

**Flood Disaster Preparedness and Management in Schools,
a Case Study of Budalang'i Area in Busia County**

By

John Justo Ambuchi

**A Research Project Submitted in Partial Fulfilment of the
Requirements for the Degree of Master of Arts in
Environmental Planning and Management (EPM)**

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Department of Geography and Environmental Studies

University of Nairobi

2011

DEDICATION

To God, my parents and my immediate family.

ACKNOWLEDGEMENT

I would like to acknowledge the support I received from a number of individuals and institutions that contributed to the successful completion of this study. They are, however, not responsible for the mistakes, omissions or errors which remain in the final product. While it is difficult to mention all the individuals by name, I would like to take this opportunity to assure those whose names I fail to mention here that their contributions, in whatever form, were all greatly appreciated.

First and foremost, I would like to sincerely register my heartfelt appreciation to my supervisors: Eng. Dr. Onyango Ogembo and Dr. John Moenga Nyangaga, for their advice, guidance and constructive criticism that have contributed immensely to the final product. They imparted in me a sense of looking at things keenly and objectively. Their input will forever be remembered. My next appreciation goes to the Department of Geography and Environmental studies: the Chairman (Prof. E.H.O. Ayiamba), the Coordinator Environmental Planning and Management (Dr. J.K. Musingi), and all my course lecturers, for help, encouragement and professional guidance in one way or another.

This work would only be a nightmare were it not for the financial support from Higher Education Loans Board and more important the National Council for Science and Technology for the research permit, the Education Officer in Budalang'i area for the coordination, the school Head teachers for the cooperation during data collection process and all the learners who participated in filling in the questionnaires.

Lastly but not least, I humbly salute my family and colleagues, especially Elizabeth Miriam, without whom the journey would not have been possible.

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LIST OF ABBREVIATIONS

ASAL	Arid and Semi-Arid Lands
CRED	Centre for Research on Environmental Decisions
DDEC	District Disaster Emergency Committee
DEB	District Education Board
DFID	Department for International Development
DM	Disaster Management
DRR	Disaster Risk Reduction
ECD	Early Childhood Development
EPRP	Emergency Education Preparedness and Response Plan
EWS	Early Warning System
FEMA	Federal Emergency Management Agency
FEWS	Flood Early Warning System
FREQ	Frequency
GDP	Gross Domestic Product
GoK	Government of Kenya
HDI	Human Development Index
HFA	Hyogo Framework of Action
ICRC	International Committee of the Red Cross
IDNDR	International Decade for Natural Disaster Reduction
IFRC	International Federation of Red Crescent
IPCC	Intergovernmental Panel on Climate Change
IRIN	Integrated Regional Information Networks
KCSE	Kenya Certificate of Secondary Education
MDG	Millennium Development Goals
MOE	Ministry of Education
NEMA	National Environmental Management Authority
OCHA	Office for the Coordination of Humanitarian Affairs
RANET	Radio and Internet
RGS	River Gauging Station
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme

UNICEF	United Nations Children's Fund
UN-IDNDR	United Nations – International Decade for Natural Disaster Reduction
UK	United Kingdom
WMO	World Meteorological Organization
WFP	World Food Programme

ABSTRACT

This research took place in Budalang'i area, (formerly Budalang'i district) which is located in Western part of Kenya near the shores of Lake Victoria, in Busia County, along Nzoia River Drainage Basin. River Nzoia traverses the area, periodically causing floods that are unique in terms of frequency and character, as it enters Lake Victoria.

The purpose of this research was to find out the level of flood disaster preparedness and management in schools, that is primary and secondary schools, located along river Nzoia, two kilometres from the river banks, in Budalang'i area, Busia County. Specific objectives are to find out the levels of awareness of the early warning systems from relevant authorities, to determine the level of preparedness of schools to respond to flood events, to find out the existing facilities/techniques in schools to combat flood problems and to establish the awareness of flood levels and frequencies. The sample size comprised of 245 respondents which comprised of pupils, students, teachers, and principals, from fifteen schools where thirteen of the schools were primary schools and two were Secondary schools.

The study used a multi-stage sampling technique where a two stage sampling design was used. The first stage was to select primary and secondary schools that are located within approximately two kilometres from the banks of river Nzoia. Fifteen schools were selected in the process, where thirteen schools were primary schools and two were secondary schools. The second stage was to select respondents from the sub groups of principals, teachers, students and pupils. Questionnaires were directed to each category of the respondents to collect primary data. Data analysis was done using Statistical Package for Social Scientists (SPSS) as a tool because it is easy to use and flexible to perform statistical tests using non-parametric techniques like Chi square, which is used to establish relationship between two variables both of which are categorical in nature.

The study found out that the level of preparedness for flood disasters management in schools is low. The schools are not members of the District Disaster Emergency Committee (DDEC), hence are not aware of early warning information from Kenya Meteorological Department (KMD), through the District Commissioner (DC), concerning the levels of water in the river. They also lack well equipped first aid kits, alarm system, evacuation routes, safe raised grounds, rescue plans and rescue teams.

The development of awareness on the prevention and or the management of the disasters should be practised and adopted as school culture to raise the level of awareness in schools and the community around the schools, through the involvement of specialists and teachers in the programmes.

The study therefore recommends that the Ministry of Education establishes a disaster management centre in schools and develop a curriculum on disaster preparedness and management in Teacher Training Colleges. Further, teacher in-service training courses for the employed teachers should be fostered. The community shall gain the knowledge that is essential in the protection of nature and the environment and shall learn ways of protecting themselves from flood disasters that occurs.

CHAPTER ONE

1.0. INTRODUCTION

1.1: Study Background

Floods are high rates of discharge and /or water levels, often leading to inundation of land adjacent to rivers and streams. They are mainly a result of quick-flow rather than base-flow, and are usually caused by intense or prolonged rainfall, snowmelt or a combination of these factors. Other causes are increased rainfall intensity or duration, reduced infiltration capacity and increased run off due to deforestation, or a change in the efficiency of drainage networks (Saenyi, 2005)

According to the Federal Emergency Management Agency (FEMA), some floods develop slowly during an extended period of rain or in a warming trend following a heavy snow. Flash floods can occur quickly, without any visible sign of rain. They have a characteristic short duration and steep rises and rapid falls of flood levels. They occur abruptly without much warning as a result of an accelerated runoff or sudden dam failure and are quite destructive due to their sudden occurrence. Catastrophic floods are associated with burst dams and levees, hurricanes, storm surges, tsunamis, and earthquakes.

Riverine floods are the most dominant floods in Kenya and mostly occur along floodplains or wash lands as a result of exceeded stream flow capacity leading to over.spilling of the natural banks or artificial embankments (Smith and Ward, 1998). River floods affect both the rural and urban areas in form of flash and urban floods. The arid and semi arid lands of Kenya and urban areas are particularly vulnerable to flash/sheet flooding (ICPAC, 2007; UN/OCHA, 2006).

Rivers that most experience flooding in Kenya are Nzoia, Nyando, Tana, Athi, Yala, Sondu Miriu, Malakisi, Nairobi and Kuja. River floods in Western Kenya have high frequency as compared to other parts of the country, making the communities of the region vulnerable to flood risk, especially frequent floods of river Nzoia in Budalang'i area. The high vulnerability to flood risk in Western Kenya is as a result of high poverty rates, poor land use patterns (deforestation and settling and cultivating along river banks), low education and

illiteracy levels and the state of infrastructure that is in neglect. The prevalence rates of floods in Kenya stands at 27% and affects 5% of the population affected by disasters. Floods related fatalities constitute a whopping 60% of disaster victims in Kenya (UNEP, 2009)

1.2: Statement of The Problem

Floods are known globally to be causing great fatalities related to natural hazards. When this happens disastrously, it is attributed to being 'acts of God', yet much of its influence can be traced back to indiscriminate human activities such as deforestation of watersheds due to harvesting timber, fuel wood and clearing vegetation for agricultural purposes (UNEP, 1986).

The loss of life and destruction of properties due to flooding has been on the rise over the years. This catastrophic occurrence is attributed to climate change. Ways and means for adaptation to climate change should therefore a top priority and estimation of risks of the future extreme flood events and their prediction should be the ultimate goal (.Walsh and Brassington, 1990, WMO, 2010).

Budalang'i area for instance, has not been spared from the effects of climate change. The region has been experiencing river flooding with high frequently, causing devastating damages to the environment, infrastructure and loss of education period due to destruction of schools. This has increased the rate of school drop out in the area, school closure and schools taking a very long time to re-open after flood events, increasing the poverty rate of the community members.

The mechanisms practiced by the community of Bangladesh to cope up the effects of climate change, on flood preparedness, have resulted to the reduction of death rates resulting from flood disaster tremendously. Moreover, schools affected have been able to open again quickly after flood disaster, reducing the loss of education that could have been experienced, were it not for the preparedness (Saadi, 2006)

The floods that were experienced in Budalang'i area in the year 2007 resulted to uncountable losses with over 44% members of the population affected. Children less than 15 years of age formed 75% of the displaced population and most of the schools were closed down. The total number of students affected was 4420. In the year 2008, floods incidence recurred again, affecting 4,145 students and even resulting to one candidate failing to sit for Kenya

Certificate of Secondary Education examinations. The loss of education months and damage caused to the institutions of learning at that time is huge and is not worth mentioning (Onywere, 2007, Kenya Red Cross Society, 2008).

The government through the Ministries of Education, Ministry of special Programmes, Kenya Meteorological department and the Non governmental organisations such as Kenya Red Cross and Amref, have been focussing on mitigation of flood problems in Budalang'i area. Schools play a critical role during and after disasters in many contexts. Schools that are well prepared against the risk of disasters will be safe havens and be able to re-open more quickly after a disaster. This can be crucial as the functioning of a school has a powerful normalizing and stabilizing effect, both on children and on wider communities (Saadi, 2006)

This study therefore, seeks to find out the level of preparedness of schools, which are located near the banks of river Nzoia, to combat floods which have caused a lot of destruction to school structures, disruption of the normal learning school programmes, school environment and even loss of life of school going pupils, students, teachers and principals in Budalang'i area, Busia County.

1.3: Research Questions

The study intends to answer the following questions:

- (a) How do the communication networks of early warning systems reach the school's administration from the disaster management institution?
- (b) How are schools prepared in response to flood events?
- (c) How are schools equipped with facilities that are used during a flood disaster management such as first aid kit, equipment of alarm systems, and life saving facilities such as boats, and canoes?
- (d) Are Principals and teachers aware of the flood levels and frequencies in the study area?

1.4: Objectives of the Study

1.4.1: General objective

To find out the level of preparedness of schools to manage flood problems.

1.4.2: Specific objectives

- a) To find out the levels of awareness of the early warning systems from relevant authorities.
- b) To determine the level of preparedness of schools to respond to flood events.
- c) To find out the existing facilities/techniques in schools to combat flood problems.
- d) To establish the awareness of flood levels and frequencies in the study area

1.5: Research Hypotheses

The following hypotheses are stated statistically to be tested using the Chi-square to establish a relationship between the two variables given in each hypothesis.

- H₀ There is no relationship between the level of schooling and the absence from school due to floods
- H₁ There is significant relationship between the level of schooling and the absence from school due to floods
- H₀ There is no relationship between the safety of the school and the level of learning of the respondent
- H₁ There is significant relationship between the safety of the school and the level of learning of the respondent

1.6: Justification of the study

Flood occurrence trends in western Kenya is increasingly becoming a major concern to the country's socio-economic development due to the substantial economic and financial losses incurred to respond to frequent flood disasters (Otiende, 2009)

Lake Victoria Basin in western Kenya, for instance, is the most flood-prone region in the country (GoK, 2007). It is also reported that among the flood events of rivers in East African countries, that is, Kenya, Uganda and Tanzania, it shows (from the table 1.1 below) that River Nzoia had been flooding continuously from the year 2006 to 2008 even when other rivers were not flooding.

Table 1.1: Selected flood events in East Africa
(Numbers in parentheses are the Julian days of the corresponding year).

Events	Images retrieved(DO Y)	Countries Affected	Rivers flooded
1.	2006/12/04 (338)	Kenya Tanzania Uganda	– Kenya: Uaso Nyiro, Tana river and tributaries. Ramisi. Lak Dera, Lak Bor, Lagahar. Ndarugu. Sosiani. Ramisi. Nzoia. Ongoche, Kuja, Migori,. Nyamasaria, Sabaki. – Uganda - River Ssezibwa – Tanzania - Wembere, Mwanza
2.	2007/08/15 (227) 2007/08/22 (234) 2007/08/24 (236)	Uganda Kenya Tanzania	– Kenya - Nzoia, Sabwani, Malakisi, Malaba, Rongai. – Uganda - Kirik, Moroto, Aswa, Ora, Ssezibwa, Dopeth. Muzizi. Nyangoma – Tanzania - Wembere, Mwanza
3.	2008/11/12 (317)	Kenya Uganda	Nzoia River

Source: Yang Hong, 2009

This is evidence that river Nzoia's frequency of flooding is unique and different from other rivers from the Lake Victoria drainage basin.

Disaster reduction initiatives should be rooted in schools and in educational programmes, but also in social community programmes and activities. The ministry of education should establish a special course for the schools in the Western region of Kenya on the effect of disaster on development that can be integrated with other courses in the learning activities (Achoka and Maiyo, 2008).

This is because the public typically expects governments and businesses to prepare for worst case disasters. An overly repeated research finding, however, is that most governments and businesses are reluctant to prepare themselves for crisis at all (Boin and Hart, 2003, p. 546).

While, it may not be possible to prevent disasters, it is quite possible to mitigate the impact of disasters as explicitly stated in the Hyogo Framework of Action. This is best done when people are “informed and motivated towards a culture of disaster prevention and resilience.....through education and training” (HFA, Priority 3, 2005).

The Kenyan community in flood prone regions on the other hand has not been sufficiently sensitised on flood risk management. Lack of flood risk information at the community level especially, in preparedness and coping mechanisms is a major setback to long-term flood risk reduction strategies. For instance, riverine communities are not informed on the importance of maintaining dykes in dry seasons to avoid flooding during wet seasons. The communities are also left with no options of where to evacuate to in the event of a flood. This is further aggravated by high population that forces people to invade river banks due to pressure on scarce land (Otiende, 2009).

In order to protect children and the community, schools should be used as vital organs for instilling values and knowledge, by providing adequate and proper education that helps them in directing their own lives (UNISDR, 2005).

This study found out that river Nzoia flooding is a real disaster in Budalang’i area, as majority of pupils and students have either witnessed flood events, or have been absent from school due to flooding. Principals and students have also indicated that their schools have been affected by river Nzoia flooding. On the contrary, schools and its community members are not prepared to handle flood problems when they arise, making them to be more vulnerable to flood problems.

1.7: Scope of the study

This study focused on the level of preparedness of schools to combat and manage flood problems in terms of teaching pupils/students safety tips, utilization of evacuation routes, raised grounds, availability of boats and well equipped first aid kit, and the availability of well coordinated communication system within the school environment.

The study concentrated on primary and secondary schools that are located along river Nzoia, especially those that are perennially affected by the floods and those that can be affected in future due to their nearness to the banks of river Nzoia in Budalang'i area. At this section of the river, the mature stage, the frequency of flooding is so high and its effects are so pronounced in the area.

Although there are other disasters that schools face in the region, like lightening, flooding is so regular and its effects so devastating, hence the study looked at flood disaster preparedness and management in schools. It is assumed that the case of Budalang'i area represents the overall condition of the level of preparedness of schools to manage floods in the country.

1.8: Definition of Key Terms

Floods: Floods are usually high rates of discharge and/ or water levels, often leading to inundation of land adjacent to rivers and streams.

Hazard: A hazard is a dangerous phenomenon, substance, human activity or condition that may cause the loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

A Disaster: A disaster is a serious disruption of the functioning of a community or society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community/society to cope using its own resources.

A Disaster Risk: The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period.

Disaster Risk Management: The systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.

Disaster Risk Reduction: The concept and practice of reducing disaster risks through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.

Vulnerability: This is susceptibility to the negative consequences resulting from a natural disaster. The many types of vulnerability include physical or material vulnerability (housing, infrastructure), social/organizational (social inequality, institutional capacity), and motivational/attitudinal (“can-do” attitude versus fatalism).

Disaster Preparedness: Disaster preparedness is a package of precautionary measures, taken in advance of an imminent threat to help people and institutions respond to and cope with the effects of a disaster. An example of a disaster preparedness activity is the Early warning system (Draft National Policy for Disaster Management in Kenya, February 2009)

Disaster Response: Response involves interventions taken during or immediately after a disaster. Such actions are directed towards saving lives and livelihoods and dealing with the immediate damage caused by disaster (World Disasters Report, 2009).

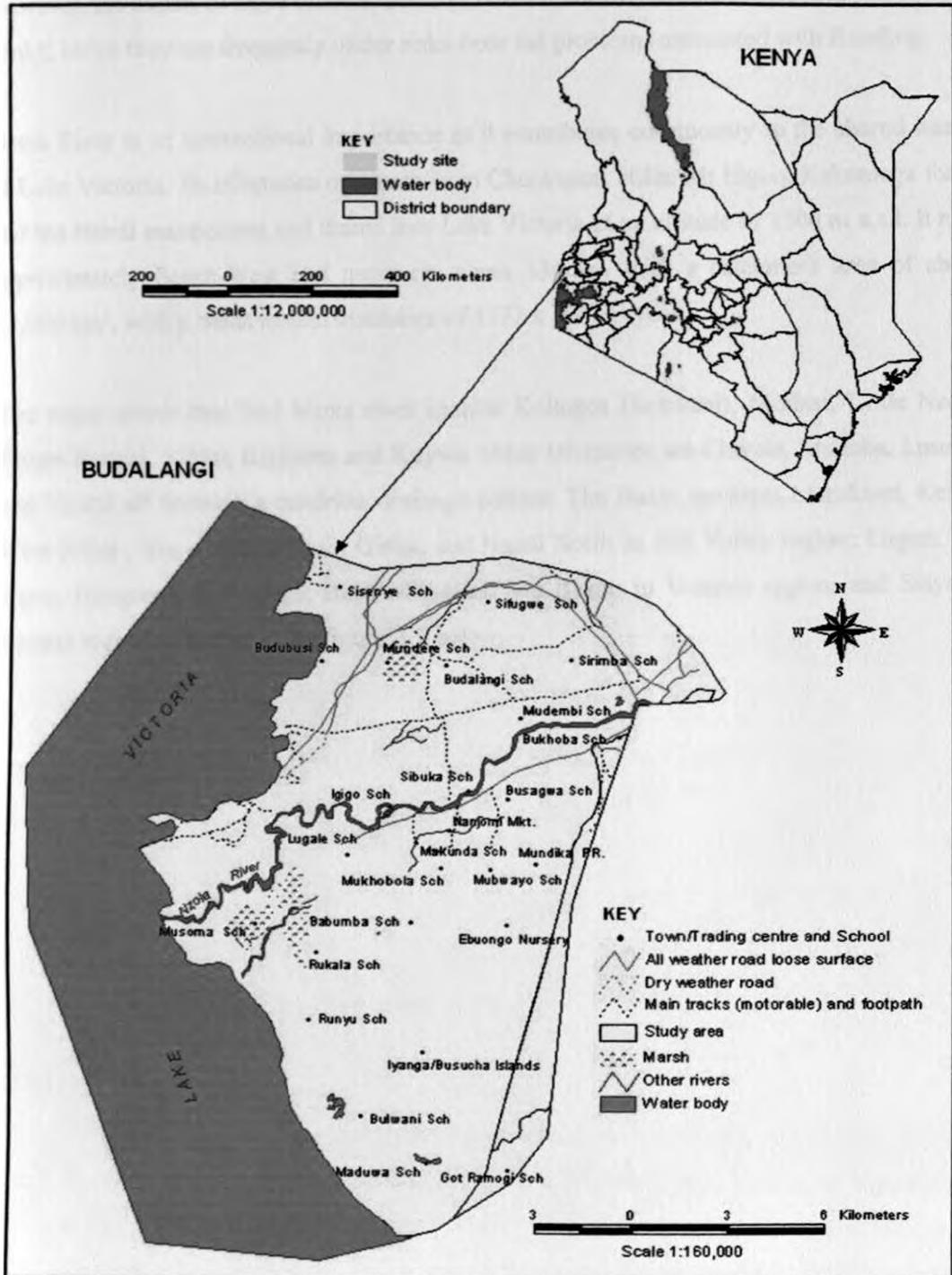
1.9: THE STUDY AREA

1.9.1: Geographical location and description of River Nzoia

Budalang'i area, (formerly Budalang'i district) is located in Western part of Kenya near the shores of Lake Victoria, in Busia County. It lies in Nzoia River Basin which is between latitudes $1^{\circ} 16'N$ and $0^{\circ} 2'N$ and longitudes $33^{\circ} 56'E$ and $35^{\circ} 35'E$. Rivers Nzoia traverses the area periodically causing floods in lower areas as it enters Lake Victoria (as shown in figure 1.1 below).



Figure 1.1: Map of Kenya showing Budalang'i Area with schools



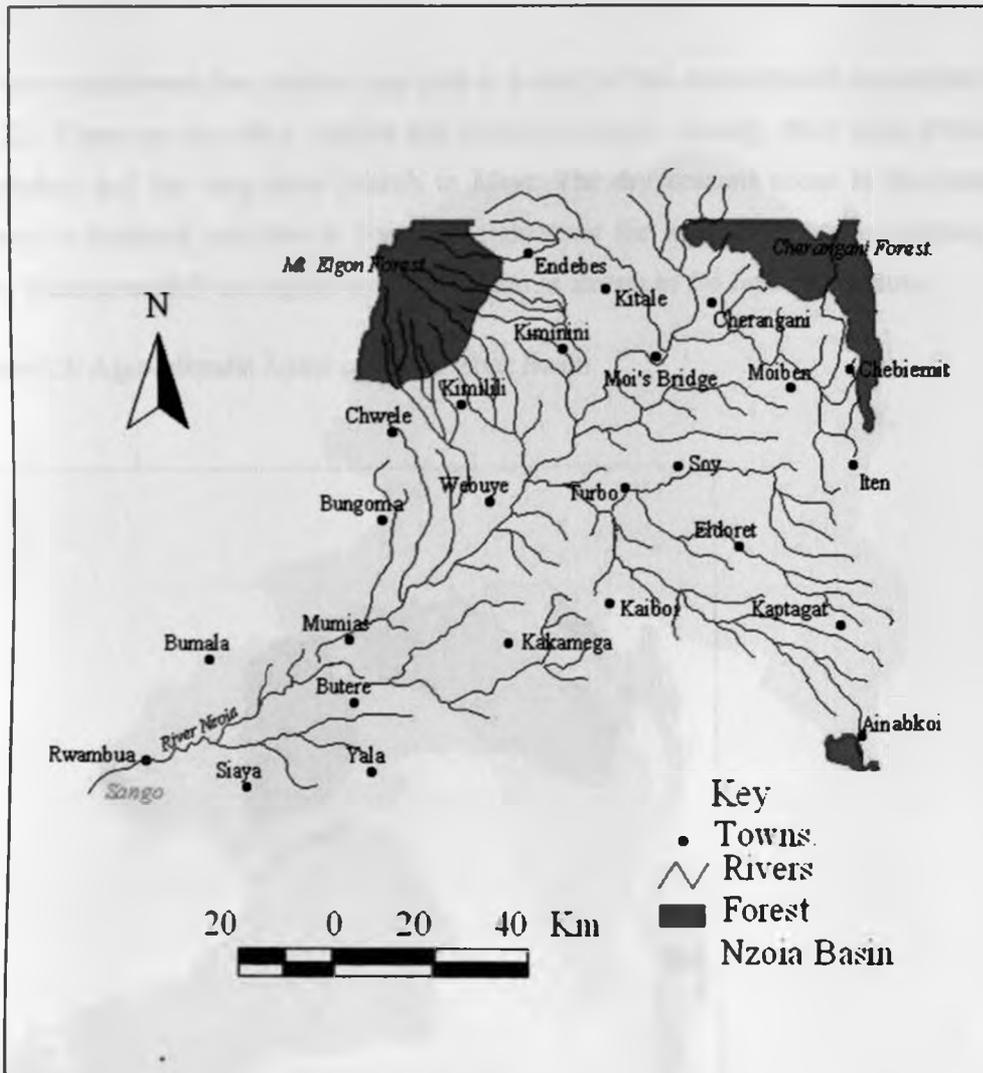
Source: Kenya Soil Survey,2010

Most of the schools in Budalang'i area, as seen in the figure 1.1 above, are situated close to the river banks with some of them located less than one hundred metres from the river banks. However, the extent of flood inundation can even be over two thousand metres from the river banks; hence they are frequently under risks from the problems associated with flooding.

Nzoia River is of international importance as it contributes enormously to the shared waters of Lake Victoria. Its tributaries originate from Cherangani Hills, Mt Elgon, Kakamega forest and the Nandi escapement and drains into Lake Victoria at an altitude of 1000 m a.s.l. It runs approximately South-West and measures about 334 km with a catchment area of about 12,900 km², with a mean annual discharge of 1777 x 106 m³/year.

The major rivers that feed Nzoia river include Koitogos (Sabwani), Moiben, Little Nzoia, Ewaso Rongai, Kibisi, Kipkaren and Kuywa. Other tributaries are Chwele, Khalaba, Lusumu and Viratsi all forming a dendritic drainage pattern. The Basin traverses Marakwet, Keiyo, West Pokot, Trans Nzoia, Uasin Gishu, and Nandi North in Rift Valley region; Lugari, Mt. Elgon, Bungoma, Kakamega, Butere-Mumias, and Busia, in Western region; and Siaya in Nyanza region as shown in the figure 1.2 below.

Figure 1.2: Nzoia River Drainage, Source and major Towns



Source: Kenya Meteorological Department, 2010

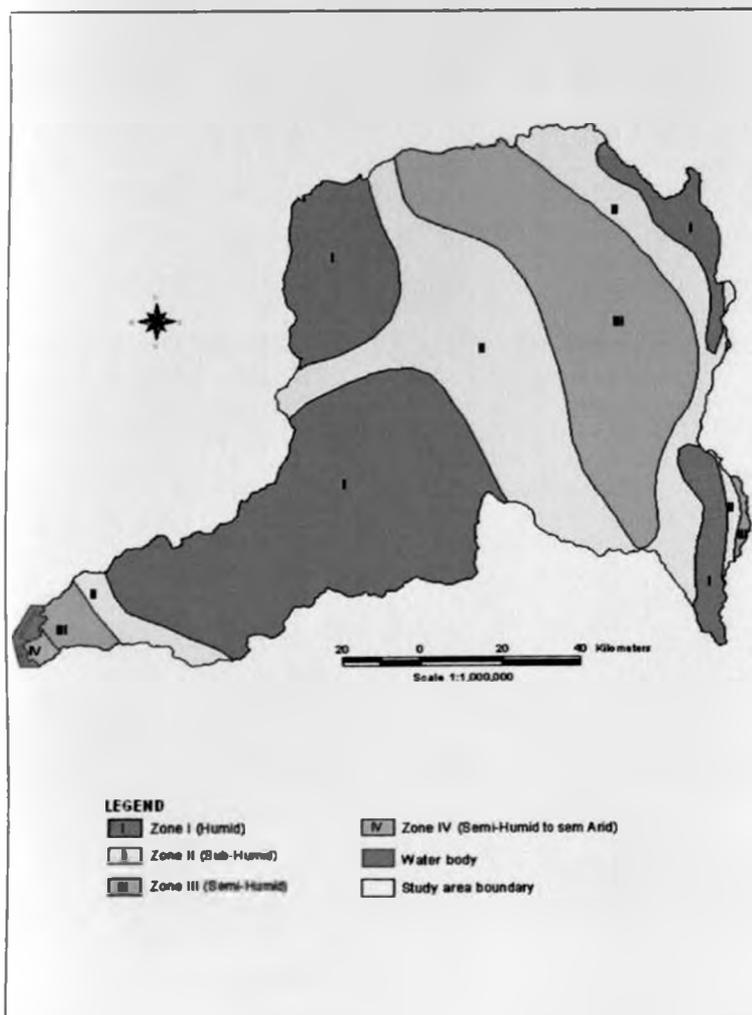
1.9.2: Climate

The climate of the Budalang'i area ranges from semi humid to semi arid, semi humid and sub humid characterized by mean annual temperatures of 20-22°C, mean maximum temperature of 26-28°C, mean minimum temperature of 14-16°C and absolute minimum temperature of 6-8°C. The area is classified as fairly warm in relation to temperature. Average annual rainfall ranges from 600-1100mm in semi humid to semi arid classified areas and 1000-1600mm in sub humid areas. The average annual potential evaporation ranges from 1550-

2200mm in semi-humid to semi arid areas and 1300-2100mm in sub humid areas (Agro-Climatic Zone Map of Kenya, 1980).

The area experiences four seasons in a year as a result of the inter-tropical convergence zone (ITCZ). There are two rainy seasons and two dry seasons, namely, short rains (October to December) and the long rains (March to May). The dry seasons occur in the months of January to February and June to September. However the local relief and influences of the Lake Victoria modify the regular weather pattern as shown in the figure 1.3 below.

Figure 1.3: Agro-climatic Zones of Nzoia River Basin



Source: Kenya soil survey, 2011

1.9.3: Settlement

The entire population of the area is estimated to be 66,723 people (Kenya Census, 2009) and it is concentrated in small pockets mostly along river Nzoia. The flood zone which represents an area along which the river escapes during floods has attracted heavy human settlements and agricultural activities due to the naturally enriched alluvial soils from the silt load that is deposited by the river during flooding over the years. In turn schools have sprung up in the area to cater for the educational needs of the community in the locality as shown in the figure 1.4 below. Flooding of the river Nzoia therefore, severely affects the life sustenance and educational activities of the communities in the flood plain.



Figure 1.4: Map of Budalang'i area showing schools distribution along river Nzoia



Source: Kenya soil Survey, 2011

1.9.4: Topography

The altitude of Budalang'i area ranges between 1100-1300 metres above sea level (3600-4300 feet). The land is generally described as midlands. Most of the land has undulating landscape with nearly a flat terrain of between 1230-1250 metres above the sea level. However, along river Nzoia valley the land lies between 1160-1200 metres above sea level. The area has also a few raised areas of between 1250-1300metres above sea level. When the water level in river Nzoia rises to an extent that it breaks its banks, it is most likely that the larger part of Budalang'i area floods due to the prevailing nature of the land and the soil type which is clay in nature.

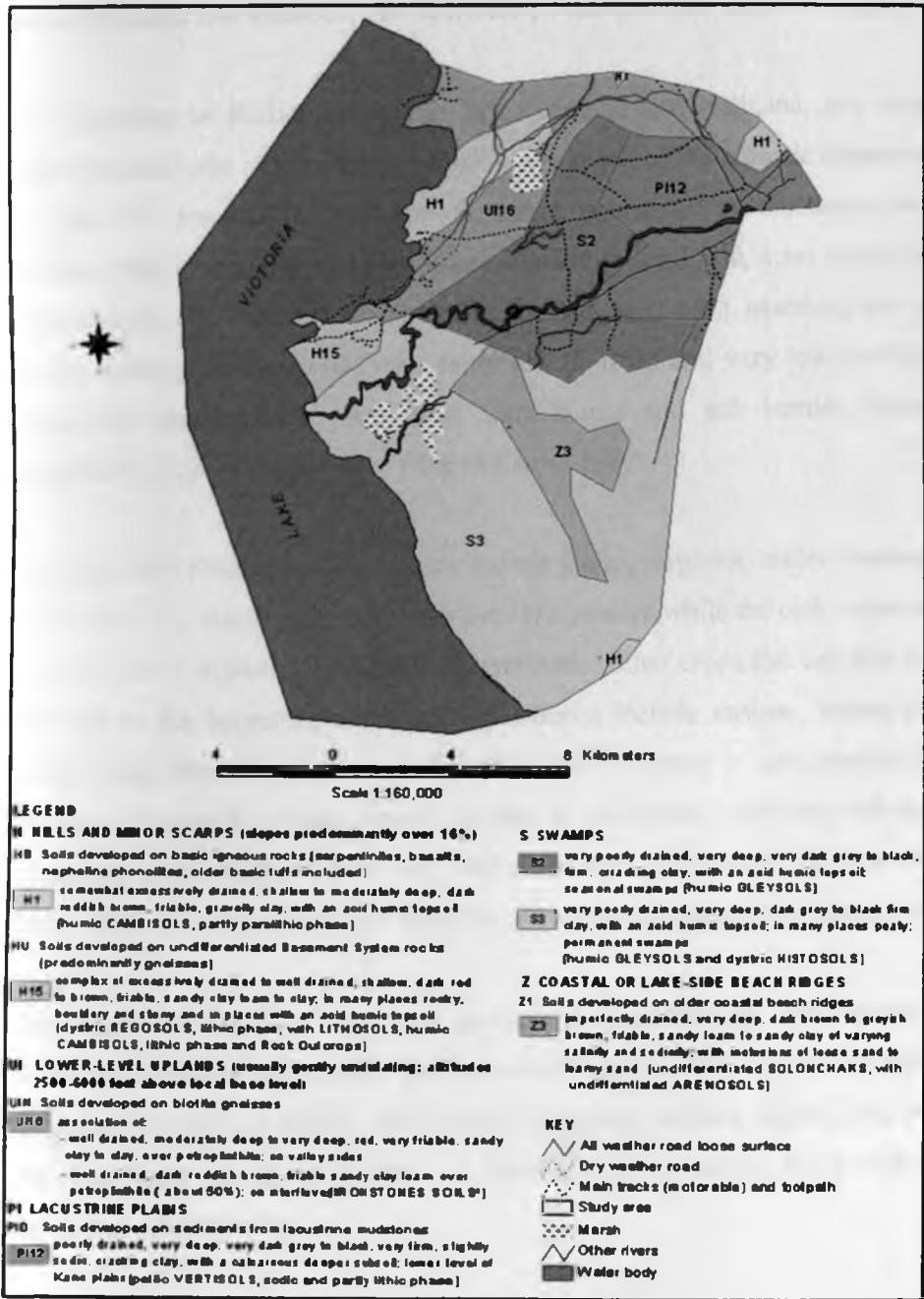
1.9.5: Geology

The geology of Budalang'i area is composed of quartzite, sericite-schist, banded magnetite-quartzite, jaspilite and greenstone-schist. Altered igneous rocks are still under the microscope and some are of definite pyroclastic origin (R. Murray-Hughes 1933). The rocks along Nzoia River and its tributaries are mostly extensive outcrops of medium grained kavirondian greywacke, fine grained argillite and nyanzian epidiorite or metabasalt (L. D. Sanders 1965). These types of rocks results to the development of sandy clay and loamy soils that are found in the area.

1.9.6: Soils

The soils in Budalang'i area comprises of complex of excessively drained to well drained, shallow, dark red to brown, friable, sandy clay loam to clay. Some places are characterised with rocky, boulder and stony, with acid humic topsoil. Majority of the region has very poorly drained, very deep, dark grey to black firm clay, with an acid humic topsoil and in many places peaty. The area has also well drained, moderately deep to very deep, red, very friable, sandy clay to clay, over petroplinthite; on valley sides (as seen in the figure 1.5 below). This has in turn attracted farming activities along the river valleys (Exploratory Soil Map of Kenya 1980). In case of a flood event, water takes longer time stagnating in most of the area because of the clay soils that tend to retain water for a long period.

Figure 1.5: Soils in Budalang'i Area



Source: Kenya Soil Survey, 2011

1.9.7: Land Use

The economy of the region is still largely rural and majority of the population earns its living from agriculture, and livestock. The farms are privately owned and on average 1 – 3 hectares.

The vegetation in Budalang'i area is dry woodland and bushland, dry forest and moist woodland and moist and dry forest, which is as a result of the climatic characteristics and the soil type. The potential for plant growth, assuming that soil conditions are not limiting, are medium, high to medium, and high in semi-humid to semi arid, semi humid and sub humid areas respectively. The risk of failure of an adopted maize crop, assuming that soil conditions are not limiting, are low (10-25%), fairly low (5-10%) and very low (0-1%) in areas that experience semi-humid to semi arid, semi humid and sub humid climatic conditions respectively (Agro-Climatic Zone Map of Kenya, 1980).

The main food crops grown in the area include maize, sorghum, millet, bananas, groundnuts, beans, potatoes, simsim, pineapple, cow peas and cassava while the cash crops consist of sugar cane (as shown in plate 2.1 below), and sunflower. Other crops that can also be grown in the area due to the prevailing climatically conditions include cashew, wheat, pyrethrum, tea, barley, sisal, cocoyam, coconut, and coffee. Dairy farming is also practiced together with traditional livestock keeping. Forests can also be cultivated in the area with Eucalyptus trees of various species likely to grow very well (Exploratory Soil Map of Kenya 1980). However, River Nzoia is the main source of water for domestic and agricultural usage in the area.

The major limitations to maximum production in Budalang'i area include soil fertility, husbandry, drainage and rainfall. The main challenges include soil erosion and sedimentation (as shown in plate 1.2 below), deforestation, *flooding*, wetland degradation, cultivation up to the river banks (as shown in plate 1.1 below), sand harvesting, brick making, and poorly developed infrastructure.

Plate 1.1: Sugarcane cultivated along the river banks photograph



Source: researcher 2011

Plate 1.2: Sand Harvesting in Budalang'i Area photograph



Source: Researcher, 2011

CHAPTER TWO

2.0: Review of the Literature

Introduction

There is convincing evidence that the number and seriousness of disasters are increasing in both developed and developing nations and poor countries and communities are disproportionately affected (DFID, 2004a). Approximately 75% of the world's population lives in areas that have been affected by disasters at least once between 1990 and 2000 and average of 184 people die every day as a result of disasters (IFRC, 2003).

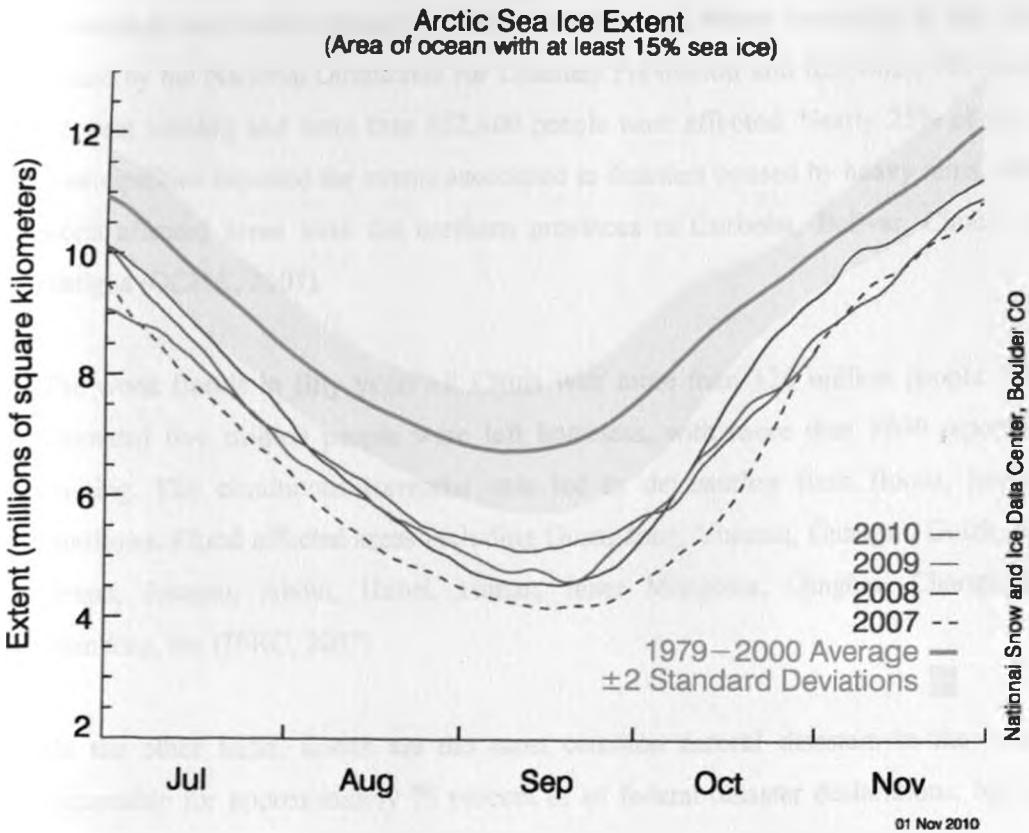
Over the last two decades, more than 1.5 million people have lost their lives due to disastrous events. While only 11% of the world population exposed to natural hazards live in countries with a low Human Development Index (HDI), these countries alone account for 54% of deaths. On the other hand, countries with a high HDI represent only 15% of the world population and account for 1.8% of deaths caused by natural disasters. It is estimated that during the last few decades, an average of 250 million people have been affected each year, with nearly 58,000 deaths and more than \$67 billion in losses as a result of disasters caused by natural hazards. In 1990, 90 million people suffered the impact of disasters, compared to 255 million in 2003. Between 1990 and 2003, a total of 3.4 billion people worldwide suffered the consequences of disasters (DFID 2004a, IFRC 2003).

Precipitation-triggered floods are among the most devastating natural hazards and one of the most prevalent hydro-meteorological disasters in the world. With the increase in precipitation intensity, flood magnitude and frequency may increase in flood-prone regions of the world (IPCC 2007; <http://www.ipcc.ch/>). In addition to other factors, ever increasing settlements in vulnerable areas with increasing population and resource utilization will certainly increase the risks of floods in the near future. Such threat is going to affect the vulnerable nations the most (Li Li et al. 2008).

The fourth assessment report of the Intergovernmental Panel on Climate Change (IPCC) notes that a warmer climate coupled with increased climate variability such as El Niño will

However, it is worth noting that the 10 warmest years on record have all occurred since 1998. The 2000s decade was warmer than the 1990s which was warmer than the 1980s and earlier decades. The first ten months of 2010 tied the same period in 1998 for the warmest combined land and ocean surface temperature on record worldwide, according to the U.S. National Oceanic and Atmospheric Administration and the UK Met Office's Hadley Centre. On 19 September 2010 at the end of the melt season the sea-ice extent was the third smallest on the satellite data record, after 2007 and 2009, as shown in the figure 2.1 below (data of U.S. National Snow and Ice Data Center). Global mean sea level is higher now and is rising more rapidly than at any other time in the past 3 000 years at the pace of approximately 3.4 millimetres per year from 1993 to 2008, according to data published by the WMO cosponsored World Climate Research Programme. This is almost twice the average rate for the twentieth century (WMO, 2010).

Figure 2.1: Arctic Sea Ice Extent



Source: WMO 2010 Report

Global Perspective

Globally, the boreal summer of 2010 witnessed a sequence of devastating extreme events associated with unprecedented impacts in many cases. Over the course of the 2010 monsoon season, Pakistan experienced the worst floods in its history. Heavy rainfall, flash floods and riverine floods combined to create a moving body of water equal in dimension to the land mass of the United Kingdom. The floods affected 84 districts out of a total of 121 districts in Pakistan, and more than 20 million people – one-tenth of Pakistan's population – devastating villages from the Himalayas to the Arabian Sea. More than 1,700 people were killed, and at least 1.8 million homes damaged or destroyed (WMO, 2010).

The devastating floods in Pakistan damaged almost 8,000 schools across the country, according to United Nations estimates. About 5,000 other schools became shelters for the displaced. Children who were not affected by the floods were not able to continue with their education. The UN planned to meet schooling needs by setting up temporary learning facilities in camps, while the government of Sindh province had announced plans to enrol students in cities unaffected by the floods (Khodr, 2010).

Thousands were also affected by floods in Colombia, where according to the official data issued by the National Directorate for Disasters Prevention and Response, 121 persons died, 22 went missing and more than 652,400 people were affected. Nearly 25% of the country's municipalities reported the events associated to disasters caused by heavy rains, although the worst affected areas were the northern provinces of Corboba, Bolivar, Choco, Sucre and Antigua (OCHA, 2007).

The worst floods in fifty years hit China with more than 120 million people affected. An estimated five million people were left homeless, with more than 1000 reported dead or missing. The continuous torrential rain led to devastating flash floods, landslides and mudflows. Flood affected areas including Guangdong, Yunnan, Guangxi, Guizhou, Sichuan, Henan, Jiangsu, Anhui, Hubei, Hunan, Inner Mongolia, Qinghai, Chongqing, Hebei, Shandong, etc (IFRC, 2007)

On the other hand, floods are the most common natural disasters in the U.S. and are responsible for approximately 75 percent of all federal disaster declarations. No area in the

United States is completely free from the threat of floods. Floodplains cover 7 percent (94 million acres) of the U.S. and 15 percent of all urban areas. More than 10 million residential and commercial buildings and 80 percent of the nation's wetlands are located in floodplains. The expansion of urban development into floodplains has greatly exacerbated problems associated with flooding (Floods / Farm Waste Spills, Livestock in Disasters / Unit 11)

On average, more than 300,000 people in the U.S are driven from their homes by floods, 200 flood-related fatalities occur, and \$4 billion in total flood damages are sustained each year. Floods are one of the leading causes of death from natural disasters in the United States. The most common causes of floods are excessive rainfall, snow melt and hurricane storm surges. No area in the United States is completely free from the threat of floods (ibid).

In addition, flooding in the Mekong Delta of Vietnam claimed hundreds of lives, the vast majority being young children. In the year 2000, 400 children died and in 2001, over 300 child deaths were recorded. In 2002, 99 children died-out of a total death of 106 in the Delta (Tinh, 2003). A study coordinated by the save children reported that most death was among children aged less than six years from poor families. Though infants may be at special risk from fast-rising floods and strong currents, many such children died not during the onset of flooding but when flood waters were well established (UNICEF, 2002, Tinh, 2003).

The number of weather-related disasters continues to rise as shown by the statistics provided by the International Federation of Red Crescent and Red Cross Societies in the year 2003, as shown in the table 2.1 below.

Table 2.1: Global trends of disasters

Disasters	Death(Thousands)	% of total	Affected	% of total
Drought/famine	276	44%	734	29%
Floods	94	15%	1,401	56%
Windstorms	61	10%	313	13%
Earthquakes	75	12%	35	1%
All natural disasters	531	85%	2496	100%
Technological Disasters	93	15%	1	0%
Total	624	100%	2497	100%

Source: International Federation of Red Crescent (2003)

The greatest number of immediate deaths in these disasters was attributed to droughts/famines, followed by floods, windstorms and earthquakes. Floods affected more people than any other disaster hazard, though medium and longer-term drought and famine impacts may have been significantly under-reported.

It has been informed that over the past thirty years the frequency and impact of natural disasters has increased and economic damages have tripled. Domesian (1997), the officer at United Nations – International Decade for Natural Disaster Reduction (UN-IDNDR), has noted that:

To get people think in a preventive way, and to see the links between disasters, development and environment, one needs a mind-set that is best developed at an early age. A culture of prevention is something that forms over time. Cultural approaches and paradigms must be taught early and in schools to have real success.

There are various on-going efforts and studies to prevent disasters and to become more disaster resistant population in the world. In 1999 UN campaign focused on assessing the concrete results and achievements of disaster reduction, and promoting “a global culture of prevention for the 21st Century”. It is stated that the past few decades brought with them considerable losses due to natural disasters. Beside the losses of many lives, \$90,000 million economic losses occurred. During the last decade UN campaigns emphasized the topics such as “disaster prevention in schools and hospitals” “vulnerable communities” “women and children-active participants in disaster prevention” “cities at risk” “too much water” “prevention begins with information” “disaster prevention-education and youth” (Ozmen, 2006).

Education is frequently touted as the most important factor for achieving sustainable development and used as an important means for changing attitudes and behaviours. The Hyogo framework for action, which was adopted by 168 nations in January 2005, recognizes this and encourages government and civic society to use education which facilitates knowledge and innovation, in order to build a culture of safety and resilience at all levels of the nation (Nakileza, 2007).

In USA, federal state and local governments have spent millions for repairing and replacing schools after the disasters. Alongside the physical damage, mental and spiritual damage have been seen among the people who have the chance of being rescued. Therefore, many states require specific disaster preparedness activities in the school systems. It is pointed out that there is much by school officials to plan for disasters, to mitigate risk, to protect the safety of students and educators, and to ensure that schools recover quickly. FEMA as a non-profit institution tries to help schools to strengthen themselves against disasters and become more disaster resistant. Through “multi-hazard safety program for schools” a specific plan of action for all schools is imposed. FEMA (2002) recommends that all schools should identify hazards likely happening to their schools, mitigate against the hazards, develop a response plan, including evacuation route, plan for coping after a disaster and implement drills and family education.

Disaster preparedness will not be effective without the participation of the vulnerable communities and related formal or informal institutions. Community participation should emphasize the steps such as contingency planning, community preparedness, task force, response mechanisms, and the like (Newport and Jawahar, 2003).

Continental Perspective

In Africa, between the years 2000 - 2001, about 35 million people, which are equivalent to 13% of the total population in Africa, were affected by disasters. In terms of economic losses, disasters significantly derail development in affected countries. For example, the year 2000 flood in Mozambique lowered the country’s Gross Domestic Product (GDP) by about 12%, and the 1992 drought reduced Zimbabwe’s and Zambia’s GDPs by about 9 per cent. In addition to such large, discrete and high impact, hazards erode the development capacity and livelihoods of the majority of the poor and weaken their coping and survival capacities (UNDP, 2004).

Considering the three major natural disaster categories, hydro meteorological disasters dominate, representing 58%, while biological disasters were 35% and geological events accounted for 4%, while famines accounted for 4 percent of all disasters during the period 1975-2002 as shown in the table 2.2 below.

Table 2.2: Occurrence of disaster by type in Africa 1975-2002

Type of disaster event	Share in total percentages
Epidemic	31.5
Flood	26.7
Drought	20.5
Windstorm	8.8
Insect infestation	3.9
Famine	3.4
Earthquake	2.1
Landslide	1.4
Wildfire	1.3
Volcano	0.8
Extreme temperature	0.6

Source: Computed from the CRED Database (2003)

The flood event alone emerged the second with 26.7% among all the disasters. This shows that in Africa, flood disaster plays a pivotal in shaping peoples' lives and the environment at large as compared to other disasters, hence developing a sense of preparedness and management of flood disaster is paramount.

Furthermore, almost the whole of Africa was affected by flood disasters in the year 2007 as shown in the table 2.3 below (as per 25 September 2007).

Table 2.3: Flood Disasters in Africa, 2007

WEST AFRICA			
Country	Affected	Displaced	Source
Burkina Faso	41,000	28,000	Government.
Cote d'Ivoire	2,000		IRIN
The Gambia	300		IFRC
Ghana	260,000		Government.
Liberia	17,000		UN-Mission In Liberia
Mali	25,200	3,800	Government.
Mauritania	30,000		IFRC
Niger	48,600		Government.
Nigeria	50,000		IRIN
Senegal	3,100		
Sierra Leone	4,500		Save the Children
Togo	111,000	14,300	Government.
CENTRAL AFRICA			
Country	Affected	Displaced	Source
Cameroon	1,500	1,200	IFRC
Central African Republic	25,200	3,800	Government.
Chad	4,700	2,300 (South) 67 households (East)	IFRC
Sudan	550,000	55,000	OCHA
EAST AFRICA			
Country	Affected	Displaced	Source
Eritrea	35,000	130 households	
Ethiopia	226,000	71,000	
Kenya	20,000	832 households	ICRC
Rwanda	2,400		WFP
Uganda	300,000	55,000	OCHA

Source: Various sources via OCHA, 2007

The table above shows that flooding phenomena is part of the disaster that affects the African continent and Kenya is one of the countries that are usually affected by flood disasters. The number of households displaced and people affected are always on the rise as compared to

other countries where the number of people displaced is minimal or does not exist. This may be attributed to the high level of preparedness and management of flood disaster events whenever they occur.

Rwandan media reported thousands of people to have been displaced and 15 killed by flooding and landslides in Western Province. At least 1,000 houses were reported to have been destroyed following heavy rains in the districts of Nyabihu and Rubavu. Reuters also reported hailstorms and landslides in Northern Province, and this put the number of displaced at 1,000. Rubavu shares a border with DR Congo near to Goma, North Kivu, where tens of thousands of people were reported to have been displaced (The New Times, Reuters, OCHA, WFP, 2007)

In Togo, flooding displaced more than 7,000 people and affected many more in the Savanes region of north-eastern, which according to recent UN studies is the country's poorest region with "alarming" rates of acute child malnutrition. Floods are reported to have washed out roads and bridges, completely cutting access to about half of Kpendjal prefecture, which had a population of an estimated 123,000. Other prefectures affected are Oti, Tône and Tandjouaré. (IRIN, All Africa, 6 September 2007).

In Kisangani, the largest city in northern Democratic Republic of Congo, the Tshopo and Congo rivers flooded their banks in late 1997 and early 1998, forcing approximately 10,000 people from their homes. In some villages along the rivers greater than 80 percent of homes were destroyed. The flooding was accompanied by an outbreak of cholera that killed hundreds of people (UNDP Report).

In the year 2000 Mozambique was hit by the worst flood event in 50 years, which caused enormous destruction and losses and left a quarter of the population affected with around 540,000 people displaced and one hundred killed. In the following year, 2001, the country was flooded again in the central region, as well as in 2003 in the northern region (UNDP Report).

National Perspective

In Kenya, floods are emerging as the most prevalent climatic disaster (GoK, 2007; ISDR). Perennial floods affect low-lying regions of the country such as river valleys, swampy areas,

lakeshores and the coastal strip that are unevenly distributed in the country. Geographically, the western, northern, eastern, central and south-eastern parts of the country are quite susceptible to seasonal floods in the wet seasons of March-April- May (MAM) and October-November-December (OND). The Arid and Semi Arid Lands (ASALs) that comprise of 80% of total landmass in Kenya are also prone to floods. This is despite of the fact that ASAL areas such as Garissa and Tana River record an average rainfall of only 300-500mm annually compared to the rainfall received in the Western and Central Highlands that receive an annual rainfall of between 1600-2000mm (WRI et al., 2007)

An estimated 723,000 people were affected by devastating floods in Kenya in November 2006, according to reports from the Relief Web organization. The heavy rains caused rivers to overflow their banks and inundate villages and farmland, produced landslides, and increased the risk of cholera and other diseases that spread when water and sanitation systems were overwhelmed by floods. The United Nations World Food Program estimates that emergency workers had been unable to reach as many 150,000 affected people due to impassable roads (UN-WFP, <http://eol.gsfc.nasa.gov>). The effects of El Nino floods of 1998 hit most parts of the country. According to first national water resources management strategy, the El Nino induced floods of 1997 - 1998 caused some US\$151.4m damage in public property.

Heavy rains experienced during the latter part of 2009 resulted in flooding in the coastal regions of Kenya which continued into January 2010 causing flooding incidences in various parts of the country. Rapid assessments in the affected regions indicated that at least 30 human deaths were reported in various parts of the country, with some 30,000 people in dire need of emergency aid (Kenya Red Cross Society, 2010)

The table 2.4 below shows flooding events in the country, indicating areas affected, inundation levels and the destruction caused.

Table 2.4: Flood Disaster Events in Kenya

Time	Region affected	River that flooded	Inundation levels	Destruction caused
February 2010	North and south rift, western, Nyanza, Kwale, Taita, Taveta and Magharini	R. Nyando	1301.6 acres of farmland submerged in water	8198 household displaced 27 people died ,297 cholera cases reported, 4,543 shoats, 196 cattle, 62 donkeys and 193 camels died 2 schools and health facilities completely destroyed Kenya-Sudan road cut off by flood waters. Boreholes and latrines destroyed Roofs of five classes destroyed in Narok 1991 hectares of farmland washed away
December 2009	Turkana East Turkana Central Turkana South Pokot	R. Nginyang	The Turkana Morulem Scheme 1000 acres of it were flooded.	7,292 households were displaced 9 people drowned in the raging waters. 5 bridges and 20 pit latrines collapsed. 2 schools and 2 health facilities were destroyed 6,734 shelters were destroyed. 4,533 goats, 196 cattle, 60 donkeys and 193 camels drowned. Kenya - Sudan road was cut off
November 2009	Lower tana, Kitale, Rift Valley-sigor, pokot, siaya, migori, Kitui and mandera	R. Tana R. Ewaso nyiro R. Nzoia R. Daua	1,800 acres and 1500 hectares of farmland submerged in water	218,869 people displaced , 5000 people marooned, 5 people drowned 1 die of cholera, 350 treated of diarrhoea. Karagoni bridge destroyed 1 vehicle was swept away 500 homes swept away
March 2008	Taita	R. Lumi		Over 2000 people were displaced Schools were closed and over 400 pupils sent home Churches, chiefs camp and farm land was submerged
Oct-Nov 2007	Tana river	R. Tana		In the district more than 125,000 people were affected of which 80,885 were displaced.
Sept 2007	Western	R. Minu		210 families displaced
February 2007	Athi	R Athi		3 people trapped in a roof of the house 1 person trapped on top of a tree Transport along Nairobi Namanga was paralysed
December 2006	Migori and Nyatike			3,000 people affected, 1130 families displaced Over 320 families marooned, 38 people rescued from floods and 3 people died.
November 2006	Garsen, Mwingi and Garissa	R. Tana R. Enziu and R. Thunguthu	Over 2.5km of the river tana's course submerged	10,410 families are displaced, 1,742 people are marooned and 1 person affected by diarrhoea Areas 20km radius from town center was cut off in tana 3 primary schools closed Destruction of water pumps at the irrigation schemes
October 2006	Moyale and isiolo		300 homesteads submerged	4 people died, 1000 people displaced 5 people spent two nights on trees 50 camels, 50 goats, 14 cattle and 27 donkeys were washed away
November 2005	Taita	R. Lumi		1 person drowned Houses submerged Plantation destroyed
May 2004	Nyando	R. Nyando		50 people died, 7,886 people displaced 21 primary schools severely damaged Destroyed most crops including maize and millet.
January 2001	Rachuonyo area	R. Sondu Minu		2000 people displaced Property destroyed and lost

Source: Compilation from Daily Nation Newspapers Documentary, IFRC Bulletins and GoK and inter agencies Reports (2011)

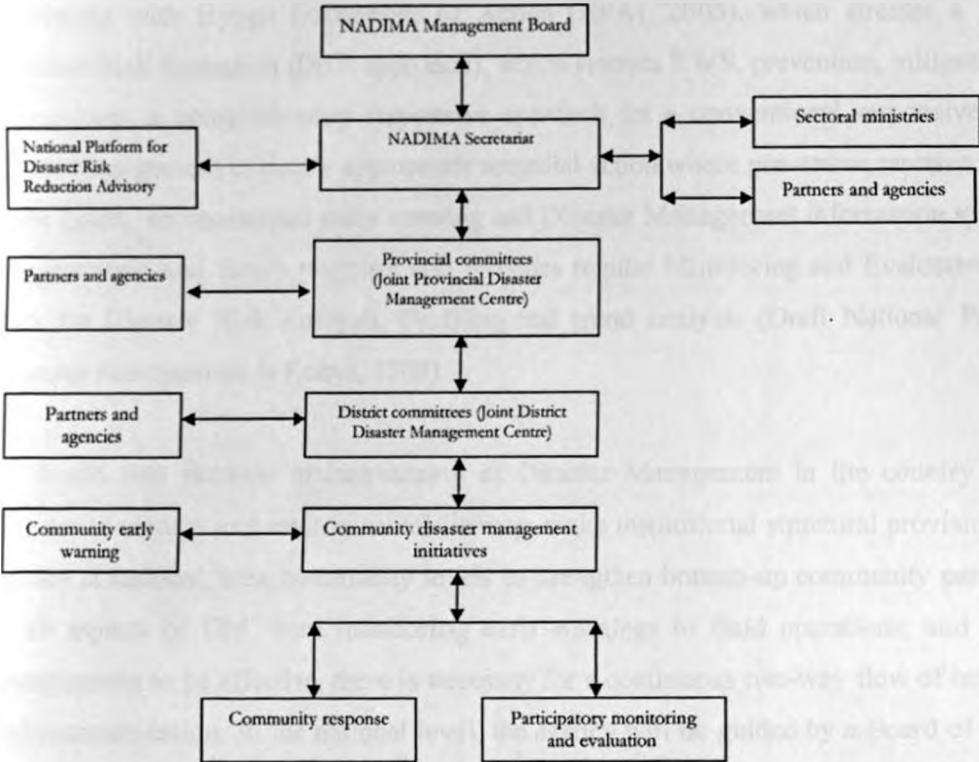
It is evident that almost every year flood disaster events affect different parts of the country, causing flooding of rivers, towns and submergence of houses and farmland. This has eventually resulted to loss of lives, displacement of families, destruction of schools, loss of animal lives and great destruction of property and loss of crops. The damage and loss to the people affected is irreparable and beyond quantifying, ranging from loss of school education to degradation of societal values due to community set up disturbance and loss of community members.

At the moment, Kenya still lacks a comprehensive flood risk management policy and relies on the existing flood risk reduction measures and strategies proposed in the draft National Disaster Management Policy of 2007. The draft revised in 2009 proposes a continuum of measures such as preparedness and prevention with specific strategies such as flood risk vulnerability assessment and mapping an integrated Flood Management (IFM) Projects, and the Strategy for Flood Management in Lake Victoria Basin of 2004. However, there are a number of sector specific pieces of legislation that attempt to provide policy direction on flood management in Kenya. These include; the Water Act, the Environmental Management and Coordination Act (EMCA), the Kenya Red Cross Act, Forest Act, Agriculture Act, Land Act, Kenya Police Act, the Chief's Act among others (GoK, 2004; GoK, 2007; WMO). Under the Chief's Act (Cap.128), power is vested in the Minister to call upon local chiefs to enlist the services of any able-bodied adult to respond to an emergency such as floods (Draft National Policy for Disaster Management in Kenya, Feb 2009).

In 2002, Kenya formulated a National Policy on Disaster Management to institutionalize mechanisms for addressing disasters (GoK, 2004b). The policy emphasises preparedness on the part of the government, communities and other stakeholders in disaster risk reduction activities. It aims to establish and strengthen disaster management institutions, partnerships, networking and mainstreaming of disaster risk reduction in the development process so as to improve the resilience of vulnerable groups to cope with potential disasters. It calls for the establishment of a National Disaster Management Agency (NADIMA) through an Act of Parliament. The policy integrates disaster risk reduction in the national development process—including through the Medium-Term Expenditure Framework, Poverty Reduction Strategy Paper (PRSP), National Development Plan, National Poverty Eradication Plan, Economic Recovery Strategy for Wealth and Employment Creation (ERS) and HIV/ AIDS

Policies. NADIMA is managed by a board, while the National Platform draws its membership from key line ministries, local authorities, non-governmental organizations (NGOs), community-based organizations, development partners, local UN offices and other stakeholders (GoK, 2004b) ((Draft National Policy for Disaster Management in Kenya, Feb 2009) (see Figure 2.2 below).

Figure 2.2: Proposed National Disaster Management Agency institutional frameworks



Source: GoK (2004b, p. 28).

Establishing National Disaster Management Agency (NADIMA) was a step in the right direction for the coordination of disaster reduction. Given the proposed framework, however, the agency is likely to suffer from coordination and role problems by working with government ministries and regions instead of establishing hazard- and catchment-specific coordination centres. Each government ministry budgets independently and their employees are ill prepared for specific disaster reduction strategies. The most appropriate personnel in

the country in disaster reduction are not necessarily found in government ministries (Achoka and Maiyo, 2008).

It is therefore believed that since its establishment, some progress has been made towards establishing and raising the level of preparedness and management of flood disasters in flood prone areas, including schools.

An effective Disaster Management system should include the a definite paradigm shift (in agreement with Hyogo Framework of Action [HFA], 2005), which stresses a proactive Disaster Risk Reduction (DRR approach), which stresses EWS, prevention, mitigation down to recovery, a complementary responsive approach for a conventional responsive Disaster Cycle Management to ensure appropriate remedial action where preventive reactive measures have failed, an operational early warning and Disaster Management information system that triggers rapid and timely response and provides regular Monitoring and Evaluation of base data for Disaster Risk Analysis, Profiling and trend analysis (Draft National Policy For Disaster Management in Kenya, 2009).

It should also promote mainstreaming of Disaster Management in the country to attain disaster awareness and environmental literacy, make institutional structural provisions for an agency at national, area, community levels to strengthen bottom-up community participation in all aspects of DM, from monitoring early warnings to field operations; and for these arrangements to be effective, there is necessity for a continuous two-way flow of information and communication. At the national level, the agency will be guided by a Board of Directors composed of representatives from key ministries and other bodies and disaster Management is to be approached comprehensively at the national level and any other prioritization is at community level where specific disasters affect specific communities (ibid). Proper implementation of the policies and framework set can result to a society that is able handle disasters with minimal impacts.

Regional Perspective

The flooding in Budalang'i area of western Kenya is as old as River Nzioa owing to its location as a low lying with flat terrain, which finds the river in its old stage; hence flooding hazard is unavoidable. However, floods became a real hazard in Budalang'i since 1940s

through 1950s. Flood disaster occurred in 1945, 1948, 1951, 1961 – 1962, 1975, 1977, 1978, 1997 –1998 (El Nino rains), 2001, and 2002 (Mango, 2003). Lately floods have occurred in 2003, 2006, 2007 and 2008.

According to the Kenya Meteorological Department reports, the cause of flooding in Budalang'i is well known. As a matter of fact, the flooding does not occur due to heavy rainfall in the area. Annual rainfall analyses indicate that the amounts of rainfall in the areas alone may not be enough to cause such floods. Massive water in-flows emanating from the catchment of River Nzoia happens to be the main cause of the floods. The River originates from high-ground areas of Mt. Elgon, Cherenganyi hills, Burnt Forest, Kakamega Forest and drains into Lake Victoria. These areas are known to have high rainfall amounts almost throughout the year. They receive average annual rainfall amounts of over 1250 mm while Budalang'i area receives an average of about 1100 mm. The Nzoia River gathers strength as it flows downstream to an extent of bursting as it reaches the Budalang'i areas. (KMD, Ranet Kenya, 2008)

It is worth noting that in the upper catchment area of river Nzoia, the main problem is soil erosion and in Budalang'i, the flooding is due to siltation, which leads to higher water levels. This is especially the case at the river mouth, which prevents water easily evacuating into Lake Victoria, leading to a back flow of flood waters (Maina, Irin News, 18 June, 2010).

However, the existing flood protection embankments or dykes which were constructed between 1975 and 1984 along the lower reaches of the river Nzoia are today failing with increasing frequency. Between 1986 and 1997 no breaches along the embankment were observed. But, between 1997 and October 2008 the embankments have breached in four sections at different times and no longer provide reliable protection to the community. This is because; the existing flood dykes (levees) in the lower reach have now exceeded their design life. Sedimentation in this reach of the river has reduced the discharge capacity of the river channel between the levees, such that the risk of overtopping has increased (Flood Management Component July 2009).

The increased frequency of dyke failure between 1997-84 has resulted in communities within the flood plain increasingly suffering the effects of flooding, resulting in damage to

dwelling, livestock and crops and most importantly risk to human life. Over 70,000 people and their properties are potentially affected by this perennial threat hence the need for redesigning the breached dyke sections and review of other flood mitigation measures (Design report for dyke rehabilitation and reconstruction by J.W.Gaturu-Bunyala area, F.Y 2008-2009)

Disasters occurrence in western region does not discriminate against the teachers and non teaching staff, all are affected equally, they are displaced, their properties destroyed and some even lose their lives. Schools are directly affected because they cannot operate effectively without key human resource pillars. Flood disasters exacerbate factors that cause children to drop out of school. Qualified teachers find it difficult to take up teaching jobs in this regions thus causing perennial shortage of qualified staff. Ultimately, this affects enrolment, quality of education, overall performance of the students and the school. Gains that have so far been registered following the introduction of free primary education in 2003 could be eroded. This situation will result in an increase in wastage as a result of students' dropout and repetition. This could render the country unable to attain the Millennium Development Goals and Education for All (EFA) goals, because disaster-hit families often fail to send children to school (Achoka and Maiyo, 2008).The table 2.5 below shows that Budalang'i area has been affected by flood disasters due to the flooding of river Nzoia that traverses the area.

Table 2.5: Flood Events in Budalang'i Area

Time of flood	Inundation levels (area covered)	Destruction caused
November 2008	19 villages submerged	1029 people displaced 25000 lives at risk 13 die due to landslides
October 2007		28,000 people affected 8,000 people displaced 2,000 people marooned by floods A dyke broke down
November 2006		Approximately 12,500 people displaced One person died A dyke broke down
2003		21,000 people were displaced

Source: Compilation from Daily Nation Documentary, IFRC Bulletin and GoK & Inter agencies Reports (2011)

It is seen that in the year 2007, from the table above, close to half of the population (44%) was affected by the flood disasters, since the population of the area by then was 64,000 people. This means that a greater majority of the population are vulnerable, hence live in great worry and panic because of the flood disaster that its frequency and destructive rate is very high. There is therefore need of a prepared mind to be developed and flood disaster management skills to be nurtured among the community members whose lives are always under constant disturbance by flood events.

In 2007 more than 1000 students in Budalang'i were moved in 3rd term to pursue studies in new institution. From Makunda mixed secondary school, 405 students were moved to St Ann Bunyala Girls, while 536 students from Makunda primary were moved to Mukhobola primary school, others were taken to Mugayo. Pupils of Ligale primary were moved to Kugunga School while others were moved to Musoma. The cost of movement was estimated at 4 million that assisted in acquiring tents which were converted into classrooms. The additional students in the schools compromised sanitation facilities and more mobile toilets were needed (Standard Newspaper, 4th September, 2007).

Floods are accompanied by a wide range of health hazard such as malaria, cholera, typhoid and bilharzias, the situation leads to strain on medical facilities. The situation is usually made worse due to overcrowding in the camps; leading to deaths in camps. Toilet facilities although not common among the Budalang'i people, which exist are submerged by the floods and hand-dug wells at higher grounds collapse thus water becomes a bigger problem (Mango, 2003).

Children are in greater danger in floods, landslides and lightening regions because they fall victim of drowning, starvation and disease. Disasters directly cause disease and damage to health infrastructure, while indirectly lowering disease resistance by heightening poverty and malnutrition. They may also lead women and girls to resort to sex work and risk HIV infection which have long-term devastating effects to the community and nation at large (Anderson, 1985).

The schools are regarded as the hub of community life. The Organisation for Economic Co-operation and Development (OECD, 2004), reports that educational facilities, by their

function, are evenly distributed across their catchment areas and that ideally, they are used by the vast majority of the population at some time in their lives. Therefore, they are well placed as potential refuges in the case of a disaster. At the same time, however, if a disaster occurs, educational buildings are bound to be affected (Ochola, and Olago, 2010). Occupants of schools are young and vulnerable people who need special attention and protection (UNISDR, 2007b).

Education is frequently touted as the most important factor for achieving sustainable development and used as an important means for changing attitudes and behaviours. The Hyogo framework for action, which was adopted by 168 nations in January 2005 recognize this and encourages government and civic society to use education which facilitate knowledge and innovation ,in order to build a culture of safety and resilience at all levels of the nation (Nakileza, 2007).

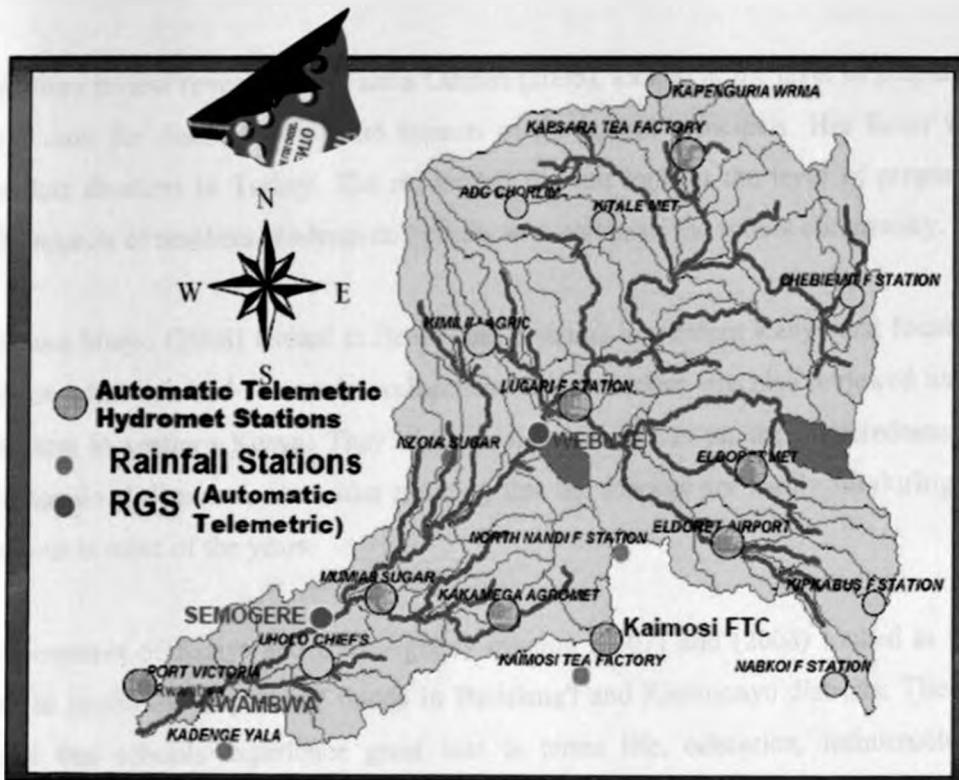
In order to manage flood disaster events in Budalang'i, Kenyan authorities have installed water radar sensors to monitor water levels on River Nzoia in an effort to mitigate flood damage. The river perennially bursts its banks, flooding parts of Budalang'i region in Bunyala area, with devastating results for thousands of people living in the area. The sensors are installed at a bridge, and have a GPRS [general packet radio service] modem that is solar-powered. Just the way you send a text message, you just call the modem like a phone, and get feedback on water levels (Maina, 2010).

The water radar sensors have been installed in the three locations of Webuye, Rwambwa and Sigomere areas in the Nzoia River Basin. They provide alerts about water levels in real-time, helping in disaster preparedness. The eye, underneath the radar sensor, records the water level. When dialed, the modems, which are fitted with subscriber identity module cards, relay data in the form of graphs to the flood management centre and the Kenya Meteorological Department (KMD, 2010).

Rwambwa station is about 30km downstream of Sigomere, as shown in the figure 2.3 below. Water takes about eight hours to reach Rwambwa from Sigomere where the data helps in the prediction of expected water level crests at Rwambwa. Several Hydromet Stations in the Basin record rainfall levels. Rainfall forecast data from the meteorological department is

integrated with water level data to produce models that are circulated to key stakeholders, including government and UN agencies. Initial flood watch bulletins are sent to the Bunyala District Commissioner (DC), who passes the information to the community through a radio with a 25km broadcasting radius. Content is read in the local Kinyala language. For example, if there is a broken dyke, the DC goes on radio to mobilize support to repair it (KMD, 2010).

Figure 2.3: Meteorological Stations



Source: Kenya Meteorological Department, Nairobi.

The Radio and Internet (RANET) programme offers an opportunity for disseminating flood forecasts to vulnerable rural communities in the flood prone areas of Kenya. RANET is an initiative of the African Meteorological Applications for Development (ACMAD), National Hydrological and Meteorological Services (NHMS) in different Countries. The programme was introduced in Kenya by the Kenya Meteorological Department in 2001.

Water levels of river Nzoia is in constant monitoring by Kenya Meteorological department. The information given is essential to school going children and teachers who cross the river when going to school and from school, community members who stay along the river banks, as it helps to know when to evacuate from areas likely to flood and when it is safer to cross over the river channel to avoid drowning and eventual loss of life.

This means that early warnings from the meteorological stations if well relayed to relevant persons and acted upon can result to no loss of life and minimal damage to property.

The literature review revealed that Fatma Ozmen (2006), looked at the level of preparedness of the schools for disasters, from the aspects of the school principals. Her focus was on Earthquakes disasters in Turkey. The researcher did not look at the level of preparedness from the aspects of teachers, students and pupils who comprise the school community.

Achoka and Maiyo (2008) looked at Horrifying disasters in western Kenya and focussed on Impacts on education and National development. Flood disaster was also reviewed as one of the disasters in western Kenya. They did not, however, focus on the preparedness of the schools for flood disasters, even after noticing that the schools are hardly hit during floods that reoccur in most of the years.

The government of Kenya and Inter Agency mission (2007) and (2008) looked at mission Reports to assess the impacts of floods in Budalang'i and Rachuonyo districts. The reports indicated that schools experience great loss in terms life, education, infrastructure and environment, but they have not looked at the aspects of preparedness of schools for flood events that most often reoccur.

Johnson M. Maina, from the Kenya Meteorological Department (KMD), looked at the flood Early warning system for the Nzoia River Basin. During floods, the reports and signals are sent from the KMD, who constantly monitor the river flow, to the community, on river water levels downstream through the District Commissioner. However, he did not investigate if this early warning information reaches the school community in the region.

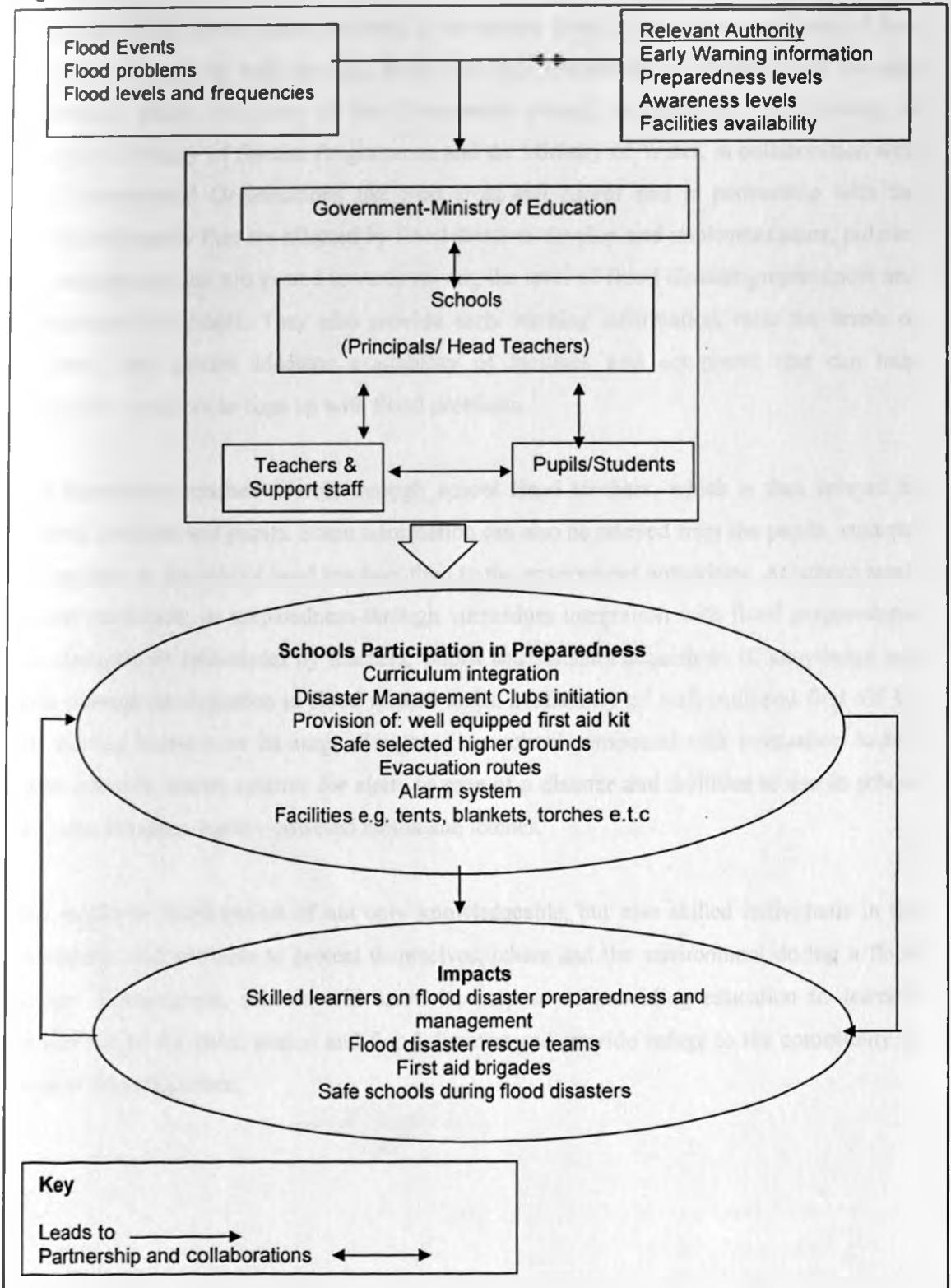
This study therefore sought to find out the level of flood disaster preparedness and management from the perspective of the school principals, teachers, students and pupils in schools that are located along river Nzoia, in Budalang'i area.

2.1: Conceptual Framework

A flood is one of the phenomenon known globally to be causing a lot of damage and destruction to property and loss of life of children, women and even men. Destruction is great where people are found unawares with lack of knowledge and skills on how to respond to flood problems. Schools in the process have been hardly hit by direct destruction from river flooding that results to school buildings and compound submerged in water for a long time or learners who cross the river before getting to school being marooned by flood water for long.

This results to loss of education, infrastructure, learning materials and destruction of the environment and loss of life of school going children. It is because of increase in frequency of loss and destruction caused by floods that the government and non governmental organisations have teamed up globally and nationally to address this problem in schools by empowering learners' knowledge and skills development through partnership with the community. The figure 2.4 below presents the conceptual framework for this study.

Figure 2.4: The Conceptual Framework



Source: Author (2011)

Flood events occur when the water level rises causing inundation to the land adjacent to the streams and rivers. This causes problems to the people living close to the river banks if they are unable to cope up with the high levels and high frequencies of flooding. The relevant Authorities, which comprises of the Government through its ministries e.g Ministry of Education, Ministry of Special Programmes and the Ministry of Water, in collaboration with Non Governmental Organisations like Red cross and Amref and in partnership with the schools community that are affected by flood disasters develop and implement plans, policies and programmes that are geared towards raising the level of flood disaster preparedness and management in schools. They also provide early warning information, raise the levels of awareness and ensure adequate availability of facilities and equipment that can help community members to cope up with flood problems.

This information reaches schools through school Head teachers, which is then relayed to teachers, students and pupils. Some information can also be relayed from the pupils, students and teachers to the school head teachers then to the government authorities. At school level, schools participate in preparedness through curriculum integration with flood preparedness and management techniques by teachers, pupils and students acquisition of knowledge and skills through participation in flood related clubs, availability of well equipped first aid kit and training learners on its usage, designing the school compound with evacuation routes, higher grounds, alarm systems for alerts in case of a disaster and facilities to use in school like tents, blankets, battery powered radios and torches.

This results to development of not only knowledgeable, but also skilled individuals in the community who are able to protect themselves, others and the environment during a flood disaster. Furthermore, schools will serve its purpose of providing education to learners irrespective of the time, season and flood disasters and provide refuge to the community in times of flood disasters.

CHAPTER THREE

3.0: RESEARCH METHODOLOGY

3.1: Introduction

In the research, the views of school principals, teachers, students and pupils were taken by use of a questionnaire, developed by the researcher. The sample of the research comprised of secondary and primary schools in Budalang'i area Busia County, along river Nzoia drainage basin, located two kilometres away from the river banks and prone to flooding that results from the overflow of river Nzoia.

3.2: Research Design

The researcher used a survey research design to find out how schools were prepared for prospective floods occurrence. Descriptive method was used to seek information that describes the existing status of the level of preparedness by asking individuals about their perceptions, attitudes and behaviour in case of a flood disaster using a questionnaire. Exploratory approach on the other hand was used in reviewing the available literature; this helped to provide significant insight into the flooding preparedness aspects. Exploratory research design collected both quantitative and qualitative data to establish the level of preparedness. This survey research design method was chosen because it is the best method that can be used in collecting original data that is also quantifiable.

3.3: Target Population

This study collected data from 245 respondents from primary and secondary schools in Budalang'i area. Among the schools, there were thirteen primary schools and two secondary schools, where the Principals, Teachers, Students (school going children in secondary schools) and Pupils (school going children in primary schools) views on the aspects of flood disaster preparedness and management were taken.

The pupils whose views were considered were from class four to class eight only and students were from form one to form four. All principals, five teachers in each school and at least ten pupils and students were chosen from the population to participate in the study. This

resulted to a total of 15 principals, 75 teachers, 20 students and 135 pupils, summing up to 245 respondents.

3.4: Sample Design

In order to effectively measure the level of preparedness of schools to combat prospective floods, a multi-stage sampling technique was used, where a two stage sampling design was chosen. The first stage was to select primary and secondary schools that are located within approximately two kilometres from the banks of river Nzoia. Fifteen schools were selected in the process, where thirteen schools were primary schools and two were secondary schools. The second stage was used to select respondents from the sub groups of principals (the persons in charge of the school), teachers (trained and qualified persons to give school going children instructions aimed at imparting skills and knowledge bringing meaningful changes to individuals in a school setting), students (school going children in secondary school), and pupils (school going children in primary schools). The subjects were selected in such a way that the existing sub groups in the population were more or less reproduced in a sample.

3.5: Data Collection

This study collected primary and secondary data.

Primary data

The primary data was obtained through administration of questionnaires to the respondents, as well as taking photographs. Four types of questionnaires were prepared and directed to principals, teachers, students and pupils, since they all play different roles and are of different level in terms of academic achievement. The prepared questionnaires had both closed-ended and open-ended questions. Contingency questions were also asked at some instances. The Likert type scale of five, with matrix questions was used for teachers and principals questionnaires.

Secondary data

Secondary data was collected through document reviews of written books from the university library and the internet, ministry of water stores, Kenya meteorological department stores, and from the Nation media documentary.

3.6: Field Visits (Ground Truthing)

Field visits were conducted after coming up with comprehensive information on the study. This was done in order to verify the secondary information gathered during desk study and to distribute the questionnaires to the respondents for filling. This was also to verify the existing evidence on the level of preparedness to floods in schools, e.g. the existence of raised grounds in the school compound for refuge during floods.

3.7: Data Processing and Analysis

3.7.1: Data Processing

At the end of data collection all completed questionnaires were thoroughly examined for completeness, coding and organizing for analysis. Only those found adequate were included in analysis. After data cleaning, Statistical Package for Social Scientists (SPSS) was used as a tool to input data variables. This is because the data collected comprised of both qualitative and quantitative data, hence, it is easy to use and flexible to perform statistical tests using non-parametric techniques like Chi square, which is used to establish relationship between two variables both of which are categorical in nature.

Chi square (χ^2), is calculated as follows:

$$\chi^2 = \sum \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

Where:

O_{ij} =observed frequency of the cell in i th row and j th column

E_{ij} = expected frequency of the cell in i th row and j th column

3.7.2: Data analysis

3.7.2.1: Determining Distribution Tendencies

In determining distribution tendencies in the sample data, various aspects were looked into.

Awareness levels of the Early Warning systems

This study used exploratory technique of frequency distribution table to check awareness levels of the early warning systems from the Kenya Meteorological Department among teachers and principals in Budalang'i area.

Level of preparedness of schools to respond to flood events

To determine the level of preparedness of schools to respond to flood events, the study used exploratory techniques of frequency tables, clustered cylinder, pie charts and radar. The areas investigated were the availability of knowledge on how to respond to flood events and its source, among pupils and students, learning of floods preparedness concepts in class, the subjects they learnt from and the class which they first learnt the concept from. Teachers were also required to show if they teach pupils and students floods preparedness and management concepts.

The study also investigated on the availability of flood management clubs in schools or clubs that impart skills on flood preparedness to pupils and students. It further looked at different levels of preparedness practised in schools to raise the level of awareness among pupils and students.

Existing facilities/techniques in schools to combat flood problems

This study investigated the existing facilities/techniques in schools to combat flood problems, by looking at the availability of trained first aid personnel in schools, well equipped first aid kit, evacuation routes, safe higher grounds, alarm systems for alerts and availability of other equipments in schools, like blankets to use during flood events.

Flood levels and frequencies awareness

The study used exploratory technique to establish teachers and principals' awareness of flood levels and frequencies using a frequency table and cluttered cylinder.

3.7.2.2: Testing for Difference in the Observed Distributions

Cross tabulation of variables was done to determine if there was a relationship between the level of schooling (class) and the absence from school due to floods. The class of the pupils and/or the students, and their responses on absenteeism were used as variables.

The study further carried out cross tabulation to establish the relationship between the safety of the school and the level of learning of the respondent (class).

CHAPTER FOUR

4.0: RESULTS AND DISCUSSION

4.1: Background Information

Preamble

This section presents analysis and findings of the study as set out in the research methodology. The results are presented on the level of preparedness of schools located near the banks of river Nzoia to combat flood problems during flood events. The data was gathered exclusively from questionnaires as the research instrument. The questionnaires were designed in line with the objectives of the study.

Response Rate

The study targeted to collect data from 245 sample respondents with regard to the level of preparedness of schools that are located along the banks of river Nzoia to combat flood problems during flood events. From the study, 191 sample respondents filled in and returned the questionnaires contributing to 78.0%, as shown in the table 4.1 below. This commendable response rate was made a reality after the researcher made personal visits to book appointments with the authorities as well as convincing the respondents on the need to participate in the study by filling-in and returning the questionnaires.

Table 4.1: Response Rate

Respondents	Distributed questionnaires	Used questionnaires	Percentage of used questionnaires
Principals	15	13	86.7%
Teachers	75	39	52.0%
Students	20	16	80.0%
Pupils	135	124	91.9%
Total	245	191	78.0%

Source: Researcher, 2011

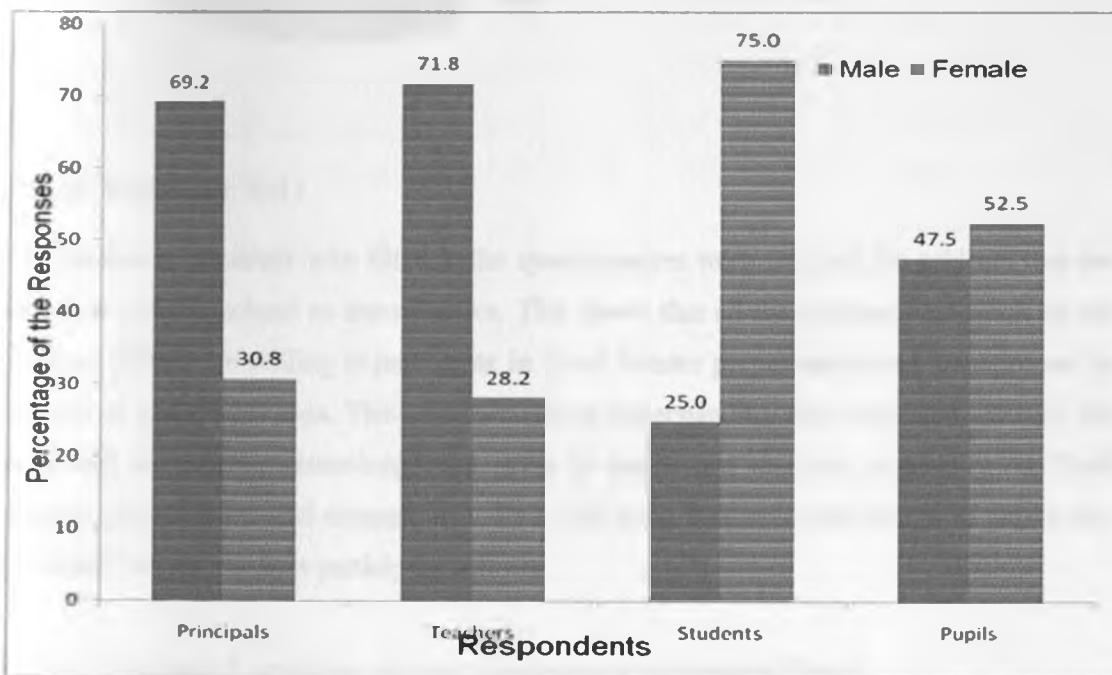
The above rate of response shows that the respondents, especially the principals, students and the pupils, through their participation are more willing to have a society free from flood

disaster disturbances and are willing to cooperate with the relevant authorities to ensure that the level of safety is achieved. The teachers' response however, is lower, showing that they are almost satisfied with the prevailing circumstances, where as the pupils and the students are very much concerned with the flood disaster problems.

Gender of the respondents

On the gender distribution of the respondents, 69.2% of the principals who participated were males, while 30.8% of them were females. Majority of the teacher respondents were males shown by 71.8%, while 28.2% were females. On the contrary, 75% of the students were females while 25% comprised of male students (as shown in the figure 4.1 below. The same trend was observed on pupils where 52.5% of them were girls and 47.5% were boys. In general, 53.4% of the respondents in this study were males while 46.6% were females.

Figure 4.1: Gender of the Respondents



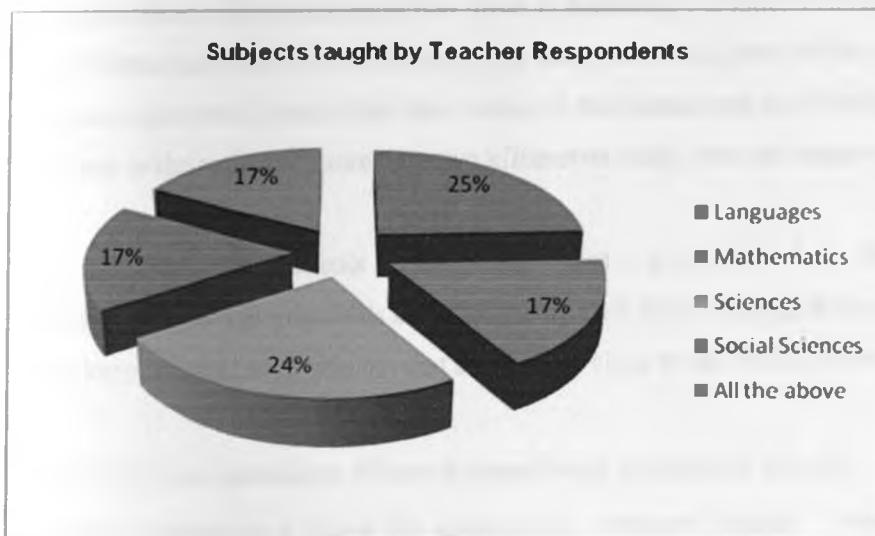
Source: researcher 2011

This shows that both male and female respondents participated in the research fully.

Subject taught by teachers

Among the respondent teachers who were investigated in primary schools, 17.9% indicated that they teach mathematics, 17.9% social sciences, 25.6% sciences, 25.6% languages and 17.9% teach all the subjects mentioned above(see figure 4.2 below).

Figure 4.2: Subjects taught by teacher respondents



Source: Researcher, 2011

The teacher respondents who filled in the questionnaires were from all the subjects that are taught in primary school as shown above. This shows that all the teachers who teach all the subjects offered are willing to participate in flood disaster preparedness and management in schools in Budalang'i area. This is paramount in understanding that motivated teachers are important in instilling knowledge and skills to pupils and students, especially on flood disaster preparedness and management. This will bring a meaningful change to pupils and students if all the teachers participate wilfully.

Knowledge and Locations where respondents witnessed floods

The study investigated knowledge of floods among pupils and students. Majority of the pupils (94%) and all students (100%) know about floods, while 88.7% of the pupils and all students have witnessed floods. On the same note 89.7% of teachers, and 92.3% of principals indicated that floods affect their schools, as shown from the table 4.2 below.

Table 4.2: Knowledge of floods

	Freq	% of Pupils	Freq	% of Students
Knowledge of floods	117	94.0%	16	100.0%
Witnessed Floods	110	88.7%	16	100.0%
		Teachers		Principals
Floods affect schools	35	89.7%	12	92.3%

Source: Researcher 2011

This is therefore a clear indication that flood in Budalang’i locality is a real disaster to school going children and the school community at large. Since majority of the teachers and school principals agree that floods affect their schools, this means that the flooding usually covers a wide area in the region of more than two kilometres away from the banks of river Nzoia.

This also shows that schools in Budalang’i area are not free from flooding and pupils, students, teachers and principals are affected by river Nzoia floods, hence, causing disruption in the learning process in schools that are located close to the banks of river Nzoia in the area.

Administrative locations where respondents witnessed floods

The study investigated where the respondents witnessed floods. Majority of pupils and students had witnessed floods from the eastern location, that is, 43.7% and 43.8% respectively. A quarter (25.3%) of the pupils witnessed floods from the south, 24.1% from central, and 6.9% from Khajula location. Almost a third (31.3%) of the students witnessed floods from the south, 18.6% from central and 6.3 from Khajula location as shown in the table 4.3 below.

Table 4.3: Administrative locations where floods were witnessed

Location	% of Pupils	% of Students
East	43.7%	43.8%
South	25.3%	31.3%
Central	24.1%	18.6%
Khajula	6.9%	6.3%

Source: Researcher, 2011

This shows that the whole area of Budalang’i is affected by floods, although the Eastern division is mostly affected while Khajula division is least affected by floods. This is an

indication that the pupils and students in Budalang'i area are aware of floods caused by river Nzoia when the river breaks its banks.

Effects of floods on education

The study investigated the effect of floods on schooling of pupils and students in terms of absenteeism. Majority (79.0%) of the pupils and students (93.8%) indicated that they have ever been absent from school because of floods during the learning process (see table 4.4 below). In addition, most pupils(72.4%) and majority of the students(93.3%) were absent from school for a period between one week and three months while 27.6% of pupils and 6.7% of students have been absent from school for more than four months at a given time due to floods.

Table 4.4: Absence of pupils and students from school

Absent because of floods	Freq	% of Pupils	Freq	% of Students
Yes	98	79.0%	15	93.8%
No	26	21.0%	1	6.2%
Total	124	100.0%	16	100.0%
Duration of absence from school				
One week to Three months	71	72.4%	14	93.3%
Four months and above	27	27.6%	1	6.7%
Total	98	100.0%	15	100.0%

Source: Researcher, 2011

It thus shows that pupils and students in Budalang'i area are sometimes forced to be absent from school when river Nzoia floods. This causes great loss to teaching and learning process which could be resulting to lack of syllabus coverage among the pupils and students from the area which could be translated to low and or poor performance in National Examinations, where all pupils and students in the country compete together irrespective of the challenges faced during the learning process. Low and or poor performance nationally can eventually lead to school dropout and increase in poverty levels in Budalang'i area.

The study used a Chi-square test, with a significant level at 0.05 to test the hypothesis. If the probability of the computed Chi-square value is less than the level of significance set, then the null hypotheses should be rejected and conclude that the two variables are not

independent of each other and vice versa. The hypotheses, there is no relationship between the level of schooling and the absence from school due to floods, was tested and the study established that there was no significant relationship between being absent from school due to floods and the class of attendance of the pupils. This is because the probability of the computed Chi-square was greater than the level of significance ($p=0.368$). Similarly, there was no significant relationship between being absent from school due to floods and the class of attendance of the student. The probability of the computed Chi-square was greater than the level of significance ($p=0.058$). Hence the null hypothesis cannot be rejected in both cases.

Safety of schools from floods

The study required respondents to indicate whether they perceived their schools being safe from floods. Two thirds (66.1%) of pupils, 81.3% of students, 76.9% of teachers and 92.3% of principals indicated that their schools were not safe from floods, as shown in the table 4.5 below.

Table 4.5: Safety of schools from floods

	Yes		No	
	Frequency	Percent	Frequency	Percent
Pupils	42	33.9%	82	66.1%
Students	3	18.8%	13	81.3%
Teachers	9	23.1%	30	76.9%
Principal	1	7.7%	12	92.3%

Source: Researcher 2011

This indicates that schools have been adversely affected by floods, to an extent that they don't provide any safety to pupils, students, teachers, principals and the community at large. It also means that the pupils, students, teachers and principals awareness levels of the flood early warning system is low, the level of preparedness of schools to combat flood disaster is inadequate and the availability of facilities and techniques in schools to handle flood problems is non-existent. If left to prevail, this pathetic situation will send most pupils, students and teachers either away from schools or away from schooling.

The second hypotheses, there is no relationship between the safety of the school and the level of learning of the respondent, was also tested at a significant level of 0.05 and the study further established that there is no significant relationship between the safety of school due to

floods and the class of attendance of the pupils as the Chi-square value was greater than the significant level of 0.05 ($p=0.160$). Therefore the null hypothesis cannot be rejected.

Explanation for lack of safety in schools

The study sought to find out from the respondents why they perceived their schools not to be safe. A few pupils (11.0%), 38.5% of students, 19.3% of teachers and 25% of principals indicated that their school compound is flat and it has been flooding so often. Also 18.3% of pupils, 53.8% of students, 19.4% of teachers and 75% of principals indicated that schools lack preventive and protective measures. While 2.4% of pupils, 7.7% of students and 6.5% of teachers indicated that their schools are located near the banks of river Nzoia. However, 68.3% of pupils and 54.8% of teachers who mentioned that their schools were not safe did not give reasons to that effect (see table 4.6 below).

Table 4.6: Lack of safety in schools

	% of Pupils	% of Students	% of Teachers	% of Principals
It has been flooding so often since the compound is flat	11.0%	38.5%	19.3%	25%
lack of preventive and protective measures	18.3%	53.8%	19.4%	75%
School is near the banks of river Nzoia	2.4%	7.7%	6.5%	
No explanation given	68.3%	0.0%	54.8%	0.0%

Source: Researcher 2011

This shows that schools in Budalang'i area are located close to the river Nzoia channel where they are usually affected when the river floods and breaks its banks. Moreover, despite of the location, no adequate measures to guarantee school safety by the school authorities and stakeholders have been put in place, making the level of preparedness of schools in Budalang'i are to respond to floods to be low.

4.2: Awareness levels of the Early Warning systems from the relevant authorities

To address objective one, to find out Teachers and principals awareness levels of the early warning system from the relevant authorities, the study investigated if schools receive early warning information on floods from the area authorities, that is District Commissioner (DC), by being aware of the existence of the District Disaster Emergency Committee (DDEC), that

the DC chairs. Majority (92.3%) of the teachers and 66.7% of principals indicated that they are not aware of the existence of the DDEC, as shown from the table 4.7 below.

In the same light, only 2.6% of the teachers who were aware of the DDEC were its members while no school principal was a member of the committee in the area.

Table 4.7: Flood awareness from the area authorities

	Freq	% of Teachers	Freq	% Principals
Not aware of its existence of DDEC	36	92.3%	8	66.7%
Aware of the existence of DDEC	3	7.7%	4	33.3%
Member of district disaster Emergency committee	1	2.6%	0	0.0%

Source: Researcher 2011

Since the majority of the teachers and school principals are not aware of the DDEC, it shows that the school community is not aware of the early warning information which alerts the community on the river levels, the areas likely to be flooded, the extent of flooding and areas that people need to evacuate to. This information is relayed from the Kenya Meteorological Department (KMD), which monitors the river water levels in conjunction with the Ministry of Special programmes, to the District Commissioner who is the chairman of the DDEC, who shall in turn inform the committee members of the warnings received and also announce the same over the Radio to the entire community. Lack of information can result to lose of life of school going children, teachers, principals and the entire school community in schools which flood unexpectedly or on their way from school to their homes or vice versa.

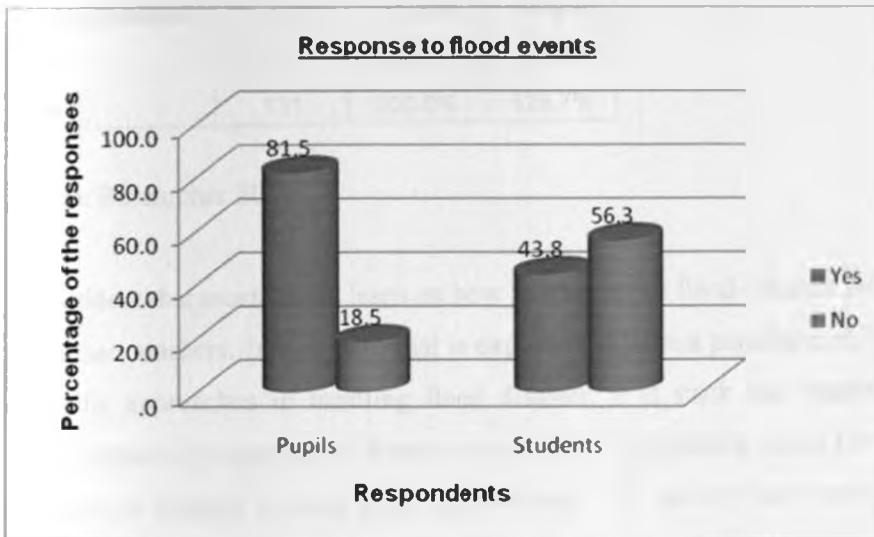
4.3: Level of preparedness of schools to respond to flood events

To address objective two, to determine the level of preparedness of schools to respond to flood events, the following aspects were looked at:

Knowledge on what to do before, during and after a flood event

The respondents were also required to indicate if they know on what to do before, during and after floods. Majority of the pupils (81.5%) indicated that they knew on what to do, while majority (56.3%) of the students indicated that they did not know on what to do before, during and after floods (see figure 4.3 below).

Figure 4.3: knowledge of flood events preparedness



Source: Researcher 2011

Knowledge on what to do before, during and after floods especially by pupils need to be investigated further in terms of specific actions to be taken. It is challenging to believe that pupils know more than students on what to do in a case of a flood disaster. Their knowledge may be traditional, which are not safe enough to be applied in case of a flood disaster. Students' low level response shows they are not well prepared in case of a flood disaster.

Source of the (as stated above) information on flood event preparedness

The respondents were also required to indicate the source of information on what to do before, during and after floods. Majority (35.9%) of the pupils got the information from parents, 29.8% from teachers, 17.6% from friends, 11.5% from the reading material and 5.3% from other sources, as seen from the table 4.8 below.

Table 4.8: source of information on flood event preparedness

	Responses		Percent of Cases
	Frequency	% of Responses	
parents	47	35.9%	46.5%
teachers	39	29.8%	38.6%
friends	23	17.6%	22.8%
reading materials	15	11.5%	14.9%
others	7	5.3%	6.9%
Total	131	100.0%	129.7%

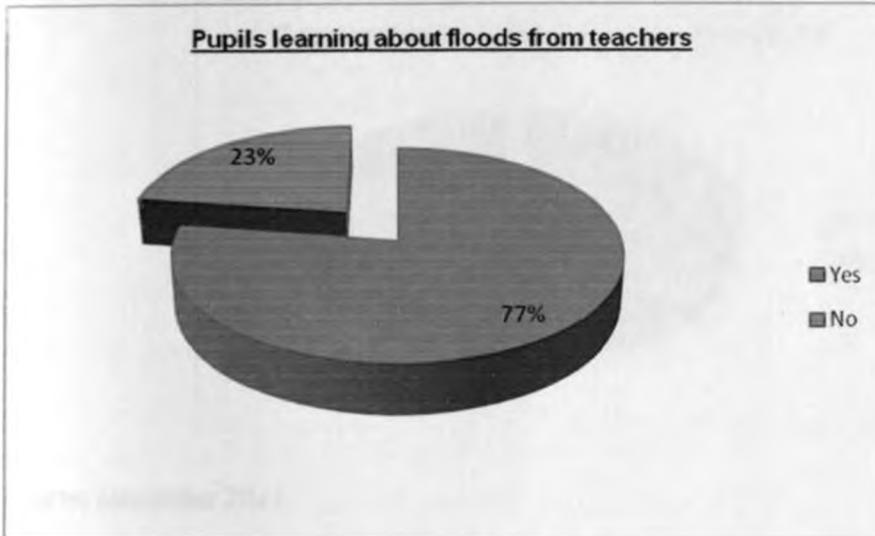
Source: Researcher 2011

It is evident that most pupils learn on how to respond to flood disaster problems from parents more than teachers. In a society that is expected to have a paradigm shift from traditional to scientific approaches in handling flood disaster, it is stack that teachers are not taking a leading role as is expected of them by the society in teaching about flood disaster problems and how to respond to them more appropriately. The society has entrusted their children to teachers to acquire knowledge and skills in school, that is helpful even to community members who have sent them to school and on the contrary parents little initiative of imparting knowledge and skills to their children, though most likely through traditional means, supersedes what teachers are doing in class, where children spent most of their time in life during the learning stage.

Learning about floods from the pupils perspective

The study investigated if pupils are taught about floods by their teachers in class during the learning process. Majority of pupils (77%) indicated that teachers teach about floods, while less than a third (23%) indicated that teachers don't teach about floods (as seen from figure 4.4)

Figure 4.4: Teaching about floods



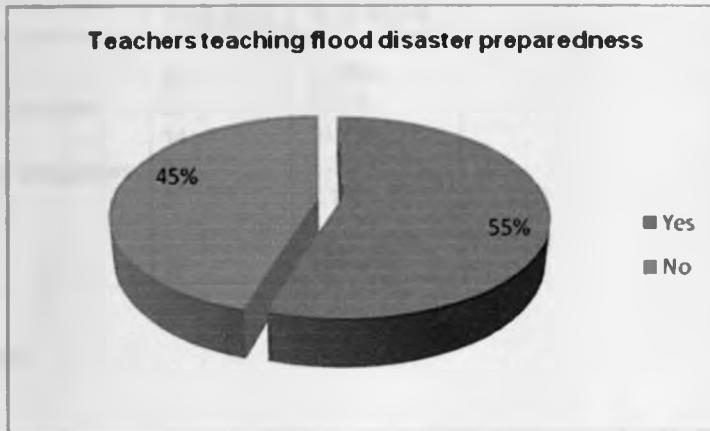
Source: Researcher 2011

Although, majority of the pupils indicated that teachers teach about flood disaster preparedness and management in school, still there is a lot to be done, that pupils and students need to learn, especially modern and scientific methods of responding to flood problems.

Teaching flood disaster preparedness and management from the teachers' perspective

Among the respondents, teachers were required to indicate if they teach about flood disaster preparedness and management in schools. Majority (55.0%) of the teachers indicated that they teach about flood disaster preparedness and management while 45.0% of the teachers don't teach about flood disaster preparedness and management, as seen in the figure 4.5 below.

Figure 4.5: Teaching Flood Disaster Preparedness and Management



Source: researcher 2011

This is clear indication that, pupils knowledge on what to do before, during and after a flood event majorly comes from parents. Teachers, whom the society is dependent upon to impart knowledge and skills to their children is unfortunately not knowledgeable of the task that rests on their shoulders and their roles of transforming and preparing the society towards managing disasters especially in this 21st century where the frequency of disasters is increasingly affecting schools.

Subjects pupils learnt about floods from

The respondents were requested to indicate the subjects that they learnt about floods. Majority (51.6%) of the pupils indicated that they were taught about floods through social studies, 26.3% from social studies and science, 14.7% from science while 5.3% mentioned social studies and languages and 2.1% learnt about floods from English, as seen from the table 4.9 below.

Table 4.9: Subjects pupils learnt about floods

Subjects	Frequency	% of Pupils
Social studies	49	51.6%
Social studies and science	25	26.3%
Science	14	14.7%
Social studies and languages	2	5.3%
English	2	2.1%
Total	92	100.0%

Source: Researcher

Teachers who teach Social Studies as a subject integrate flood preparedness and management concepts mostly in their discipline while those who teach Languages integrate very little in their discipline while teaching, yet the later is taught daily in schools. However, there are no Mathematic teachers who integrate flood disaster concepts in their discipline, yet are teaching the subject that is mostly taught in schools as compared to all other subjects and are rich in statistical data on flood events. This means that not all teachers have taken flood disaster as an emerging issue that needs more focus and attention even in a flood prone area such as Budalang'i.

The subject students learnt about floods first

When students were asked which subjects they were taught about floods first, most of them (43.8%) first learnt about floods from social studies. About a third (31.3%) learnt from science while 18.8% learnt from geography and 6.3% learnt from social studies and science (see table 4.10 below).

Table 4.10: the subject the students first learnt about floods

	Frequency	% of Students	Cumulative Percent
Social studies	7	43.8%	43.8%
Science	5	31.3%	75.0%
Geography	3	18.8%	93.8%
Social studies and science	1	6.3%	100.0%
Total	16	100.0%	

Source: Researcher 2011

It is evident that majority of the students learnt about floods first while in primary school from Social Studies and Science disciplines. Although some of the students learnt about floods while in secondary school from the Geography discipline. However, no student mentioned any Language or Mathematics as a discipline that he/she learnt about floods first.

The class the student learnt about flood first

The study also sought to investigate which class the students first learnt about floods. Majority (56.3%) of the students were taught about floods first in class four, 6.3% in class five, 12.5% in class six, 6.3% in class eight and 18.8% of the students in form one (see table 4.11 below).

Table 4.11: The class the students first learnt about floods

	Frequency	Students %
Class four	9	56.3%
Class five	1	6.3%
Class six	2	12.5%
Class eight	1	6.3%
Form one	3	18.8%
Total	16	100.0%

Source: Researcher 2011

Flood disaster concepts are taught as early as in class four in primary school in Budalang'i area, although a few of the students learnt about it later in secondary school. A society that nurtures a mindset that is prepared to handle flood disaster problems early in life is a prepared society.

Knowledge of a flood management club in schools

The study sought to find out if the respondents have knowledge of a club that deals with flood management in totality. Majority (78.2%) of the pupils and students (56.3%) indicated that they are not aware of it. However, out of 21.8% of pupils who knew about it, 59.3% of them indicated that they have the club in their schools while 43.8% of the students who knew about the club, only 14.3% indicated that they have it in their schools(see table 4.12 below). Further, it is worth noting that 92.3% of the teachers and all the principals indicated that they don't have the club of flood management in their schools.

Table 4.12: Flood management club

	Yes		No	
	Freq	Percent	Freq	Percent
Pupils	27	21.8%	97	78.2%
Students	7	43.8%	9	56.3%
Have the club in school				
Pupils	16	59.3%	11	40.7%
Students	1	14.3%	6	85.7%
Teachers	3	7.7%	36	92.3%
Principals	0	0.0%	13	100.0%

Source: Researcher 2011

Clubs in schools are major avenues where pupils and students are sensitized on specific knowledge and vital skills developed. Lack of a club that deals with floods or disaster in a flood prone like Budalang'i, as indicated by pupils and students, is a vivid proof that schools are not exploiting prime areas which can be used to impart knowledge and skills to pupils and students that they can use in times of need. This ends up developing confounded individuals in a society when a disaster strikes, hence resulting to more damage and irreparable damage.

In addition, lack of principals' awareness of clubs that exist in their schools is evidence that they are not taking up a leading role, by virtue of their position, to sensitize on flood preparedness and management.

Other clubs teaching flood disaster preparedness and management

The study also sought to find out from teachers and principals if there was any other club in school that teaches about flood preparedness and management. Majority (69.2%) of teachers and principals (61.5%) indicated that there is no other club in school that teaches about flood management. However, 2.6% of the teachers mentioned of the health and disaster management club, 10.3% of teachers and 7.7% of principals indicated scouting club, 2.6% of teachers indicated geography, 2.6% life skill and 2.6% social clubs, while 7.7% of teachers and principals indicated environmental club. A few (2.6%) of the teachers indicated flood awareness club while 7.7% and 15.4% of principals indicated mass media and health and scouts respectively, as shown in the table 4.13 below.

Table 4.13: Other clubs teaching flood disaster preparedness and management

	Teachers		Principals	
	Frequency	Percent	Frequency	Percent
None	27	69.2%	8	61.5%
Health and disaster management	1	2.6%		
Scouting	4	10.3%	1	7.7%
Geography	1	2.6%		
Life skills	1	2.6%		
Social	1	2.6%		
Environmental	3	7.7%	1	7.7%
Flood awareness	1	2.6%		
Mass media			1	7.7%
Health and scouts			2	15.4%
Total	39	100.0%	13	100.0%

Source: Researcher 2011

The club that can effectively develop knowledge and skills on flood preparedness and management and develop focussed attention among pupils and students is the environmental club and flood awareness. Other clubs mentioned have their core mandates, hence cannot be instrumental enough to sensitize awareness and develop required skills among the learners.

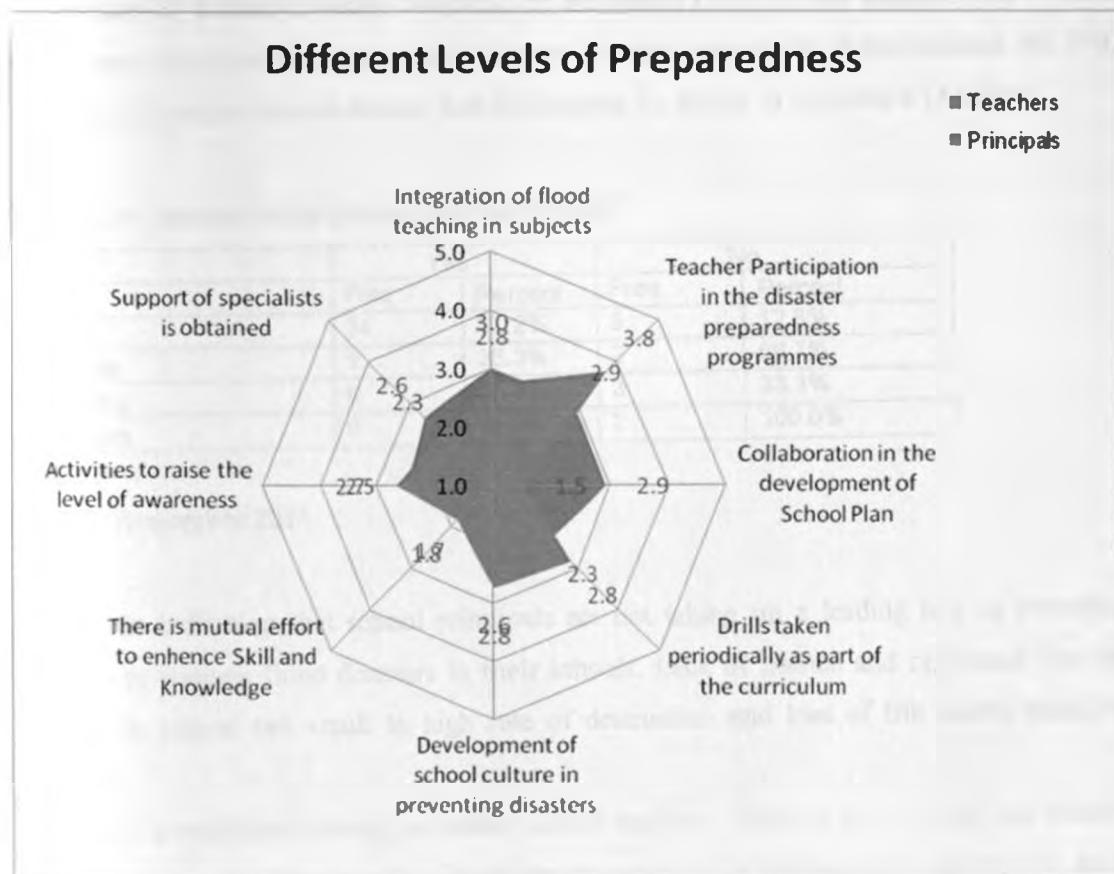
Levels of preparedness

The scale where 1= strongly disagree, 2= disagree, 3= neutral, 4= agree, and 5= strongly agree, was used to test the means (α) of different aspects of the level of preparedness to flood disaster phenomenon.

The respondents were required to indicate if drills related to the actions that should be done during the disasters are taking place periodically as part of school curriculum, teachers ($\alpha=2.3$) and principals ($\alpha=2.8$) disagreed. On development of a conscious, wide-awake school culture for preventing disasters, teachers ($\alpha=2.6$) and principals ($\alpha=2.8$) disagreed. The teachers ($\alpha=1.7$) and principals ($\alpha=1.8$) strongly disagreed that there is mutual effort to enhance the level of the necessary skills and knowledge for everybody at school. When asked if some activities such as workshops, seminar, conferences are being realised to raise the level of awareness for disasters at school and school environment, teachers ($\alpha=2.5$) and principals ($\alpha=2.7$) disagreed.

The respondents were also required to indicate if they benefit from the support and aid of some specialists such as doctor, engineer, electrician, etc to be prepared for the disasters, teachers ($\alpha=2.6$) and principals ($\alpha=2.3$) disagreed. On the aspects where principals ensure integration of flood preparedness and management aspects in the teaching subjects in the curriculum, teachers ($\alpha=3.0$) were neutral, while the principals ($\alpha=2.8$) disagreed. The teachers ($\alpha=2.9$) disagreed, while the principals ($\alpha=3.8$) were neutral when asked if principals ensure the participation of the teachers in the programmes towards the disaster preparedness. moreover, the respondents were asked if the school staff, the members of the school community, and the authorities of the other related institutions work collaboratively in the development of the school plan, teachers ($\alpha=2.9$) disagreed while the principals ($\alpha=1.5$) strongly disagreed as shown in the figure 4.6 below.

Figure 4.6: Different levels of preparedness



Source: Researcher 2011

The distribution of mean(α) values have revealed that the views of the teachers and principals related to different dimensions of disaster preparedness do not significantly differ from each other. However, this indicates that the level of flood disaster preparedness in schools in Budalang'i area is low. In case of a flood disaster, there is bound to be a lot of destruction and loss of property and lives in schools, than they being hubs for safety, refuge, knowledge and skills for saving lives.

4.4: Existing facilities/techniques in schools to combat flood problems

To address objective three, to find out the existing facilities/techniques in schools to combat flood problems, the following aspects were investigated;

Trained and organized first aid brigade

The study sought to investigate if the respondents are trained and organized in giving out first aid in case of a flood disaster. Majority of the pupils (87.2%) and teachers (66.7%) are trained and organized first aid brigade. On the contrary, two thirds of the students (66.7%), and all the principals are not trained first aid brigade, as shown in the table 4.14 below.

Table 4.14: Trained and organised first aid brigade

	Yes		No	
	Freq	Percent	Freq	Percent
Pupils	34	87.2%	5	12.8%
Students	1	33.3%	2	66.7%
Teachers	6	66.7%	3	33.3%
Principals	0	.0.0%	2	100.0%

Source: Researcher 2011

This is an indication that school principals are not taking up a leading role in preparing learners to manage flood disasters in their schools. Lack of trained and organised first aid brigade in school can result to high rate of destruction and loss of life which could be avoided.

The same is replicated among secondary school students, where a few of them are trained. Hence, it shows that primary school teachers are conscious in training pupils on first aid skills than secondary school teachers.

Availability of a well equipped first aid kit

The respondents were also required to indicate the availability of a well equipped first aid kit in their schools to help in times of flood disasters. Majority of the pupils (69.4%), students (81.4%), teachers (79.5%) and principals (84.6%) indicated that their schools lack well equipped first aid kits, as shown in the table 4.15 below.

Table 4.15: Well equipped first aid kit

	Yes		No	
	Frequency	Percent	Frequency	Percent
Pupils	38	30.6%	86	69.4%
Students	3	18.8%	13	81.3%
Teachers	8	20.5%	31	79.5%
Principal	2	15.4%	11	84.6%

Source: Researcher 2011

Lack of well equipped first aid kit in schools explains as to why there are no organised first aid brigades. Despite of the effects of flood disaster such as diarrhoea diseases due to contaminated water, and drowning of school going children in the past, schools are ill prepared or are not prepared at all to handle such eventualities.

Availability of escape/evacuation routes

The respondents were required to indicate if their schools have escape routes to help in times of flood disasters. Majority of the pupils (57.9%) indicated that there are escape routes while on the contrary; majority of the students (68.8%), teachers (59.0%) and principals (53.8%) indicated that there are no escape routes in the school compound to help in times of flood disasters (see the table 4.16 below).

Table 4.16: Escape routes

	Yes		No	
	Freq	Percent	Freq	Percent
Pupils	70	57.9%	50	42.1%
Students	5	31.3%	11	68.8%
Teachers	16	41.0%	23	59.0%
Principals	6	46.2%	7	53.8%

Source: Researcher 2011

The overwhelming response from the pupils indicating that there are escape routes in contrast to the responses of the students, teachers and principals is a likely indication that they don't have a clear understanding of an escape route, especially in times of a flood disaster. However, lack of escape routes, especially in schools situated at the banks of river Nzoia which can break its banks anytime and cause unexpected floods, is an indication that little or nothing at all is being done in schools to guarantee the safety of pupils, students and the entire school community in Budalang'i area.

Availability of Selected Safe areas in the school compound

The study sought to find out if schools have selected safe areas in times of floods. Majority of the pupils (50.8%), students (93.8%), teachers (64.1%) and principals (76.9%) indicated that there are no selected safe areas for convergence in times of flood disasters, as shown in the table 4.17 below.

Table 4.17: selected safe areas in schools

	Yes		No	
	Freq	Percent	Freq	Percent
Pupils	61	49.2%	62	50.8%
Students	1	6.3%	15	93.8%
Teachers	14	35.9%	25	64.1%
Principals	3	23.1%	10	76.9%

Source: Researcher 2011

This shows that schools have been built and developed in areas that are not safe; neither do they have selected safe spots in the school compound. Safe spot areas are raised grounds in the school compound that the school community members can gather in preparation for evacuation.

Number of people in a selected safe area

Among the pupils who indicated that their schools have selected safe areas, close to a third of them (29.0%) indicated that the areas can only accommodate up to fifty people at a time, 46.8% said that the areas can accommodate between fifty one to two hundred people at a given time, while 9.7% of them indicated that the areas can accommodate up to four hundred and 14.5% of the pupils indicated that the available selected safe areas can accommodate above four hundred people (see table 4.18 below).

Table 4.18: The number of people on selected safe areas

	Frequency	% of the pupils
1 to 50	16	29.0%
51-200	20	46.8%
201-400	6	9.7%
401 and above	9	14.5%
Total	51	100.0%

Source: Researcher 2011

Most of the schools have a population of above four hundred people and yet the selected safe areas are below their carrying capacity. This means that the selected safe areas have not been designed to provide safety to the school community during a flood disaster. There is therefore need to design and construct safe selected areas in schools which can be used by the school community whenever it floods.

Availability of Alarm system for alert in school

The study sought to find out the availability of alarm systems in schools to alert students on the incoming danger in case of a flood disaster. Majority of the pupils (90.3%), all students(100%), 89.7% of the teachers and 84.6% of the principals indicated that their schools lack alarm systems to alert them in times of floods which sometimes occur suddenly, as shown in the table 4.19 below.

Table 4.19: Alarm system

	Yes		No	
	Freq	Percent	Freq	Percent
Pupils	12	9.7%	112	90.3%
Students	0	0.0%	16	100.0%
Teachers	4	10.3%	35	89.7%
Principals	2	15.4%	11	84.6%

Source: Researcher 2011

Lack of an alarm system in schools to provide an alert to show that there is danger that needs each and everyone’s immediate attention and which calls for a urgent meeting in a designated place, means that in such cases, little children and sometimes adults who may be far or busy,

may not know what is going on and may lose their lives and even properties when floods are sudden and abrupt. Schools close to the banks of the rivers should be well prepared for such eventualities.

Availability of activities, facilities and equipments

The table 4.20 below shows the responses on the availability of facilities, equipments, techniques and apparatus in schools to assist in flood preparedness and management.

It was noted that majority of the teachers (51.3%) and principals (53.8%) agree that necessary efforts have been devoted for strengthening of the school buildings. Moreover, more than half of the teachers (59.0%) and more than three quarters of the principals (76.9%) disagree that a rescue plan is given to each teacher to be applied during a flood disaster event. Majority of the teachers (46.2%) and principals (69.2%) disagreed that there are school based rescue teams in the frame of urgent rescue plan.

The respondents were also required to indicate if there are supplies such as blanket, battery-powered radio, and tent, to help during disasters in schools. Majority of the teachers (59.0%) and principals (61.5%) disagreed of their availability. Regarding the availability of a special structural design from the ministry of education for building schools in flood prone areas, more than a third of the principals (38.5%) agree that the ministry has provided the design, while 53.8% of them disagree that all schools are built as per the design from the ministry of education. Lastly, majority of the principals (69.2%) disagree that the plans related to the stages of a prospective disaster, that is before, during and after, were developed at the school.

Table 4.20: Facilities/equipment

	% of Teachers			% of Principals		
	Disagree	Neutral	Agree	Disagree	Neutral	Agree
Necessary efforts have been devoted for strengthening of the school buildings.	35.9%	12.8%	51.3%	23.1%	23.1%	53.8%
Rescue plan is given to each teacher to be applied during a disaster.	59.0%	23.1%	17.9%	76.9%	23.1%	0.0%
There are school based rescue teams in the frame of urgent rescue plan.	46.2%	35.9%	17.9%	69.2%	30.8%	0.0%
There are the supplies such as blanket, battery-powered radio, tent and the like at school.	59.0%	23.15%	17.9%	61.5%	23.1%	15.4%
The ministry has provided a special structural design for building schools in flood prone areas.				23.1%	38.5%	38.5%
All schools are built as per the design provided by the ministry of Education.				53.8%	30.8%	15.4%
The plans related to the stages of a prospective disaster were developed at the school.				69.2%	30.8%	0.0%

Source: Researcher 2011

Although the ministry of education is suppose to provide a special design that schools should follow when putting up structures in a flood prone area, it is evident that neither the planned design has been given out nor has it been followed when putting structures. Hence schools are still building structures that can easily be destroyed by the floods as shown in the figure 4.7 below.

Figure 4.7: Newly constructed structure at Lugare primary school



Source: Researcher 2011

It is also evident that schools are ill equipped with facilities and equipments that are mandatory during a flood disaster. For example schools should have battery powered radios for communication, tents, rescue plans and rescue team. This means that schools cannot protect themselves and the community at large in case of a flood disaster crisis and this can lead to great loss of property and loss of life.

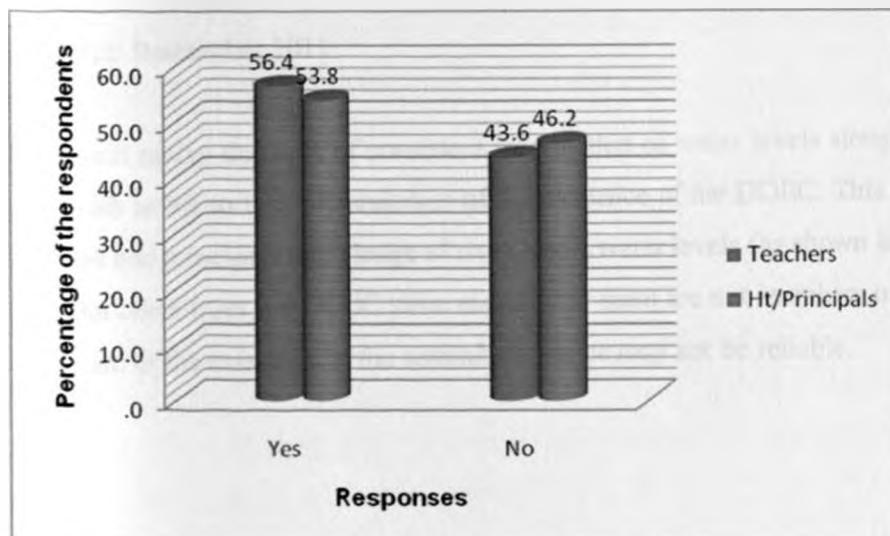
4.5: Flood levels and frequencies awareness

To address objective four, to establish teachers and principals' awareness of flood levels and frequencies, the following aspects were investigated:

Flood level awareness

The study required the respondents to indicate whether they are aware of the flood levels and flood frequencies. Slightly more than a half (56.4%) of teachers and principals (53.8%) indicated that they are aware of the flood levels and frequencies along river Nzoia (see figure 4.8 below).

Figure 4.8: Flood level awareness



Source: Researcher 2011

In the area that is prone to floods like Budalang'i, teachers and principals should be highly aware of the flood levels along the river channels, so that they can sensitize pupils and

students and the entire community in turn on water levels to ensure safety whenever there is river flood, or when crossing the river when travelling home from school. This low level of awareness indicates that pupils, students and the community's flood level awareness might be very low, since teachers form an integral part of the community in influencing its members.

Frequent flood level awareness

Moreover, principals were also required to indicate if they are always informed of water levels along river Nzoia. Only 38.5% of the principals agreed to always have knowledge of the water levels along river Nzoia, while 30.8% of the respondents were neutral and 30.7% disagreed to always have knowledge of water levels along river Nzoia, as seen from the table 4.21 below.

Table 4.21: Frequent flood level awareness

	Frequency	Principals %
Disagree	4	30.7%
Neutral	4	30.8%
Agree	5	38.5%
Total	13	100.0%

Source: Researcher 2011

It is worth noting that lack of consistent information of water levels along river Nzoia by the principals is due to lack of awareness of the existence of the DDEC. This also means that the teachers and principals knowledge of river Nzoia water levels (as shown in section 4.3 above) does not come from the DDEC since majority of them are not members of the committee nor are aware of the existence of the committee, hence may not be reliable.

CHAPTER FIVE

5.0: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1: Summary of Findings

From the results and discussion in chapter four, the study revealed, from the background information, that floods is a disaster in Budalang'i area. This is evidenced by the high knowledge of pupils and students on floods and confirmed by the teachers and principals agreement that floods indeed affect their schools. This is further revealed when majority of pupils and students revealed that they have absent from school because of floods, to a period of up to four months and even beyond.

The study also revealed that the schools in budalangi area do not receive early warning information from the Kenya meteorological department that deals with the monitoring of the river Nzoia water flow levels and issuing of flood early warnings information on areas that are in danger of flooding so that people can evacuate to avoid flood disaster related fatalities. This was revealed by teachers and principals' lack of awareness of district disaster emergency committee which is chaired by the district commissioner, yet the committee is the one responsible in dissemination of early warning information from the Kenya meteorological department to the community members.

Moreover, the level of preparedness and management of flood disasters in Budalang'i area is very low. This is evidenced by most teachers indicating that they don't teach disaster preparedness concepts and further proved by the pupils' responses that their knowledge on how to respond to flood events is majorly from parents other than teachers. This is further supported by lack of floods management clubs or clubs related to floods in schools that are perennially affected by floods. The teachers and principals agreed also that that there are no activities practised in schools to raise the level of awareness.

Lastly, the study revealed that the schools are not prepared to handle flood disaster events. This is indicated by lack of important facilities such as well equipped first aid kit, evacuation routes, raised safe grounds in the school compound, alarm system for alerts during disaster periods and lack of facilities like tents, blankets in schools.

5.2: Conclusions

From the results obtained in Chapter Four, it can be concluded here that, schools in Budalang'i area are not safe from River Nzoia floods which has been causing expansive flooding to its environment. The schools are located near the banks of the river, they are ill prepared in terms of protective equipment and facilities, they are built in flatly levelled ground without raised selected safe grounds, evacuation routes, and school structures are built with no regard to special structural designs that are protective and resistant to floods.

In addition, schools lack development of conscious wide-awake school culture for preventing disasters by the school administration, through integration of flood disaster preparedness and management concepts in the teaching disciplines. For example, mathematics teachers are not sensitizing pupils and students on floods concepts at all. The school administration is not also creating platforms for pupils, students and teachers, such as flood management clubs, for learning protective skills in case of a flood disaster.

The level of flood disaster awareness among students from form one through to form four is higher than pupils from class four through to class eight in Budalang'i area. Majority of students (100%) were knowledgeable about floods as compared to pupils (94%). It also emerged that majority of the students (100%) had witnessed floods as compared to pupils (79%). Moreover, more students (93%) have been absent from school due to floods at a given time compared to pupils (79%) who were also absent from school due to flood disaster. Above all, majority of the students (43.7%) are aware of a club that deals with a flood disaster as compared to pupils (21.8%) who knew about the club.

Schools in Budalang'i area are yet to realise their significant roles in imparting knowledge and skills to pupils and students which can bring meaningful change in the society. This is evidenced by majority of pupils indicating that they learnt from parents rather than from teachers on how to respond to flood disaster events. However, increasing the level of awareness of flood risk in schools, building knowledge among pupils, students, teachers, and the community on flood preparedness and management is an effective way toward reducing the impact of flood disaster.

Information on hazards, mitigation measures and preparedness plans should be shared, both in the classroom and out. The schools can easily play vital roles in helping communities assess and adapt to climate change, tracking trends and balancing the knowledge of elders with new evidence.

5.3: Recommendation

In a country like Kenya, which is exposed to many great disasters almost every year, the level of preparedness for flood disasters should be considerably high.

(i) To Policy Makers

- a) It therefore requires very urgent and effective measures to be taken by the Ministry of Education in training of people by the use of divergent means, which should include training of teachers in disaster preparedness and management in colleges and providing in-service teacher training courses for those already in the service by the ministry of education.
- b) The Ministry of Education should likewise take steps for forming a disaster management centre in each school body and formulation of clubs that deal with specific disasters. In that way, the decisions together with the other related institutions may be made more easily and effectively; the training of the teachers, students, pupils and even families may be obtained; and more healthy relationships with the environment may be developed.
- c) Schools are the most convenient places to develop a disaster resistant culture in the society. To achieve this, there should be training programmes at schools targeting principals, teachers, students, and pupils. These programmes should be generated, implemented, evaluated, and continuously renewed and improved. Principals, who are number one persons for the realization of effective instruction and management of the schools, should be trained for gaining leadership qualities to deal effectively and adequately with the issues on disaster preparedness and management.
- d) There should also be not only integration of some instructional units, but also obligatory courses and subjects towards mitigation of the hazardous effects of floods

in the school curriculum, and provision of facilities such as well equipped first aid kits, alarm system, special plan for building flood resistant buildings, evacuation routes, and raised safe grounds in flood prone schools.

- e) The principals should pay special efforts to create awareness for disasters and build a disaster resistant culture at schools. To achieve this, many activities through theatres and movies may be displayed; workshops, conferences, seminars and meetings may be organized; some contents may be arranged and rearranged and specialised resource persons be invited to create awareness in different areas to pupils, students, teachers and principals.

- f) School head teachers should be mandatory members of the Disaster Emergency Committees in the area, together with teachers who are in charge of clubs that handle flood disasters in schools. This will ensure the flood early warning information from the Kenya Meteorological Department reaches schools on time and pupils, students and teachers are able to ensure safety measures are in place.

(ii) To Future Researchers

Since majority of pupils and students indicated that they have been absent from school for a period up to one term or three months due to floods and even beyond, the loss of education is thus immense, therefore, the effect of absenteeism on education process should be investigated and necessary efforts be put in place to avoid the same in future.

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APPENDIXES

APPENDIX I

Time Schedule/Time Frame

No	Task Name	Start	Finish	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
1	Literature Review	Jul	Dec												
2	Preparation of Data Collection Tools	Jan	Feb												
3	Data Collection	Feb	March												
4	Data Analysis and Interpretation	March	March												
5	Review of Report by the Supervisors	April	April												
6	Project Presentation and Defense	May	May												
7	Incorporation of comments, Reporting and Drafting Final Report.	June	June												

The Study Duration is 12 Months

APPENDIX II

Project Budget

The total cost of the project is estimated as:

Item	Unit	Quantity	Unit Price per day(KShs)	Amount (KShs)
1.0 Data Collection Expenses				
1.1 Enumerator	Staff	6 days	2,000	12,000.00
1.2 Transport				5,000.00
1.3 Internet Services				2,000.00
1.4 Communication (telephone)				2,000.00
2.0 Report Writing Expenses				
2.1 Drafting, production and reproduction of reports				10,000.00
2.2 Communication (telephone)				2,000.00
Sub-Total				33,000.00
Contingency				10,000.00
Total Costs				43,000.00

APPENDIX III

Questionnaires

Serial No: 1

(a) Questionnaires for Pupils

Please tick (✓) in the box below to the right responses

Gender

Boy Girl

1. (a) Do you know what a flood is? Yes No

If yes go to question 1(b), if no, go to question 2,

- (b) Have you ever witnessed it? Yes No

If yes go to question 1(c) below.

- (c) Where did you witness it from
- _____

2. (a) Do you know on what to do before, during and after flood has occurred?

Yes No

If yes, go to question 2(b), if no proceed to question 3.

- (b) Where did you get the above information from? Tick where you got it from?

Parents Teachers Friends Reading Materials Others

3. (a) Have you ever been absent from school because of floods? Yes No

If yes, go to question 2(b), if no proceed to question 4.

- (b) For how long? _____

4. (a) Do teachers teach you on what to do during a flood event? Yes No

If yes, go to question 4(b), if no proceed to question 5.

- (b) From which subject(s)
- _____

5. (a) Do you know of a Flood Management Club? Yes No

If yes, go to question 5(b), if no, proceed to question 6.

- (b) Do you have it in your school? Yes No

6. In case of flood in the school compound, does the school have an escape route which you follow in order to escape? Yes No

7. (a) Is there a safe raised ground in the school compound that water cannot reach where you can run for refuge? Yes No

If yes, proceed to part 7(b) below, if no, go to question 8.

- (b) How many people can be accommodated there at a time? _____

8. (a) Does the school have well equipped first aid kits? Yes No

If yes, go to question 8(b), if no, proceed to question 9.

(b) Are you trained on how to give first aid to any person in need? Yes No

9. (a) Does your school have an alarm system to alert pupils and teachers of any flood danger? Yes No

If yes, go to question 9(b), if no, proceed to question 10.

(b) Is there a point/place where you gather in the school compound for briefs on what is happening after the alarm has been raised? Yes No

10. (a) If flood occurs today in your school, is it a safe place to be? Yes No

If no, explain,

(b) Questionnaires for Students

Please tick (✓) in the box below to the right responses

Gender

Boy Girl

1. (a) Do you know what a flood is? Yes No

If yes, go to question 2(b) below, if no, proceed to question 2.

(b) Have you ever witnessed floods yourself? Yes No

If yes, proceed to part 1(c) below.

(c) Where did you witness it from

2. Does your school have a good action plan that clearly indicates what needs to be done before, during, and after a flood event? Yes No

3. (a) Do you know what to do before, during and after a flood event has occurred?

Yes No

If yes, go to question 3(b), if no, proceed to question 4.

(b) Where did you get the above information from? Tick where you got it from:

Parents, Teachers Friends reading material or others

4. (a) Have you ever been absent from school because of floods? Yes No

If yes, go to question 4(b) if no, proceed to question 5.

(b) For how long were you absent from school because of floods? _____

5. (a) In which class were you first taught about floods?

(b) Which subject(s) were you taught about floods?

6. (a) Do you know of a Flood Management Club? Yes No

If yes, go to question 6(b) below, if no, proceed to question 6(c).

(b) Do you have it in your school? Yes No

(c) Which other club teaches about Flood Disaster preparedness and Management?

7. In case of flood occurrence in the school compound, are there designated evacuation/escape routes in the school compound? Yes No

8. Are there selected safe areas for shelters in the school compound in times of flood?

Yes No

9. Are there raised grounds in the school compound? Yes No

10. (a) Does the school have well equipped first aid kits? Yes No

If yes, go to question 10(b), if no, proceed to question 11.

(b) Are you an organized and trained first aid brigade? Yes No

11. (a) Does your school have an alarm system to alert pupils and teachers of any flood danger? Yes No

If yes, go to question 11 (b), if no, proceed to question 12.

(b) Is there a point/place where you gather in the school compound to know what has happened when the alarm sounds? Yes No

12. Is there a mechanism at school to turn off the gas, electricity, and water automatically in case of floods? Yes No

13. (a) If flood occurs today in your school, is it a safe place to be? Yes No

(b) If no, explain,

(c) Questionnaires for Teachers

Please tick (✓) in the box below to the right responses

Gender

Male Female

Teaching Subjects _____

1. Is flood part of a disaster that affects your school? Yes No
2. In your teaching subject, do you teach pupils/ students about floods preparedness, effects and management? Yes No
3. Are you aware of the water levels along the river Nzoia and its flood frequencies?
 Yes No
4. Does your school have a good action plan that clearly indicates what needs to be done before, during, and after flood? Yes No
5. (a) Does your school have Flood Management Clubs? Yes No
If no, proceed to question 6.
6. Which other club teaches about flood disaster preparedness and management?

7. In case of flood in the school compound, are there designated evacuation/escape routes in the school compound Yes No
8. Are there selected safe areas for shelters in the school compound in times of flood?
 Yes No
9. Are there raised safe grounds in the school compound? Yes No
10. (a) Does the school have well equipped first aid kits? Yes No
If yes, proceed to part 10(b), if no, go to question 11.
(b) Are you a trained first aid brigade? Yes No
11. (a) Does your school have an alarm system to alert pupils and teachers of any danger?
 Yes No
If yes, proceed to question 11(b), if no, go to question 12.
(b) Is there a point/place where you gather in the school compound to know on what is happening and what to do next? Yes No
12. (a) Does your region have District Disaster Emergency Committee (DDEC)?
 Yes No
If yes, proceed to part 12(b), if no, go to question 13.
(b) Is the school a member of the DDEC? Yes No

If yes proceed to part 12(c) below.

(c) Who represents the school in the DDEC? _____

Please tick (✓) the right responses below using the key provided;
1= strongly disagree 2= Disagree 3= Neutral 4=Agree 5= strongly agree

No	Questions	1	2	3	4	5
13.	The Principal ensures the inclusion of some subjects that teach the way of protection towards disasters in the curriculum.					
14.	The principal ensures the participation of the teachers in the programs towards the disaster preparedness.					
15.	The school staff, the members of the school community, and the authorities of the other related institutions work collaboratively in the development of the school plan.					
16.	Necessary efforts have been devoted for strengthening of the school buildings.					
17.	The drills related to the actions that should be done during the disasters are taken place periodically as a part of school curriculum.					
18.	There is a conscious, wide-awake school culture for preventing disasters.					
19.	A rescue plan is given to each teacher to be applied during a disaster.					
20.	There are school based rescue teams in the frame of urgent rescue plan.					
21.	There are the supplies such as blanket, battery-powered radio, tent and the like at school.					
22.	There is not a mutual effort to enhance the level of the necessary skills and knowledge for everybody at school.					
23.	The support and aid of some specialists such as doctor, engineer, electrician, etc. are obtained to be prepared for the disasters.					
24.	Some activities such as workshops, seminars, conferences are being realized to raise the level of awareness for disasters at school and school environment.					

25. If flood occurs today in your school, is it a safe place to be? Yes No
 If no, explain,

(d) Questionnaires for Principal/ Head teacher

Please tick (✓) in the box below to the right responses

Gender

Male Female

1. Is flood part of a disaster that affects your school? Yes No

2. (a) Does your school have Flood Management Clubs? Yes No

If yes, proceed to question 3, if no, go to question 2(b) below.

(b) Which Club teaches about flood disaster management?

3. In case of flood in the school compound, are there designated evacuation/escape routes in the school compound? Yes No

4. Are there selected safe areas for shelters in the school compound in times of flood?
 Yes No

5. Are there raised grounds in the school compound? Yes No

6. (a) Does the school have well equipped first aid kits? Yes No

If yes proceed to part 6(b), if no, go to question 7.

(b) Are you an organized and trained first aid brigade? Yes No

7. (a) Does your school have an alarm system to alert pupils and teachers of any danger?
 Yes No

If yes, proceed to question 7(b), if no, go to question 8.

(b) Is there a point/place where you gather in the school compound to know on what is happening after the alarm has sounded? Yes No

8. (a) Does your region have District Disaster Emergency Committee (DDEC)?
 Yes No

If yes, proceed to part 8(b) below, if no, go to question 9.

(b) Is the school a member of the DDEC? Yes No

If yes, proceed to part 8(c) below.

(c) Who represents the school in the DDEC? Yes No

Please tick (✓) the right responses below using the key provided;
1= Strongly disagree 2= Disagree 3= Neutral 4=Agree 5= Strongly agree

No	Questions	1	2	3	4	5
9.	The Principal ensures the inclusion of some subjects that teach the way of protection towards disasters in the curriculum.					
10.	The school staff, the members of the school community, and the authorities of the other related institutions work collaboratively in the development of the school plan.					
11.	Necessary efforts have been devoted for strengthening of the school buildings.					
12.	The ministry has provided a special structural design for building schools in flood prone areas.					
13.	All schools are built as per the design provided by the ministry of Education.					
14.	The drills related to the actions that should be done during the disasters are taken place periodically as a part of school curriculum					
15.	The Principal ensures the participation of the teachers in the programs towards the disaster preparedness.					
16.	There is a conscious, wide-awake school culture for preventing disasters.					
17.	School personnel and students are not continuously trained on protection, evacuation, and rescue issues.					
18.	A rescue plan is given to each teacher to be applied during a disaster.					
19.	The plans related to the stages of a prospective disaster (before, during and after) were developed at the school.					
20.	There are school based rescue teams in the frame of urgent rescue plan.					
21.	There are the supplies such as blanket, battery-powered radio, tent and the like at school.					
22.	There is not a mutual effort to enhance the level of the necessary skills and knowledge for everybody at school.					
23.	The support and aid of some specialists such as doctor, engineer, electrician, etc. are obtained to be prepared for the disasters.					
24.	Some activities such as workshops, seminars, conferences are being realized to raise the level of awareness for disasters at school and school environment.					
25.	Principals are always aware of the level of water along river Nzoia and the frequencies of floods.					

26. (a) If flood occurs today in your school, is it a safe place to be? Yes No

(b) If no, explain briefly,

APPENDIX IV

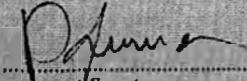
Research Authorization Documents

(a) Research Permit

PAGE 2	PAGE 3
THIS IS TO CERTIFY THAT:	Research Permit No. <u>NCST/RRI/12/1/SS-011/137</u>
Prof. Dr. Mr. Mrs. Miss. <u>JOHN</u>	Date of issue <u>17/02/2011</u>
<u>JUSTO AMBUCHI</u>	Fee received <u>SHS 1,000</u>
of (Address) <u>UNIVERSITY OF NAIROBI</u>	
<u>P.O. BOX 30197, NBI</u>	
has been permitted to conduct research in	
.....Location,	
<u>BUNDALANG' I</u>District,	
<u>WESTERN</u>Province,	
on the topic..... <u>FLOOD DISTATER</u>	
<u>PREPAREDNESS AND MANAGEMENT</u>	
<u>IN SCHOOLS, BUNDALANG' I DISTRICT</u>	
.....	
for a period ending <u>31ST MAY</u>20 <u>11</u>	



Applicant's
Signature


Secretary
National Council for
Science and Technology

(b) Letter of Authorization from the MOE to the Area Authorities

REPUBLIC OF KENYA



NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telegrams: "SCIENCETECH", Nairobi
Telephone: 254-020-241349, 2213102
254-020-310571, 2213123
Fax: 254-020-2213215, 318245, 318249
When replying please quote

P.O. Box 30623-00100
NAIROBI-KENYA
Website: www.ncst.go.ke

Our Ref: **NCST/RRI/12/1/SS-011/137/4**

Date:
17th February 2011

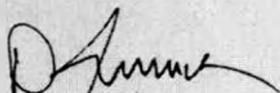
John Justo Ambucchi
University of Nairobi
P. O. Box 30197
NAIROBI

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Flood disaster preparedness and management in schools Budalang'i District*" I am pleased to inform you that you have been authorized to undertake research in Budalang'i District for a period ending *31st May 2011*.

You are advised to report to the **District Commissioner and the District Education Officer, Budalang'i District** before embarking on the research project.

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


P. N. NYAKUNDI
FOR: SECRETARY/CEO

Copy to:

The District Commissioner
Budalang'i District

The District Education Officer
Budalang'i District

(c) Letter to School Authorities from the Area Officers

REPUBLIC OF KENYA



MINISTRY OF EDUCATION

Telephone: 020-268438
Mobile: 0733567210
When replying please quote:

District Education Officer
Bunyala District
P. O. Box 169
PORT VICTORIA

Ref. No.

3rd March, 2011

**TO ALL
THE PRINCIPALS AND HEAD TEACHERS**

**RE: RESEARCH AUTHORIZATION
JOHN JUSTO AMBUCHI**

I hereby authorize the above named student from the University of Nairobi to undertake research in your school for the period ending 31st May, 2011.

Any assistance accorded him will be highly appreciated.

For DISTRICT EDUCATION OFFICER
BUNYALA

**JOHN W. KALIZO
FOR: THE DISTRICT EDUCATION OFFICER
BUNYALA**

中华人民共和国签证申请表

Visa Application Form of the People's Republic of China

申请人必须如实、完整地填写本表格。请逐项在空白处用中文或英文大写字母打印填写，或在□打×选择。如有更多需要声明事项，请附另纸说明。 *Applicant should fill out this form truly and completely. Please type your answer in capital English letters in the space provided or cross the appropriate box to select. If there is more information to declare, please type on a separate sheet.*

如申请到中国工作、留学，或与护照偕行人同行，或不在国籍国申请签证，你还需填写签证申请表附表(Form V.2011B)。 *If you are applying to work or study in China, or if someone else travelling with you shares the same passport, or if you are applying for a visa in a country or territory other than the country of your current nationality, you should fill out the Supplementary Visa Application Form(Form V.2011B).*

一、个人信息 Section 1: Personal information

1.1 英文姓名 Full English name as in passport	姓 Surname:	1.2 性别 Sex	<input type="checkbox"/> 男 M <input type="checkbox"/> 女 F	照片 / Photo 请将 1 张近期正面免冠、浅色背景的彩色护照照片粘贴于此。 Please affix one recent identical color photo (full face, front view, unmounted and against a plain light background).
1.3 中文姓名(如有, 请用汉字) Name in Chinese character (if applicable)	名 Given name:			
1.4 别名或曾用名 Other names you are, or have been known by				
1.5 用本国语言书写的名字 Name in ethnic script				
1.6 现有国籍 Current nationality		1.7 曾有国籍 Former nationality		
1.8 同时具有的国籍 Other nationality(ies)		1.9 出生日期 Date of birth (yyyy-mm-dd)		
1.10 出生地点(国、省/市) Place of birth (city, province/state, country)		1.11 当地身份证号码 Local ID card number		
1.12 婚姻状况 Marital status	<input type="checkbox"/> 已婚 Married <input type="checkbox"/> 未婚 Never Married <input type="checkbox"/> 离婚 Divorced <input type="checkbox"/> 丧偶 Widowed <input type="checkbox"/> 其他(请说明) Other (Please specify):			
1.13 当前职业 (可选多项) Current occupation(s)	<input type="checkbox"/> 商人 Businessman <input type="checkbox"/> 政府官员 Government official <input type="checkbox"/> 公司职员 Company employee <input type="checkbox"/> 新闻从业人员 Staff of media <input type="checkbox"/> 教师 Teacher <input type="checkbox"/> 宗教人士 Religious worker <input type="checkbox"/> 学生 Student <input type="checkbox"/> 现役军人 Active duty military personnel <input type="checkbox"/> 家庭主妇 Housewife <input type="checkbox"/> 退休 Retired <input type="checkbox"/> 无业 Unemployed <input type="checkbox"/> 乘务人员 Crew member <input type="checkbox"/> 国会议员 Member of national parliament <input type="checkbox"/> 其他(请说明) Other (Please specify):			
1.14 护照种类 Passport type	<input type="checkbox"/> 外交 Diplomatic <input type="checkbox"/> 公务、官员 Service or official <input type="checkbox"/> 普通 Ordinary <input type="checkbox"/> 其他证件(请说明) Other (Please specify):			
1.15 护照号码 Passport number		1.16 签发日期 Date of issue (yyyy-mm-dd)		
1.17 签发地点(省/市及国家) Place of issue (city, province/state, country)		1.18 失效日期 Expiration date (yyyy-mm-dd)		
1.19 办理签证通常需要 4 个工作日。如需加急，请注明，但须另外缴费。Normally visa processing takes 4 working days. Extra fees are charged for express or rush service.		<input type="checkbox"/> 普通(4 个工作日) Regular for 4 working days; <input type="checkbox"/> 加急(2-3 个工作日) Express for 2-3 working days; <input type="checkbox"/> 特急 Rush for 1 working day.		

二. 赴美旅行信息 Section 2: Travel information

2.1 赴中国主要事由 (可多选) Major purpose(s) of your visit(s) to China	<input type="checkbox"/> 旅游 Tourism	<input type="checkbox"/> 记者常驻 As resident journalist
	<input type="checkbox"/> 探亲 Family visit	<input type="checkbox"/> 记者临时采访 As journalist for temporary news coverage
<input type="checkbox"/> 访友 Visiting friends	<input type="checkbox"/> 商务 Business trip	<input type="checkbox"/> 常驻外交、领事官员 As resident diplomat or consul
<input type="checkbox"/> 会议 Meeting	<input type="checkbox"/> 过境 Transit	<input type="checkbox"/> 商业演出 Commercial performance
<input type="checkbox"/> 任职就业 Employment	<input type="checkbox"/> 其他(请说明) Other (Please specify):	<input type="checkbox"/> 执行乘务 As crew member
<input type="checkbox"/> 其他(请说明) Other (Please specify):		<input type="checkbox"/> 留学 Study
		<input type="checkbox"/> 官方访问 Official visit

2.2 计划入境次数 Intended number of entries	<input type="checkbox"/> 一次入境(自申请日起3个月内有效) One entry valid for 3 months from application
	<input type="checkbox"/> 二次入境(自申请日起3-6个月内有效) Two entries valid for 3 to 6 months from application
	<input type="checkbox"/> 半年多次入境(自申请日起半年内有效) Multiple entries valid for 6 months from application
	<input type="checkbox"/> 一年多次入境(自申请日起一年内有效) Multiple entries valid for 12 months from application
	<input type="checkbox"/> 其他(请说明) Other (Please specify):

2.3 首次行程抵达中国的日期 Date of your first entry (yyyy-mm-dd)	
--	--

2.4 预计行程中单次在华停留的最长天数 Your longest intended stay among all entries of your intended visits in China	Days
---	------

2.5 在中国逗留期间的住址及电话 (按时间顺序) Residence(s) and phone number(s) during your stay in China (in a time sequence)	详细邮政地址 Detailed mailing address		电话 Phone number
	1.		
	2.		
	3.		
	4.		

2.6 谁将承担往返中国及在中国的旅行及生活费用? Who will pay for your cost of travelling and living during your stay in China?	<input type="checkbox"/> 你本人 Yourself <input type="checkbox"/> 邀请单位或个人 Inviter <input type="checkbox"/> 父母或法定监护人 Parent(s) or legal guardian(s) <input type="checkbox"/> 其他(请说明) Other (Please specify):
---	---

2.7 在华期间有无医疗保险?如有,请填写保险公司名称及保险账号。 Do you have medical insurance covering your visit in China? If 'Yes', please fill out the name of the medical insurance company and your account number.	
---	--

2.8 在华邀请、联系的单位名称、地址及电话 Name, address and phone number of your inviter or contact unit in China	
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2.9 在华亲友、联系人的姓名、地址、电话 Name, address, phone number of your relative, friend or contact person in China	
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三、家庭、工作或学习信息 Section 3: Information about your family, work or study

3.1 详细家庭邮政住址 Detailed home mailing address			
3.2 家庭电话 Home phone number		3.3 手机号码 Mobile phone number	
3.4 电子信箱 Email address			
3.5 工作单位或学校 Current employer or school	名称 Name		
	邮政地址 Mailing address		
	电话 Phone number		
3.6 主要家庭成员 Major family members	姓名 Name	国籍 Nationality	职业 Occupation
17 紧急情况下的联系人 Contact person in case of emergency		3.8 电话号码 Contact person's phone number	

四、其他情况 Section 4: Other information

4.1 是否曾经访问过中国？如果是，请说明最近一次情况。Have you ever visited China before? If 'Yes', please specify date, places and purpose of the recent visit.	
4.2 在过去的 12 个月里是否访问过其他国家或地区。如果是，请说明。Have you ever visited other countries or territories in the last 12 months? If 'yes', please specify date, name of countries or territories and purpose of the visits.	
4.3 是否曾在中国超过签证或居留许可允许的期限停留？ Have you ever overstayed your visa or residence permit in China?	<input type="checkbox"/> 是 Yes <input type="checkbox"/> 否 No
4.4 是否曾经被拒绝颁发中国签证，或被拒绝进入中国？ Have you ever been refused a visa for China, or been refused entry into China?	<input type="checkbox"/> 是 Yes <input type="checkbox"/> 否 No
4.5 是否在中国或其他国家有违法记录？ Do you have any criminal record in China or any other country?	<input type="checkbox"/> 是 Yes <input type="checkbox"/> 否 No
4.6 是否患有以下任何一种疾病 Are you afflicted with any of the following diseases? ① 严重精神疾病 Serious mental disorder ② 传染性肺结核病 Infectious pulmonary tuberculosis ③ 可能对公共卫生造成危害的其他传染病 Other infectious disease of public health hazards	<input type="checkbox"/> 是 Yes <input type="checkbox"/> 否 No
4.7 近 30 日内是否前往过流行性疾病传染的国家或地区？ Did you visit countries or territories infected by infectious diseases in the last 30 days?	<input type="checkbox"/> 是 Yes <input type="checkbox"/> 否 No

4.1 如果对 4.3 到 4.7 的任何一个问题选择“是”，请在下面详细说明。
 If you select Yes to any questions from 4.3 to 4.7, please give details below.

五、有关声明 Section 5: Relevant declaration

5.1 如计划赴中国工作、留学，或使用的护照上有一同旅行的携行人，或是在非国籍国申请签证，请填写签证申请附表(Form V.2011B)，与本表一同递交。If you are seeking to work or study in China, or if someone else travelling with you shares the same passport with you, or if you are making this visa application in a country or territory other than the country of your nationality, please fill out the *Supplementary Visa Application Form (Form V.2011B)* and submit with this application form.

5.2 如果有本表未涉及而需专门陈述的其他与签证申请相关的事项，请在此说明。If you have more information about your visa application other than the above to declare, please give details below.

六、签名 Section 6: Signature

6.1 我已阅读并理解此表所有内容要求，并对照片及填报情况的真实性和准确性负责。I have read and understood all the questions in this application. I shall be fully responsible for the answers and the photo, which are true and correct.
 6.2 我理解，能否获得签证、获得何种签证、入境次数以及有效期、停留期等将由领事官员决定，任何不实、误导或填写不完整均可能导致签证申请被拒绝或被拒绝进入中国。I understand that whether to issue a visa, type of visa, number of entries, validity and duration of each stay will be decided by consular officers, and any false, misleading or incomplete statement may result in the refusal of a visa for or denial of entry into China.

■ 申请人签名

日期

Applicant's signature: Date (yyyy-mm-dd):

注：未满 18 周岁的未成年人可由父母或监护人代签。Note: Parent or guardian may sign on behalf of a minor aged less than 18 years.

七、他人代填申请表时填写以下内容 Section 7: If the application form is completed by another person on the applicant's behalf, please fill out the following:

7.1 代填申请表人的姓名 Name of the person completing this form on the applicant's behalf		7.2 与申请人关系 Relationship to the applicant	
7.3 地址 Address		7.4 电话 Phone number	
7.5 所持身份证件种类 Type of ID document		7.6 证件号码 Number of ID	
7.7 声明 Declaration 我声明本人是根据申请人要求而协助填表，并证明申请人理解并确认表中所填写内容准确无误。 I declare that I have assisted in the completion this form at the request of the applicant and the applicant understands and agrees that the information provided is correct.			
代填人签名 /Signature :		日期/Date (yyyy-mm-dd):	

以下仅供领事官员填写 Official use only

签证种类		有效期		停留期	
审核人		日期		备注	