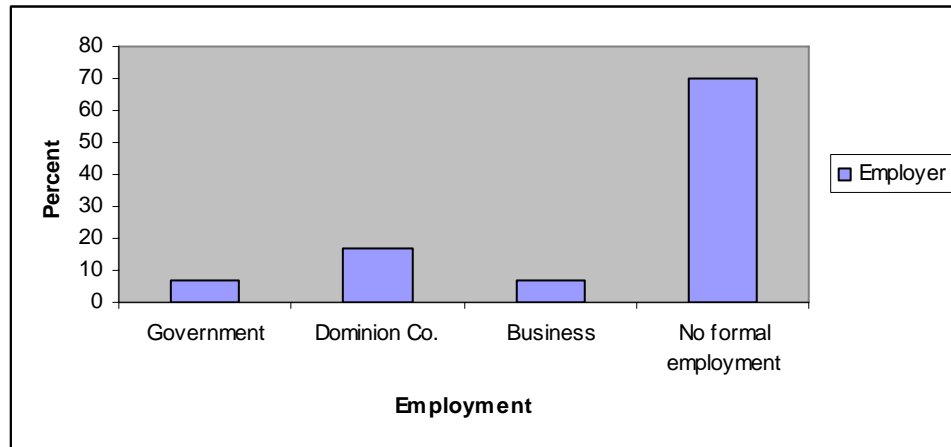
The majority of the respondents from the questionnaire interview (Table 3.2), reported that their livelihoods had changed negatively (62.3%) with 37.7% reporting they had seen positive impacts with the coming of the company into the area. How their livelihoods changed is further reflected in Table 4.6 where those who had positive livelihood changes listed employment and good salary, good business, improved standard of living, good infrastructure and schools, increased production of maize and reduced cases of malaria, accounting for a 40% positive change. Those saying they have experienced negative livelihoods listed less farming land, loss of grazing field, loss of livestock, less papyrus and building materials, low fish catches and increased incidences of sexual immorality, accounting for a 48% negative change while 12% of the respondents said they had seen no change. It is worth mentioning here that most respondents were non-committal in responding to issues to do with cash incomes while assessing their livelihood status.

Table 3.2: How life has changed since dominion came into the village (n= 122).

Positive Changes (37.7%)			Negative Changes (62.3)		
	Frequency	Percent		Frequency	Percent
Employment opportunities	25	20.5	Less farming land	24	19.7
Improved business	11	9	Loss of income	12	9.8
Less malaria	2	1.6	Loss of livestock	11	9.0
Improved School	1	.8	Less papyrus	3	2.5
Improved roads	1	.8	Less building material	3	2.5
			Low fish catch	3	2.5
			Life has not changed	14	11.5

While most members of the community do not have formal employment and never did, the entry of Dominion Farms (K) Ltd has provided employment opportunities and is currently the largest single employer in the area followed by the Government which was at same rating with business activities (Fig. 3.4).

Figure 3.4: Main Employers at the Yala Swamp (n=122).



3.8 Diversification and Migration

According to the SLA framework livelihood diversification fosters people’s livelihoods thus enabling them tackle any emerging the natural and economic shocks. Results from the study (Appendix I) indicate that there was remarkable diversification of livelihood sources among most respondents as a result of supplemented incomes from different activities including peasant farming, livestock and bee keeping. Dominion Company reported re-investing savings and loans in other income generating activities including small businesses. The importance attached to diversification of income and spreading of risks among the rural poor people has also been pointed out by studies on floodplain agriculture on African wetlands (Adams, 1995; Aseto *et al.*, 2003). There were notable immigrants into Yala area, mostly in search of employment at the farm and also to do supplier business to company employees and area residents. Some of those who no longer had access to the swamp had to seek alternative income activity by temporarily migrating to shores of Lake Kanyaboli and River Yala for fishing purposes.

However, half of the respondents said loss of access to the swamp had made them more vulnerable to hunger and poverty with few options for alternative livelihood strategies. They included women, youth and the elderly who could not access gainful employment at the farm and whose traditional skills in making products made from swamp resources could no longer be put into use. These products include hand craft items, pottery and products from the papyrus reeds. Similar resulted were also obtained on studies done wetlands of Ethiopia (Abebe *et al.*, 2003). It is worth mentioning here that the study did emphasize on farming and income sources from maize because it is the major crop and stable food in the community for both household consumption and for domestic marketing.

Table 3.3: Amount of money per month from sale of maize in Kenya Shillings* (n=122).

	Frequency	Percent
<500	8	6.5
500-2000	13	10.8
2000-4000	5	4.1
>4000	3	2.4
Total	29	23.8
No idea	93	76.2

*1 US\$= Ksh 63 (Based on Central Bank of Kenya 3rd December 2007)

The field study results (Table 3.3) shows the income from maize as a major crop in the area. Other income sources for the respondents include transfer payments from employed family members or from their small-scale enterprises (Appendix I). Such alternative income sources constitute a positive livelihoods and as spelt out in the SLA framework. On the contrary though respondents in all the focus group discussions said the entry of the company had reduced their ability for other alternative livelihood sources particularly due to loss of access to the swamp land and resources.

Bee Keeping

On realization that some people had lost part of their livelihood sources, Dominion Company has initiated an out-growers project for bee-keeping for the community. The company provides beehives and extension services for bee keeping whereby the community members engage in bee-keeping in their farms while the company harvests the honey for processing in their modern processing plant. Harvested honey is sold to the company where part of the money from the sale is deducted for the company to recover the cost of the beehive given to farmers on credit. The project has been successful and more members from the community are willing to engage in it. The project which took off in 2005 with only 60 beehives had by September 2007 given out a total of 427 beehives. In the same period the company had on the farm a total of 164 beehives, 110 of which were already colonized. This apiary project is one of the new livelihood options the community have come to appreciate both as a good source of income and for providing honey for their improved health status. As provided in the SLA framework and also highlighted by Samantha *et al* (2004), Scoones (1998) and Hajdu (2006) this is one way of enhancing rural people's strategies to achieving positive livelihoods. More than half of the respondents do support this project and feel the company now has their interests in its plans. This group of stakeholders now feels no longer neglected by wetland planners and that they are closely engaged in decision-making processes. According to the SA (Chapter 2) they seem to have moved from Box (B) to Box (A) in the influence-interest grid.

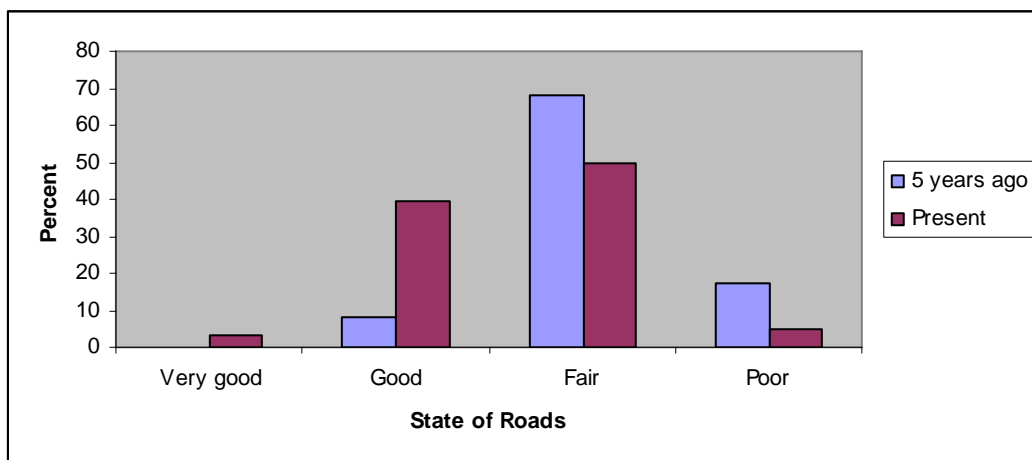


Plate 3.1: *Modern Beehives ready to be supplied to community out-growers for the beekeeping community project* (Photo by author).

3.9 Infrastructure & rural development

From the field investigation and based on interviews, discussions and field observations, there was overwhelming agreement on the general improvement of the infrastructure and of social amenities since the entry of the company. For example, comparative results in Figure 3.5 shows that before the entry of the company, only about 9% of the respondents gave good rating of status of infrastructure, while now 46% rate it good or very good. There was consensus by all stakeholder groups on general improvements on roads, electricity and health facilities. This echoes arguments for enhancement of the physical capitals and means that enable people attain desired livelihoods (Bauman, 2002; Farrington *et al.*, 2004). This also helps open up the rural infrastructure for more livelihood options.

Figure 3.5: **Comparison of communication services 5 years ago and at present (n =122).**



Education and health

According to SLA principles (FAO, 2007; DFID, 2002) human capital in form of skills and knowledge, ability to labour and good health constitute human capital which is a vital asset in the realization of livelihood strategies. Any effort geared towards enhancing this

capital produces positive livelihoods and vice versa. At the Yala Swamp results show low literacy levels and therefore the need for provision and improvement of educational standards in the area. The status of educational facilities were also said to have been enhanced in one way or another with the participation of the new company, with more than 50% of the respondents from both the questionnaire, individual and focus group discussions saying there has been a general improvement in their status (Appendix I). This has been in the form of assistance in building new classrooms and equipping existing schools in the area. The company had helped equip the laboratory of the nearby Ratuoro Health centre and occasionally provided the company's ambulance to assist in times of emergency. According to the 2006 investment plans, the company has indicated its commitment to fighting malaria and other water-borne diseases in collaboration with the government and other health providing organizations including NGOs/CBOs (EIA, Dominion farms, 2006)

3.10 Wetland ecology and conservation

During individual interviews and focus group discussions most respondents talked of 'pollution' of the swamp, River Yala and Lake Kanyaboli waters as compared to their earlier experiences based on local knowledge. However, they appraised the government agencies responsible for water research and management on the ground but put a lot of blame on Dominion Company in initiating industrial activities that they fear may degrade the wetland.

The area used by Dominion is large and manual fertilization or weeding is not perceived as realistic. Hence, aerial spraying is practiced. The use of aerial sprays in application of agro-chemicals in the farm continues to receive opposition from the community and environmentalist. The community allegedly reported poultry deaths and destruction of horticultural produce including vegetables and tomatoes due the chemicals spills from the farm during aerial spraying. More than half of the environmental organizations interviewed including members of focus group discussion said the use of aerial chemicals in the farm for scaring away birds was not 'environmentally friendly' and could be the cause of loss of waterfowls and other biodiversity. Studies done in the basin have also highlighted the potential for nutrient loading and consequent eutrophication and water pollution of adjacent water bodies including Yala River and Lake Kanyaboli due to fertilizer application on adjacent agricultural fields (Thenya, 2006; Ong'ang'a, 2005; Kipkemboi *et al.*, 2007; Gichuki, 2003)

While the company acknowledged that the use of aerial sprays had caused some tension in the area, they were also quick to point out they were using recommended chemicals and that they did so when most employees were not in the farm as a health precaution. This reduces the risk for employees but it does not solve the problem of spillover and risk of eutrophication. The issue still remains controversial and is yet to be resolved.

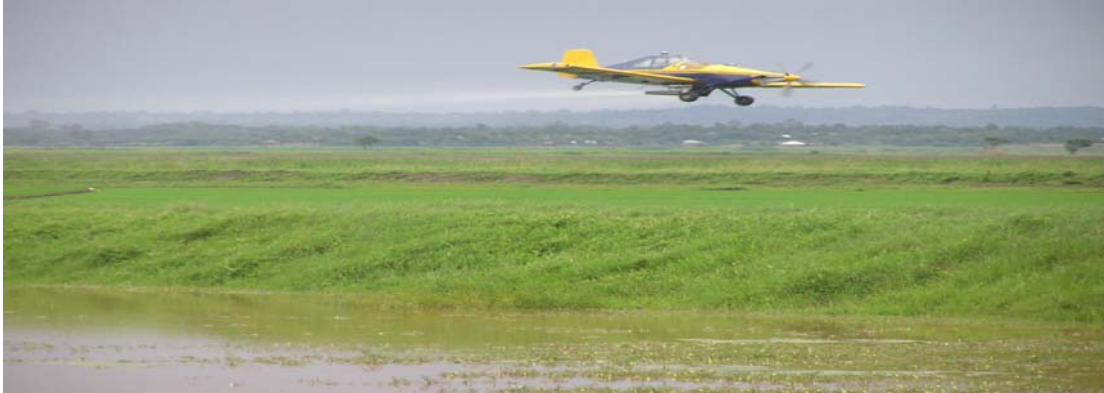


Plate 3.2: Aerial application of fertilizer over Dominion farm at Yala Swamp (Photo by author)

Both the company and the community continue to obtain water for domestic purposes from the wetland sources including the newly constructed shallow wells along the drainage canal. The latter were constructed along the feeder canal for use by the community and for their animals as compensation after access to the main river canal was fenced off by the company. However, some of the seven shallow wells have broken down and there were no proper maintenance mechanisms in place thus jeopardizing their sustainability.

3.11 Participatory approaches

As spelt out in the SA and highlighted by Grimble and Chan (1995) any policy or project concerning use of a contested natural resource should ensure the participation of key stakeholders for it to succeed in its overall objectives. From field data and observations, there is clear evidence of inadequate all-inclusive participatory approaches in the management of the Yala swamp and a lack of forum and a feedback mechanism between key stakeholders. Key stakeholders who include the community (farmers, fisher folk, papyrus collectors, informants, village elders, local administrators, small scale entrepreneurs, and social workers), government employees in the area, Siaya and Bondo County Council officials, representatives of NGOs/CBOs working in the region, environmentalists, researchers, Dominion Farms Company management and employees. Although most of these actors said there was a low participatory approach in the running of the swamp affairs, there was documentary evidence at the company offices and at National Environment Management Authority (NEMA) local offices to the contrary. They include comprehensive Environmental Impact Assessment (EIA) and Audit documents that indicate provision for full public participation in Yala swamp project, though at appropriate levels.

Whereas the company and government agencies seemed to collaborate well, most of the respondents from the community felt that despite them being primary stakeholders of the swamp, they are not adequately empowered to participate in decision-making regarding the wetland. Hence they view the company, local politicians and the county councils as the winners while they are the losers in terms of benefits out of the contested wetland resources. The only exception to this argument though, came from those either directly employed by the company or those whose income has improved as a result of the new

project. Within the power/influence and importance/interest axis of SA described earlier, Dominion farms appeared winners while the local community seems to have to a large extent been losers especially in terms of access to and control over the swamp. The SLA also points out that it is important for all stakeholders be empowered to enable them harness capital assets for their livelihoods. However, some of them have partly been compensated for by new livelihood sources through employment opportunities.

3.12 Dominion Farms (K) Ltd and rural development

The field experience during the study at the Yala swamp revealed existence of continuing tension with the surrounding community though at a downward trend. Most company employees were reluctant to discuss most of the issues raised in the study questions owing to the perceived controversy. However, the management gave out the company's objectives and future prospects. The company spelt out how they have contributed to the standard of living of the people in the area. This includes creating employment opportunities and demonstration of new farming techniques by encouraging their adoption by farmers in the area for enhanced food production. The study established the company employs over 260 people on a full-time basis while another about 1000 people on a seasonal basis. Recruitment of company workers is based on an arrangement giving equal and priori opportunities for the local residents except where expertise skills may be sought from outside. Interactions with company employees during field study revealed they are fairly comfortable with terms and conditions of their employment and within collective bargaining agreements and principles of labour laws.

However, all part-time employees who are seasonally employed depending on farm demands and on stage of farm preparations, expressed fears that their future position in the company remains uncertain. Most of them argued that they are never certain when they are to be laid off or get recalled and that too could have adverse impacts in planning for their livelihood activities. However on the contrary, the company indicated it will be absorbing more people from the community as it plans to diversify and expand its activities to include growing of cotton, Artemisia and fish farming. Apart from large scale production of maize, rice and other crops both for local market and export, the company has initiated aquaculture and apiculture programmes with the latter being incorporated into an outreach programme for the community.

There was also evidence of the company's involvement in opening up the rural road networks and electricity expansion programmes that have helped spur easy communication and provide more market opportunities for the local people. One such new open market takes place every Saturday at a designated field next to the company offices. This has encouraged many traders in the area as one responded said:

“nowadays I don't have to travel all the way to Siaya town to sell my products and buy good white maize, but instead I conduct my business here at Ratuoro and buy the maize at a lower price from Dominion” (a middle-aged man commenting on the new open market).

The company has initiated many other programmes as part of corporate social responsibility, which include construction of a man-made dam and shallow water wells around the perimeter of the farm for use by the people and animals; assisted in equipping local schools and the two health centres with equipment and free distribution of mosquito nets for the local community in the spirit of fighting malaria disease in the area.

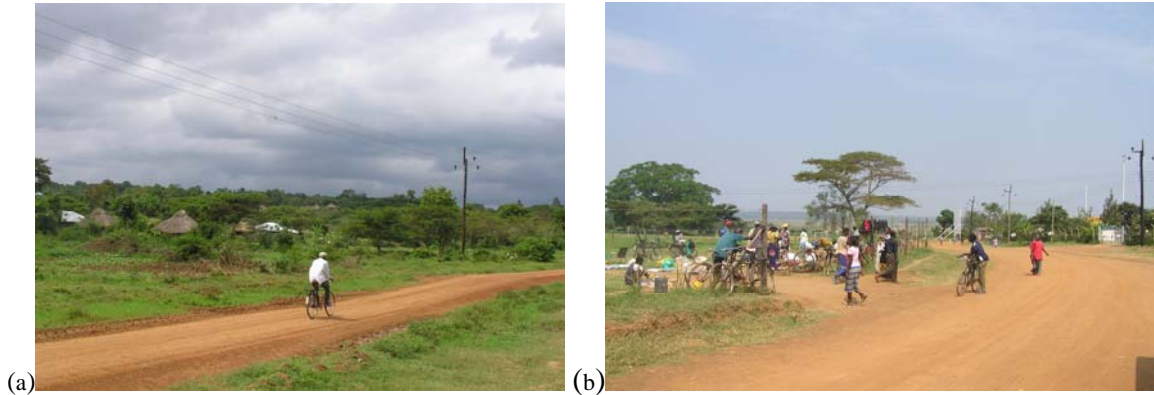


Plate 3.3: (a) New road and installation of electricity at Yala (b) New open market next to the Dominion Farm (K) Head office at Ratuoro area (Photos by author).

3.2 Discussion

The results presented in this study are based on the findings from the field study conducted at the Yala swamp regarding the conversion of the wetland into large-scale agricultural production and how this has impacted on the rural people's livelihoods. It is important to note that the findings were based on the willingness of the people to respond to the issues raised by the study and most responses oscillated around their views concerning the entry of Dominion Farms (K) Ltd into the area with positive responses coming from those supporting them while critics provided a negative appraisal. This was in the face of a perceived conflict and as earlier advocated for by some civil society organizations in the area. Other factors that influenced responses included the level of education, poverty and present status of respondent in terms of benefits or losses they are getting with respect to the activities of the company.

3.2.1 Food security versus food sovereignty

The importance of food security for the increasing population against decreasing resources in Africa was evident at the Yala swamp. Environmental implications notwithstanding, the increasing food demand continues to put more pressure for more arable land including conversion of fragile ecosystems like wetlands into agriculture. Other studies do highlight similar arguments (UN, 2007; Adams, 1995; FAO, 2005). The importance rural people attach to the access to a natural resource for their livelihood was also demonstrated at the Yala Swamp where they rate the new company lowly in terms of livelihood contribution. As this appears true because most people don't have as much access as before in earning a living from the swamp, long-term impacts may suggest otherwise as more opportunities may be created by the company that may possibly

provide them with alternative or complimentary income sources. This however, contrasts with the critics of the project who accuse its activities for degrading the environment and contributing to increased poverty in the region (Ong'ang'a, 2005; KLA, 2006; KWF, 2006).

From field results the improved agricultural production as demonstrated by Dominion confirms the current surge in investment meant to enhance agricultural outputs through intensification as a promising approach to address Africa's food crisis. According to Djurfedt *et al* (2005) and Holmen (2004a) this is an example of what may be called Africa's green revolution. This is also emphasized by Kenya government in her resolve to revitalize agriculture including increased investment and intensification in modern technologies for improved productivity within the framework of Strategy for Revitalization of Agriculture (SRA) and as one of the national policies geared towards attaining the MDGs and meeting the country's vision 2030.

However, according to Grain (2005) and Rosset (2006) the effects of industrialization, globalization and free international trade on imports/exports exhibits itself to the people of Yala through the activities of the new investment project where there is now large-scale food production both for domestic and export purposes through Dominion farms (K) Ltd. Given the current global trends it becomes difficult for rural people to continue engaging in food production approaches for their own subsistence and self-reliance by embracing food sovereignty. In Africa, where most government policies allow for trade in food imports/exports and receive foreign donor funding and investment in agriculture and other sectors, it will be difficult for food sovereignty ideologies to be embraced. This phenomenon has also been demonstrated at the Yala swamp where agricultural intensification is now being embraced and adopted by the local community as more than 50 percent of respondents said they now use farm inputs in maize production. As illustrated by the SLA this is one way in which adaptive strategies can equally contribute to rural livelihoods in Africa (Farrington *et al.*, 2004).

3.2.2 Sustainable livelihoods

If opportunities for tapping productive resources at Yala swamp including local technologies for rain water harvesting and peoples empowerment to access other capital assets are availed it is possible for them to improve their livelihoods through diversified food production including intensification even irrespective of Dominion company's presence to supplement their livelihood sources. The enhancement of people's production factors including human, financial, natural, physical and social assets plays a major role for sustainable livelihoods. From the study more than 60 percent (see Figure) attribute lack of access to the swamp as an impediment to their livelihood strategies. However, if other production options are availed like financial and human empowerment, other livelihood strategies can be constructed like engagement in non-farm activities that generate income. This may include opportunities to access education, skills and knowledge to help take other livelihood choices; access to financial resources including wage employment, credit facilities and social networks and cooperatives. Studies by DFID (2001 and 2002) while applying SLA in rural development share similar

arguments. The Yala swamp scenario presents some of these opportunities particularly for those with employment in the farm and in other employment regimes and also those conducting various business ventures and other non-farm enterprises in the community. After all, this is what development is all about. As one respondent put it:

“ the fertile swamp now boasts of a variety of food crops including fish and honey and there are direct jobs and service supplies to the company that have reduced poverty levels in the area” (businessman supplying goods and services to the company).

More than 50 percent of respondents from individual and focus group discussions seemed to have similar views while positively appraising the new large-scale agriculture.

3.2.3 Communication and Stakeholder participation

Yala swamp is a contested resource and the need for appropriate communications amongst multiple users is central to its sustainable management. As discussed in chapter two, various stakeholders claim competitive and contested interest on the Yala wetland. Primary stakeholders with direct use of the swamp being the Dominion company, local county council and the local people. It is important for appropriate consultations with those who have incompatible goals and/or interests as an important way of addressing any problems and in seeking solutions. It was observed though that public participation occurred mainly during EIA sessions. There was no evidence of a more pro-active and functional forum for either continuously discussing project planning, decision-making or policy settings regarding the activities of Dominion farms. In the field most responses from both stakeholder groups showed concern for proper communication and a feedback mechanism that recognizes the interests and perspectives of the public in problem identification and solving. In this way, potential conflicts, misunderstanding and lack of cooperation may be avoided. While working on SA for natural resources Grimble and Chan (1995) and other studies done by researchers at FAO (2007) also emphasis the importance of identifying and analyzing concerns of different stakeholders to actively incorporate them in a project's operations.

The lack of and/or inadequate communication between the local Yala community and the company has had adverse effects regarding their relationship resulting in the witnessed mistrust and suspicion on the activities of the company as viewed by the local people. It is important that key stakeholders of Yala swamp who include Dominion company, local community and the local county councils take initiative to devise a mechanism that will foster dialogue amongst all other stakeholders to address emerging wetland use conflicts and try seeking an amicable balance of trade-offs for sustainable management of the wetland for both present and future needs of society and ecosystem health. It is important that capacities be built that acknowledge and appreciate the fact that in any contested issue involving multiple players there will always be winners and losers. Short term losers may turn out to be long term winners. However, a major problem is that many short term losers have few or no alternatives to fall back upon during the transition period hence in need of some temporary safety-nets. Therefore in planning and implementation of decisions, all views raised by stakeholders should be put into consideration in order that no stakeholder feels neglected.

3.2.4 Role of Environmentalists and NGOs

Non-governmental organizations (NGOs) have continued to function in service delivery, empowerment and consciousness raising to campaigning, lobbying and advocacy work to change the wider policy environment. The Lake Victoria Basin and Lake Victoria itself continues to attract a lot of attention from environmentalists including international NGOs. However, most of these NGOs tend to advocate for environmental conservation *per se* with little emphasis on maintenance of access to local environmental resources to sustain livelihoods. This is also highlighted by Holmén (2006), who says:

“With its overall emphasis on conservation, global biodiversity values focus on...wild rather than agricultural biodiversity [and counterpose]...wildness versus human landscapes – [with] a clear prioritization of the former” (p 461).

While discussing with them, most NGOs appeared unwilling to sacrifice environmental quality for the often not very important benefits of economic growth at the Yala swamp. While NGOs can support grassroots activities and local organizations by lobbying and pressuring governments, organizing networks of support and creating strategic alliances to conserve and use sustainably natural resources including the Yala swamp, there was little evidence of existence of local environmental organizations drawing membership from the community. The international NGOs criticizing the Yala swamp project mainly through the print and electronic media appears to be urban-based with their own unique agendas and conflicting interests, and lacking grassroots inter-organizational coordination. Their activities appeared to be only announced, rather than negotiated with the local community. However, there was evidence of active participation and local representation of both national and international NGOs working in health services, HIV/AIDS and rural poverty concerns. The role of NGOs regarding the Yala swamp seems to confirm the arguments by Samantha *et al* (2004) and Holmen and Jirström (2008) regarding inadequate or lack of accountability and representation of some NGOs particularly in the third world countries.

3.2.5 Environment and development

The issue of ecology and conservation of the Yala swamp had attracted a lot of interest even before entry of Dominion Company into the scene. There are a lot of research and other studies on ecological changes and status of the swamp (Thenya, 2006; Post, 2006; Owino, 2007; Ong’ang’a et al., 2001; Gichuki, 2003; Aloo, 2003; Abila and Othina, 2006; Nilsson, 2006). However, evidence from the field revealed a big gap in knowledge dissemination that could be beneficial of the wetland including the local community. Despite a lot of findings touching on the ecosystem and related fisheries findings, most members of the community still continue to regard the wetland as an unlimited common property natural resource meant for their livelihoods. On the other side ecologists in many of their studies regard the swamp as a “living museum” of biodiversity because it provides critical habitat for endangered fish species that have disappeared from Lake Victoria itself; provides refuge for endangered sitatunga antelope, and that for centuries thousands of families have depended on the wetland for clean water, fishing, grazing and agricultural land and papyrus for their artifacts industry. For this group the best way forward for the swamp are policies for its protection and conservation. There was general

feeling for concerted effort for all actors to collaborate for the purpose of sustainable exploitation, conservation and management of the swamp.

Economic development activities, however, need to be ecologically sustainable in facilitating today's needs without compromising the ability of future generations to meet theirs. This observation is also well embedded within the sustainable livelihoods framework. A livelihood resource should continuously be used to improve the livelihoods of the local communities through their empowerment. As efforts are being put in place to develop the area as a means of triggering a trickle down effect of ending poverty, there should be an equal consideration on redress of possibly failing ecological life support systems through holistic and comprehensive management mechanisms and policies.

With heavy investment in finances, technology, human resources and equipment and with a 25 year lease agreement the company hopes to revolutionize the region's economy for the benefit of both its owners, the local community and that of Kenyan populace at large through increased food production for domestic consumption, export and foreign exchange earnings. By embarking on such multiple and integrated development activities the company shall be immensely promoting the capital assets available for the rural people for tapping and transformation into sustainable livelihood options for improved food security, safety and poverty reduction. As discussed earlier this is basically what the SLA principles are all about with regard to natural resources management for rural people's livelihoods.

Despite the company experiencing initial problems in establishment that included political support/resistance, protests and demonstrations for and against its activities, Environmental Impact Assessment difficulties and other government bureaucratic constraints, it has now settled and is on course as most of its programmes are running as plans are underway for expansion and inclusion of others for realizations of its full potential in the development of the region.

On a critical and livelihood perspective, the developments brought about by Dominion company's activities at the Yala wetlands have facilitated good access to market centres and there is moderate income diversification. These changes take care of would-be vulnerability and uncertainties thereby shielding people from shock due to failure of one or more of the livelihood activity. This is viewed as being desirable in achieving sustainable livelihoods for the rural community. Since the activities of the new project have just started being felt within the community, it would be interesting to learn how the impacts caused over time will be contributing to the development or destruction of both ecological and socio-economic resiliencies in response to the new changes brought on to the wetland. This is a potential area for future research and investigations.

3.3 Summary of major findings

From the survey, field observations and discussions with various stakeholders of the Yala swamp, there was evidence that on short-term basis, livelihoods of many of the local people who have traditionally used the swamp have been impacted negatively. Some of these people who include the elderly, widows, women and the youth remain vulnerable to poverty and loss of income as they may neither be able to secure employment within the large-scale agricultural farm nor get suitable alternatives for enhanced livelihoods. However, on long-term basis, the entry of Dominion farms (K) Ltd into the Yala swamp has potential for creating employment opportunities and contributes to improvement of the rural infrastructure opening up more avenues for people to seek other livelihood strategies for better outcomes. This has partly compensated loss of livelihoods due to conversion of part of the swamp into large-scale agriculture. As the company plans to expand its activities in future, there is potential for enhanced food security for the region and improved revenue base for the government of Kenya.

The study discovered, though at a reducing scale, existence of conflict over resource use. The Yala swamp, before regarded as a common pool resource (despite the government earmarking part of it for commercial agriculture), to which local people regarded themselves as having rights, contribute in a variety of ways to people's livelihoods. The conversion of part of it to large-scale agriculture by Dominion farms appeared to have blocked local use thus adversely affecting their well-being. This is still a cause of some discontent amongst some people who are not able to gain alternative sources of livelihoods. These people have been target for NGOs to continue voicing their opposition to the project thereby conflicting with the interests of the Company and the government on one side.

It was also evident that land remains a fundamental livelihood asset at the Yala swamp area. Access to secure, safe and fertile land is regarded crucial for both food security and source of income for the local community. At the Yala swamp, compensation for the loss of people's access to the land and swamp resources should be based on a full economic valuation of the benefits and costs derived from the swamp they have traditionally used for their livelihoods including opportunity costs when converted to large-scale agricultural activities. Holistic valuation exercises may help reveal the economic value of the wetland resources and the significant contribution they make to complex, diverse and dynamic livelihoods. It is, however, a challenge especially for policy makers on how to seek for suitable alternative accommodation of the multiple resource use and addressing trade-offs thereof.

From the field observations, Yala swamp community is in need of development initiatives to address the prevailing poverty and food insecurity and poor infrastructure in order to raise the standard of living of the people. However, lack of effective communication and coordination of programmes by planners, culture and local politics remains an impediment towards achieving this objective. This explains why 'development' initiatives by Dominion farms (K) Ltd continue to receive mixed reactions from key stakeholders in the area. This challenge can be overcome if the Yala swamp managers, particularly the local government authorities take lead in embracing an all-

inclusive participatory approach involving key stakeholders in planning and implementation of development programmes regarding the wetland.

The study discovered evidence of emerging transformations and features of change that are likely to become more pronounced in the area over time. These include diversification of livelihoods and occupational multiplicity, culture of modernity as more people seek alternative sources of livelihoods through smallholder farm intensification, non-farm and business activities. The entry of Dominion Company in the area has largely contributed to these new changes.

There was evidence of poor coordination, integration and involvement of key stakeholders regarding the management of the Yala swamp. It was only in the 2006 EIA report for the Dominion Company that a comprehensive plan of action regarding stakeholder participation in project planning and implementation has been suggested. It remains a challenge to decision-makers whether the proposals will be implemented including strict enforcement of monitoring and evaluation of project activities by competent authorities and lead agencies.

A lot of politics seems to be surrounding the project splitting the local people into two opposing camps. Some community members view the local authorities and government as collaborators with the investor (Dominion Company) in a ploy to rob them their source of livelihoods. At the same time, a number of community and local leaders see some locals as being selfish and anti-development by refusing to support the new project. The study discovered claims that a number of stakeholders had been compromised to either support or not support the project. In such a polarized situation, raising any issue on the project, how genuine it may be one is quickly branded as falling in the pro or anti-Dominion alignment. Public awareness and capacity building on the project objectives to members of the community can potentially neutralize such situation. This is a collective responsibility of community leaders, civil society and local organizations, Dominion farms and the Local Government

CHAPTER FOUR

CONCLUSION AND RECOMMENDATIONS

Wetlands fulfill many functions and provide many products and services that have sustained humans over time. Yala Swamp, like many other wetlands in developing countries, supports a wide array of flora and fauna. This study results have indicated that the local community living around the wetland continue to depend on the swamp for their livelihoods which include farming, fishing, water, and macropyte harvesting amongst many other benefits. To meet these benefits against increasing population and poverty, there is need for a management strategy that accounts for both peoples' livelihoods balanced with conservation initiatives. This calls for a participatory management approach involving the local community, Dominion Company, Local councils and other stakeholders. This approach will have to integrate the technical, socio-economic, environmental and legal aspects of the wetland resources management.

There is need for the willingness of key stakeholders to work together and explore how separate and often divergent views can be shared in balancing trade-offs in the wise and sustainable utilization of the swamp to meet both present and future needs. Considering the controversies that have been witnessed before regarding the activities of the project, an elaborate EIA should always be in place and be strictly enforced, prior to the decisions to develop the swamp further and that local involvement and participation be present in all stages.

The study results have also shown that the livelihoods of some locals have been negatively impacted due to conversion of part of the swamp into large-scale agriculture. To help compensate for loss of their sources of income, alternative sustainable development options need to be considered including recreation and eco-tourism, research and educational sites and agro-forestry. It is hoped that such management principles should help meet the needs of an increasing population while conserving the wetland ecosystem.

On the other hand, the conversion of the swamp into large-agriculture as shown from the findings of the study is not bad at all for its has helped enhance the livelihood base and spur rural development of the area, but needs to be done in such a way that the local community and other stakeholders get to accept and appreciate it. Development could have both positive and negative sides and at times may require that some sacrifices are made, like discarding some of the traditional lifestyles and adapting new and modern systems including agricultural intensification. Such attitude and understanding needs to be instilled in all the people within the Yala swamp ecosystem, to help them make unbiased, wise and informed decisions when assessing the activities of Dominion Farms (K) Ltd.

The conceptual tools of SA and SLA have been integrated in the study to help in the understanding of the intricate inter-linkages between different stakeholders and how they pursue various livelihood strategies with regard to a natural resource. At the Yala swamp

like in other related studies elsewhere these tools of analysis, their weaknesses withstanding, have been of relevance in connecting theory and practice for synthesis and analysis of field results obtained in the field.

4.1 Recommendations

The study has shown that many stakeholders have raised varied objections and counter-objections to specific aspects of the project, ranging from ecology, environment, land usage, compensation, and market competition for a number of crops to viability of proposed projects. As Dominion Company embarks on long-term expansion of its agricultural activities, it is an opportunity time for the establishment of a stakeholder forum to be discussing the EIA reports on any on-going and proposed projects as a continuous process to help identify and propose mitigation measures on possible negative environmental and socio-economic impacts. Through such a mechanism, confidence, mutual and reciprocal trust amongst key stakeholders will be built whereby any emerging issues shall be amicably resolved for the enhancement of the general development of the area. Local political leaders should be members of such forum in order for them to avoid using any tension therein in enticing people against each other for their narrow political mileage.

Wetland resources, including the swamp are under pressure from growing human population for settlement and reclamation for agriculture. Any alteration of the swamp for the public interest should be subject to an EIA, a cost-benefit analysis, and wider consultations, and should be in harmony with the integrity of the wetland.

There is need for a clear and shared national vision, strategy for the conservation and management of wetlands in Kenya. A national wetland policy should be fully developed in a participatory manner that will guide how wetlands in Kenya should be managed. Since wetlands are cross-sectoral resources, there is need to create and establish an appropriate national mechanism and coordination framework for their conservation and management. As is the case at the Yala swamp, Dominion Company has to comply with various sectoral legislations making the exercise cumbersome in monitoring and evaluation as required in the EIA regulations.

For effective conservation and management of the swamp, there is need to promote effective communication, education and public awareness among stakeholders on wetland resources to encourage understanding and participation of the public, private sector, local authorities, NGOs and other interested persons. Through such initiatives, conservative traditional views on use of the wetland may well be integrated into the dynamic contemporary society as people adapt new ways of life.

As livelihood diversification takes shape at the Yala swamp, there is potential for enhanced livelihoods through encouragement and promotion of eco-tourism. While such activity will provide more opportunities for improved incomes, it will also help in ecosystem conservation and reduced pressure on the remaining intact wetland from the community.

This Yala Swamp study was by no means exhaustive as the following areas are recommended for further research.

- Studies on environmental valuation (including indirect and non-use values) of Yala wetland ecosystem. This may assist in assessing trade-offs between maintenance of intact wetland against its conversion into other uses. Such investigation will ensure that the broadest implications of any further conversion of the swamp is fully understood and to better factor the wetland into future planning through a more balanced cost-benefit analysis.
- The Yala swamp large-scale agricultural production is now on course and plans are underway for expansion of its activities. So far no studies have been conducted on people's resiliencies as a result of these new 'developments'. How people have learned to cope and adapt to changes in their lifestyles as well as ecological succession patterns will help in future planning of the swamp.
- Future Yala wetland studies need to include gender and related contemporary issues. For instance the influence of culture and role of women and youth in the conservation and development of Yala wetland resources should be studied including the contribution of wetland-based enterprises in the alleviation of poverty.

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- Addendum **II**: Fish Farming Activities
- Addendum **III**: Dam and Reservoir & Fuel Storage and Dispensing Facility
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APPENDICES

Appendix I: Frequency Tables showing Summary of field survey questionnaire output.

Table 1: Frequency distribution of the respondents' age brackets (n=122)

	Frequency	Percent	Valid Percent	Cumulative percent
20-29 Years	29	23.8	23.8	23.8
30-39 Years	23	18.7	18.7	42.5
40-49 Years	24	20.0	20.0	62.5
50-59 Years	20	16.3	16.3	78.8
60-69 Years	11	9.0	9.0	87.8
70 and Above	15	12.2	12.2	100.0
Total	122	100.0	100.0	

Table 2: Frequency distribution of the respondents by Gender status (n=122)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	77	63,1	63,1	63,1
	Female	45	36,9	36,9	100,0
	Total	122	100,0	100,0	

Table 3: Frequency distribution of the respondents' by marital Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	,8	,8	,8
	Married	87	71,3	71,3	72,1
	Widow	16	13,1	13,1	85,2
	Single	17	13,9	13,9	99,2
	Separated	1	,8	,8	100,0
	Total	122	100,0	100,0	

Table 4: Frequency distribution of the respondents' educational Level (n=122)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	University	1	,8	,8	,8
	Tertiary college	10	8,2	8,2	9,0
	Secondary	33	27,0	27,0	36,1
	Primary	54	44,3	44,3	80,3
	Never attended school	24	19,7	19,7	100,0
	Total	122	100,0	100,0	

Table 5: Frequency distribution of the respondents' use of Yala wetland 10yrs ago (n=122)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Grazing fields	46	37,7	46,5	46,5
	Subsistence farming	35	28,7	35,4	81,8
	Grass for building	1	,8	1,0	82,8
	Water collection	15	12,3	15,2	98,0
	Collect wood for fuel	1	,8	1,0	99,0
	Fishing	1	,8	1,0	100,0
	Total	99	81,1	100,0	
Missing	No Response	23	18,9		
Total		122	100,0		

Table 6: Use of Yala wetland with Dominion as owners of Yala wetland (n=122)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Grazing fields	4	3,3	23,5	23,5
	Subsistence farming	1	,8	5,9	29,4
	Papyrus harvesting	1	,8	5,9	35,3
	Water collection	11	9,0	64,7	100,0
	Total	17	13,9	100,0	
Missing	No Response	105	86,1		
Total		122	100,0		

Table 7: Frequency distribution of whether maize growing is as a source of income (n=122)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	26	21,3	21,3	21,3
	No	96	78,7	78,7	100,0
	Total	122	100,0	100,0	

Table 8: Frequency distribution of whether millet/sorghum growing is as a source of income (n=122)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	17	13,9	13,9	13,9
	No	105	86,1	86,1	100,0
	Total	122	100,0	100,0	

Table 9: Frequency distribution of whether poultry farming is as a source of income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	21	17,2	17,2	17,2
	No	101	82,8	82,8	100,0
	Total	122	100,0	100,0	

Table 10: Frequency distribution of whether income is from milk (n=122)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	30	24,6	24,6	24,6
	No	92	75,4	75,4	100,0
	Total	122	100,0	100,0	

Table 11: Frequency distribution of whether income is from wages/salary

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	30	24,6	24,6	24,6
	No	92	75,4	75,4	100,0
	Total	122	100,0	100,0	

Table 12: Frequency distribution of whether income is from transfer payments

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	1,6	1,6	1,6
	Yes	33	27,0	27,0	28,7
	No	87	71,3	71,3	100,0
	Total	122	100,0	100,0	

Table 13: Frequency distribution of whether income is from other business

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	29	23,8	23,8	23,8
No	93	76,2	76,2	100,0
Total	122	100,0	100,0	

Table 14: Frequency distribution of Amount of money per month from sale of maize in Kenya Shillings (KSh)*

	Frequency	Percent	Valid Percent	Cumulative Percent
<500	8	6.5	27.3	27.3
500-2000	13	10.8	45.4	72.7
2000-4000	5	4.1	17.1	89.8
>4000	3	2.4	10.2	100.0
Total	29	23.8	100.00	
No response	93	76.2		
Grand Total	122	100.0		

*1 US \$= Ksh 63 (Based on Central Bank of Kenya, 3rd December 2007)

Table 15: Frequency distribution of Amount of money per month from wages/salary in Kenya Shillings (Ksh)*

	Frequency	Percent	Valid Percent	Cumulative Percent
<5000	6	4.9	20.7	20.7
5000-10000	17	13.9	58.6	79.3
10000-15000	4	3.4	13.8	93.1
15000-20000	2	1.6	6.9	100
Total	29	23.8	100.0	
No response	93	76.2		
Grand Total	122	100.0		

* 1 US \$= Ksh 63 (Based on Central Bank of Kenya, 3rd December 2007)

Table 16: Frequency distribution of Amount of money spent on school fees per month in Kenya Shillings* (KSh)

	Frequency	Percent	Valid Percent	Cumulative Percent
<500	64	52.5	90.1	90.1
5001-10000	5	4.1	7.1	97.2
10001-15000	1	.8	1.4	98.6
15001-25000	1	.8	1.4	100.0
Total	71	58.2	100.0	
No response	51	41.8		
Grand Total	122	100.0		

* 1 US \$= Ksh 63 (Based on central bank of Kenya, 3rd December 2007)

Table 17: Frequency distribution of Status of communication services 5yrs. ago

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Good	10	8,2	8,6	8,6
	Fair	83	68,0	71,6	80,2
	Poor	21	17,2	18,1	98,3
	No Idea	2	1,6	1,7	100,0
	Total	116	95,1	100,0	
Missing	No Response	6	4,9		
Total		122	100,0		

Table 18: Frequency distribution of Status of communication services at present (n=122)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very good	4	3,3	3,5	3,5
	Good	48	39,3	42,1	45,6
	Fair	56	45,9	49,1	94,7
	Poor	6	4,9	5,3	100,0
	Total	114	93,4	100,0	
Missing	No Response	8	6,6		
Total		122	100,0		

Table 19: Frequency distribution of water source for domestic use at present

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	River Yala	53	43,4	43,8	43,8
	River Channel	38	31,1	31,4	75,2
	Lake Kanyaboli	26	21,3	21,5	96,7
	Borehole/well	4	3,3	3,3	100,0
	Total	121	99,2	100,0	
Missing	No Response	1	,8		
Total		122	100,0		

Table 20: Frequency distribution on status of health services 5yrs. ago

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very good	2	1,6	1,7	1,7
	Good	5	4,1	4,3	6,1
	Fair	94	77,0	81,7	87,8
	Poor	13	10,7	11,3	99,1
	No Idea	1	,8	,9	100,0
	Total	115	94,3	100,0	
Missing	No Response	7	5,7		
Total		122	100,0		

Table 21: Frequency distribution on status of health services at present

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very good	5	4,1	4,3	4,3
	Good	47	38,5	40,9	45,2
	Fair	60	49,2	52,2	97,4
	Poor	3	2,5	2,6	100,0
	Total	115	94,3	100,0	
Missing	No Response	7	5,7		
Total		122	100,0		

Table 22: Frequency distribution on status of electricity supply 5yrs. ago

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very good	1	,8	1,1	1,1
	Good	3	2,5	3,3	4,4
	Fair	15	12,3	16,7	21,1
	Poor	69	56,6	76,7	97,8
	No Idea	2	1,6	2,2	100,0
	Total	90	73,8	100,0	
Missing	No Response	32	26,2		
Total		122	100,0		

Table 24: Frequency distribution on status of electricity supply at present

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very good	9	7,4	10,1	10,1
	Good	41	33,6	46,1	56,2
	Fair	30	24,6	33,7	89,9
	Poor	9	7,4	10,1	100,0
	Total	89	73,0	100,0	
Missing	No Response	33	27,0		
Total		122	100,0		

Appendix II: INTERVIEW SURVEY QUESTIONNAIRE

NB: The information provided will be treated with confidentiality and only for research purposes.

Title: Wetland conversion to large-scale agricultural production and implications on the livelihoods of rural communities, Yala Wetland, Kenya.

1. Date.....
2. Name of interviewer.....
3. Name of Respondent.....

4. Age (Yrs).....
5. Gender Male Female
6. Location_____ Sub Location_____ Village_____
7. Marital status Married Widow Single Separated
8. Whether attended school Yes No
9. Educational level University Tertiary college Secondary
 Primary Never attended school
10. Economic activity done for a living
 1) Farmer peasant
 2) Employed
 3) Other (specify)
11. If a farmer, what kind of farming?
 a) Livestock farming (cows, goats, sheep, poultry.....)
 b) Food crop farming (maize, millet, potato, rice, sugarcane.....)
 c) Other (specify).....
12. If employed, who is the employer?
 1. Government 2. Dominion Farms 3. Other_____

USE OF WETLAND

13. How have you been using this wetland (Yala swamp)?
 Rank 3 of the uses in order of preference:-

Wetland use	(a) 10 years ago	(b) Now	With Dominion as owners of wetland
(a) Grazing fields			
(b) Cut grass for building			
(c) Harvest papyrus			
(d) Water collection			
(e) Collect medicinal herbs			
(f) Hunting wild animals			
(g) Collect wood for fuel			
(h) Collect wood for construction			
(i) Pottery			
(j) Subsistence farming			
(k) Fishing			
(i) Other (specify)			

14. Do you have a monthly generating income activity?

Yes

No

a) If yes, which activities in order of performance or output.

Income sources	Amount (Kshs) per month	Per Year
Maize produce		
Millet/Sorghum		
Poultry		
Milk		
Wages/Salary		
Transfer payments		
Other (specify)		

b) Expenditure

Item/ Activity	Amount (Ksh) per month	Per Year
School fees		
Food		
Hospital		
Housing		
Clothing		

15. Changes in livelihoods

Has your livelihood changed since Dominion Farms (K) Ltd came to this village?

Yes No

If Yes, how has your life changed.....

.....

If no, state how.....

16. Status of infrastructure before and now?

Status: - 1. Very Good 2. Good 3. Fair 4. Poor

Infrastructure	5 years ago	Present
Primary schools		
Secondary schools		
Water		
Communication/Roads		
Electricity		
Hospital/Dispensary		
Shops/markets		
Other (specify)		

17. Main source of water for domestic use presently

River Yala

River channel

Lake Kanyaboli

Wetland/swamp Borehole/well other (specify).....

Appendix III: Interview Guide for Dominion Farms (K) Limited

1. What is the Brief History o the company in Yala swamp?
2. How do you use the wetland?
3. How have you contributed to the standard of living and general conditions in the local area?
4. How many employees (Both fulltime and part-time do you have? Where do they come from?
5. What has happened to livelihood opportunities? According to you who benefits?
6. What can you comment about the environment?
7. What can you comment about infrastructure?
8. What challenges have you encountered? If any how have you gone about them?
9. In your own views, what is the future of Yala swamp under Dominion farm (K) Ltd?
10. Any general comments regarding Yala swamp.

Appendix IV: Interview Guide for Siaya and Bondo County Councils

1. How did the council use and manage Yala swamp (a) before and (b) after entry of Dominion Farms Limited?
2. How did the council/local community benefit?
3. What can you comment about the activities of Dominion company’s activities in this area?
4. Most recently, there were controversies regarding the ‘development of Yala swamp’ what are your comments?
5. What has happened to livelihood opportunities? Who benefits?
6. Were there any evictions of people from Yala swamp?
7. What do you feel for the future of the Yala swamp with reference to the people and environment?
8. What are your general comments regarding the issues to do with Yala swamp?

Appendix V: Interview guide for Individual interviews

1. What do you do for a living?
2. How do you use the wetland, before and after entry of Dominion Company in Yala swamp?
3. How has your life changed since the coming of Dominion Company into this area?
4. What are your views regarding the activities of this company. How has it contributed to the living standard of the local community?
5. Who do you feel is responsible for the present state of affairs in this area?

6. What do you feel for the future of the Yala people in relation to the Yala wetland?
7. Comment on the general environment and livelihood trends in this area..

Appendix VI: Focus Group Discussions Guide

Areas focused during the group discussions

1. Water sources
2. Fuel sources
3. Communication network
4. Land uses
5. Seasonal calendar (Agriculture, rainfall etc.)
6. Time line (Historical -50yrs. Ago)
7. Present/Future economic activities



Plate 6.1 Focus group discussion with stakeholders (Photos by author).