

**EFFECTS OF FLOODS ON STUDENTS' ACCESS TO SECONDARY
EDUCATION IN NYANDO DISTRICT, KISUMU COUNTY, KENYA**

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DECLARATION

This project is my original work and has not been presented for a degree in any other university.

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DEDICATION

This project is dedicated to my children, Achieng[~] and Adoyo, for their encouragement, support and endurance during the long hours of my absence from them.

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I thank the almighty God for enabling me to undertake and complete this study.

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LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
CDF	Constituencies Development Fund
DRR	Disaster Risk Reduction
EFA	Education for All
FDSE	Free Day Secondary Education
GER	Gross Enrolment Rate
GoK	Government of Kenya
HFA	Hyogo Framework for Action
HIV	Human Immune Virus
INEE	Inter-Agency Network for Education in Emergencies
IRIN	Integrated Regional Information Network
KEMI	Kenya Education Management Institute
MDG	Millennium Development Goal
MOE	Ministry of Education
UPE	Universal Primary Education
UNEP	United Nation Environment Program
UNISDR	United Nations International Strategy for Disaster Reduction
SPSS	Statistical Package for Social Sciences

ABSTRACT

Floods are among the most common and destructive natural hazards. The destruction of schools is one way in which floods can inhibit educational attainment. Education as a human right is universal and inalienable. This right does not disappear or get suspended because of disasters and emergencies. The purpose of the study was to investigate the effects of floods on students' access to secondary education in Nyando District, Kisumu County, Kenya. The research objectives formulated to guide this study are to: establish the effects of floods on students enrolment, attendance, classroom participation and to identify the mitigation measures employed during floods in Nyando District, Kisumu County, Kenya. The study used a research design of 800 students drawn from the randomly selected 11 schools, 120 school teachers, and 11 principals. Questionnaires and observation checklists were used to collect data. Descriptive statistics were used to analyse data. Findings revealed that floods not only close schools, they destroy infrastructure, make roads inaccessible for students and teachers displace families and increase disease outbreak. Families may lose their source of livelihood and be unable to send their children to school. Floods hamper enrolment as parents do not want to endanger the lives of the children so schools prone to floods have a high chance of closing down due to low enrolment. Annually recurring floods regularly prevent millions of children from attending a full year of school. At times the learning resources and materials are washed away or destroyed. Schools may be used as shelters for people who have been displaced from their homes due to the natural disaster. The additional students from flood affected areas leads to hundreds of students to squeeze in to poorly lit rooms usually designed for not more than forty. Every year floods provoke delay to study programmes and damages to schools. Governments are primarily responsible for keeping their people safe by adopting coping mechanisms which include flood forecasting, flood stockpiling digging trenches around their compounds, planting trees and sisal fences to break and reduce the flow of flood waters and to prevent erosion. So there is need for a paradigm shift from reactive to proactive flood management. Therefore it's recommended that schools should engage qualified professionals to assess school buildings, design, construct and maintain school facilities to be resilient in the face of recurrent floods and other weather related disasters. Disaster risk reduction should be integrated in the syllabus. Principals, teachers and students should undergo annual training on disaster risk reduction. The county governments should sensitize the communities on insuring educational institutions. The recommendations for further study are that the study can be replicated in other areas that are affected by floods in the country as well as a study on the effect of floods on early childhood and tertiary education.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The current climatic variability is having a significant influence on the frequency and magnitude of climate related disasters like floods and drought. Floods are among the most common and destructive natural hazards causing extensive damage to infrastructure, public and private services, the environment, the economy and devastation to human settlements (Bakker, 2009). In the past decade there was catastrophic flood in Bangladesh, China, India, Germany, United States, Malawi, Ethiopia, Nigeria, among other nations. Recurring flood losses have handicapped the economic development of both developed and developing countries and are the leading hydro-meteorological disasters in East Africa.

Floods are a problem when the magnitude and impacts of their occurrence exceeds the ability of affected communities to cope or they become a disaster when an event leads to a serious disruption of the functioning of a community or society causing widespread human, material, economic and or environmental losses, which exceed the ability of the affected society to cope using their own resources (United Nations International Strategy, 2008). In Sub-Saharan Africa, flood impacts are felt across various sectors of the economy, including education, agriculture, livestock, transport, housing, public health, industrial processing, and

tourism. The impacts have severe socio-economic and political implications. Disasters affect not only individuals, but can also tear the fabric of social life in larger communities, even whole countries (Dida, Gicher, Olado, Anyona, Matano & Ofulla, 2013). Flooding is the most common of all environmental hazards and it regularly claims over 20,000 lives per year and adversely affects around 75 million people. Flooding is one of the major factors that prevent Africa's growing population from escaping poverty (Matiki, 2005).

The prevalence rate of floods in Kenya stands at 27 percent and affects 5 percent of the population affected by disasters. Floods related fatalities constitute over 60 percent of disaster victims in Kenya (United Nations Environmental Programme, 2010). In Kenya, these hazards have increased in number, frequency and complexity. The level of destruction has also become more severe with more deaths of people and animals, loss of livelihoods, destruction of infrastructure among other effects resulting in losses of varying magnitude.

Education as a human right is universal and inalienable and is especially important in enabling people to reach their full potential and exercise other rights. This right does not disappear or get suspended because of disasters and emergencies (Republic of Kenya, 2012). When education is interrupted or limited, students drop out, with negative and permanent economic and social impacts for students, their families, and their communities. (Matiki, 2005) further observes that flooding has a negative impact on school attendance because school

children cannot cross flooded rivers. Floods also result in the destruction of water and sanitation infrastructure. This has negative impacts on schools as a result of coming into contact with contaminated water that increases the prevalence of water-related diseases and this leads to chronic absenteeism which hampers learning.

In emergency situation through recovery quality education provides physical psychosocial and cognitive protection that can ensure dignity, sustain and save lives (Inter-Agency Network for Education in Emergencies, 2012). In Kenya, the secondary school net enrolment rate was approximately 50 per cent. Annually recurring floods regularly prevent millions of children from attending a full year of school (United Nations Children's Fund, 2011).

In the Sessional Paper No. 1 of 2005, the government of Kenya focuses on promotion of access, equity, relevance and quality of education and the policy framework aims at achieving Education For All by 2015, ensuring the right of children to basic education as underscored in the Children Act 2001 (Republic of Kenya, 2001), increasing access, equity and relevance of education, and delivering quality services efficiently and effectively at all times and at all levels (United Nations Children's Fund, 2011).

Education is frequently touted as the most important factor for achieving sustainable development and used as an important means for changing attitudes and behaviour. The Hyogo Framework for Action recognises this and encourages

governments and civil 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 (Turnbull & Street, 2013).

The destruction of schools is one way in which floods can inhibit educational attainment. Thus protecting students and schools during natural hazards is paramount in the 21st Century (Achoka & Maiyo, 2008). Kenya experiences a number of natural hazards, the most common being weather related, including floods, droughts, landslides mudslides, lightning/thunderstorms, wild fires, and strong winds (United Nations International Strategy for Disaster Reduction, 2008). In the recent past, these hazards have increased in number, frequency and complexity.

When floods occur in less developed nations like Kenya, they can effectively wipe out decades of investments in infrastructure, seriously cripple economic prosperity, and result in thousands of deaths and epidemics. The majority of these deaths can be found within the most vulnerable members of society (Achoka & Maiyo, 2008). In Kenya floods affect Nairobi, Turkana East, Tana Delta, Naivasha, Narok, Kajiado, Rongai, Wajir, Marsabit and parts of western Kenya. Typically, multiple actions must be taken to proactively manage the floods. A multiple mitigation approach would consider measures such as preventing or restricting new or inappropriate development or activities in the flood plain; removal of certain structures from the floodway; flood-proofing of structures in

the flood plain; introduction of structural measures such as levees, dams and constructed channels; controlling land use practices within the basin; and applying flood forecasting and warning systems linked with response mechanisms (Petry, 2008). There is seldom a single approach to reduce and manage risk, but rather an array of measures that run from the development and enforcement of policies to the construction of works to the development of the forecasts, warnings, and response programme (United Nations, 2008).

In Kenya, by April 2013, there were 33 deaths and 53,000 families displaced by floods, land and mudslides (Kenya Red Cross Society, 2013). Nyando district was not spared as in both January and May some schools did not open with others due to floods, hence shortening school terms.

1.2 Statement of the Problem

Floods have led many schools to be closed, students drop out, properties destroyed, infrastructure damaged and formal learning temporarily stops (Achoka & Maiyo, 2008). Education in emergencies is a necessity that can be both life sustaining and life saving, providing physical, psychological and cognitive protection (Richardson, 2011). This is why this study seeks to examine effects of floods on access to secondary school education in Nyando district, Kisumu County, Kenya. Nyando district has 28 public secondary schools and every year at least 25% of them are affected by floods as indicated in table below (District education office Nyando, 2013).

**Table 1: Number of public secondary schools affected by floods in Nyando
(Out of 28 public secondary Schools)**

Year	January	May
2009	3	5
2010	3	6
2011	3	4
2012	4	5
2013	4	6

Source: District education office Nyando (2013)

Floods disrupt people's lives through displacements, destruction of livelihoods and property, deaths and injuries as well as increase disease outbreak. When floods occur schools are either closed, marooned or partially submerged in flood waters and this makes the roads bridges and footpaths impassable for students and teachers. Accessing the schools become almost impossible as both teachers and learners have challenges wading through the flood waters. The school may be abandoned for some time as learners and teachers are forced to transfer for safety

to other schools or drop out completely due to inaccessible schools (Lay, Sanjaya, Ma, Anisur & Mdzakir, 2008). At times the schools are moved to higher grounds but since they are surrounded by lowlands they become inaccessible because the roads are flooded or partially submerged.

1.3 Purpose of the Study

The purpose of the study is to investigate the effects of floods on access to secondary school; education in Nyando District, Kisumu County, Kenya.

1.4 Objectives of the Study

The study aimed to achieve the following objectives:

- I. To establish the effects of floods on students' enrolment in secondary education in Nyando District.
- II. To establish effects of floods on students attendance in secondary education in Nyando District.
- III. To examine the effects of floods on students classroom participation in secondary schools in Nyando District.
- IV. To identify the mitigation measures employed by the schools during floods.

1.5 Research Questions of the Study

This study was guided by the following research questions:

- I. What are the effects of floods on student enrolment on secondary education in Nyando District?

- II. What are the effects of floods on students' attendance on secondary education in Nyando District?
- III. How do floods affect students' classroom participation on secondary education in Nyando District?
- IV. What are the mitigation measures employed by the secondary schools in Nyando District during floods?

1.6 Significance of the Study

Ministry of education and teachers will get more information on developing disaster resilience. Scholars and researchers will use the study as a means of reference for future studies. The study will help in prevention and management of floods and related disasters, risks and vulnerability reduction. Promote use of local knowledge in reducing vulnerability to floods. Networking and partnerships, early warning systems, mitigation, information dissemination and living with floods will enhance safety and hence promote attainment of quality education. Quality education and training offers the graduates an opportunity to be economically mobile and competitive.

1.7 Assumptions of the Study

The study made the following assumptions:

- I. The respondents have been affected by floods and they will give honest and correct information required.
- II. Students, teachers and principals in Nyando are prepared for floods.
- III. There are mitigation measures in place.

IV. There are mechanisms to create awareness on floods in secondary schools

1.8 Limitations of the Study

According to Best & Khan (2009), limitations are conditions beyond the control of a researcher that may place restriction on the conclusions of the study and their application to other situations.

- I. When floods occur, many schools may not be easily reached, so the researcher will have to use boats to reach the schools.
- II. The study relied on information from the district education officer, principles, teachers and students and omitted other stake holders like parents, board of managers and other opinion leaders.

1.9 Delimitations of the Study

The study is confined to Nyando, which is one of the 12 districts that make up Kisumu County, while floods affect many other areas like Rachuonyo, West Pokot, Nairobi, Tana Delta, Kitui, Naivasha, Narok, Kajiado, Rongai and other areas. The study is restricted to 28 public secondary schools in the district yet floods affect all sectors of the education system including early childhood education, primary education, tertiary institutions and other sectors of the economy.

1.10 Definition of Significant Terms

Access refers to an opportunity to enrol in, attend and complete secondary school in Nyando.

Attendance refers to going to a secondary school regularly in Nyando

Classroom participation refers to taking part in classroom activities in secondary school in Nyando.

Coping mechanism refers to dealing effectively with floods so that it does not cause damage.

Disaster mitigation refers to measures aimed at reducing the impact of a disaster on society and the environment. It is in effect a form of disaster prevention.

Enrolment refers to putting yourself or someone else on to the official list of members of a school in Nyando.

Floods refer to an overflow of large amounts of water over schools and the surrounding area.

1.11 Organisation of the Study

The final study is organised into five chapters. Chapter One entail statement of the problem, purpose of the study, objectives, research questions, significance of the study, assumptions of the study, limitations of the study, delimitations of the study, definition of significant terms, and organisation of the study. Chapter Two reviews related literature (on flood hazard, on access, attendance, enrolment,

classroom participation and flood coping mechanism), summary of literature review, conceptual framework and theoretical framework. Chapter Three deals with research methodology. It is organised under the following headings: research design, target population, sample size, sampling techniques, research instruments, instrument validity and reliability, data collection and analysis techniques. Chapter Four covers data analysis and research findings. Chapter Five has a summary of the whole project, conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature related to flood hazard on access, enrolment, attendance, classroom participation and flood coping mechanism, summary of the literature review, the theoretical framework and the conceptual framework.

2.2 Effects of floods on Access

Access to education has long been recognized as a fundamental human right. Article 26 Of the universal declaration of human rights proclaims that everyone has a right to education. .Floods not only close schools they destroy infrastructure, make roads inaccessible for students and teachers displace families and increase disease outbreak. Families may have lost all their assets and be unable to send their children to school due to lack of food, clothing, etc. Schools and their contents may be damaged or destroyed, making them permanently or temporarily unavailable for learning activities. Schools may be used as shelters for people who have been displaced from their homes due to the natural disaster (Lay et al, 2008).

In Cambodia during floods students encounter difficulties to school because of road damages and having to travel across rivers. They have to use a boat to school, this could lead to high absenteeism rate among poor students .Public transport in Cambodia is limited so students use their own means to travel to

school. Most travel by foot or bicycle so some students suspend their studies for a month or two due to road damage caused by floods, (Lay et al, 2008).

Koshi River in Nepal breached its embankments in 2008 and wreaked havoc in 67 schools, walls of 15 schools collapsed causing damage to the furniture and facilities. 23,000 school going children were deprived of education .Learning was equally interrupted in the host schools where the displaced people had sheltered (Integrated Regional Information Network News, 2009).

In Uganda, Birungi (2008) cited previous year's floods in eastern Uganda left many schools in disrepair; children in Bundibugyo district cannot access schools during the rainy season. In Kenya the long rain season started in the first week of March 2013 causing severe flooding in most parts of the country. The floods caused massive displacements, loss of lives, destruction of houses, livelihoods and vital infrastructure. Access to many of the affected areas is extremely difficult therefore helicopter assistance as well as boats has been required for search and rescue. The destroyed infrastructure limits access of the population to schools (Kenya Red Cross Society, 2013). During floods in Nyando some classrooms are filled with water so students are released to go home. In severe flood occurrences some schools closed for two months while the least affected closed for two weeks. Some schools have spring water emerging in classrooms long after the floods (Okuom, 2012).

2.3 Effects of Floods on Students Attendance

In Bangladesh, there was a 20 percent drop in attendance after the 2007 floods.

During the floods 1.6 million children were affected as schools were damaged and some used as shelters (Integrated Regional Information Network, 2013). Hurricane sandy in 2012 destroyed hundreds of public buildings and facilities including schools. More than 100 schools were closed due to damage and over 50 were completely destroyed (IRIN News, 2013) In Zambia, the students were unable to cross rivers due to collapsed bridges and culverts. The most affected districts reported 40 to 50 per cent reduction in attendance (Zambia Vulnerability Assessment Committee, 2007).

In Kenya a sizeable number of children still find themselves out of school owing to a number of reasons one of them being floods (Achoka & Maiyo, 2008). Rains continue, most areas are now drying up even though the terrain remains muddy making some areas inaccessible, (*Daily Nation*, Jan 10, 2007). During floods many roads are destroyed or washed away making schools inaccessible therefore the attendance rate becomes low. Usable toilets are limited and health facilities unreachable causing learners to suffer illnesses hence unable to attend school after learning resumed in schools (Okuom et al, 2012). Since some of the flood prone schools are in the rural areas the teachers opt to relocate to urban areas (INEE, 2012). During floods families may not afford the opportunity costs associated with their children attending school rather than earning money by scavenging it (INEE, 2012).

Floods not only close schools like in Nyando one school was completely closed due to floods and the students and teachers were forced to leave (Kenya Red cross, 2013). Ensuring access to education in difficult times and keep students healthy enough to attend school is a big job (Kenya Red Cross, 2012).

2.4 Effects of Floods on Students Enrolment

Floods hamper enrolment as parents do not want to endanger the livelihoods of the children. So schools prone to floods have a higher chance of closing down due to low enrolment. The impact of lose of livelihood as a result of the floods can hamper enrolment so they fail to register their children for lack of funds (INEE, 2012).

During floods schools become inhabitable and roads impassable, these discourage parents as well as the learners from registering in such schools .A school feeding programme in Bangladesh has resulted in 35 percent overall increase in enrolment. This helps in achieving the millennium development goal number two, which is attaining universal basic education (Braun, Swaminathan & Rose Grant, 2004).

In Ethiopia, 385,000 children need emergency education (IRIN, 2012), between June and July 2012, the dropout rate had reached 50 percent (UNICEF, 2012) because of floods. The school feeding programme helped draw pupils back to

school. Enrolment and retention rate may be high when educational facilities are made available during periods suitable to the students.

In Cambodia during floods students encounter a lot of difficulties to reach school. The average dropout rate in 3 flood prone provinces is 7 per cent per annum that is 1700 students per year in 2007 (Lay et.al, 2008). In Kenya the situation is not different as the dropout rate increases during floods (Nyakundi et al, 2010).

2.5 Effects of Floods on Students Classroom Participation

Every year floods provoke delay to study programmes and damages to schools. 21 percent of schools in Cambodia are in flood prone areas (Lay et.al, 2008). Qualified teachers may find it difficult to take up teaching jobs in this regions causing perennial shortage of qualified staff. In Fiji during the April 2012 floods classrooms, teacher's quarters, boarding facilities, furniture and books were destroyed. The play grounds looked like rivers (IRIN News, 2012).

In Pakistan floods damaged schools leading to education worries during august 2010, piles of debris including bricks, bits of wood, concrete and broken household goods are becoming visible through out flood ravaged southern district of Punjab. .It could be months before affected children can get back to school because of the impact of floods on families and school buildings. Those in better shapes are used as relief camps and may not be vacant for a long time (Red Cross, 2012).

In Nigeria floods submerged several schools, displaced several families and forced the displaced to use the bush as toilets were also submerged. The schools are at times used as evacuation centres and this interferes with classroom participation. School buildings and bridges sometimes collapse or are submerged for several weeks. Electric polls get destroyed cutting power supply (Kesieno, 2011).

In Tanzania rains pounded Kilosa district and affected 5,867 households. The affected families initially sheltered in schools (IRIN News, 2010).

Recurring cycle of floods in several parts of Kenya have impacted negatively on livelihood, loss of life, destruction of property and infrastructure as well as disruption of education in cases of schools being submerged, books destroyed, students displaced or schools used as shelter by the displaced. Toilets get submerged pausing health and hygiene dangers. Poor sanitation facilities are one of the reasons of lower participation rates of girls in education. .Separate toilet facilities in the school premises create an aspect of security and privacy for girls and boys (Okuom et al, 2012). Transport is also interfered with as bridges are washed away or roads submerged (Red Cross, 2012).

Evacuated families require psycho-social support to help them cope with experiences from the disaster and the situation of displacement having lost shelter, belongings, some injured, lost loved ones and others still have family members missing. As a result of these losses children as well as teachers get traumatized

and therefore cannot effectively participate in class. An appropriate school environment provides adequate level of inputs, such as: personnel, learning materials and facilities that must accompany the learning process for its efficiency and effectiveness (Richardson, 2011). Schools are directly affected because they cannot operate effectively without key human resource pillars (Yande, 2009).

The schools which have not been destroyed or marooned are usually used as evacuation centres. At times the learning resources and materials are washed away or destroyed .In Nyando, the schools in the flood prone areas are subject to closure at least one and a half months due to flooding which results in delay of study time in each academic year. Most schools do not have an alternative place for students to study (Okuom et.al, 2012). The additional students from flood affected areas leads to hundreds of students to squeeze in to poorly lit rooms usually designed for not more than 40.

2.6 Coping Mechanism for Schools

Governments are primarily responsible for keeping their people safe by adopting risk reduction measures a good example being Netherlands. Much of the country lies below sea level, increasing its vulnerability to flooding and storms, but over the centuries the Dutch have developed physical barriers and water management systems to protect the country from the effects of natural hazards (IRIN News, 2013). The home of floods in Kenya, Budalangi has remained dry throughout 2013 after 50 years of torment from floods, dykes which were redesigned did the

miracle, and the secret is to learn how to live with the floods (*Daily Nation*, May 4, 2013).

Flood disaster has different impacts on schools. Schools cope in different ways. Those who have the capacity after being hit by a disaster emerge faster while those without such capacity sink deeper into the spiral of impoverishment.

Coping mechanisms include actions such as flood forecasting, flood insurance of buildings and school property, food stockpiling, providing emergency health services and building flood shelters, digging trenches around their compounds and planting trees and sisal fences around the schools to break and reduce the flow of floodwaters and to prevent erosion (Achoka et al, 2008). In the severely affected areas, boats became the principal means of communication and many coped by living in shelters and relief camps while others made arrangements in their own homes to deal with the rising flood waters. Classroom block at Maniquenique was built as a safe haven during floods. Other coping mechanisms include facilities for water retention such as storage reservoirs (Krysanova¹, Buiteveld, Haase, Hattermann, Niekerk & Roest, 2009).

The purpose of monitoring and early warning is to enable remedial measures to be initiated and to provide timelier and effective relief through disaster and emergency preparedness actions (UNISDR, 2008). Early warning mechanisms provide the school community and other stakeholders with relevant information to enable them make informed decisions for evacuation or relocation.

Countries like Bangladesh, Cuba, Vietnam and Madagascar have been able to significantly reduce the impact of meteorological hazards, such as tropical storms and floods, through improved early warning systems, disaster preparedness and other risk reduction measures (UNISDR, 2008.)

2.7 Summary of Literature Review

The literature reviewed revealed that flooding is a global disaster and it affects school attendance in both developing and developed nations. Many scholars in the past researched on different aspects of floods. (Graciela & Michael, 2009) researched on flood coping strategies in Barangays Philippines. This is linked to flood coping mechanism in this study. (Lay et al, 2008) looked at the impact of disasters on the education sector in Cambodia in 2008 and it's linked to this study in that every year flooding is one of the factors disrupting study programmes accomplishment.

(Petry, 2008) dealt with flood coping measures and it's in line with the flood coping measures in this study. (Nyakundi, 2010) studied on community perceptions and response to floods. (Achoka & Maiyo, 2008) studied horrifying natural disasters in western Kenya. Priority 3 of the Hyogo Framework for Action 2005-2015 states that through the use of knowledge, innovation and education disasters can be reduced. Literature on the effects of floods on access to secondary

schools education was comparatively limited. This study sought to address this gap.

The literature revealed that Kenya has a long history of flood disasters that have hit schools and most schools have no capacity to handle flood disasters. There is need to conduct a study on educational institutions and floods vulnerability. This is where the study came in.

2.8 Theoretical Framework

The theoretical perspective identified to guide this study is the Trans-theoretical model of behaviour change based on the social science theory. The theory describes the type of interventions that brings about the outcomes depicted in the pathway of a change map. The key proponents of the theory are (Prochaska & Diclemente, 1983). In order for behaviour change towards floods to occur, individuals need to change in knowledge, attitudes and skills. The theory describes the types of interventions that brings about the outcomes depicted in the pathway of a change. This model gives five stages towards personal change: Pre-contemplation stage where the individual doesn't intend to change in the near future.

The second stage is where the individual is not prepared to take action at present but intends to do so in the future. Third stage is where the individual is considering changing his or her behaviour. Fourth is the action stage where the individual has made the behaviour change but the changes are not well

established. The final stage is maintenance in which the individual has engaged his or her behaviour and is working to sustain the change.

Personal behaviour change model has been chosen because it addresses individuals change in behaviour towards disaster in this case floods.

2.9 Conceptual Framework

The framework shows factors that contribute to access to secondary school education in flood prone areas. Floods severely limit and hamper access to education and frequency of attendance to schools by the students and teachers depends on flood coping measures in place thereby reducing the loss of learning time.

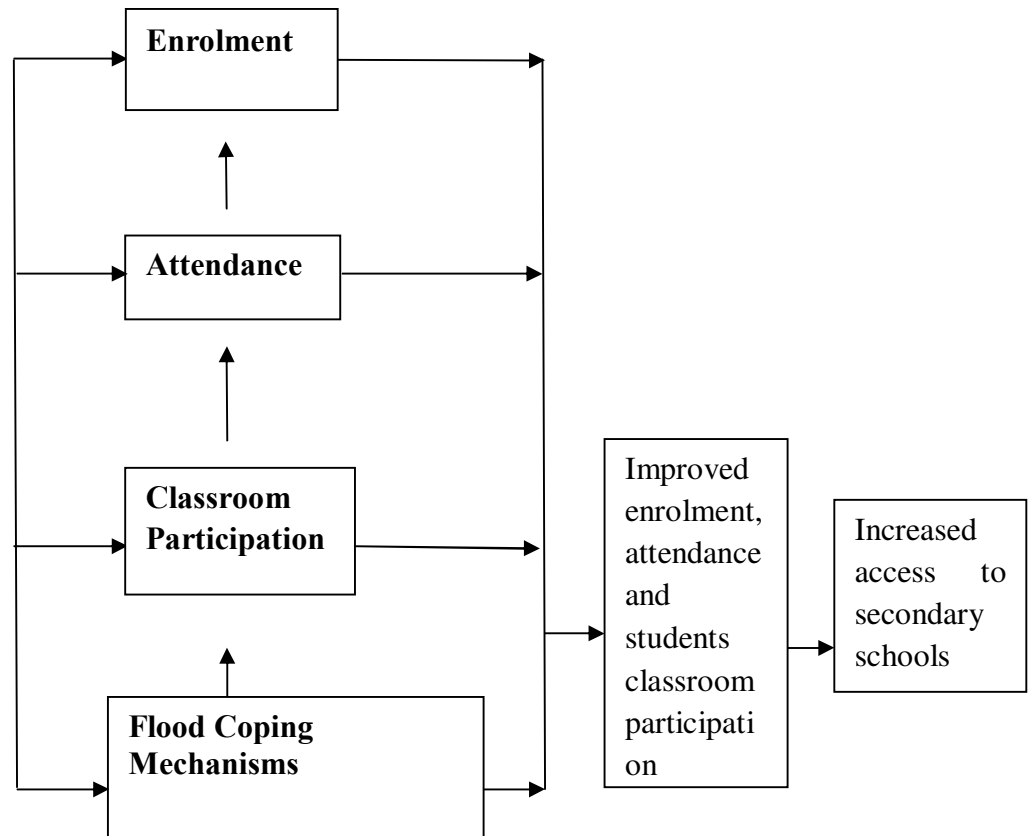


Figure 1: The Relationship between Floods and Access to Secondary Education

The conceptual framework shows that if floods are managed by applying flood coping mechanisms there will be improvement in attendance, enrolment and students' classroom participation hence increased access to secondary schools.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research procedure and techniques that will be used in the study. It describes the research design, target population, sample size sample selection.

3.2 Research Design

A research design is a plan, structure and strategy of investigation conceived so as to obtain answers to research questions and control variance (Mugenda & Mugenda, 2003). In order to understand the effects of floods on access to secondary education in Nyando, it was necessary to use descriptive survey design. It permits the researcher to gather comprehensive, systematic and in-depth information about each case of interest (Kothari, 2004). The researcher constructed questionnaires that solicited desired information from principals, teachers and students.

3.3 Target Population

(Orodho, 2008) defines a target population as the set of elements that the researcher focuses upon and to which the results obtained by testing the sample should be generalized. The study was conducted in Nyando District, Kisumu County. Nyando District has two administrative divisions: Kadibo and Nyando and 28 secondary schools. The study targeted population is 2,000 secondary students, 300 secondary school teachers and 28 school heads.

3.4 Sample Size and Sampling Procedures

The study employed 40% proportion of the total secondary schools in the district to arrive at 11 secondary schools according to (Creswell, 2003). There are 28 secondary schools in Nyando District and the District is divided into two administrative divisions: Kadibo and Nyando.

Nyando Division has 15 secondary schools and Kadibo Division has 13. Simple random sampling technique was used to get the sample 11 secondary schools for the study based on the assumption that what is being investigated is experienced in all schools in the district. The district was divided into two strata i.e. Nyando Division and Kadibo Division. In Nyando Division, a total of 6 schools with a sample size of 6 principals, 70 teachers and 450 students were obtained through simple random sampling while in Kadibo Division, a total of 5 schools with a sample size of 5 principals, 50 teachers and 350 students were obtained through simple random sampling. The student sample was distributed across all forms. Purposive sampling was used to select the 11 principals

Table 2: Sample size

Respondents	Target population	Sample size
Principals	28	11
Teachers	300	120
Students	2000	800
Total	2328	931

Table 1 shows the target population and a sample size of 40 % of the respondents that is 11 principals, 120 teachers and 800 students.

3.5 Research Instruments

Questionnaires and observation checklist were used for this study in order to obtain data. (Creswell, 2003) points out that a questionnaire allows respondents to give in depth responses and they are also easy to administer. The questionnaires had structured open-ended and unstructured close-ended questions. The instrument is designed to seek information on their level of awareness on flood disaster risk and to seek information on the effect of floods on school access, and the coping mechanism undertaken by the school. This was used to gain primary data. Secondary data was obtained from published and unpublished data existing in libraries, journals and websites to corroborate the information from primary data (Creswell, 2003). The check list was used to confirm the information provided by the respondents (Mugenda & Mugenda, 2003). The check list

includes physical facilities required in a flood prepared environment like unclogged drainages, water harvesting tanks gutters, first aid kits, evacuation maps and retrofitted buildings.

3.6 Validity of the Instrument

Questionnaires were piloted in two schools randomly selected from the schools that will not form part of the sampled schools for the study in the District. The pre testing helped in identification of weakness contained in the instrument. It also tested the identifiable ambiguities in the structure of the questions and hence made improvements. (Creswell, 2003) observe that the pretesting of the study instruments can bring out the unanticipated problems that may be solved at this stage thereby saving time and effort. Therefore the procedure ensured that the study instruments are improved before they are finally administered in the study. The checklist was assessed and analysed by the researcher's supervisors and piloted.

3.7 Reliability of the Instrument

Reliability is a measurement of the degree to which a research instrument yields consistent results after repeated trials (Mugenda & Mugenda, 2003). The researcher used test- retest technique in order to test reliability of the instruments. The instruments were given to similar subjects for the study but not those used in the final study. The same instruments were administered to the same group of subjects after two weeks. The comparison between the answers obtained in the two sets were made using Pearson's Correlation coefficient

Formula indicated below,

$$r = \frac{\sum ij xy - \sum ij x \sum ij y}{\sqrt{(\sum ij x^2 - \frac{(\sum ij x)^2}{N})(\sum ij y^2 - \frac{(\sum ij y)^2}{N})}}$$

Where $\sum ij xy$ =sum of gross product values of each variables.

$(\sum ij x)(\sum ij y)$ =product of the sum of x and the sum of y

N=total no of items r = Pearson's correlation coefficient

x=Score for test 1 y=Score for test 2

$\sum ij$ =Summation

3.8 Data Collection Procedure

In order to collect data from the targeted respondents, the researcher obtained an introductory letter from the University of Nairobi and a permit from the National Council of Science and Technology. The permit was presented to the District Education Officer who granted permission for the research to be conducted in Nyando District Schools before going to the concerned schools to seek permission for the study from the head teachers. Distribution of the research instruments was done by the researcher to the respondents. Questionnaires were collected immediately after being filled by the respondents. To ensure a high response rate, the purpose of the study was explained to the respondents, difficult questions clarified and participants assured of total confidentiality (Creswell, 2003).

3.9 Data Analysis Techniques

The data was gathered from 11 out of the 28 secondary schools in Nyando District through administration of questionnaires to a cross-section of respondents drawn from principals, teachers and students. Before collecting the questionnaires from the respondents the researcher checked the completeness and accuracy of the answers given.

Questionnaires were checked for completeness before data entry and data cleaning done to enhance data quality. Data was analysed using descriptive statistics and presented in frequencies and percentage, tables, graphs and charts. Statistical package for social sciences (SPSS) aided in analyzing quantitative data. Qualitative data will be transcribed, organised into various emerging themes and reported in narrative form (Creswell, 2003).

3.10 Ethical Considerations

Ethical principles are norms of conducts that distinguish between acceptable and unacceptable behaviour (Creswell, 2003). The unacceptable behaviour is written or unwritten standards that govern any discipline and as a working profession, has its own distinguished standards of behaviour that govern its conduct. These standards include harm to participants, confidentiality, anonymity, voluntary participation and informed consent (Kothari, 2004). Before engaging in actual field work, the researcher applied for a research permit from the MoE. Once the permit was granted, the researcher sought consent from the Sub-county/District Education Officer in Nyando to grant access to the schools within the district.

During the actual data collection, the respondents were requested to voluntarily participate in the study; no respondents were compelled to participate in the study. For the sake of confidentiality, the respondents were not to write their names on the questionnaire. They were assured that the information they give will be strictly confidential and only meant for research purposes. No reference will be made to individuals or schools.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter focuses on the return rate of questionnaires, demographic information of the respondents, data interpretation and discussion of findings. The presentation was done on the research objectives and research questions. The data presented in this chapter were processed using statistical package for social sciences (SPSS). All themes discussing the same research questions were presented and analysed together. Items focusing on a particular theme were presented together.

4.2 Questionnaire Return Rate

Questionnaire return rate is the proportion of the questionnaires returned after they have been issued to the respondents.

Table 4.1 Questionnaire return rate

Respondents	Sample	Rate of Return	%
Principals	11	11	100.0
Teachers	120	100	83.3
Students	800	700	87.5
Total	931	811	270.8

Out of the 11 principals, 120 teachers and 800 students sampled during the study, 11 principals, 100 teachers and 700 students filled and returned the questionnaires. The return rate was 100% for principals, 83.3% for teachers and 87.5% for the students, it was therefore deemed adequate for data analysis. Questionnaire return rate is presented in Table 4.1.

4.3 Demographic Characteristics of Respondents

This section presents the characteristics of personal attributes of individual respondents. They include age, gender and duration of stay in the various schools in terms of number of years.

4.31 Distribution of respondents by gender

The researcher sought to find out the gender of principals, teachers and students in various schools. The respondents were requested to indicate their gender and reported as shown in Table 4.2

Table 4.2 Distribution of Respondents by Gender

	Principal		Teachers		Students	
Respondents	F	%	f	%	f	%
Male	6	54.5	50	50	416	52
Female	5	45.5	50	50	384	48
Total	11	100	100	100	800	100

The table above shows that out of the 11 principals 6 are male while 5 are females. The data indicates that there were more male principals than females. The ratio of male to female teachers was 50 to 50 as there were 50 female teachers and 50 male teachers and these implies that they have achieved gender parity. The boys were 52% while the girls were 48% showing that there are more boys than girls in the secondary schools in Nyando, therefore alot need to be done to achieve gender parity among the students.

4.32 Distribution of respondents by age

The respondents were requested to indicate their age. The results are shown in Table 4.3

Table 4.3 Distribution of respondents by age

Respondents age in years	Principals		Teachers	
	F	%	f	%
21-35	0	0	20	20.0
36-50	4	36.4	50	50.0
51-60	7	63.6	30	30.0
Total	11	100	100	100

From the table above 63.6% of principals were between 51-60 years while 30% of teachers were between 36-50 years. This implied that they have witnessed floods severally and the assumption therefore is that they have experience on flood mitigation measures and therefore will be a reliable source of information for the researcher.

4.33 Distribution of respondents by duration of stay in their schools

The principals and teachers were to indicate how long they had been in their current schools and their responses are shown in Table. 4.4

Table 4.4 Distribution of principals and teachers on the number of years in the school

Duration	Principals		Teachers	
	F	%	f	%
1-5years	1	9.1	20	20.0
6-10years	3	27.3	20	20.0
Over 10 years	7	63.6	60	60.0
Total	11	100.0	100	100.0

The findings indicate 63.6% of the principals and 60% of the teachers had been in their current schools for over ten years and therefore it is assumed that they are in a position to provide adequate information on effects of floods on access to secondary school education in Nyando district because of witnessing a number of flooding disasters.

4.4 Effects of Floods on Students Enrolment

Objective one of the study sought to establish the effects of floods on student enrolment in secondary schools in Nyando District. The respondents were to respond to a series of questions related to the effects of floods on students' enrolment. The respondents were asked to indicate whether they had ever transferred because of floods as indicated in Table 4.5

Table 4.5 Effects of Floods on Student Enrolment

Response	Principals		Teachers	
	f	%	f	%
Enrolment dropped	7	63.6	65	65.0
Enrolment didn't drop	4	36.4	25	25.0
Not sure	1	9.1	10	10.0
Total	11	100.0	100	100.0

From the study, floods affect enrolment as 63.6% of the principals and 65% of the teachers stated, there was a decrease in enrolment during floods, only 36.4 % stated that enrolment didn't drop while 1% of the principals and 10% of the teachers were not sure as to whether floods affect enrolment. This varied responses may be due to the fact that 72.7% of the sampled schools are mixed day while 27.2% are boarding. This concurs with the study done by (Achoka & Maiyo, 2008) which implied that floods make enrolment of students to drop.

4.5 Effects of Floods on Attendance

Objective two of the study sought to establish the effects of floods on attendance in secondary schools in Nyando district. The respondents were asked to comment on whether floods affect attendance or not, and their responses are in Table 4.6.

Table 4.6 Effects of Floods on Attendance

Response	Principals		Teachers		Students	
	F	%	f	%	F	%
Attendance affected	8	72.8	70	70.0	420	60.0
Attendance not affected	3	27.8	30	30.0	280	40.0
Total	11	100.0	100	100.0	700	100.0

From the data on attendance, it's clear that floods affect attendance as 72.7 % principals, 70% teachers and 60% of the students stated that it affects attendance and this can lead to poor syllabus coverage leading to poor performance in exams .This concurs with a study done in Bangladesh where there was a 20% drop in school attendance after the 2007 floods (IRIN, 2013). The researcher also observed that floods affected attendance as the implication made was that the day scholars missed school totally or came late as they had to wait for the flood waters to subside before wading through to school.

The respondents were asked to comment on the effects of floods on footpaths, roads and farms and they responded as shown in the table below.

Table 4.7 Principals response on effects of floods on footpaths, roads and farms

Areas	No effect		Moderate		Severe	
	F	%	f	%	f	%
Footpaths	1	9.1	2	18.2	8	72.7
Roads	0	0	3	27.3	8	72.7
Farms	1	9.1	5	45.5	5	45.5

N=11

The data in Table 4.7 shows that floods severely affect footpaths and roads, as 72.7% of the principals indicated that and these hampers access to schools. The principals also indicated that 45.5 % of farms are moderately affected while 45.5% are severely affected this can interfere with learning if farms are the major sources of livelihood then students may be forced to drop out because of lack of fees. When footpaths and roads are severely affected by floods the implication is that students may fail to come to school or come late. According to the (Zambia

Vulnerability Assessment Committee, 2007) students were unable to cross rivers due to collapsed bridges and culverts.

Table 4.8 Teachers' response on effects of floods on footpaths, roads and farms

Areas	No effect		Moderate		Severe	
	F	%	F	%	F	%
Footpaths	0	0	10	10.0	90	90.0
Roads	0	0	5	5.0	95	95.0
Farms	30	30.0	10	10.0	60	60.0

N=100

From the data in table 4.08 areas that are severely affected by floods are roads 95% and footpaths 90%. When roads and footpaths are severely affected it's assumed that the students and teachers who reside outside the school may not come to school or have serious challenges wading through muddy areas. This concurs with a study done in Uganda by Birungi, 2008 where schools in Bundibugyo district could not be accessed during the rainy season.

Table 4.9 Students' Response on Effects of Floods on Footpaths, Roads and Farms

Areas	No effect		Moderate		Severe	
	F	%	f	%	f	%
Footpaths	28	4.0	140	20.0	532	76.0
Roads	28	4.0	112	16.0	560	80.0
Farms	140	20.0	280	40.0	280	40.0

N=700

From the data in table 4.9 the areas that are severely affected by floods according to the students are roads 80% and footpaths 76%. This means that reaching the schools becomes difficult and even the ones who make it to school may reach late hence missing some lessons.

4.6 Effects of floods on Students' Classroom Participation in Secondary Schools in Nyando

The third objective sought to examine the effects of floods on student's classroom participation.

The respondents were asked to indicate whether their schools had been used as emergency shelter for people displaced by floods, they responded as shown in Table 4.10.

Table 4.10 Use of Schools as Camps for People Displaced by Floods

	Principals		Teachers		Students	
Response	F	%	f	%	f	%
Used	2	18.7	20	20.0	69	9.9
Not used	9	81.8	20	80.0	631	90.1
Total	11	100.0	100	100.0	700	100.0

The data in Table 4.10 show that 81.8% of the principals, 80% of the teachers and 90.8% of the students indicated that their schools were not used as evacuation centres by the displaced implying that students' classroom participation was not interfered with as the people displaced by floods sought refuge in other areas like primary schools.

Table 4.11 Principals' Response on the Effect of Floods on the following Facilities

Facilities	No effect		Moderate		Severe	
	F	%	f	%	F	%
Textbooks	11	100	0	0	0	0
Classrooms	1	9.01	5	45.5	6	54.5
Playgrounds	0	0	6	54.5	5	45.5
Latrines	0	0	4	36.4	7	63.6
Boreholes	1	9.01	4	36.4	6	54.5

N=11

The data in Table 4.11 indicates that the areas severely affected by floods in the school are latrines, boreholes, classrooms and playgrounds.63.6% of principals indicated that floods severely affect the latrines and this can interfere with classroom participation as learners may not be comfortable without proper sanitation facilities. When boreholes and latrines are flooded it can lead to outbreak of waterborne diseases thereby interfering with classroom participation. When classrooms are severely affected it implies that learning may not take place

in those classrooms or the students are forced to squeeze in the few classes which are not affected hence making learning difficult due to overcrowded classes.

Table 4.12 Teachers' Response on Effects of Floods on the following Facilities

Facilities	No effect		Moderate		Severe	
	F	%	f	%	f	%
Textbooks	85	85	10	10	5	5
Classrooms	10	10	35	35	55	55
Playgrounds	0	0	40	40	60	60
Latrines	0	0	15	15	85	85
Boreholes	0	0	15	15	85	85

N=100

The data in Table 4.12 shows that the areas that are severely affected by floods as indicated by the teachers are boreholes, latrines and playgrounds, 85% of the teachers indicated latrines and 85% boreholes. This can easily lead to outbreak of waterborne diseases hence interfering with classroom participation. Poor sanitation facilities are one of the reasons of lower participation rates of girls in education. Separate toilet facilities in the school premises create an aspect of security and privacy for girls and boys (Okuom et al 2012). From the researchers

observation as well as the data in table 4.12 textbooks were least affected because they used waterproof storage facilities fixed high up and this showed an aspect of flood preparedness

Table 4.13 Students' Response on the Effect of Floods on the following Facilities

Facilities	No effect		Moderate		Severe	
	F	%	f	%	f	%
Textbooks	560	80	56	8	84	12
Classrooms	70	10	70	10	560	80
Playgrounds	0	0	140	20	560	80
Latrines	0	0	84	12	616	88
Boreholes	140	20	8	84	280	40
N=700						

The data shows that the most severely affected areas are latrines 88%, playgrounds 80% classrooms. This concurs with research on Fiji during the 2012 floods (IRIN News) where classrooms and boarding facilities were destroyed. When it floods some classes are completely marooned or destroyed by floods so

hundreds of students are at times forced to squeeze in the accessible classrooms designed for not more than forty. This study agrees with the research done by Okuom et al, 2008 whereby most schools do not have an alternative place for students to study during floods so classroom participation is interfered with.

4.7 Mitigation Measures Employed by Schools during Floods

The fourth objective was on mitigation measures employed by schools during floods so the respondents were asked questions on availability of water harvesting facilities, tree planting, clubs that deal with environmental conservation and safety measures taken by the schools during floods.

Table 4.14 on Availability of Water Harvesting Facilities

	Principals		Teachers		Students	
	f	%	f	%	F	%
Not available	1	9.1	10	10	61	8.7
1-3	3	27.3	30	30	280	40.0
4-6	5	45.5	40	40	280	40.0
More than 7	3	27.3	20	20	79	11.3
Total	11	100.0	100	100.0	700	100.0

Water harvesting reservoirs were available in 99% of the schools. However not many of the principals and teachers associated them with flood coping measures but with sanitation and clean drinking water. This is because floods did not result from direct rainfall but from surface runoff from the hills and river Nyando bursting its banks. A unique feature of floods in Nyando is that most of the runoff is generated in the upper catchments which receive much higher rainfall (Okuom et al, 2012).

Table 4.15 Clubs that deal with Environmental Conservation

	Principals		Teachers		Students	
Response	F	%	f	%	f	%
No	0	0	0	0	112	16
Yes	11	100	100	100	588	84
Total	11	100.0	100	100.0	700	100

From the data in Table 4.15 only 16% of the students indicated there were no clubs that deal with environmental conservation while 100%of principals and 100% of teachers indicated that there were school clubs that deal with environmental conservation. The assumption made here is that the clubs deal with

flood coping mechanisms and the students who are not aware of the clubs may be new comers and may not have fully undergone orientation.

The principals, teachers and students were requested to indicate the number of times trees had been planted in schools and their responses are indicated in Table 4.16.

Table 4.16 The number of Times Trees had been Planted in schools within the last seven years

Response	Principals		Teachers		Students	
	F	%	f	%	f	%
None	0	0	0	0	12	1.7
1-3	2	18.2	25	25.0	128	18.2
4-6	7	63.6	45	45.0	532.	76.0
7and above	2	18.2	30	30.0	28	4.0
Total	11	100.0	100	100.0	700	100.0

From the data in table 4.16 63.6% of the principals indicated that trees have been planted between 4-6 times in their schools while teachers 45% were in that category and 76% students. The assumption made is that trees are planted once a

year. Planting trees around the schools break and reduce the flow of floodwaters and help to prevent erosion (Achoka et al, 2008).

Students were requested to indicate how they get information about floods by ticking any of the options and their responses are in the table 4.17

Table 4.17 Students’ response on how they get information about floods

Source of information	f	%
Students	140	20.0
Teachers	140	20.0
Media	420	60.0
Total	700	100.0

The data in Table 4.17 indicates that 60% of the students get information on floods from the media. The assumption made is that the media gets information from the metrological department. 20% of the students get information from teachers while the other 20% get information on floods from their fellow students. The assumption made is that the information is vital and it comes before the onset of floods so when floods come it does not cause damage as the students were prepared for it.

The principals and teachers were asked to indicate on how often classrooms, toilets, electrical lights, sockets and appliances are checked by competent authorities.

Table 4.18 Principals' Response on Maintenance of classrooms, toilets, electrical lights, sockets and appliances by competent authorities

Facilities	Not checked		Checked after every rainy season		Checked annually	
	Frequency	%	Frequency	%	Frequency	%
Toilets	4	36.6	2	18.2	5	45.5
Classrooms	4	36.6	2	18.2	5	45.5
Offices	4	36.6	2	18.2	5	45.5
Sockets	5	45.5	5	45.5	1	9.1
Electrical lights	5	45.5	5	45.5	1	9.01
Other electrical appliances	6	54.5	0	0	1	9.1
N=11						

The data in Table 4.18 shows there is need for information on living with floods as this will help stake holders see the need of working with professionals to avert calamities as 36% indicated that there facilities were never checked only 18.2% have their facilities checked after every rainy season. The assumption made here is that some schools may have the information but they lack funds to pay the experts. Insecurity for students can emanate from inappropriate school facilities and infrastructure (Safety standards Manual, 2008).

Table 4.19 Results of the observation schedule

Facility	Availability of facility per school
Water tanks	3 to 6
Drainage systems	Most schools had more of ditches than proper drainage systems
Gutters	5 to 6
Retrofitted buildings	0 to 1
Evacuation maps	0 to 1

Most schools had poor drainage systems; they were more of ditches than drainages constructed without regard to the elevation of land without the input of an expert. Most of the buildings were not retrofitted and only 3 principles claimed

to have evacuation maps. So in case of floods there may be high casualties due to panic, stampede and lack of mitigation measures in place.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter focuses on the summary of the study, findings of the study, conclusions, recommendations and suggestions for further research.

5.2 Summary of the study

The purpose of the study was to investigate the effects of floods on access to secondary school education in Nyando District, Kisumu County, Kenya. The study was guided by four research objectives, the first objective sought to establish the effects of floods; on student's enrolment in secondary schools in Nyando District. The second objective sought to establish the effects of floods on attendance in secondary schools in Nyando District. The third objective sought to examine the effects of floods on learner's classroom participation in secondary schools in Nyando District while the last objective sought to identify the mitigation measures employed by the schools during floods.

The study was conducted using descriptive survey which is a method of collecting information by interviewing or administering a questionnaire to a sample of individuals. The sample of study comprised of 11 principals, 120 teachers and 264 students. The main instrument for data collection in the study was the questionnaire; an observation checklist was also used.

5.3 Summary of the findings

According to the findings, there were more male principals and teachers, as 55% were male. Regarding the length of stay in various schools most principals and teachers had overstayed in the schools as 60% of the respondents had stayed in their stations for over ten years.

Floods were realized to be a real problem affecting the schools, 100% of principals and 90% of teachers affirmed that floods frequently affected their schools.

Findings from the study revealed that floods hamper students enrolment as there were times that some schools were closed during floods. This was because classrooms were flooded, roads to schools damaged, dormitories flooded while some schools could not be reached.

During floods, 25% of schools are affected and at times students sent home. Students and teachers were unable to cross the flooded rivers and areas.

Drainage systems one of the coping strategies during floods was found to be lacking in 70% of the schools. The existing ditches from the researcher's observation were dug without regard to the elevation of land and without the input of an expert. In some situations the ditches were clogged with rubbish and soil. This lack of drainage led to non flow of excess run off causing floods in schools.

Water harvesting reservoirs were available in 99% of the schools. However not many of the principals and teachers associated them with flood coping measures

but with sanitation and clean drinking water. This is because floods did not result from direct rainfall but from surface run off from the hills and river Nyando bursting its banks.

There were warnings given through the radio, .however there was no alternative site to relocate to and these led to destruction of property, displacement as well as closing some schools because some classrooms were flooded, roads damaged, toilets and dormitories flooded. There were unfavourable working conditions for teachers therefore some applied for deployment.

5.4 Conclusions

Based on the findings of the study it was concluded that floods not only make learning inaccessible for learners and teachers, they close schools, destroy infrastructure, displace families and increase disease outbreak schools are also used as shelter for displaced families. There is need to shift from reaction to preparedness strategy with particular focus on floods. During floods quality education provides physical, psychological and cognitive protection that can ensure dignity, sustain and save lives. .Its therefore recommended that schools should engage qualified professionals to assess school buildings, design, construct and maintain school facilities to be resilient in the face of recurrent floods and other weather related disasters. Disaster risk reduction should be integrated in the syllabus. Principals, teachers and students should undergo annual training on disaster risk reduction. The county governments should sensitize the communities on insuring educational institutions.

5.5 Recommendations

In order to improve the situation, the researcher made the following recommendations based on the research findings

The board of management should engage qualified professionals to assess the structural safety of damaged school buildings, design, construct and maintain school facilities to be resilient in the face of recurrent disasters such as floods and other weather related disasters.

Enrolment and retention rate may be high when educational facilities are made available during periods suitable for them for example by closing during floods and opening during the dry season.

Disaster risk reduction should be integrated in the syllabus. Principals, teachers and students should undergo annual training on disaster risk reduction.

The county governments should sensitize the communities on insuring educational institutions against natural disasters such as floods

The ministry of education should ensure that the safety standards manual requirements are implemented in the schools.

5.6 Suggestions for further research

The study can be replicated in other areas that are affected by floods in the country.

There is need to focus on a study on effect of floods on early childhood and tertiary education.

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APPENDIX 1: LETTER OF INTRODUCTION

University of Nairobi

College of Education and External Studies

Department of Education and Administration and Planning

P.O BOX 92,

KIKUYU

THE HEADTEACHER

-----SCHOOL,

Dear Sir/ Madam

RE: PERMISSION TO COLLECT DATA IN YOUR SCHOOL

I am a post-graduate student at the University of Nairobi pursuing a Masters Degree in Education in Emergencies. I am collecting data on the effects of floods on access to education in secondary schools in Nyando District, Kisumu County.

Kindly allow me to collect data in your school.

Yours faithfully,

Susan Akello.

APPENDIX II: QUESTIONNAIRE FOR TEACHERS

This survey will help determine the effects of floods on access to secondary school education. I kindly request you to fill this questionnaire. Do not write your name or the name of your institution. Please answer the questions as honestly and as truthfully as possible by ticking in the spaces provided. The information you give will be treated with utmost confidentiality and will be used for this study only. Thank you for taking the time to complete this survey.

Demographic Information:

1. How long have you been in this school? ũ ũ ũ ũ ũ ũ ..

2. Male Female

3. Age range: 23-30 31-40 41-50 51-60

4. Which months of the year are worst affected by floods?

Section A :Effects of Flood on Enrolment

5. Did any of your classrooms /buildings collapse due to floods?

Yes No

6. Did the collapse force you to relocate to a new area?

Yes No

7. Have you ever transferred from one school to another because of floods?

Yes No

8. Was there any incident of floods before this year in your school?

Yes No

9. What type of sanitary facility do you have?

a) Traditional pit latrine b) Others (specify)

Section B Effect of Floods on Attendance

10. My school building is sufficiently secure and safe for staff and students.

Strongly agree Agree Disagree Strongly disagree

11. Have you ever failed to come to school because of flooding?

Yes No

12. If the answer to 7 is yes, why? (Indicate main reasons)

a) Road impassable b) Bridge culvert washed away /submerged c) School submerged/ surrounded by water

13 Have you ever lost books as a result of floods?

Yes **No**

14. Has your school ever been used; as a camp for people displaced by floods?

Yes **No**

b).Was learning taking place during that time?

Yes **No**

c).For how long was the school used as a rescue centre?

15. What was the effect of floods on the following facilities?

Areas Level of effect Comment

	1=No effect 2=Moderate 3=Severe	
Textbooks		
Classrooms		
Playgrounds		
Latrines		
Boreholes		
Footpaths		
Roads		
Farms		

APPENDIX III; QUESTIONNAIRE FOR STUDENTS

This survey will help determine the effects of floods on access to secondary school education. I kindly request you to fill this questionnaire. Do not write your name or the name of your institution. Please answer the questions as honestly and as truthfully as possible by ticking in the spaces provided. The information you give will be treated with utmost confidentiality and will be used for this study only. Thank you for taking the time to complete this survey.

Section A:

Demographic Information:

How long have you been in this school? ..

Which months of the year are worst affected by floods?

Age range: 13-15 16-18 19-22 23-30

Section B: Coping strategies

4 .Does your school have water tanks? **Yes** **No**

5. If yes, how many are they? **1-3** **4-6** **More than 7**

6. How do the water tanks get filled?

Students **Workers** **Rain**

7. How do you get information about floods?

Fellow students **Teachers** **Media**

8. Can you swim? **Yes** **No**

9. Are there school clubs that deal with environmental conservation?

Yes **No**

If yes list them.

10. How many times have trees been planted in your school?

1-4 **4-6** **7 and above**

Section C: Effects of floods on attendance and classroom participation

11. What was the effect of floods on the following?

Areas Level of effect Comment

	1=No effect 2=Moderate 3=Severe	
Textbooks		
Classrooms		
Playgrounds		
Latrines		
Boreholes		
Footpaths		
Roads		
Farms		

APPENDIX IV: QUESTIONNAIRE FOR PRINCIPALS

This survey will help determine the effects of floods on access to secondary school education. I kindly request you to fill this questionnaire. Do not write your name or the name of your institution. Please answer the questions as honestly and as truthfully as possible by ticking in the spaces provided. The information you give will be treated with utmost confidentiality and will be used for this study only. Thank you for taking the time to complete this survey.

Demographic Information:

1. How long have you been in this school? ..

2. Age range: 23-30 31-40 41-50 51-60

3. Gender: Male Female

Section A: Flood hazard on attendance and enrolment

4. To what extent did the floods affect:

students' attendance in your school?

students' enrolment in your school?

5. Are there students or teachers who did not return after the floods?

If yes specify and explain

Section B. Coping Strategies

6. What are the main coping mechanisms that you employ during floods?

7. Have you ever undergone specific training on how to live with floods?

Yes **No** If yes state the year of training.

8. Briefly explain the main concepts of the seminar.

9. How often are classrooms, toilets, lights, sockets and appliances checked by competent authorities after floods?

10. What was the effect of floods on the following? Use the key to guide you in filling the table, Key 1=No effect. 2=Moderate. 3=Severe

Areas	Effects	Comments
Textbooks		
Classrooms		
Playgrounds		
Latrines		
Boreholes		
Roads		
Farms		

APPENDIX V: OBSERVATION SCHEDULE

Facility	Details per school
Water tanks	
Gutters	
Drainage systems	
Evacuation Maps	
Flood Assembly points	
First Aid Equipments	
Retrofitted Buildings	

Appendix VI: RESEARCH AUTHORIZATION

Appendix ;RESEARCH PERMIT