

**INFLUENCE OF FLOODS ON TEACHING AND  
LEARNING PROGRAMMES IN PUBLIC PRIMARY  
SCHOOLS, A CASE OF BUDALANG'I PLAINS, BUSIA  
COUNTY, KENYA.**

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BY

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**A RESEARCH PROJECT REPORT SUBMITTED IN PARTIAL  
FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE  
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MANAGEMENT OF THE UNIVERSITY OF NAIROBI.**

## DECLARATION

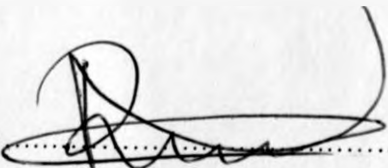
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## DEDICATION

I dedicate this research project report to my dear wife, children, my late dad, beloved mum and my cousin.

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## **ABBREVIATIONS AND ACRONYMS**

ASAL-	Arid and Semi Arid Land
CEFPI-	Council of Educational Facility Planners International
CRED-	Centre for Research on Epidemiology of Disasters
EFA-	Education for All
GOK-	Government of Kenya
IFCR-	International Federation of Red Cross and Red Crescent Societies
IPCC-	Intergovernmental Panel on Climate Change
KCPE-	Kenya Certificate of Primary Education
KRCS-	Kenya Red Cross Society
LRC-	Learning Resource Centers
MMUST-	Masinde Muliro University of Science and Technology
MOEST-	Ministry of Education, Science and Technology
MWI-	Ministry of Water and Irrigation
NCEF-	National Clearing House for Educational Facilities
NEAP-	National Environment Action Plan
NEMA-	National Environmental Management Authority
ROK-	Republic of Kenya
SHELDUS-	Spatial Hazard Event and Losses Database for the United States
TAR-	Third Assessment Report
UK-	United Kingdom
UNDP-	United Nations Development Programme
UNFCCC-	United Nations Framework Convention on Climate Change
UNESCO-	United Nations Education, Science and Culture Organization
UNICEF-	United Nations International Children's Emergency Fund
UON-	University of Nairobi
UPE -	Universal Primary Education
USA-	United States of America
WB-	World Bank
ZVAC-	Zambia Vulnerability Assessment Committee

## ABSTRACT

The purpose of this study was to establish the influence of floods on learning and teaching programs in public primary schools in Budalang'i plains of Busia County in Kenya. The literature reviewed revealed that a number of regions in Kenya had suffered devastating effects from disasters. Whenever the hazards occurred, the consequences of these disasters were enormous; they included among others; disruption of human settlements, destruction of shelter, damage to infrastructure, disease outbreaks, disruption of teaching and learning programs and the environment. It was therefore important to establish the influence these floods had on the teaching and learning programs in Budalang'i plains of Busia County. Some of the objectives the study sought to establish included; to determine the extent to which floods influenced pupils' participation in teaching and learning programmes in Budalang'i of Busia County; to determine the level at which floods influenced teachers' participation in teaching and learning programmes in Budalang'i of Busia County; to investigate the extent to which floods influenced teaching and learning infrastructure in Budalang'i of Busia County; to examine the level at which floods influenced management of teaching/ learning programmes in Budalang'i of Busia County. This study used ex post facto design in Budalang'i flood plain in Bunyala District of the Busia County in the Republic of Kenya. The target population was 724 standard eight pupils, 150 teachers and 18 head teachers of the 18 primary schools from the five administrative locations in the flood plains that were chosen using simple random and purposive sampling techniques. The study used two structured questionnaires and an interview schedule developed by the researcher; the first and second questionnaires were used to gather data from standard eight pupils and teachers respectively according to the objectives of the study. The interview schedule collected data from the head teachers according to the objectives of the study. After data collection, the responses were organized, coded and entered into the computer for analysis using descriptive statistics. The collected data was analyzed, presented in cross tabulation, interpreted and discussed in relation to the study objectives. The study found out that floods led to low school enrolment among pupils in public schools in Budalang'i flood plains. Similarly, the study showed that floods caused destruction of teaching and learning infrastructure in schools. Enrolment in schools was lowered in public schools due to floods. The study concluded that this was due to harsh conditions which were caused by floods and fear among both parents and school going children to join schools which were affected by floods. The study also concluded that floods affected the teaching and learning programmes in Budalang'i flood plains by destroying the school structures. These structures included toilets, playgrounds, desks, classrooms, staffrooms and books. In order to improve the quality of teaching and learning programmes in public primary schools in Budalang'i floodplains, it is recommended that low enrolment and destruction of school structures needed to be addressed. Low enrolment among the pupils in the flood plains could be addressed through sensitization programmes in which both parents and pupils are made to understand that despite the harsh conditions experienced during floods, it is important to ensure that school going children attend school. On other hand, destruction of teaching and learning structures in schools called for should schools being constructed on raised grounds which were not affected by floods.

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background to the Study

Cole (1996) established that the value of education to the learners and their community was manifested in their performance. World Bank (2001) on the other hand indicated that educational programmes all over the world were frequently affected by natural disasters. Offid (2004) established that there was convincing evidence that the number and seriousness of disasters were increasing in both developed and developing nations and the poor countries and communities were disproportionately affected. According to (IFRC, 2003), floods were the most natural disasters in the world and that the changing trend and impact of flood disasters on humanity was increasingly challenging governments, educational institutions and communities occupying floodplains (Kenya Red Cross Society, 2004). Senior and Fleming (2006) noted that the world had changed and would continue changing in terms of education provision yet the demand for better teaching and learning services was increasing across the world. This demand was however faced by the challenge of ever changing weather and environmental conditions which had proved disastrous to teaching and learning processes (Home, Panda and Kar, 2004). WHO (2000) established that in recent times, the pattern of flood disasters across most continents was becoming more frequent and unpredictable for government and communities to able form strategies that can counteract the negative effect of floods on provision of quality education.

According to data from the Spatial Hazard Events and Losses Database for the United States (SHELDUS), floods were the most lethal natural disaster in the United States (U.S.) which affected the education sector. It is estimated that 2,353 persons were killed and 17,129 injured by flood events from 1960 to 2005, majority of them being school going children and

teachers. The economic impact from flood events was substantial. The destruction of school property and infrastructure from flooding was unevenly distributed in the U.S., with states like Florida and Texas burdened more significantly this was according to (Brody et al. 2007). Some European countries which among include France, Netherlands, Belgium and the Ukraine had been ranked among the top 10 countries most affected by deadly disasters, taking 3rd, 5th, 6th and 9th places respectively (Nakileza, 2007).

In East Asia, especially Pakistan there had been the worst monsoon related floods with the half of the 15.4 million people affected being the children, (UNDP 2006). A total of 26 learning institutions were totally destroyed this was cited by the world disaster report by the international federation of Red Cross and Red Crescent societies (IFRCSS, 2001), the situation was worse in the third world especially in African continent where the poor were relegated to dangerous grounds and forced by prevailing economic stress to overuse flood proof land. In Africa, between the 2000 and 2001, about 35 million people which were about 13% of the total population of the continent were affected by the floods. Majority of the affected were school going children whose education system was destroyed. ZVAC (2007) reported that the education system in Zambia was negatively affected by floods by way of damaged teaching/learning infrastructure, inaccessibility to schools and relocation of teachers and learners to safer grounds. Similar scenarios had been noted in most countries in Africa especially in Mozambique in the year 2000, Zimbabwe in 1992.

Kenya, a third world country in Africa was a historical victim of flood disasters. According to a report by the Ministry of Water and Irrigation (MWI), the country experienced historical flood events in 1937, 1947, 1951, 1957-58, 1961, 1978 and 1988. The report further indicated that each flood event caused a lot of losses to development programmes especially in the field of education. Budalangi, a floodplain in the Busia County

of the Republic of Kenya was a notable victim of flood disaster events, (K.R.C.S, 2003). According to a government report, floods caused extreme damage to development programmes like education projects, infrastructure and lives in Budalangi (ROK, 2004). Though flood disasters were harmful to the occupants of the flood plains, the floodplains were continuously occupied of education programmes (Anders et al 1986) and the demand for quality education was increasing daily (Jamshoro & Dad, 2010; UNICEF, 2002).

Anders and Timberlake (1986) noted that floods disrupted educational services in floodplains by submerging school compounds and occasionally causing death of students and teachers. According to (UNICEF, 2002), school infrastructure and teaching and learning programmes which were the core education services were severely damaged and disrupted by flooding waters. It was against this background that this study was designed to assess the influence of floods on teaching and learning programmes in public primary schools in Budalang'i flood plains in Busia County.

## **1.2 Statement of the Problem**

In Kenya, the teaching and learning programmes had not yet been perfected due to interference by variations in weather and environmental conditions. According to the Ministry of Water and Irrigation of the Republic of Kenya, Budalang'i had a long history of devastating flood disaster events dating between 1937 to date. A study by (World Bank, 2006) and (Kenya Red Cross Society, 1999) indicated that floods interfered with education programmes. This scenario threatened the country's commitment to EFA goals of 1990 held in Jomtien and provision of UPE to its citizens as stipulated in the UNICEF charter. The Government of Kenya had also committed most of its revenue towards the development education sector through the provision of the necessary teaching and learning resources.

Almost every year, floods disrupted smooth learning and teaching processes in schools. The problem of floods disrupting the teaching and learning had been perennial each time taking back years of teaching and learning and costing the government millions of shillings in reconstruction of teaching and learning infrastructure. Each year several teachers and pupils were reported dead or injured due to floods necessitating action to curb the menace. All the efforts were however not yielding much in certain areas especially in flood prone areas (Nakileza, 2007).

Previous studies done had dwelt majorly on general effects of floods on development, for example the full length research paper on horrifying disasters in western Kenya; Impact on development by Achoka and Maiyo (2008); without addressing their influence on teaching and learning programmes in public primary schools in Budalang'i floodplains. According to the District Education office report, schools affected by floods in the region recorded an average mean score of 260.5 marks in K.C.P.E in 2009 national exams as compared to schools in the region not affected by floods which had an average mean score of 271.2 marks.

This study therefore purposed to assess the extent to which floods influenced teaching and learning programmes in public primary schools within the Budalang'i plains of Busia County.

### **1.3 Purpose of the Study**

This study aimed at investigating the influence of floods on teaching and learning programmes in Budalangi plains, Busia County.

## **1.4 Objectives of the Study**

The study was guided by the following objectives;

- 1) To establish the extent to which floods influence pupils' participation in teaching and learning programmes in Budalang'i of Busia County.
- 2) To determine the level at which floods influence teachers' participation in teaching and learning programmes in Budalang'i of Busia County.
- 3) To investigate the extent to which floods influence teaching and learning infrastructure in Budalang'i of Busia County.
- 4) To examine the level at which floods influence management of teaching and learning programmes in Budalang'i of Busia County.

## **1.5 Research Questions**

The study was guided by the following research questions:

- 1) To what extent do floods influence pupils' participation in teaching and learning programmes in Budalang'i of Busia County?
- 2) To what level do floods influence the teachers' participation in teaching and learning programmes in Budalang'i of Busia County?
- 3) To what extent do floods influence teaching and learning infrastructure in Budalang'i of Busia County?
- 4) To what level do floods influence management of teaching and learning programmes in Budalang'i of Busia County?

## **1.6 Significance of the Study**

It was hoped that the findings of this study would help pupils and teachers in flood plains to develop better teaching and learning strategies in response to flood disaster events. Stakeholders in education especially the policy makers would be helped to re-orient their



policy decisions towards better academic performance. The findings of the study especially those that would be published in re-known journals would enhance existing literature about flood disasters and academic programmes and would also form a strong foundation for further studies.

### **1.7 Basic Assumption of the Study**

This study was based on the assumption that the current pupils and teachers in the flood plain have experienced flood disaster events for so long that it is possible for a researcher to assess and establish the influence of the flood events on their participation in teaching/ learning programmes.

### **1.8 Limitations of the Study**

This study would have been limited by uncertain outbreak of flood disaster events since the floods experienced in Budalang'i are not easily predictable. However, by the time the study was being carried out, we had not had an outbreak of floods. Since the study area was very large consisting of three divisions with poor transport network and wide sample population, it was expected that fiscal resources and time could be very limited and inhibit thorough research. The researcher opted to use cheap and convenient means of transport to cover the entire study area.

### **1.9 Delimitations of the Study**

This study was carried out among head teachers, teachers and standard eight pupils in 18 public primary schools in Budalangi flood plain, in Bunyala District of Busia County in the Republic of Kenya. The study area was located at the mouth of River Nzoia in the floodplains of River Nzoia and Lake Victoria basin. It was approximately 50 kilometers South-West of Busia town. It was surrounded by Lake Victoria to the South, Siaya district to the East and Funyula district to the North. The study was delimited to 18 schools in Bunyala

West, Bunyala Central, Bunyala East, Bunyala South and Khajula locations that were bypassed by river Nzoia within a distance of three kilometers from the river bank on either sides of the river. The standard eight pupils were targeted because among the pupils in the school they have had maximum exposure to both teaching and learning programmes and flood disaster events. The study area was chosen because of its high level of illiteracy which would be attributed to effect of floods.

#### **1.10 Definition of Significant Terms used in the study**

**Teaching and learning programmes:** An activity of educating or instructing; an activity that imparted knowledge or skill in any public primary school in Budalang'i floodplain.

**Teaching and learning infrastructure:** The facilities which were used in the programmes of ensuring there was imparting of knowledge and skills in any public primary school in Budalang'i floodplain. They included classrooms, text books, exercise books offices, playgrounds, dormitories, toilets, laboratories, workshops, management records, water points and desks.

**Pupil participation:** Is an activity of how a pupil in any public primary school in Budalang'i interacted with school infrastructure, teachers and school management to ensure that learning objectives were achieved.

**Teacher participation:** Is a process in which a teacher in any public primary school in Budalang'i utilized the available school infrastructure in collaboration with the school management to ensure that teaching and learning objectives were achieved.

**Management of teaching and learning programmes:** How any school administrator kept and used the available records to coordinate teaching and learning process in a public primary school.

### **1.11 Organization of the study**

Chapter one discussed the aims of the study as well as why the research was very important to be done in a relative urgent manner. It also described the study area and the major problems that had been experienced during this research. The literature related to the topic under study was covered in chapter two while research design, target population, sample size and sampling procedures, data collection instruments, validity and reliability of data collection instruments and data analysis are explained in chapter three. Chapter four showed data presentation, analysis and interpretation while chapter five covers discussion, conclusions and recommendations.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

This chapter reviews literature related to the floods and how they affect teaching and learning programmes in the following subheadings: floods and learners' participation in education; floods and teachers' participation; floods and infrastructure; management of schools in flood prone areas; theoretical framework; conceptual framework and gaps in the literature review.

#### 2.2 Floods and Learners' Participation in Education

In all societies, children represent hope for the future. By extension, schools, because of their direct link to youth, are universally regarded as institutions of learning, both for instilling cultural values and for passing on traditional and conventional knowledge to younger generations. Therefore, protecting the children and schools during natural hazards is paramount in the 21<sup>st</sup> century (Achoka and Maiyo, 2008). To date the majority of research on education and climate change has focused on the impact of climate and associated environmental change on schooling. According to two recent publications: Save the Children's (2008) - *Legacy of Disasters* and UNICEF UK's (2008), *-Our Climate and Our Children are our Responsibility*, it is children who will be hardest hit by the effects of climate change. These impacts will be seen, for instance, in the direct effects on educational provision associated with increasing incidences of severe weather. Events like drought, flooding, cyclones, heat waves, incremental environmental changes like sea level change, salination, and changes in season patterns, desertification, soil erosion and species loss are likely to result in deteriorating livelihoods which impact upon both household expenditure on schooling and the nutritional status of school going children. Evidence of the supply side consequences of extreme weather events is already emerging. The aftermath of Cyclone Sidr, which struck Bangladesh in November 2007, left 74 government primary schools destroyed

and another 8,817 damaged. An estimated 103,664 pupils were affected as a result. The estimated cost of reconstruction and refurbishment was more than US\$ 82 million (Das 2008). Similarly, the 2000 flood in Cambodia destroyed approximately 18% of the country's schools, impacting upon the education of 500,000 children and costing \$1.6 million in rehabilitation costs. Subsequent research in Cambodia has also demonstrated that school absenteeism and drop out are higher in flood-prone areas.

Moreover, there is evidence that flooding inhibits completion of the school programmes. With schools located in flood-prone areas, they have had to close schools at least one and a half months early due to flooding (Asian Disaster Preparedness Centre 2008). The cumulative effects of extreme weather events on both initial enrolment and longer term educational performance are not well known. Research in India, however, concludes that women born during flood years in the 1970s were 19% less likely to have attended primary school (UNDP 2007). This therefore means that floods interrupted, reduced access to education, has a detrimental impact on learning outcomes, reducing the likelihood that children and young people – and especially girls – will be able to break the cycle of poverty (Elimu Yetu Coalition 2005). A further important implication that the Cambodia and Bangladesh examples demonstrate is the significant financial burden that rehabilitation costs exert on constrained education budgets. Emergency responses to extreme weather events and their aftermath thus have the potential to undermine investment in the longer term quality improvement of education provision.

Over a long period of time, climate change in combination with factors such as population pressure are likely to lead to environmental degradation and the related deterioration in livelihoods. Associated reductions in household income will influence decisions regarding the number and gender of children sent to school as well as whether there

is continued support for their attendance. Moreover, deteriorating livelihoods are likely to increase the time required to secure clean water and fuel, and to care for siblings and the sick. Research suggests that in all instances such effects are likely to disproportionately affect girls and impact on gender equity and female student performance.

There have been many attempts at explaining education and learning processes both in Australia and overseas in terms of learners missing classes due to floods according to (Molino, Stewart, 2007). They noted that 80% of pupils missed classes due to floods. Most of these programs aim to raise awareness about flooding and how learners can continue to participate in education during flood events. Sadly, almost all of these programs were poorly designed, not evaluated and short term leading to poor quality of teaching and learning during floods. Moreover, they generally undersell the value of education flood in flood prone areas (Dufty, 2008). The article describes a new approach to community flood education that is showing promise in providing effective and long term benefits to flood prone communities in some parts of world on how learners can adapt to new learning techniques. The first feature of the new approach is that it extends the reach of flood education, from just raising awareness and preparedness levels, to helping build flood resilient communities. According to (Paton 2006), resilience is a measure of how well people and societies can adapt to a changed reality and capitalise on new possibilities offered. In terms of learning in flood prone areas, resilience involves the ability of pupils to not only resist and recover from a flood, but also to improve as a result of the changed realities that the flood may cause.

Flood resilient communities will be critical in an uncertain future of 'accelerated' climate change. Most climate change models predict increases in the intensity of storm events and floods exceeding the 1-in-100 year flood over the next 50 years. With the limitations of structural works to protect communities against the side effects of floods

already acknowledged, a future of increased flooding risk communities may be further exposed and hence being prepared in case of the occurrences of the floods. The ability of school communities to adapt to flooding in the future is therefore paramount, not only to minimising loss of life of learners and damages to educational infrastructures, but also in ensuring a steady path towards learning is maintained (Folke, 2002). Because of its ability to help people learn and improve as a result of learning, education is well-placed to help communities build their resilience to flooding. As a result, community flood education is here defined as any learning process or activity that builds community, which includes all pupils, teachers, managers and parents resilience to flooding. In the past, raising community awareness about flooding has been the main focus of many flood education programs. The value of this focus is questionable as several researchers, such as Boura (1998) and Paton et al. (2003) have demonstrated that there is not a strong and causal link between people being aware of a hazard and acting appropriately for that hazard.

Community educators believed some years ago that there was a linear relationship between becoming aware of an issue, clarifying attitudes and values about that issue and then acting appropriately in order to allow learners to adapt accordingly to the changed pattern of learning in their schools due to floods. Awareness is now viewed as one of a nest of factors that precipitate appropriate behaviours. For example, in relation to hazards, Paton et. al. (2003) identifies critical awareness as one of a sequence of components that determine a person's adoption of a protective action. A community flood education program should therefore be designed to not only raise awareness but also focus on the other psychological factors including barriers that convert people to preparedness and especially learners. Furthermore, to assist in building flood resilient communities, learning in flood prone areas was not just focus on preparedness, but it also related to other components of resilience, this

was cited by (Paton, 2006) who said these included adaptive systems and competencies. A second feature of the new approach is the clear identification of the functions of flood education in building flood resilient communities. Webber and Dufty (2008) identified the learners' preparedness conversion, mitigation behaviours and adaptive capability as the functions of flood education in the new approach.

### **2.3 Floods and Teachers' Participation**

The floods cause significant damage to people's lives and the environment (Palakudiyil and Todd, 2003). There is a responsibility for school teachers to understand the risks to the areas they serve and make necessary preparations for mitigating the risks and impacts of flooding. However, the reality is that flood risk management is a challenging and complex process that requires a great deal of resources and capacity. According to Climate Change in England: Framework for Action (Defra, 2007), teachers are at the front line in planning for the impacts of climate change and picking up the pieces when the weather creates problems for local communities. In managing flood risk in schools the teachers should understand and communicate the different types of local flood risk to school communities and stakeholders; plan and prepare for flooding emergencies; respond to and recover from floods ( Defra, 2007). This should be done if early retirement among teachers has to be avoided and hence interfering with teaching and learning process.

Anders and Timberlake (1986) noted that floods disrupted educational services in floodplains by submerging school compounds and occasionally causing death of students and teachers. This led to many cases of both teachers and learners missing school and classes.

The delivery of education in flood prone areas is challenging and may be by various means, depending on context and resources, including written materials, radio and television broadcasts, public meetings and demonstrations, and household visits. In Vietnam, much of



this work is undertaken through conventional propaganda channels such as the local government loudspeakers sited throughout communities (Few *et al.* 2004). Following the Orissa cyclone (1999), UNICEF assisted with production of handbills and loudspeaker announcements, and supported a series of hygiene education programmes using 3,900 teachers (Palakudiyil and Todd, 2003). Health and hygiene education can be provided as flood preparedness in flood-seasonal environments or distributed as emergency response during and after the flood event. But whatever the timing of delivery, the key to effective education appears to advance planning by the teacher to ensure information provided is accessible, appropriate and widely disseminated for the learners to comprehend. For example, drawing lessons from the experience of Hurricane Floyd (1999) in North Carolina, USA, Becker *et al.* (1999) noted that public service announcements, educational materials, and training programs on flood preparedness should be made accessible to all teachers and learners before the hurricane season. The manual for contingency planning for floods produced by Caribbean Environmental Health Institute (2003) stresses that for each aspect of environmental health, a key action is to ensure not only that public advisory and education materials are developed but also that mechanisms are in place by the teacher to disseminate them. With thoughtful intervention, it may be feasible to draw positive lessons from flood experience during the recovery stage to enhance health promotion in general.

Maber (1989) reports how flood disaster highlighted poor hygiene practices and inadequate knowledge of causes and treatment of common diseases in schools in north-east Peru hence affecting the staffing of teachers in schools especially females. Health promotion became a key parallel activity to a participatory programme of sanitation works in flood prone areas. A community medical centre was established, which concentrated efforts on regional campaigns, education programmes and workshops on general preventive medicine

and practices. In India, after the Orissa cyclone in 1999, relief agencies became involved in training programmes for local volunteers and teachers that took a similarly wide approach to the communities' future health needs (Palakudiyil and Todd 2003).

#### **2.4 School Infrastructure in Flood Prone Areas**

A comfortable indoor climate is essential for the productivity of the learners (Reinink, 2004). According to him, if one is too hot, he becomes lethargic and loses concentration while too cold, the body stiffens. If the light is too bright or too dull one gets sore eyes and heads. If it is too noisy, the audience can't hear and lose concentration; (Reinink 2004). It is along this line that school infrastructure in flood prone areas should be keenly assessed and repaired in case they have been destroyed by floods in order to make learners have a convenient environment.

Most schools within most flood prone areas in Kenya are in pathetic situations and disheartens educationists. In some cases, a school consists of six or ten classrooms in two or three blocks, if the school is fortunate, the oldest block will have been built sturdily, though newer blocks, often built by the community seem temporary. These blocks will vary in quality from mud and cement block used in construction. They suffer from inadequate maintenance and the compounds are usually dusty. The additional students from disaster affected areas, leads to hundreds of pupils to squeeze into poorly-lit rooms usually designed for not more than forty some without chairs and desks. (Daily Nation, February 9th, 2003). 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. The greater the quality and quantity of inputs in forms of school infrastructure, the better the quality of teaching and learning programmes in schools which will satisfy the expectation of the society and the government (Achoka and Maiyo, 2008)

Increased instances of drought, flooding and severe weather events as well as incremental environmental change through processes such as inundation, desertification and salination are likely to exacerbate existing problems related to the school infrastructure (Smith and Vivekananda 2007; WHO 2008; UNICEF UK 2008). Education is a key priority for international development as its impact is likely to be disproportionately felt in developing countries. This is because developing countries are generally warmer, more prone to rainfall variability and hence floods, and as a result of low income have limited risk mitigation infrastructure, both physical and financial (Stern 2007).

Consequences for the majority of people in Asia and Africa as well as those living in Small Island developing states are likely to be particularly significant, although the specific nature of climate threats will vary between countries. Article 6 of the United Nations Framework Convention on Climate Change (UNFCCC) also known as the New Delhi work program, directs countries to consider education, training and public awareness as integral to responses to floods and other disasters. Increasingly, countries should develop plans utilizing the UNFCCC framework to incorporate education-specific elements such as school infrastructure in flood prone areas. However, the degree of success of such plans will be determined by the extent to which countries recognize and are able to adequately address resource responses to the challenges posed by climate change, namely: extreme weather events, changes in seasonality, population movements, and demand side and health impacts on enrolment, attendance and educational performance. These challenges will need to be addressed both in terms of educational infrastructure as well as teaching and learning processes. With thousands of school building fully or partially affected due to floods and no chance of their repair and reconstruction in near future, hundreds of thousands of displaced children have nowhere to go to for schooling.

Stem (2007) noted that to save the academic future of the school going children due to destruction of infrastructure, the government and civil society organizations must start massive non-formal schooling system in the world. Education sector in most parts of the world, which had already been neglected, is now in critical condition due to the flood losses. He further says this natural calamity aggravated by ill-conceived decisions, poor irrigational management and lack of vision with the government to face effectively with this massive challenge, besides destroying agriculture, livestock and housing sector, has dealt a fatal blow to educational infrastructure in the flooded areas.

## **2.5 Floods and Management of Education**

Each public authority including individual schools should have management policy, a policy document which can be adopted in its entirety or adapted to reflect the different needs of different schools (Bowes 2007). A school should have in place an overall policy statement, endorsed by top management and made readily available to staff at all levels of the organisation, on how it manages its records, including electronic records during floods. The policy statement should provide a mandate for the performance of all records and information management functions. In particular, it should set out a school's commitment to create, keep and manage records which document its principal activities and ensure important information is not lost during floods. The policy should also outline the role of records management and its relationship to the school's overall strategy; define roles and responsibilities including the responsibility of individuals to document their actions and decisions in the school's records, and to dispose of records; provide a framework for supporting standards, procedures and guidelines; and indicate the way in which compliance with the policy and its supporting standards, procedures and guidelines will be monitored.

According to Marcouse (2003) in order to implement standards, procedures and guidelines schools should rely on advice provided by education personnel in flood prone areas.

Schools like other organizations in flood prone areas today have to be more productive and in order for that to occur, management have to be dedicated in achieving this goal, (Bowes 2007). Each member of the team should be involved in the everyday decision making and change to drive performance. One of the approaches to management is the ethical approach to management. One definition suggests that 'ethics are the moral principles that should underpin decision-making. A decision made on ethics might reject the most profitable solution in favour of one of greater benefit to society as well as the organization, (Marcouse, 2003). The key words used in definition are 'moral principles', so this definition suggests that acting ethically means acting in a moral way. Another definition suggests that ethics 'is the study of morality – practices and activities that are considered to be importantly right and wrong, together with the rules that govern those activities and the values to which those activities relate' (Mullins, 2005). The words leadership and management have been used by some people synonymously for decades. The two words have very different meanings and play two very different roles within the structure of an organization. Although the most successful management teams have great leadership, some management teams lack leadership at all. Management is merely the positions within organizations that set goals and expectations for its members to achieve, (Tanya Y. 2008). Leadership is the way in which management will motivate its members to achieve those goals and expectations. Management is the place in the organizational structure that affords a person the ability to lead. Leaders are the people who are able to efficiently and effectively achieve the goals of the organization by motivating its members.

The roles and responsibilities of leaders in schools in times of floods is very important for the success of teaching and learning programmes. In order to better understand what the roles and responsibilities of great leaders are, we must first know what a leader's role is. Bateman & Snell (2009) defined a leader as one who influences others to attain the goals of the organization. Leaders are responsible for motivating their members to achieve the desired goals. Historically, just getting participants to be active and do the job that they were paid to do was considered leadership. As time and competition evolved management realized that the mark of real leadership came from an individual's ability to empower and motivate the people around them to contribute their own thoughts and ideas. It is important for management to stimulate its team members because a person's performance is determined not only by their ability but by the motivation that they have to do their very best.

School organizations in flood prone areas have today become increasingly diverse with participants of different genders, races, cultures, ethnic origins, and lifestyles. There have been so many changes in the cultural make-up of school organizations that it has become imperative for leaders and supervisors to understand cultural diversity and how it can affect their organization (Bowes, 2007). By understanding how this diversity can affect their organization, school leaders are taking steps to assure a conflict-free environment and promoting positive outcomes for the school despite the drawbacks due to floods, as well as its community members. Diversity in management today is being viewed as a key means to strengthen the human capital of an organization and improve overall performance (Bowes, 2007). Schools in flood prone areas should embrace all aspects of management and leadership by formulating good policies that can assist them to withstand the negative effects of floods which are likely to compromise the quality of teaching and learning processes by engaging diversity in management.

## 2.6 Theoretical Framework

This study on effect of floods on teaching and learning programmes in public primary schools in Budalang'i plains in Busia County was based on Bronfenbrenner's theory.

Bronfenbrenner's theory looked at a child's development within the context of the system of relationships that formed his or her environment (Berk, 2000). Bronfenbrenner's theory defined complex "layers" of environment, each having an effect on a child's development and education. This theory had recently been renamed "bio ecological systems theory" to emphasize that a child's own biology was a primary environment fuelling her development. The interaction between factors in the child's maturing biology, his immediate family/community environment, and the societal landscape fuelled and steered his development and education. Changes or conflict in any one layer would ripple throughout other layers. To study a child's development and education then, it looked not only at the child and her immediate environment, but also at the interaction of the larger environment as well (Henderson, 1995). It was on this basis that the study investigated how floods being an effect on an environment within which pupils in Budalang'i flood plains interacted with their development and education. The interaction of learners and teachers with floods was being viewed to have an effect on teaching and learning programs in public schools. This interaction would be well managed in order to ensure success of achievement of educational programs in schools.

## 2.7 Conceptual Framework

This study was guided by the following conceptual framework:

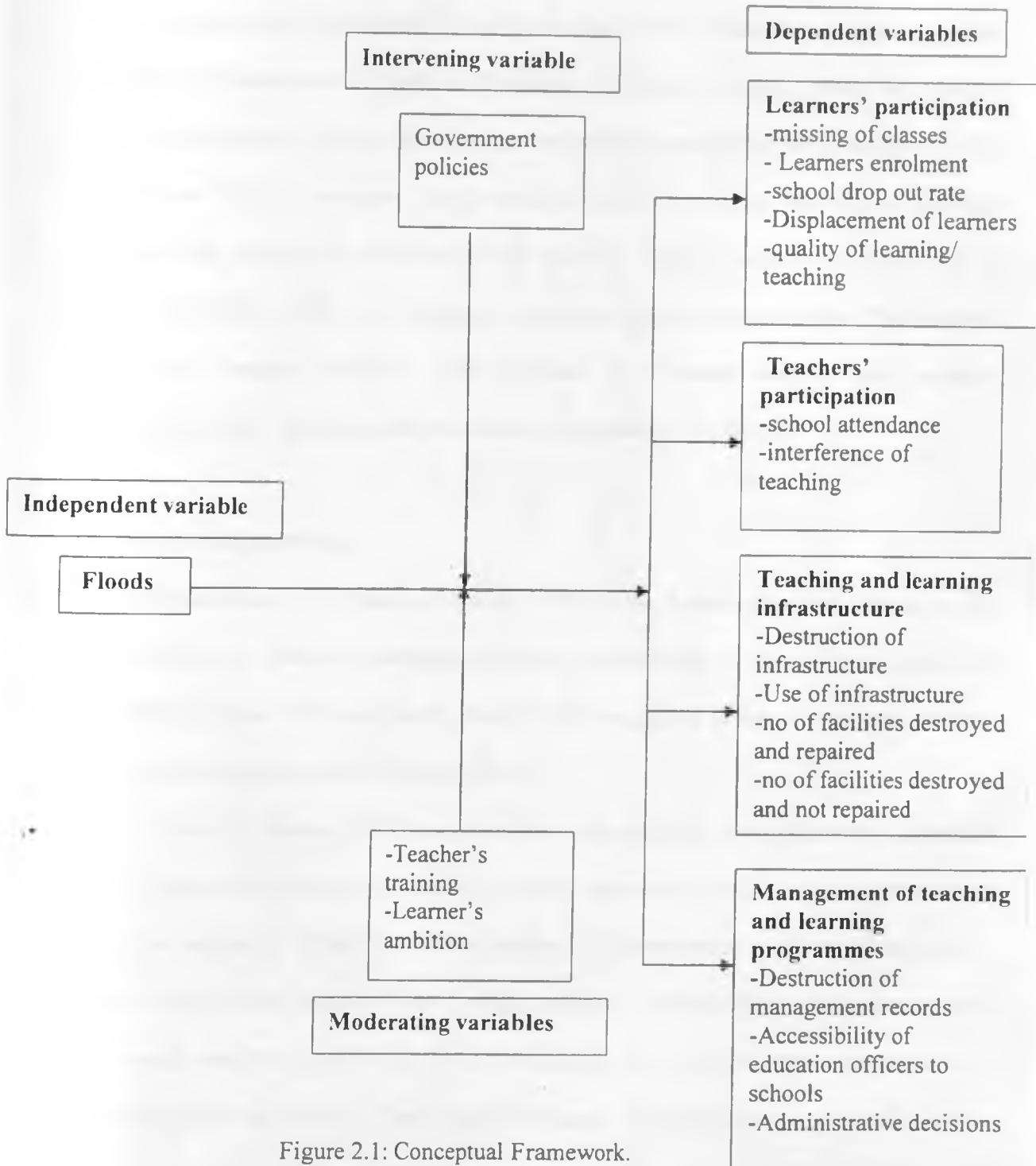


Figure 2.1: Conceptual Framework.



The floods being the independent variable would affect teaching and learning processes in public schools in Budalang'i flood plains of Busia County through pupils' participation, teachers' participation, and school infrastructure and school management being dependent variables. The occurrence of floods in Budalang'i floodplains directly affected how pupils, teachers, teaching and learning infrastructure; and school management could contribute to the teaching and learning processes. The government policies on floods, teaching and learning programs was expected to intervene in this study by affecting indirectly measures put in place to curb effects of floods on education programs by school administration. The teachers' training and learners' ambition were expected to moderate learners' and teachers' participation, school infrastructure and school management in the study.

## **2.8 Gaps in the knowledge**

A previous study by Achoka and Maiyo (2008) on the floods in Budalang'i dwelt on the general effects on general development without concentrating on the effect of floods on academic programs. The same study dwelt much on general effects of disasters without putting much emphasis on the effects of floods.

A study by Bowes (2007) suggested that each public authority including individual schools, should have management policy, a policy document which could be adopted in its entirety or adapted to reflect the different needs of different schools. The study said that a school should have in place an overall policy statement, endorsed by top management and made readily available to staff at all levels of the organization, on how it managed its records, including electronic records. The policy statement would provide a mandate for the performance of all records and information management functions. In particular, it would set out a school's commitment to create, keep and manage records which document its principal

activities. However, the study did not explain how head teachers in flood prone areas would manage schools in the event of floods.

Defra (2007) suggested that in managing flood risk in schools the teachers would understand and communicate the different types of local flood risk to school communities and stakeholders; plan and prepare for flooding emergencies; respond to and recover from floods. However, the study never dealt with how the teacher, who was also a victim of floods, would be catered for in the event of floods. While many studies have been carried out on the influence of floods on education, none of them had ever been done to cover Budalang'i.

Failure by previous studies to address key issues on the influence of floods in teaching and learning programs formed a basis for my study which aimed to fill the above gaps.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### **3.1 Introduction**

This chapter describes the research procedures in terms of the research design, target population, sampling procedure and sample size, data collection instruments, pilot testing, validity of instruments, reliability of instruments, data collection procedures, data analysis techniques, ethical considerations and operational definition of the variables.

#### **3.2 Research Design**

Ex post facto design was adopted because according to Fraenkel and Wallen (2000), this design facilitated collection of information from large sample drawn from a predetermined population at a particular point in time after the events being investigated have already occurred. The design was considered appropriate for the study because it facilitated coverage of a large section of the target population and study area was that the large samples used to take care of experimental modality and representativeness (Frankel et al, 2000).

#### **3.3 Target Population**

The target population for the study was 1012 persons consisting of 724 standard eight pupils, 270 teachers and 18 head teachers of the 18 primary schools which were bypassed by River Nzoia from the five administrative locations in the district.

#### **3.4 Sampling Procedures and Sample size**

This section presents sample size and sampling procedures.

### 3.4.1 Sample Size

In this study, the sample consisted of standard eight pupils, teachers and head teachers. The sample size of the head teachers, teachers and pupils was determined using the following Yamane's formula as outlined by Yamane (1967)

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

Where:

n was the proposed sample size.

N was the target population which in this case is 1012.

e was standard error which is a standard value of 0.05.

On substituting  $n=1012/1+ 1012 (0.05)^2$

Calculation of the sample size based on these figures gave a sample size of 286.

### 3.4.2 Sampling Procedures

A sample size of 286 was distributed proportionately as follows:

Pupils:  $724 \times 286 / 1012 = 205$

Teachers:  $270 \times 286 / 1012 = 76$

Head teachers:  $18 \times 286 / 1012 = 5$

Basing on the above breakdown of samples, the study used purposive sampling to identify the 5 head teachers who were given questionnaires. Since 5 head teachers were used in the study, it implied that 5 schools in the study area were studied and hence an average of 41 pupils per school was required for the study. To choose the 5 schools, simple random

sampling was used in which a school with 45 pupils and above was considered for sampling. The results from the sampled schools were generalized since all schools in the study area experienced same influence due to floods.

### **3.5 Data Collection Instruments**

Data was collected using two structured questionnaires developed by the researcher; the first one was used to gather data from standard eight pupils according to the objectives of the study. The questionnaire had two sections. Section one had four open ended questions while section two had 14 closed ended questions. The second questionnaire collected data from the teachers according to the objectives of the study. The questionnaire had two sections. Section one had four open ended questions while section two had 14 closed ended questions. To gather data from head teachers in relation to the study objectives, an interview schedule on the four study objectives was organized.

#### **3.5.1 Pilot Testing of the Instruments**

To standardize the instruments before they were used for data collection, a minor study called a pilot study was conducted. The pilot study was done in two primary schools on 10 standard eight pupils, ten teachers and two head teachers in the Nyando floodplain. Nyando floodplain was chosen because it had the same geographical and climatic conditions as Budalang'i floodplains and hence results gotten from the pilot study were likely to reflect the situation in Budalang'i. The main intention of the pilot study was to identify problems that respondents would encounter and to determine if the items in the research instrument would yield the required data for the main study. Therefore, the items in the instrument were revised depending on the result of the pilot study.

### 3.5.2 Validity of the Instruments

According to Mugenda and Mugenda (1999), validity of an instrument was a measure of the degree to which the results obtained using the instrument represented the actual phenomenon under study. Peers and research measurement experts from University of Nairobi were used to validate each instrument. The instruments were given to two experts and two peers in the department of project planning and management for validation. The two experts had wide experience in supervising graduate students while the two peers were graduate students undertaking similar research but in different geographical areas. They were asked to evaluate the instruments in terms of content and face validity. They helped to ensure that the items in each questionnaire captured the intended information accurately according to the objectives of the study.

### 3.5.3 Reliability of the Instruments.

Mbwesa (2006) defined reliability as the degree to which a measure supplied consistent results. In order to ensure reliability of the instruments, the split-half technique which involved administering only one testing session and taking the results obtained from one half of the scale items and checking them against the other half of items to determine their correlation coefficient was used.

The study used Spearman Brown prophecy formula to calculate the reliability coefficient.

The formula for this test was as follows:

$$\text{Reliability on scores on total test} = \frac{2 \times \text{reliability for } \frac{1}{2} \text{ test}}{1 + \text{reliability for } \frac{1}{2} \text{ tests}}$$

Where reliability for  $\frac{1}{2}$  test =0.42.

On substituting, the value of reliability on scores on total test =0.6

Mugenda and Mugenda (1999) suggested a correlation coefficient of 0.6 for such studies.

### **3.6 Data Collection Procedures**

A letter was obtained by the researcher from the Graduate School requesting for a permit from the Ministry of Higher Education and Science through the National Council of Science and Technology of Kenya to carry out the research. On acquisition of the permit, the researcher proceeded to the study area for appointments with school administrators in preparation for data collection which followed accordingly. In order to carry out the research within the required time frame the researcher employed the services of two competent research assistants.

### **3.7 Data Analysis Techniques**

After data collection, the responses were organized, coded and entered into the computer for analysis using descriptive statistics. The descriptive statistics included percentages, mean, mode, median and standard deviations.

### **3.8 Ethical Consideration**

Research and professional ethics was upheld by treating every information obtained through data collection with maximum confidentiality and only used to answer the research questions on the influence of floods on the teaching and learning programmes in public primary schools in Budalang'i in Busia County.

### 3.9 Operational Definition of Variables

Objectives	Variables	Indicators	Measurement Scale
<p>To establish the extent to which floods influence pupils' participation in teaching and learning programmes in public primary schools in Budalang'i of Busia County</p>	<p><b>Independent variable</b> floods</p> <p><b>Dependent variable</b> pupils' participation in teaching and learning</p>	<p>-missing of classes</p> <p>- Learners enrolment</p> <p>-school drop out rate</p> <p>-Displacement of learners</p> <p>-quality of learning/teaching</p>	<p>Nominal</p> <p>Nominal</p> <p>Nominal</p> <p>Nominal</p> <p>Nominal</p>
<p>To determine the level at which floods influence teachers' participation in teaching and learning programmes in public primary schools in Budalang'i of Busia County.</p>	<p><b>Independent variable</b> floods</p> <p><b>Dependent variables</b> Teachers' participation in teaching and learning process</p>	<p>-school attendance</p> <p>-interference of teaching</p>	<p>Nominal</p> <p>Nominal</p>
<p>To investigate the extent to which the floods influence teaching and learning infrastructure in public primary schools Budalang'i of Busia County.</p>	<p><b>Independent variable</b> floods</p> <p><b>Dependent variable</b> teaching and learning infrastructure</p>	<p>-Destruction of infrastructure</p> <p>-Use of infrastructure</p>	<p>Nominal</p> <p>Nominal</p>



<p>To examine the level at which floods influence management of teaching and learning programmes in public primary schools in Budalang'i of Busia County.</p>	<p><b>Independent variable</b> floods</p> <p><b>Dependent variable</b> Management of teaching / learning programmes</p>	<p>-Destruction of management records</p> <p>-Accessibility of education officers to schools</p> <p>-Administrative decisions</p> <p>-Change of management</p>	<p>Nominal</p> <p>Nominal</p> <p>Nominal</p> <p>Nominal</p>
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Table3.1: Operational definition of variables

## CHAPTER FOUR

### DATA ANALYSIS, PRESENTATION, INTERPRETATION AND DISCUSSIONS

#### 4.1 Introduction

This chapter presents data analysis, presentation, interpretation and discussion in the following subtitles: Respondents return rate, influence of floods on pupils' participation, teachers' participation, school infrastructure and school management in teaching and learning programmes in public primary schools in Budalang'i floodplains in Busia County.

#### 4.2 Respondents Return Rates

A total of 205 pupils, 76 teachers and 5 head teachers were targeted for this study. A total of 205 pupils and 76 teachers were given questionnaires and 5 head teachers interviewed and out of these the return rate was 286(100%). The high respondent return rate could be attributed to the use of drop and collect survey theory in which you come face to face with the target key informants. The high return rate could also be due to the high level of mobilization and awareness created about this study by the District Education Officer and the head teachers of the sampled schools prior to the data collection. Similarly the study was being carried out during the season when floods usually occur and hence most respondents were keen in participating in the study. The respondents were all found in schools which were fully operational and hence they made it easier to collect all the data without any hitch.

#### 4.3 Background information of the respondents

The study sought background information of the respondents which included gender, their age brackets for pupils while for teachers and head teachers, information on gender, age and working experience in Budalang'i was sought.

### 4.3.1 Gender of the respondents

The study sought to find out the gender distribution among the head teachers, teachers and pupils respondents; and whether floods had any influence on gender of respondents in Budalang'i floodplains. The respondents were therefore asked to state their gender. The responses of the interviewees were recorded in table 4.1.

**Table 4.1: Gender distribution for respondents**

Gender	Pupils		Teachers		Head teachers	
	Frequency	%	Frequency	%	Frequency	%
Male	142	69.3	46	60.5	4	80
Female	63	30.7	30	39.5	1	20
<b>Total</b>	<b>205</b>	<b>100</b>	<b>76</b>	<b>100</b>	<b>5</b>	<b>100</b>

Results in table 4.1 showed that majority of the respondents constituting 4(80%) of the head teachers interviewed were males while female were 1 (20%). This probably pointed to the fact that in Budalang'i area the number of male head teachers was significantly more than that of female head teachers. The case duplicated the situation in Peru which was as observed by Maber (1989) who reported how flood disaster highlighted poor hygiene practices and inadequate knowledge of causes and treatment of common diseases in schools in north-east Peru hence affecting the staffing of teachers in schools especially females.

Results in table 4.1 showed that majority of the respondents constituting 46 (60.5%) of the teachers interviewed were males while females were 30 (39.5%). This probably pointed to the fact that in Budalang'i area the number of male teachers was significantly more than that of female teachers. The head teachers who were interviewed confirmed this disparity and attributed it to the fear of women to work in this challenging environment and would prefer areas which are not affected by floods. The case duplicated the situation in Peru which was as observed by Maber (1989) who reported how flood disaster highlighted poor hygiene

practices and inadequate knowledge of causes and treatment of common diseases in schools in north-east Peru hence affecting the low staffing of female teachers in schools.

Table 4.1 showed that majority 142 (69.3%) of the respondents were male pupils while 63 (30.7%) were females. This quite accurately reflected the true situation on the ground since in nearly all primary schools in Budalang'i flood plains majority of the pupils were male. This meant that it was easier to access the male pupils during the study than it was to meet their female counterparts. The accessibility of the fewer female was an indication that floods could have affected girl child education more negatively than the male pupils. This probably pointed to the fact that since in Budalang'i area the number of male teachers is significantly more than that of female teachers, the girl child had no role model to motivate them to attend school. Similarly this confirmed the observation by Elimu Yetu Coalition (2005) that it would also seem safe to conclude that interrupted and reduced access to education had a detrimental impact on learning outcomes, reducing the likelihood that children and young people – and especially girls – would be able to break the cycle of poverty. This also concurred with research in India which concluded that women born during flood years in the 1970s were 19% less likely to have attended primary school (UNDP 2007).

#### **4.3.2 Age categories of the respondents**

The study sought to find out the age distribution among the head teachers, teachers and pupil respondents; and whether floods had any influence on age of respondents in Budalang'i floodplains. The respondents were asked to state their age categories and the results were recorded in figures 4.2 and 4.3.

**Table 4.2: Age categories of the pupil respondents**

<b>Age category</b>	<b>Frequency</b>	<b>Percentage (%)</b>
13years & below	66	32.2
14 – 16 years	125	61.0
17years & above	14	6.8
<b>Total</b>	<b>205</b>	<b>100</b>

The results in table 4.2 showed that the highest number of respondents constituting 125 (61%) of all respondents from the pupil category were in the age range of 14 to 16 years. Pupils in the age category of 13 years and below constituted 66 (32.2%) of total pupil respondents while those above 17 were the least and comprised 14 (6.8%). The results pointed out that most of the pupils were not affected by floods in terms of promotion from one class to another and hence their age category coincided with the right class. The results showed that Budalang'i community had adapted to the effects of floods to ensure steady learning in their schools. This steady path towards learning would be explained by a study by Folke (2002) who observed that the ability of school communities to adapt to flooding in the future was paramount in ensuring a steady path towards learning is maintained by way of promotion of learners from one stage to the next.

**Table 4.3: Age categories of the head teacher and teacher respondents**

Age category	Teachers		Head teachers	
	Frequency	Percentage (%)	Frequency	Percentage (%)
19years & below	0	0.0	0	0
20 - 29 years	13	17.1	0	0
30 – 39 years	30	39.5	1	20
40 – 49 years	21	27.6	3	60
50years & above	12	15.8	1	20
<b>Total</b>	<b>76</b>	<b>100</b>	<b>5</b>	<b>100</b>

Table 4.3 showed that majority of head teacher in this study were those in the age category of 40 to 49 years who constituted 3(60%). There were no respondents who were 29 years and below. Respondents who were within the age category of 30 to 39 years and 50 years and above comprised of 1(20%) each. The results showed that most head teachers in the region were in their prime working age. The lack of head teachers who are young pointed out that much had not been done to prepare the young generation to counter act the effects of floods as was pointed out by the interviewed head teachers who said that the challenges of the floods could not be addressed by young administrators. The head teachers in the study area were all having an administrative experience of between 10 years and above. The results indicated that maybe most head teachers were promoted to the post and were rarely transferred to other areas which were not affected by the flood menace. This scenario complicated the way influence of floods on teaching and learning programmes in public primary schools was handled since there was no room for injection of new ideas on how to deal with the menace.

Similarly, the results from table 4.3 showed that majority of teacher respondents in this study were those in the age category of 30 to 39 years who constituted 30 (39.5%). There were no respondents who were 19 years and below. Respondents who were within the age category of 40 to 49 years comprised of 21 (27.6%) while those in the age category of 20 to 29 years being 13 (17.1%) of the total respondents. Respondents who were 50 years and over comprised 12 (15.8%) of all the teacher respondents in this study. The results showed that most teachers in the region were in their prime working age.

**4.3.3 Administration and teaching experience of the head teachers and teacher respondents respectively.**

The study sought to find out the experience among the head teachers and whether floods had any influence on the duration head teachers served in Budalang'i floodplains. The respondents were asked to state their administration experience and the results were recorded in figure 4.4 shown.

**Table 4.4: Administration experience of the head teachers.**

<b>Experience</b>	<b>Frequency</b>	<b>Percentage (%)</b>
4 years and below	0	0
5 – 9 years	0	0
10 years and above	5	100
<b>Total</b>	<b>5</b>	<b>100</b>

From table 4.4, it was evident that all respondents 5(100%) were those who had been head teachers in Budalang'i flood plains for a period of between 10 years and above. The results indicated that most head teachers were promoted to the post and were rarely transferred to other areas which were not affected by the flood menace. This scenario complicated the way

influence of floods on teaching and learning programmes in public primary schools was handled since there was no room for injection of new ideas on how to deal with the menace. Similarly, the study sought to find out the teaching experience among the teachers and whether floods had any influence on the duration teachers served in Budalang'i floodplains. The respondents were asked to indicate their teaching experience and the results were recorded in figure 4.5 shown.

**Table 4.5: Teaching Experience of Teacher Respondents.**

<b>Experience</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>4 years and below</b>	37	48.7
<b>5 – 9 years</b>	21	27.6
<b>10 years and above</b>	18	23.7
<b>Total</b>	<b>76</b>	<b>100</b>

From table 4.5, it was evident that most respondents were those who had taught in Budalang'i flood plains for a period of 4 years and below comprised 37(48.7%) of all respondents from the teachers' category. Those who had taught for more than 10 years comprised 18 (23.7%) while those who had taught in Budalang'i flood plains for a period of between 5 and 9 years constituted 21 (27.6%) of the respondents. The results indicated that most teachers worked in the study area and due to floods, they transferred out of the area or died before they reached their retirement age. This could be explained by what one of the head teachers observed that there was high teacher transfer rate in the school due to floods. The frequent transfers among teachers in the area never gave them enough experience in dealing with the effects of floods as was pointed out in the experience of Hurricane Floyd (1999) in North Carolina, USA, in which the experience of a teacher in flood prone area was



important in ensuring relevant information pertaining to floods was accessible, appropriate and widely disseminated for the learners to comprehend.

#### **4.4 Pupils' Participation in Teaching and Learning Programs**

The study sought to determine how floods influenced pupils' participation in teaching and learning programs in public primary schools in Budalang'i flood plains. Missing of classes by pupils, school drop out, quality of teaching and learning; and school enrollment were the variables that were determined and used to measure the influence of floods on pupil participation.

##### **4.4.1 Missing of classes by pupils.**

The study sought to determine how floods influenced missing of classes by pupils in public primary schools in Budalang'i flood plains. The pupils were asked to state if they missed classes because of floods. The results were as shown in the table 4.6.

**Table 4.6: Missing of classes by pupils.**

<b>Option</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Yes</b>	125	61
<b>No</b>	80	39
<b>Total</b>	<b>205</b>	<b>100</b>

From table 4.6, it was shown that most of the pupils 125 (61%) said that they had missed classes due to floods while 80 (39%) said they had not missed classes due to floods.

Among those who said that they had missed classes due to floods, the study further sought to determine how frequent they missed. The respondents were therefore asked to state how

frequent they had missed classes due to floods. Their responses were as shown in the table 4.7 shown.

**Table 4.7: Frequency of missing classes by pupils**

<b>Options</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Very frequent</b>	21	16.8
<b>Frequent</b>	73	58.4
<b>Not sure</b>	10	8.0
<b>Rare</b>	13	10.4
<b>Very rare</b>	8	6.4
<b>Total</b>	<b>125</b>	<b>100</b>

From table 4.7, 73(58.4%) of the pupils rated themselves as having missed classes frequently, while very few 8 (6.4%) said that they missed lessons very rarely. Of the respondents, 21(16.8%) said the missing of classes by pupils was very frequent, 13(10.4%) said it was rare and 10(8.0%) were not sure. This showed that floods led to missing of classes among pupils in Budalang'i flood plains. However, very few pupils rarely missed classes due to floods in the study area maybe due to their personal determination and perseverance with the aim of wanting to excel in examination despite harsh conditions experienced during floods. These findings were in line with the ones of (Molino, Stewart, 2007) who explained about a high rate of 80% of missing classes among pupils in flood prone areas both in Australia and overseas.

To verify this, the teacher respondents were asked the extent to which the pupils missed classes due to floods. The results were as shown in the table 4.8

**Table 4.8: Extent of pupils' missing classes due to floods.**

<b>Level</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Very big</b>	32	42.1
<b>Big</b>	22	28.6
<b>Not sure</b>	8	10.4
<b>Small</b>	8	10.4
<b>Very small</b>	6	7.9
<b>Total</b>	<b>76</b>	<b>100</b>

From table 4.8, it was evident that most of the teachers respondents 32 (42.1%) said that the extent of missing classes by pupils due to floods was very big while only 6 (7.9%) said that the extent of missing classes by pupils due to floods was very small. 22(28.6%) put the extent as big, 8(10.4%) said the extent was small while 8(10.4%) were not sure of the extent.

The head teachers who were interviewed also concurred with what both pupils and teachers had stated. They claimed that during floods it became hard to tell the average number of pupils who missed classes due to floods since it depended on the magnitude of the floods. This clearly showed that during floods missing of classes by pupils was common since most learners were infected by water borne diseases which mostly occurred during floods and even making the classrooms inaccessible. This concurred with ZVAC (2007) which reported that the education systems in flood prone areas was negatively affected by floods by way of making learners miss lessons since classrooms were inaccessible.

#### 4.4.2: Displacement of pupils

The study sought to determine whether pupils in Budalang'i flood plains had ever been displaced by floods. The pupils were asked to state whether they had ever been displaced by floods. The results were as shown in the table 4.9.

**Table 4.9: Displacement of pupils.**

Option	Frequency	Percentage (%)
Yes	175	85.4
No	30	14.6
<b>Total</b>	<b>205</b>	<b>100</b>

According to the findings, 175 (85.4%) of the pupil respondents agreed that they had been displaced by floods while 30 (14.6%) of the pupils said they had not been displaced by floods. The results showed that few pupils came from areas which were not greatly affected by floods. Displacement of pupils by floods interfered with smooth teaching and learning processes in schools since pupils had to move to safer grounds away from the submerged schools. The same scenario was observed in Zambia as was reported by ZVAC (2007) that the education system was negatively affected by floods which displaced pupils away from their schools.

The study further sought to determine the proportion of pupils who were displaced by floods in Budalang'i flood plains. The teachers were asked to state the proportion of pupils who had been displaced by floods. The results were as shown in the table 4.10.

**Table 4.10: Proportion of displacement of pupils**

<b>Proportion</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Very big	30	39.5
Big	29	38.2
Not sure	6	7.9
Small	6	7.9
Very small	5	6.6
<b>Total</b>	<b>76</b>	<b>100</b>

The results in table 4.10 explained the extent to which floods interfered with the pupils' participation in teaching and learning programmes in Budalang'i floodplains in which 30 (39.5%) of the teacher respondents said that floods displaced a very big proportion of pupils. Only 5(6.6%) of the respondents said that the proportion of the displaced pupils was very small while 29(38.2%) said a big proportion, 6(7.9%) put the proportion as being small and 6(7.9%) were not sure. One of the head teachers narrated how most of pupils in his school had been displaced during times of flood to Namanya hills. From the results, it was evident that floods displaced many pupils in the study area and hence interfering with teaching and learning in public primary schools in Budalang'i floodplains as it had been previously observed in Zambia by ZVAC (2007).

#### **4.4.3 School drop out**

The study sought to determine how floods influenced pupils' participation in teaching and learning programs in public primary schools in Budalang'i flood plains school drop-out.

In order to establish that, pupils were asked whether there were any of them who had dropped out of school due to floods in the study area. The results were as shown in the table 4.11 shown.

**Table 4.11: School drop out**

<b>Option</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Yes</b>	128	62.4
<b>No</b>	77	37.6
<b>Total</b>	<b>205</b>	<b>100</b>

From the table 4.11, it was shown that 128 (62.4%) of pupils agreed that some of the pupils had dropped out of school due to floods while only 77 (37.6%) disagreed that some of them had dropped out of school due to floods. This may have been due to tough and intolerable conditions due to floods which might have forced some pupils to drop out of school.

Of those who agreed, the study sought to know the proportion of the pupils who dropped out of school due to floods. The pupil respondents were asked to state the proportion of the pupils who had dropped out of school due to floods and the results were as shown in the table 4.12.

**Table 4.12: Proportion of school drop out- Pupil respondents**

<b>Level</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Very many</b>	9	6.8
<b>Many</b>	56	43.8
<b>Not sure</b>	12	9.6
<b>Few</b>	32	24.7
<b>Very few</b>	19	15.1
<b>Total</b>	<b>128</b>	<b>100</b>

From the table 4.12 many pupils dropped out of school as it was pointed out by 56 (43.8%) of pupil respondents. Only 19 (15.1%) of the respondents stated that very few pupils dropped out of school due to floods. the proportion. According to the respondents, 9 (6.8%) of the pupils said that there were very many school drop outs, with 32 (24.7%) putting the drop out as few while 12 (9.6%) were not sure of the proportion of school drop out. It was evident that floods affected pupils' participation in teaching and learning programs by making pupils not to complete schooling.

Similarly teachers were asked the extent to which floods occasioned school drop out among pupils. The results were as stipulated in table 4.13.

**Table 4.13: Proportion of school drop out- Teachers respondents**

Level	Frequency	Percentage (%)
Very big	30	39.5
Big	23	30.3
Not sure	8	10.5
Small	9	11.8
Very small	6	7.9
<b>Total</b>	<b>76</b>	<b>100</b>

From the table, 30 (39.5%) of teachers put the extent of drop out of pupils as very big, 23 (30.3%) as big with only 9 (11.8%) and 6 (7.9%) stating the extent of drop out was small and very small respectively. However, 8 (10.5%) of the respondents were not sure of the proportion of the school drop out. The high drop out among school going children could be due to discouragement among pupils after experiencing tough conditions during floods. The above results were supported by the head teachers who were interviewed. They similarly observed that many school drop outs in the study area was occasioned by the floods. The head teacher of one of the primary school who was interviewed was quoted saying, “*Most of my pupils drop out of school during floods.*” Similarly, the study results agreed with what was observed by Das (2008) who researched in Cambodia and demonstrated that school drop out among pupils were higher in flood prone -areas.



#### 4.4.4 Quality of Learning in Public Primary Schools

The study sought to determine how floods influence pupils' participation in teaching and learning programs in public primary schools in Budalang'i flood plains through establishing the quality of learning at different seasons. The study sought to determine how floods influence the quality of learning in public primary schools in Budalang'i flood plains at different season. The teachers were asked to evaluate the quality of learning before, during and after floods. The results were as shown in the table 4.14.

**Table 4.14: Quality of learning**

Timing	Quality of learning					Total
	Very good	Good	Not sure	Poor	Very poor	
Before floods	30 (40%)	22 (29.3%)	8 (10.7%)	9 (12%)	6 (8%)	76 (100%)
During floods	7 (9.2%)	5 (6.6%)	3 (3.9%)	20 (26.3%)	41 (53.9%)	76 (100%)
After floods	21(27.6%)	18 (23.7%)	10 (13.2%)	14 (18.4%)	13 (17.1%)	76 (100%)

From the results in the table 4.14, most of teacher respondents, 30 (40%) agreed that quality of learning was very good before floods and 41 (53.9%) pointed out that the quality of learning was very poor during floods. After floods, 21 (27.6%) of the number of respondents said that quality of education was very good as was indicated in table 4.14. This showed that most of the respondents believed that schools generally recovered from the negative effects of floods in terms of quality of learning

The teachers were similarly asked to evaluate the quality of teaching before, during and after floods. The results were as shown in the table 4.15.

**Table 4.15: Quality of teaching**

Timing	Quality of teaching					Total
	Very good	Good	Not sure	Poor	Very poor	
Before floods	40 (52.6%)	22 (28.9%)	3 (3.9%)	6 (7.9%)	5 (6.7%)	76 (100%)
During floods	5 (6.7%)	6(7.9%)	2 (2.6%)	24 (31.5%)	39(51.3%)	76 (100%)
After floods	27(35.5%)	20 (26.3%)	5 (6.7%)	14 (18.4%)	10 (13.1%)	76 (100%)

Results in table 4.15 showed that, majority of respondents, 40 (52.6%) agreed that quality of teaching was very good before floods and 27 (35.5%) after the floods. Similarly majority of the respondents 39 (51.3%) agreed to confirm that quality of teaching was very poor during floods. The head teachers who were interviewed similarly pointed out that processes of teaching and learning were adversely affected and thought that the poor performance in public primary schools in the flood prone area might have been due to the low quality of teaching and learning which was influenced by floods. These results were in agreement with the findings of Molino, Stewart (2007) who compared quality of teaching and learning processes in flood prone areas in Australia and found out that the quality was poor during floods.

**4.4.5 School Enrolment**

The study sought to determine the extent to which floods affected enrollment in public primary schools in Budalang'i flood plains and how it influenced pupils' participation in teaching and learning programs. Teacher respondents were asked to state the extent to which floods affected pupil enrollment in schools. The results were as shown in the table 4.16.

**Table 4.16: Extent of effects of floods on school enrolment**

<b>Extent</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Very big	24	31.6
Big	19	25
Not sure	15	19.7
Small	8	10.5
Very small	10	13.2
<b>Total</b>	<b>76</b>	<b>100</b>

From the table 4.16, 24 (31.6%) pointed out that floods had a very big impact on the reduction of enrollment of pupils in public primary schools while only 8 (10.5%) put the impact as small. 19 (25%) of the teacher respondents stated that the extent of effects of floods on school enrollment was big, 10 (13.2%) putting the effect as very small while 15 (19.7%) were not sure of the extent of effects of floods on school enrollment. The head teachers interviewed pointed out that the enrolment in schools which were not in flood prone area was better than in flood prone areas. They attributed this to the fact that parents preferred taking their children in schools which were safe from floods. According to them, parents preferred schools where learning and teaching processes were not interrupted due to floods. The research findings agreed with the study that was done by Nakileza (2007) who noted that there was low enrolment in the schools in flood prone areas.

#### **4.5: Teachers' Participation in Teaching and Learning Programs**

The study sought to determine how floods influence teachers' participation in teaching and learning programs in public primary schools in Budalang'i flood plains. Teachers' lesson

attendance and interference of floods on teaching were the variables that were determined and used to measure the influence of floods on teachers' participation in teaching and learning programmes in public primary schools in the areas.

#### 4.5.1 Failure of teachers to attend school due to floods

The study sought to determine how floods influenced failure of teachers to attend school in public primary schools in Budalang'i flood plains. Respondent pupils were asked to state if any of their teachers had failed to attend school due to floods. The results were as shown in the table 4.17.

**Table 4.17: Attendance of teachers**

Option	Frequency	Percentage (%)
Yes	147	71.7
No	58	28.3
<b>Total</b>	<b>205</b>	<b>100</b>

According to results in table 4.17, majority of the pupils 147 (71.7%) said their teachers had failed to attend schools due to floods while only 58(28.3%) said their teachers had not failed to attend school due to floods. It was evident that floods caused low school attendance among teachers in flood prone areas. This might have been due to floods making schools to be inaccessible.

Of those pupils who said yes, the study sought to determine the proportion of their teachers who failed to attend school due to floods. The pupil respondents were asked to state the proportion of their teachers who failed to attend school due to floods. The results were as shown in the table 4.18.

**Table 4.18: Proportion of teachers who failed to attend school due to floods**

Level	Frequency	Percentage (%)
Very many	43	29.3
Many	58	39.4
Not sure	4	2.7
Few	23	15.7
Very few	19	12.9
Total	147	100

From the table 4.18, 58(39.4%) of the pupils observed that the proportion of teachers who failed to attend school due to floods was many while only 19 (12.9%) of the pupils said that the proportion of teachers who failed to attend school was very small. Of all the respondents, 43 (29.3%) put the proportion as very many while 23 (15.7%) said few and 4 (2.7%) were not sure. The observation on failure to attend school by teachers concurred with what one of the head teachers said that some of the teachers in his school could not access school during floods because the road to school was impassible as it had also been observed by Anders and Timberlake (1986) who said that floods make schools inaccessible leading too absence from school among teachers.

#### **4.5.2: Interference of floods on teaching**

The study sought to determine how floods interfere with teaching in public primary schools in Budalang'i flood plains. The teachers were asked to state the extent to which the floods interfered with the process of teaching. The results were as shown in the table 4.19.

**Table 4.19: Interference of floods on teaching**

<b>Level of interference</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Very big</b>	36	45.8
<b>Big</b>	17	22.2
<b>Not sure</b>	8	11.1
<b>Small</b>	8	11.1
<b>Very small</b>	7	9.7
<b>Total</b>	<b>76</b>	<b>100</b>

The results in table 4.19 showed that most of the teachers 36 (45.8%) indicated that the interference of floods on the teaching was very big as compared to only 7 (9.7%) who said the interference was very small. 17 (22.2%) of the teacher respondents said the interference was big, 8 (11.1%) said small while other 8 (11.1%) were not sure of the level of interference. This might have caused low performance in the national examinations in the area as it was pointed by the Bunyala district education office report, which pointed out that schools affected by floods in the region recorded an average mean score of 260.5 marks in K.C.P.E in 2009 national exams as compared to schools in the region not affected by floods which had an average mean score of 271.2 marks. Therefore there was need for teachers to understand flood risks if learning has to go on without interference by floods as it was pointed out by Defra (2007).

#### **4.6. School infrastructure**

The study sought to determine how floods influence school infrastructure in teaching and learning programs in public primary schools in Budalang'i flood plains. Extent of interference of floods on school infrastructure and ability to use the available facilities during

floods were the variables that were determined and used to measure the influence of floods on school infrastructure in teaching and learning programmes in public primary schools in the areas.

#### 4.6.1 Destruction of school infrastructure

The study sought to determine the extent to which floods influenced the destruction of school toilets, playground, classrooms, staffrooms, desks and books in public primary schools in Budalang'i flood plains. The teacher respondents in the study area were asked to state extent to which the floods interfered with the above named school infrastructure and the results were as shown in the table 4.20.

**Table 4.20: Destruction of the school infrastructure**

Response	Toilets		Playground		Classrooms		Staffroom		Desks		Books		Average	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Very big	40	53	30	39	30	39	23	30	25	33	16	21	27	35.8
Big	22	29	19	25	26	34	21	28	28	37	30	40	24	32.2
Not sure	6	8	9	12	12	13	14	17	4	4	21	26	11	13.3
Small	7	9	12	16	3	4	13	17	7	9	8	11	8	11.0
Very small	1	1	6	8	5	7	6	8	13	17	2	3	6	7.3
<b>Total</b>	<b>76</b>	<b>100</b>	<b>76</b>	<b>100</b>	<b>76</b>	<b>100</b>	<b>76</b>	<b>100</b>	<b>76</b>	<b>100</b>	<b>76</b>	<b>100</b>	<b>76</b>	<b>100</b>

The table showed that 30(36.6%) of respondents reported that the extent of damage to school infrastructure during floods was very big. The least number of respondents 7(7%) indicated that the damage on school infrastructure during floods was very small. The head teachers also pointed out that floods had greatly damaged the infrastructure and hence greatly interfered with the teaching and learning programmes in their respective schools. Most head teachers also observed that toilets were the most affected infrastructure which made them not

to be used by pupils and hence led to out break of many water borne infectious diseases like cholera, typhoid; among both teachers and pupils. These interfered greatly with the teaching and learning programmes in the schools as it was observed by Anders and Timberlake (1986) who noted that floods disrupted educational services in floodplains by submerging school compounds. Similarly, according to (UNICEF ,2002), school infrastructure and teaching / learning programmes which were the core education services were severely damaged and disrupted by flooding waters. It was along this line that school infrastructure in flood prone areas should had been keenly assessed and repaired in case they had been destroyed by floods in order to make learners and teachers have a convenient environment. Additionally, ZVAC (2007) reported that the education system in Zambia was negatively affected by floods by way of damaged teaching/learning infrastructure.

#### **4.6.2 Use of School Infrastructure**

The study sought to determine how floods influenced the use of available school infrastructure in public primary schools in Budalang'i flood plains. In order to know the results, views of the pupils on the use of the facilities were sought. The results were as shown in the table 4.21.



**Table 4.21: Use of infrastructure**

Level of agreement	Desks		Classrooms		Playgrounds		Average	
	Frequency	%	frequency	%	frequency	%	frequency	%
Strongly agree	20	9.8	15	7.3	13	6.3	16	7.8
Agree	28	13.6	30	14.6	32	15.6	30	14.6
Not sure	5	2.4	7	3.4	10	4.9	7	3.6
Disagree	67	32.7	63	30.7	59	28.8	63	30.7
Strongly disagree	85	41.5	90	43.9	91	44.4	89	43.3
<b>Total</b>	<b>205</b>	<b>100</b>	<b>205</b>	<b>100</b>	<b>205</b>	<b>100</b>	<b>205</b>	<b>100</b>

The table 4.21 showed that generally most respondents 89( 43.3%) strongly disagreed that desks, class rooms and playgrounds were used during floods as compared to only 16 (7.8%) who agreed that the facilities were still used during floods. Most respondents pointed out that play grounds were the affected and hence not used mostly. Desks according to 85(41.5%) were the ones which were better made used of. This could have led to most infrastructures in schools not being fully utilized during floods. This concurred with ZVAC (2007) which reported that the education system in Zambia was negatively affected by floods by way of damaged teaching/learning infrastructure like desks, playgrounds which reduced their utilization.

#### **4.7 Management of School Programmes**

The study sought to determine how floods influence school management in teaching and learning programs in public primary schools in Budalang'i flood plains. Extent of destruction of management records by floods, accessibility of the education officers to schools during floods and extent of management decisions during floods were the variables that were

determined and used to measure the influence of floods on school management in teaching and learning programmes in public primary schools in the areas.

#### 4.7.1 Accessibility of education officers

The study sought to determine how floods influenced accessibility of schools by the education officers to inspect schools during floods in Budalang'i flood plains. Respondent pupils in the study area were asked to state to what level they agreed with the fact that education officers still visited schools to carry out inspection. The results were as shown in the table 4.22.

**Table 4.22: Inspection of schools**

Level of agreement	Frequency	Percentage (%)
Strongly agree	33	16.0
Agree	36	17.5
Not sure	39	19.4
Disagree	40	19.4
Strongly disagree	57	27.7
<b>Total</b>	<b>205</b>	<b>100</b>

From table 4.22, majority of the respondent strongly disagreed 57(28.1%) that education officers still visited schools to inspect them with the minority of the respondent 33(16%) strongly agreeing that inspection of the schools by the education officers was still done during floods. 36 (17.5%) of the pupil respondents agreed, 40 (19.4%) disagreed while 39 (19.4%) were not sure. The results pointed to the fact that generally the level of the inspection went down during floods. The head teachers in the study area noted that their schools were still being visited by the education officers who came around to assess the

situation on the ground. They said that the inspectors came to determine whether the schools were still in useable states. The observation made was not in line with the finding of Marcouse (2003) who said that in order to implement standards, procedures and guidelines in schools in flood prone areas, inspection was to be enhanced by education personnel.

#### 4.7.2 Destruction of Management records

The study sought to determine how floods influence management of teaching and learning programmes in public primary schools in Budalang'i flood plains by determining the extent to which floods cause destruction of management records in schools. The records included attendance registers, pupils' performance progressive reports, records of work books schemes of work and lesson plans. The teacher respondents were asked to state the extent to which floods caused destruction of management records in their schools. The results were as shown in the table 4.23.

**Table 4.23: Extent of destruction of management records**

Level	Frequency	Percentage (%)
Very big	7	9.2
Big	9	11.8
Not sure	4	5.3
Small	26	34.2
Very small	30	39.5
<b>Total</b>	<b>76</b>	<b>100</b>

Following the results in the table 4.23, majority of the teachers 30 (39.5%) who were asked said the extent of the destruction of the records was very small while very few teachers 7 (9.2%) put the extent of the destruction as being very big. Of the respondents, 9 (11.8%) said

the extent of destruction was big while 26 (34.2%) said the extent was small and 4 (5.3%) were not sure of the extent of destruction of management records. The head teachers similarly viewed very little destruction on the school records since floods were anticipated and the school management made prior arrangements to have their records safely stored. They claimed that since most of those records were less bulky they could easily transfer them to safer grounds. This was in agreement with what was observed by Bowes (2007) who said that the school management had put some policies on how it managed its records, including electronic records in times of floods.

#### 4.7.3 Administrative decisions

The study sought to determine how floods influenced school administration in making decision in public primary schools in Budalang'i flood plains. Respondent teachers were asked to state how often their head teachers made certain administrative decisions including adjustment of lessons, shifting classrooms, merging of schools and use of movable blackboards in schools during floods. The results were as shown in the table 4.24.

**Table 4.24: Administrative decisions**

Option	Adjustment of lessons		Shifting of classrooms		Merging of schools		Use of movable blackboards		Average	
	freq	%	freq	%	freq	%	freq	%	freq	%
Very often	31	41.9	28	36.8	13	17.1	16	21.6	22	29.4
Often	23	31.1	24	31.6	13	17.1	18	24.3	20	26.0
Not sure	4	5.4	13	17.1	19	25	6	8.1	11	13.9
Rare	9	12.2	7	9.2	19	25	21	28.4	14	18.7
Very rare	7	9.5	4	5.3	12	15.8	13	17.6	9	12.1
<b>Total</b>	<b>76</b>	<b>100</b>	<b>76</b>	<b>100</b>	<b>76</b>	<b>100</b>	<b>76</b>	<b>100</b>	<b>76</b>	<b>100</b>

From table 4.24, most of the respondents 22(29.4%) said that the head teachers made various decisions very often while the least number of respondents 9(12.1%) reported that the school heads very rarely made decisions. It was evident that school head teachers in flood prone areas were faced with various challenging situations which were to be addressed lest the learning and teaching would be adversely affected as it had been shown previously by (Bowes, 2007) that each public authority including individual schools should have management policy in which their actions and decisions in times of floods were dealt with so that smooth learning and teaching were maintained.

#### 4.7.4 Change in school administration

The study sought to determine how floods influence change in administration in public primary schools in Budalang'i flood plains. Respondent pupils were asked to state to what degree they agreed that there was change in school administration during floods. The results were as shown in the table 4.25.

**Table 4.25: Change in administration**

<b>Level of agreement</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Strongly agree</b>	21	10.1
<b>Agree</b>	26	12.5
<b>Not sure</b>	9	4.5
<b>Disagree</b>	71	34.5
<b>Strongly disagree</b>	78	38.4
<b>Total</b>	<b>205</b>	<b>100</b>

According to the findings in table 4.25, most pupils 78 (38.4%) strongly disagreed that there was change in the administration of schools during floods. Only 21 (10.1%) strongly agreed

that there was change in the administration in schools which were affected by floods. 26 (12.5%) respondents agreed that there was change in administration due to floods, 71 (34.5%) disagreed while 9 (4.5%) were not sure. From the results, it was concluded that there were very few cases of change in the school administration. The respondent head teachers confirmed this by virtue of having indicated that head teachers served for many years in the schools in the study area. According to the head teachers, their colleagues from other areas not affected by floods were not very much willing to serve in the flood prone area. This never worked well with schools in Budalang'i floodplains as they never embraced diversity in management as was argued out by (Bowes, 2007) who said that all aspects of management and leadership in formulating good policies like change in administration could assist them to withstand the negative effects of floods which were likely to compromise the quality of teaching and learning processes.

## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter presents the summary of the findings of this study. It also presents the conclusions of this study. Finally, this chapter presents the recommendations of this study and its contribution to the body of knowledge.

#### 5.2 Summary of the findings

This study investigated the influence of floods on the teaching and learning programmes in public primary school in Budalang'i floodplains, Busia County. This was based on the pupils' and teachers' participation; teaching and learning infrastructure and management of teaching and learning programmes.

With regard to the first objective on the extent to which floods influence pupils' participation in teaching and learning programmes in public primary schools in Budalang'i of Busia County it was observed from the findings that the floods negatively affected the pupils participation in the teaching and learning programmes in public primary schools in Budalang'i floodplains which was measured in terms of missing of lessons by pupils, school drop out, school enrolment and quality of learning. According to the findings, 73 (50.4%) of the pupil respondents said there was frequent missing of classes by pupils due floods, 30 (39.5%) of the teacher respondents said there was big displacement of pupils due to floods, 56 (43.8%) of the pupils attributed many school drop outs to floods, and 24 (31.6%) of teacher respondents sais there was a very big drop in school enrollment due to floods.

In respect to the second objective, the level at which floods influence teachers' participation in teaching and learning programmes in public primary schools in Budalang'i of Busia County, the study established that the floods similarly had a negative impact on the

way teachers performed their duties in the public primary schools in the study area. The study established that floods negatively affected the quality of teaching. It was observed that floods interfered with teaching in a very big extent through teachers not being able to attend to their classes as 71.7% of the pupil respondents reported in the end quality of teaching dropping from 52.6% before onset of floods to mere 5% during floods before improving to 27% after the floods.

With regards to the objective on the extent to which floods influence teaching and learning infrastructure in public primary schools in Budalang'i of Busia County the study observed that floods interfered with various teaching and learning infrastructure in schools. According to 27(35.8%) of the teachers, there was a very big destruction of school infrastructure due to floods which according to 89 (43.3%) of the pupil respondents strongly disagreed that those destroyed infrastructure would still be used. The most affected form of infrastructure were toilets which 40 (53%) teacher respondents said were affected to a very big level. The head teachers interviewed also made the same observation hence observing that this led to an outbreak of many water borne diseases which interfered with teaching and learning programmes in schools in the study area. The floods also made most of infrastructure in schools to be rendered useless. However some of the infrastructures like desks could be used as per the views of the respondents.

To examine the level at which floods influence management of teaching/ learning programmes in public primary schools in Budalang'i of Busia County, the study concluded that floods similarly influence the management of the teaching and learning programmes in the schools in the study area. However the influence was not much since the management in most schools didn't change as it was observed by 78 (38.4%) of all the pupil respondents in the study. The management was however compelled to make various decisions to mitigate



against the impacts of floods if need arose according to 22 (29.4%) of the teacher respondents. The decisions included merging of schools, using movable black boards, adjustment of lessons and shifting of classroom to safer grounds. The education officers continued to visit schools during floods as per what was observed by 57 (27.7%) of the pupil respondents but to assess the situations in the schools and not to supervise the quality of the teaching and learning.

### **5.3 Conclusion**

This study concluded that floods affect the pupils' participation in teaching and learning programmes. The study concluded that pupil attendances, enrolment, quality of learning are all affected by floods. Floods led to pupils missing lessons since both teachers and pupils were not able to reach school because floods rendered schools inaccessible. Floods also caused waterborne diseases which infected both teachers and pupils and led to their absence. Enrolment in schools was lowered in public schools due to floods. The study concluded that this was due to harsh conditions which were caused by floods and fear among both parents and school going children to join schools which were affected by floods. The study also concluded that the quality of learning was compromised by floods. This was due to the absence of teachers and destruction of learning and teaching infrastructure.

The study similarly concluded that teachers' participation in the teaching and learning was negatively affected by floods through causing much teacher absence and lowering the quality of teaching.

The study also concluded that floods affected the teaching and learning programmes in Budalangi flood plains through interfering with the school infrastructure either by destroying or rendering them less useful. These infrastructures included toilets, playgrounds, desks, classrooms, staffrooms and books.

Lastly the study found out that management of teaching and learning programmes in public primary schools is to certain level affected by floods. The study concluded that there was little impact on the change in management since school headship never changed due to floods. However certain management decisions had to be made due to occurrence of floods in order to ensure teaching and learning programmes were running smoothly in schools. Management data was found to be destroyed by floods and hence interfered with teaching and learning programmes in public primary schools in Budalangi flood plains.

#### **5.4 Recommendations**

In order to improve the quality of teaching and learning programmes in public primary schools in Budalang'i floodplains, it was recommended that the bottleneck caused by the floods would be addressed. The bottlenecks included: high school drop out, low enrolment, high teacher and pupil absenteeism, destruction of school infrastructure and management data, outbreak of water borne diseases, food insecurity and low staffing of personnel in the study area. The following recommendations were made:

- 1) Sensitize both parents and pupils that despite the harsh conditions experienced during floods, it was important to ensure that school going children attended school.
- 2) The government would as well introduce some incentives in schools like free feeding programmes that would discourage school drop out.
- 3) Schools would as well be put up on higher safe grounds which would not be affected by floods.
- 4) Government and other humanitarian agencies would always organize to rehabilitate the destroyed infrastructure so that smooth learning and teaching was maintained.
- 5) School management data should be digitalized to reduce the bulkiness of the data and hence ensure that it could easily be transferred from one place to other safer places.

6) Putting up permanent and strong dykes which would reduce cases of overflowing water submerging schools and hence interfering with the provision of quality teaching and learning programmes in public primary schools in Budalangi flood plains.

### **5.5 Suggestions for further research**

- 1) A similar research would be carried out to cover a wider geographical area in Western region to establish whether or not there were other factors that influenced teaching and learning programmes in public primary schools other than floods which this study addressed.
- 2) Other methods of research particularly experimental design could be used to determine the influence of floods on the teaching and learning programmes in the Budalangi floodplains in Busia County. Further research would therefore lead to identifying other alternative causes of poor academic performance.

## 5.6 Contributions to the body of knowledge.

The study results contributed to the body of knowledge as summarized per objectives as in table 5.1.

**Table 5.1 Contributions to the body of knowledge.**

No.	Study Objectives	Contribution to body of Knowledge
1.	To establish the extent to which floods affect pupils' participation in teaching and learning programmes in Budalang'i of Busia County.	Floods negatively affect pupils' participation in teaching and learning programmes in Budalangi of Busia County. It does so through lowering enrolment, raising school drop out, causing absentism among pupils and lowering quality of learning.
2.	To determine the level at which floods affect teachers' participation in teaching and learning programmes in Budalang'i of Busia County.	Floods negatively affect teachers' participation in teaching and learning programmes in Budalangi of Busia County. It does so through causing absentism among teachers and lowering quality of learning
3.	To investigate the extent to which floods affect teaching and learning infrastructure in Budalang'i of Busia County.	Floods negatively affect teaching and learning infrastructure in Budalangi of Busia County. Floods destroy infrastructure and make some less useful and hence comprising the quality of teaching and learning in public primary schools in Budalangi flood plains.
4.	To examine the level at which floods affect management of teaching/ learning programmes in Budalang'i of Busia County.	Floods negatively affect management of teaching and learning programmes in Budalangi of Busia County through limiting accessibility of education officers, destruction of management data. However it does not change the management of schools.

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## APPENDICES

### Appendix A: Letter of Authorization

REPUBLIC OF KENYA



## NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telegrams: SCIENCETECH Nairobi

Telephone: 254020241349, 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](http://www.ncst.go.ke)

Date 17 august 2011

Our ref:

NCST/RRI/12/1/AS-011/18/5

Oundo Mark Emmanuel

University of Nairobi

P.O. Box 422-50100

KAKAMEGA

**RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on “**Influence of Floods on Teaching and Learning Programmes in Public Primary School, A Case Study of Budalang'i Plains Busia County Kenya**”. I am pleased to inform you that you have been authorized to undertake research in Bunyala District for a period ending *30 June 2011*.

You are advised to report to the **District Commissioner & the District Education Officer, Bunyala 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.

A handwritten signature in black ink, appearing to read 'P. N. Nyakundi'.

**P. N. NYAKUNDI**

**FOR: SECRETARY/CEO**

Copy to:

The District Education Officer  
Bunyala District

The District Commissioner  
Bunyala District

THIS IS TO CERTIFY THAT:

Prof. Dr. Mr. Mrs. Miss OJINGO

AKIKI OJINGO

of (Address) UNIVERSITY OF NAIROBI  
BOX 422-50100 KAKAMEGA

has been permitted to conduct research:

BUNYALA DISTRICT District  
WESTERN Province

on the topic: IMPACT OF FLOODS ON TEACHING  
AND LEARNING PROGRAMS IN PUBLIC PRIMARY  
SCHOOLS A CASE STUDY OF BUDALANGI PLAINS,  
BUSIA COUNTY KENYA.

for a period ending 30TH APRIL 2011

Research Permit No. NCBT/RR1/22/9/A3-P11/09

Date of issue 12.8.2011

Fee received KSH 1000



*Signature*  
Director  
Kenya

*Signature*  
Secretary  
National Council for  
Science and Technology

CONDITIONS

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

*Signature*  
Director  
Kenya



REPUBLIC OF KENYA

RESEARCH CLEARANCE  
PERMIT

CONDITIONS - see back page

## APPENDIX B: LETTER TO RESPONDENTS

Oundo Mark Emmanuel,  
Department of Extra- Mural Studies,  
University of Nairobi,  
P.O. Box 469-50100  
Kakamega.

Dear Sir/Madam,

### RE: RESEARCH QUESTIONNAIRE

I am a student presently undertaking Masters of Arts degree in Project Planning and Management at the University of Nairobi and I am conducting research as part of the examination of the University.

The reason for this letter is to forward to you the enclosed questionnaire and to request that you respond. All the responses will be treated privately and will only be used for academic purposes.

Thank you in advance.

Yours faithfully,

Oundo Mark Emmanuel.

## APPENDIX C: PUPILS' QUESTIONNAIRE

### Introduction

The purpose of this questionnaire is to collect data for study entitled influence of floods on teaching and learning programs in public primary schools in Budalang'i flood plains, Busia County. The information collected will be treated with utmost confidentiality and used for the purpose of this study only. Kindly give the information in the spaces provided. (Indicate with a tick where appropriate).

### Section A: Personal information

Gender Male  Female

Age: 13 years and below  14- 16  17 and above

### Section B: Influence of Floods on Teaching and Learning Programmes

- 1) Have you ever missed class due to floods?  
Yes  No
- 2) If yes, how frequent?  
Very frequent  Frequent  Not sure  Rare  Very rare
- 3) Are there pupils in your school who have dropped out of school due to floods?  
Yes  No
- 4) If yes, what proportion?  
Very many  Many  Not sure  Few  Very few
- 5) Has any of your teachers failed to attend school due to floods?  
Yes  No
- 6) If yes, what proportion?  
Very many  Many  Not sure  Few  Very few

7) Comment on the following by ticking in the table below.

**Key**

1- Strongly agree 2- Agree 3-Not sure 4 Disagree 5- Strongly disagree

<b>Influence of floods</b>	<b>Level of agreement</b>				
	1	2	3	4	5
Floods interfere with accessibility to classrooms					
Playgrounds can still be used during floods					
Floods destroy pit latrines in your school					
Floods destroy school textbooks and exercise books					
Desks can still be used during floods					

8) Comment on the following by ticking in the table below.

**Key**

1- Strongly agree 2- Agree 3-Not sure 4 Disagree 5- Strongly disagree

<b>Influence of floods</b>	<b>Level of agreement</b>				
	1	2	3	4	5
Education officers still come during floods					
There is change in school administration during floods					
Schools are merged during floods					
Timing of school activities change during floods					

## APPENDIX D: TEACHERS' QUESTIONNAIRE

### Introduction

The purpose of this questionnaire is to collect data for study entitled influence of floods on teaching and learning programs in public primary schools in Budalang'i flood plains, Busia County. The information collected will be treated with utmost confidentiality and used for the purpose of this study only. Kindly give the information in the spaces provided. (Indicate with a tick where appropriate).

### Section A: Personal information

Gender Male  Female

Age: 19 years and below  20 - 29  30 - 39

40 - 49  50 and above

Teaching experience in Budalang'i: 4 years and below  5 - 9   
10 and above

### Section B: Influence of Floods on teachers' Participation in Teaching and Learning Programmes

1) Have floods ever interfered with your pupils' learning?

Yes  No

2) By filling the table below, indicate to what extent the floods interfere with the learning process through the following?

Interference	Extent				
	Very big	Big	Not sure	Small	Very small
destruction of learning aids					
displacement of learners					
School attendance by pupils					
School drop-out					
School enrollment					

3) What is the quality of learning processes before, during and after floods?

Time	Very good	Good	Not sure	Poor	Very poor
Before floods					
During floods					
After floods					

4) How is the influence of floods on school attendance by pupils?

Time	Very high	High	Not sure	Low	Very low
Before floods					
During floods					
After floods					

### Section C: Effect of Floods on Teachers' Participation in Teaching Programmes

1) Have floods ever interfered with your teaching?

Yes  No

2) By filling the table, indicate to what extent teachers' participation in teaching is interfered with floods.

Time	Level of interference				
	Very big	Big	Not sure	Small	Very small
Before floods					
During floods					
After floods					

4) How is the influence of floods on school attendance by teachers?

Time	Level of attendance				
	Very high	High	Not sure	Low	Very low
Before floods					
During floods					
After floods					

**Section D: Influence of Floods on management of Teaching and Learning programmes.**

1) By use of a tick, indicate the extent to which floods influence the management of each of the selected aspects of teaching and learning programmes.

Teaching/ Learning aspect	Extent of influence				
	Very big	Big	Not sure	Small	Very small
Adjustment of lesson time					
Shifting of classes from one room to another					
Merging of schools					
Use of movable blackboards					
Frequency of inspection by education officers					
Destruction of management records					

2) By use of a tick, indicate the extent to which floods influence the frequency of head teacher's decisions to carry each of the following teaching and learning practices.

Teaching/ Learning aspect	Frequency				
	Very often	Often	Not sure	Rare	Very rare
Adjustment of lesson time					
Shifting of classes from one room to another					
Merging of schools					
Use of movable blackboards					



**Section E: Influence of Floods on Teaching / Learning Infrastructure**

1) By use of a tick, indicate the extent to which the floods interfere with each of the following selected teaching / learning infrastructure.

Teaching / Learning infrastructure	Extent				
	Very big	Big	Not sure	Small	Very small
Toilets					
Playgrounds					
Classrooms					
Staffroom					
Desks					
Books					

## APPENDIX E: HEADTEACHERS' INTERVIEW SCHEDULE

### Introduction

The purpose of this interview is to collect data for study entitled *influence of floods on teaching and learning programs in public primary schools in Budalang'i flood plains, Busia County*. The information collected will be treated with utmost confidentiality and used for the purpose of this study only. Kindly give the information in the spaces provided. (Indicate with a tick where appropriate).

### Section A: Personal information

Gender Male  Female

Age: 19 years and below  20 - 29  30 - 39   
40 - 49  50 and above

Administration experience in Budalang'i: 4 years and below  5 - 9   
10 and above

### Section B: Influence of Floods on Teaching and Learning Programmes

1) To what extent do floods influence pupils' participation in teaching and learning programmes in the school?

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.....  
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2) How do floods influence with the teachers' participation in teaching and learning programmes in the school?

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.....

3) Briefly state how floods influence teaching and learning infrastructure in the school?

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.....

4) To what level do floods influence management of teaching / learning programmes in the school?

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.....  
.....

5) What are some of the strategies that can be employed to reduce the effects of floods on teaching and learning programmes in public primary schools in the region?

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