

**FACTORS INFLUENCING IMPLEMENTATION OF FLOOD DISASTER
SAFETY STANDARDS IN PUBLIC PRIMARY SCHOOLS IN URANGA
DIVISION, SIAYA COUNTY, KENYA**

By

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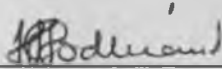
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DECLARATION

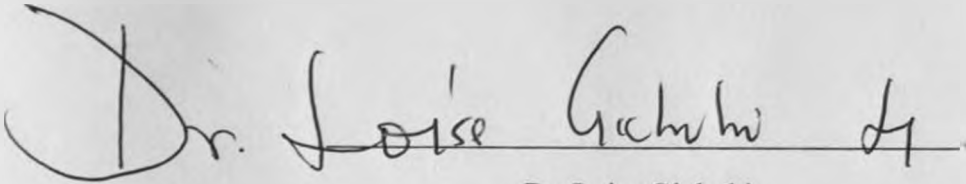
This research project is my original work and has not been presented for examination or award of any degree in any other university.



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DEDICATIONS

This research project is dedicated to my beloved wife Celo and our little angels Roy, Rianne Joy and Ryan for their unending love and encouragement during the production of this report.

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LIST OF ABBREVIATIONS AND ACRONYMS

DRR	Disaster Risk Reduction
EFA	Education For All
GoK	Government of Kenya
INEE	Inter-Agency Network for Education in Emergencies
IFRC	International Federation of Red Cross and Red Crescent Societies
HFA	Hyogo Framework for Action
MoE	Ministry of Education
MoSSP	Ministry of State for Special Programmes
NDOC	National Disaster Operations Centre
NGO	Non-Governmental Organization
OCHA	Office for the Coordination of Humanitarian Affairs
SMC	School Management Committee
UNESCO	United Nations Educational Scientific and Cultural Organization
UNICEF	United Nations Children’s Fund
UNISDR	United Nations International Strategy for Disaster Reduction

ABSTRACT

The safety of pupils is central to the provision of quality education, particularly critical for learners at the primary school level in view of their relatively tender ages. The ability of school programmes to ensure safety of pupils can be crucial in ensuring continuity in the provision of quality education during flood emergencies. Implementing safety measures in schools has been found to be a major challenge. This study aimed at investigating factors that influence implementation of flood disaster safety standards in Urunga Division of Siaya County. Four objectives thus guided the study; to identify ways in which school policies and plans prioritized Disaster Risk Reduction (DRR) as a basis for flood disaster safety in schools; to determine the extent to which flood DRR had been integrated into the school curriculum; to examine level to which the School Management Committee (SMC) participated in implementation of flood disaster safety standards in schools and to examine the role pupils played in implementation of flood disaster safety measures in schools. The factors were put in a conceptual framework to demonstrate their relationship with effective implementation of flood disaster safety standards. Literature was reviewed based on the above variables.

The study adopted the Bronfenbrenner's Ecological Systems Model of Child Development as its theoretical framework. The research used descriptive survey design. The sample size for the study consisted of 5 schools, 10 members of the School Management Committee, 5 Head-teachers, 10 teachers and 200 pupils. Data collected using 4 sets of questionnaires for the SMC, the Head-teachers, teachers and pupils was analyzed using descriptive statistics and presented in frequencies and percentages in form of tables with the help of Statistical Package for Social Sciences (SPSS) computer software.

The main findings of the study indicated that the lack of comprehensive flood disaster safety policies was a major contributor to the level of implementation of school safety standards in public primary schools. According to the study, a majority of schools had inadequate resources for operationalizing flood safety measures necessary for ensuring the recommended safety standards in terms of safe school facilities and inclusion of flood Disaster Risk Reduction (DRR) education in the school curriculum. While a few schools had constructed safe shelters-in-place, compliance with building codes and regulations was still wanting. The study concluded that inadequate resources, lack of stakeholder training on flood DRR and absence of school-wide participation posed major hindrances to implementation of flood disaster safety standards. Finally the study has provided the stakeholders in education with recommendation of flood disaster safety measures that can enhance safety standards in public primary schools. The study recommends training of all school stakeholders on flood DRR order to improve their capacity to effectively implement flood safety standards. In addition the study has suggested further research in areas such as the impact of flood disasters on school access and educational achievement of pupils.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Floods have, in recent decades, emerged as the most prevalent climatic disaster worldwide (MoSSP, 2007). According to ActionAid (2011), flood disasters pose serious challenges on the abilities of communities to cope with their impacts, in effect manifestly increasing the vulnerability of communities by precipitating a vicious cycle of deaths, destruction and poverty. Save The Children UK (2007) projected that the number of vulnerable children would rise globally from an estimated 66.5 million annually in the 1990's to 175 million per year by 2010.

The increasing frequency and intensity of natural disasters worldwide has been identified as a major barrier to the achievement of Education For All (EFA) goals (UN, 2000). Schools have often incurred heavy costs in direct losses due to flood damage to school infrastructure, high mortalities and serious threats to physical and mental health (Sayers, 2013). According to Sayers (2013), the poor physical environment in flood-affected areas often affected pupils' access to learning facilities, and contributed to low quality of learning. Sanchez (2013) observes that flood-affected schools often had extended closures, and those that remained open after a flood disaster reported a higher teacher absence, increase in drop-out rates and lower competencies in Mathematics and English (Sanchez, 2013). Nicolai (2003) recommends that alternative access to education opportunities be provided in order to ensure schooling continues uninterrupted during and after disasters.

Growing recognition of the limitations of structural approaches to flood mitigation has diverted focus on the role proactive Disaster Risk Reduction (DRR) can play in ensuring protection of children's lives and their right to educational continuity (Sayers, 2013). DRR has also been viewed globally as a key strategy for improving the capacity of schools to cope with the challenges to flood safety in schools (ActionAid, 2011). According to World Bank surveys, the cost of implementing long-term measures for preventing a global disaster loss in the 1990s would have been far less expensive, estimated at \$40 billion, compared with that of mitigating the eventual disasters that could not be prevented, estimated at \$280 billion (Back, 2009). Sayers (2013), however, observes that strategies for implementing flood DRR at grassroots levels have often been heavily biased towards "quick wins", with little attempt to coordinate DRR efforts in succeeding years (Sayers 2013). Inter-Agency Network for Education in Emergencies (INEE) (2010) therefore recommends that learners, teachers and other educational personnel should be trained to support DRR activities in schools.

The "Hyogo Framework for Action-HFA 2005" provides a global policy framework for the implementation of DRR in schools, particularly HFA Priority 3, which advocates the "use of knowledge, innovation and education to build a culture of safety and resilience at all levels" (Gautam, 2010). Kenya, like other developing countries that have often been affected by natural disasters, has emphasized the mainstreaming of DRR in its national school safety policies and

plans, such as the Draft National Policy for Disaster Management in Kenya 2009 and the Safety Standards Guidelines for schools in Kenya, (MoE, 2008). However, delays in enacting supportive legislation have resulted in an absence of a comprehensive policy framework for coordinating implementation of flood disaster safety standards in schools (MoSSP, 2009). According to Barakat & Hardman (2012), national policies provide an important framework for implementing school-level DRR measures.

It is, then, no wonder that the severity of recent flood disasters in Kenya has exceeded the ability of the affected schools to cope with them using their own resources (Mutunga, 2006). According to global assessments, Kenya has, in recent decades, continued face a high and rising degree of vulnerability to flood disaster risk (UNISDR, 2009). According to the United Nations Environmental Programme (UNEP) (2009), flood-related fatalities have recently accounted for 60 percent of disaster victims in the country. The Ministry of Education (MoE) (2012) estimated that a significant 100,000 (36 percent) of flood-affected population in the recent floods of 2012 were school-going children. Office for the Coordination of Humanitarian Affairs (OCHA) (2012) reports indicate that approximately 84 people died, 30,000 were displaced and about 280,000 were affected by the nation-wide flood incidences in 2012 alone.

The Lake Victoria Basin remains the most flood-prone region in the country, with Siaya County being among the areas worst affected by recent flood incidents

(IFRC, 2010). Not only are riverine floods the most dominant floods in Kenya, River Nzoia is also one of the main rivers that continues to cause perennial flooding and colossal loss and damage to life and property (MoSSP, 2007). Eitel & Ochola (2006) estimates the annual flood loss along River Nzoia at about US\$ 850, 000.

While it may be impossible to prevent some flood disasters, implementing safety measures in schools can mitigate the impact of flood disasters and make schools safer (Mutunga, 2006). Bushnell & Wakesa (2012) further asserts that the cost of managing disaster risks in Kenya was much lower as compared with that of responding to an eventual disaster.

However, Otiende (2009) observes that the level of implementation of flood mitigation measures remained low in Western Kenya in recent years, despite the construction of dykes along River Nzoia and establishment of Early Warning Systems (EWS) such as the Radio Internet Project (RANET). However, research studies of primary schools in Nyatike indicate that no EWS was in place, nor was there an established flood flow forecasting system on any river in the flood-prone area (Ong'idi, 2013).

Annual flood disasters in Uranga Division have continued to frequently disrupted learning in about 15 public primary schools (42 percent), affecting over 5796 pupils (43 percent) in the area (MoE, 2013). According to reports, floods remain a major hindrance to pupils' access to schools, many of whom used longer, insecure

or more hazardous routes to access learning in schools that still operated in the neighbouring Kabura Ward (Okondo, 2013).

Tran (2011) observes that the effective implementation of safety measures for reducing flood disaster risks in schools will depend on factors obtaining in the schools, including the promotion of DRR as a basis of school safety, integration of aspects of it into the school curriculum, enhancing of community awareness and mobilization of their participation in implementation of school safety programmes, and engaging pupils' as agents of change and key actors in school safety, through their participation in school DRR activities (Tran, 2011). A clear understanding of the underlying factors influencing implementation of flood disaster safety standards in schools was, therefore, crucial in aiding the Kenyan education system enhance the safety of our schools from flood disasters.

Although Otiende (2009) has focused on the challenges facing implementation of flood DRR in communities in Western Kenya, no studies had focused on the under-lying factors influencing implementation of flood disaster safety standards in schools in Kenya, even though public outrage at the devastating effects of floods, as seen in media reports, had indicated ineffective flood disaster response in affected schools. Based on this background, this study intended to investigate factors influencing implementation of flood disaster safety standards in public primary schools in Uranga Division, Siaya County.

1.2 Statement of the problem

As indicated in the background, the increasing severity and frequency of recent flood disasters in Urunga Division has continued to cause heavy loss and damage to life and property in the area (MoE, 2013). Despite the efforts of the MoE and its partner organizations to implement the Safety Standards Guidelines for Schools in Kenya (2008), over 5796 pupils (43 percent) in 15 public primary schools (42 percent) remain vulnerable to the ravages of frequent flood disasters in Urunga Division. The public outrage at the perceived low capacity of schools to protect pupils during flood emergencies, as seen in political speeches and calls for action, drew the researcher's interest in the study.

Although Otiende (2009) highlights the low level of implementation of flood safety measures in communities located on the flood-plains of River Nzoia, no study has so far focused on the under-lying factors influencing implementation of flood safety standards in primary schools in Kenya. Even though Kikuvi (2011) noted shortfalls in implementation of disaster preparedness in secondary schools in Nairobi, these studies have focused on implementation of structural measures to flood disaster mitigation in schools. Few researchers have given more than a cursory glance at the role DRR education plays in disaster mitigation efforts in schools. More so, no study had so far examined the factors influencing implementation of flood disaster safety standards in public primary schools in Urunga Division, Siaya County, and this study intended to bridge that gap.

1.3 Purpose of the study

The purpose of this study was to examine factors influencing implementation of flood disaster safety standards in public primary schools in Uranga Division, Siaya County, Kenya.

1.4 Objectives of the study

In order to fulfill the above purpose, the study was guided by the following objectives:

- i) To identify ways in which school policies have prioritized Disaster Risk Reduction as a basis for flood disaster safety in schools.
- ii) To determine the extent to which flood Disaster Risk Reduction has been integrated into the school curriculum.
- iii) To examine ways in which School Management Committees (SMCs) have participated in implementation of flood disaster safety standards in schools.
- iv) To examine the role pupils have played in implementation of flood disaster safety measures in schools.

1.5 Research questions

In order to achieve the above objectives, the study sought to answer the following research questions:

- i) In what ways have school policies prioritized Disaster Risk Reduction as a basis for flood disaster safety in school?

- ii) To what extent has flood Disaster Risk Reduction been integrated into the school curriculum?
- iii) In what ways has the School Management Committee participated in implementation of flood disaster safety standards in schools?
- iv) What role have pupils played in implementation of flood disaster safety measures in schools?

1.6 Significance of the study

The findings of the study might be significant in that it may provide the Ministry of Education and its local partners with valuable insight into the factors that influence implementation of flood disaster safety standards, thereby providing basis for effectively addressing future challenges facing implementation of flood disaster safety standards in schools. The study may further encourage head-teachers, teachers, pupils and SMCs to perceive DRR as relevant and urgent enough in schools in Kenya to be intrinsically tied to implementation of the school curriculum. Further, the findings of the study might add to the growing pool of knowledge on flood safety in schools that could be crucial in catalyzing future explorations by researchers who might wish to further delve into the existing knowledge and incorporate other aspects not included in it.

1.7 Limitations of the study

Respondents may have had limitations with filling in the questionnaires due to variations in interpreting questionnaire items. This could have brought forth unintended or incorrect responses that might compromise the outcome of the

study and thus necessitated the use of research assistants with competence in the use of local languages to interpret every question upon request. The researcher, in addition, was not able to control for the attitudes of the respondents which may have affected the responses, given that, in some cases, the respondents could have given socially acceptable but not honest answers in order not to offend the researcher.

1.8 Delimitations of the study

The study intended to focus on the factors influencing implementation of flood disaster safety standards in public primary schools in Uranga Division, Siaya County. The study focused on public primary schools located in Uranga Division which are affected by floods. Although there were other disasters that schools faced in the region, flooding was so frequent, and its effect so devastating, hence the study looked at the factors influencing implementation of flood disaster safety standards in public primary schools.

1.9 Assumptions of the study

The study assumed that:

- i) There were factors that could influence the effective implementation of flood disaster safety standards.
- ii) The respondents would be able to identify the factors influencing implementation of flood disaster safety standards.
- iii) Responses by individuals were correlated and thus non-independent.

1.10 Definition of operational terms

Disaster refers to a serious flood incident that disrupts the normal functioning of a primary school, causing widespread human, material, or environmental loss which exceeds the ability of the affected population to cope with using their own resources.

Disaster risk refers to the potential loss to a particular school expressed in lives, health status, livelihoods, property and services arising from impact of a flood hazard.

Hazard is a potentially damaging flood incident that may cause loss of life or injury, damage to property, socio-economic disruption or environmental degradation in a school.

Pupil refers to any learner in a public primary school, including out-of-school children.

Safety standard refers to the level of quality achievement in relation to a School Safety component, such as safe buildings or well maintained sanitation facilities.

School refers to a public primary school in Uranga Division.

School safety refers to measures undertaken by pupils, teachers, head-teachers and SMCs that minimize or eliminate flood risk.

Vulnerability is the characteristic and circumstance of pupils and their teachers that result in them being susceptible to harm, loss or distress arising from flood incidents.

1.11 Organization of the study

The study is organized into five chapters: Chapter One is the introduction. It includes background and statement of the problem, the purpose, objectives, research questions, significance of the study, limitations, delimitations, assumptions of the study, definition of the operational terms and organization of the study. Chapter Two deals with the literature review. It includes concepts of DRR and school safety, school policies on implementation of flood disaster safety standards, integration of DRR into school curriculum, SMC awareness and participation in implementation of flood disaster safety standards, role of pupils in implementation of flood disaster safety measures, summary of reviewed literature and theoretical framework. Chapter Three deals with research methodology of the study, wherein the methodology used in carrying out the study is outlined. It includes the research design, target population, sample size and sampling procedures, research instruments, instrument validity, instrument reliability, data collection procedures and data analysis techniques. Chapter four of the study deals with details on data collection, data organization, analysis and presentation, while chapter five focuses on summary of the findings, conclusions and recommendations for further studies.

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CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This section deals with reviewed literature. In this section six categories of literature were reviewed, including the concepts of DRR and school safety, school policies on implementation of flood disaster safety standards, integration of DRR into school curriculum, the role of SMC awareness and participation in implementation of flood disaster safety measures, the role of pupils in implementing flood disaster safety measures, summary of reviewed literature and theoretical framework showing the interactive relationships.

2.2 Concepts of Disaster Risk Reduction and school safety

Tran (2011) defines Disaster Risk Reduction (DRR) as a systematic attempt to analyze and reduce disaster risks, in order to enable education systems to continue to provide educational services, and all children to continue to access quality education both during and after emergencies. According to Tran (2011), DRR is a combined function of the characteristics and frequency of hazards, the degree to which communities are exposed, and the degree of their vulnerability. DRR enhances communities' ability to prevent disasters, mitigate the impacts of hazards and prepare for unavoidable hazard risks (Tran, 2011). Even though all communities have recently faced the consequences of increasing incidences of natural disasters on education, the adverse impacts globally have disproportionately affected the poorer communities, often the same ones located on lands pre-disposed to flooding, and for whom the provision of social

infrastructure crucial for prevention and mitigation of flood disasters was poor (ActionAid, 2011).

According to Sinclair (2002), maintaining education functions in emergencies can halt the self-perpetuating cycles of vulnerability. Education in emergencies can also protect school children from the impacts of disasters (Nicolai & Triplehorn, 2003). The safety of a school is therefore defined by its ability to predict the risk of disaster hazards in its environment, minimize its impacts, and continue to provide quality education during emergencies (Tran, 2011). According to the MoE (2008), the safety of pupils is central to the provision of quality education in Kenya, particularly critical for learners at the primary school level in view of their relatively tender age.

2.3 School policies on implementation of flood disaster safety standards

According to the MoE (2008), many school-going children have, in recent years experienced an unprecedented level of insecurity arising from poor levels of safety standards. Many schools have had their infrastructure destroyed, thus disrupting learning, necessitating the development and distribution of the Safety Standards Manual for Schools in Kenya (2008) (MoE, 2008). Although the MoE has provided schools with several policy guidelines on safety, most of the schools have not only not implemented the MoE safety guidelines, but also lack awareness of the existence of the safety guidelines (Nyakundi, et al, 2014).

According to the Ministry of State for Special Programmes (MoSSP) (2009), lack of a comprehensive policy framework for implementation of flood safety

programmes, rather than the erratic and unpredictable nature of flood incidences in Kenya in recent decades, could be blamed for the low level of implementation of diverse flood disaster mitigation efforts in flood prone areas in Kenya. The National Disaster Operations Centre (NDOC) (2013) observes that high vulnerability of schools in Kenya to flood disaster risk has been exacerbated by a lack of a comprehensive policy for provision of physical infrastructure necessary for establishment of safety in schools, such as flood-resilient buildings, good roads and paths, strong bridges, and well constructed and maintained drainage systems. According to the MoSSP (2009) poor enforcement of building codes and regulations in schools encouraged the proliferation of school buildings of low resilience to the flood hazards.

Barakat & Hardman (2012) points out the low priority school policies often give to the provision of sufficient resources needed for enhancing flood disaster safety programmes in different contexts of capacities, vulnerabilities and needs of the affected communities. Research findings indicate that funding for flood mitigation programmes in schools have often been inadequate and not commensurate to the specific magnitude of flood disasters in different areas (Ong'idi, 2013). According to Greg (2012), short-term funding hampered the sustainable implementation of flood disaster safety programmes in schools. Otiende (2009), however, attributed the unsustainable nature of flood DRR initiatives in communities in Western Kenya to dependence on conditional donor support.

2.4 Integration of flood Disaster Risk Reduction into the school curriculum

According to Tran, (2011) integrating DRR into the school curriculum links mitigation efforts with long-term development efforts, thereby ensuring that children are safe, education services continue to be provided, and educational developments are secure during emergencies. The integration of flood disaster safety standards into the Kenyan school curriculum has, however, often been faced with challenges that an already over-loaded regular curriculum poses. According to INEE (2010), schools affected by disasters often had disproportionately fewer teachers, who also lacked requisite pedagogical skills for handling skills-based subjects, such as DRR. Nyambala (2006) observes that teachers in schools in Kenya have often perceived the task of including non-examinable subjects, such as DRR, as an unwelcome add. Nicolai (2003) recommends the use of child-centered approaches in emergency contexts in order to ensure effective learning of both traditional and new subject content, such as DRR.

According to Barakat & Hardman (2012), training teachers on skills for adapting basic instructional manuals and visual aid into child-friendly resources can significantly improve the dissemination of information on DRR and mitigate the high staff turnover common in flood-affected areas. ActionAid (2011) recommends that local experts and illustrators be engaged in incorporating DRR content into classroom pedagogy and reading materials.

2.5 School Management Committee participation in implementing flood disaster safety standards

According to Valasquez & Pierce (2012), using a “one-size-fits-all” model to implement DRR initiatives in varying contexts of vulnerability, capacity and need at grassroots levels often led to low stakeholder buy-in of the initiatives. Otiende (2009) also attributes the low implementation of flood mitigation efforts in communities in Western Kenya to low capacities to play an active role in flood mitigation programmes. Local communities therefore need to undergo sensitization training in ways in which they can actively participate in flood mitigation programmes meant to benefit them. According to United Nations Educational Scientific and Cultural Organization (UNESCO) (2005), schools are critical agents in the HFA 2005-2015 strategy for building the capacity of communities to reduce disaster risk. ActionAid (2011), however, observes that rural communities in flood-prone areas instead often perceive schools as centres of disaster relief operations. Tran (2011) points out that community networks such as the SMCs play a crucial role in supporting implementation of school-based flood disaster safety initiatives.

2.6 Role of pupils in implementation of flood disaster safety measures

While Tran (2011) emphasises the need for broad school-wide participation in the implementation of flood safety standards, ActionAid (2011), however, views pupils as being pivotal to linking school-based activities with community-based DRR initiatives, through inclusive child-led DRR initiatives. According to Valasquez & Pierce (2012), child innovation in school DRR clubs can be

effective in mobilizing locally available resources to enhance safety from flood disasters. Supporting child-led DRR initiatives can not only enhance child participation as facilitators in school- and community DRR awareness-raising activities, but can also mitigate the prevalent shortage of specific teachers for disseminating information on flood DRR to teachers, pupils and their parents.

2.7 Summary of reviewed literature

This section has explored literature related to the study. The chapter is subdivided into concepts of DRR and school safety, school policies on implementation of flood disaster safety standards, integration of DRR into school curriculum, community awareness and participation in implementing flood disaster safety standards, role of pupils in implementation of flood disaster safety measures, summary of literature review and theoretical framework showing the interactive relationships.

In reviewing the literature on factors influencing implementation of flood disaster safety standards in public primary schools, it is clear that sustainable funding is crucial for supporting implementation of flood disaster safety policies if continuity in education provision is to obtain. The reviewed literature has underscored the central place of pupils and communities in implementation of flood disaster safety policies, including integration of DRR education in school curricula, which viewed together, can achieve significant levels of flood disaster safety in schools.

That heavy loss of life and property in public primary schools has persisted in parts of the country points to a low level of implementation of flood disaster safety standards in schools in Kenya (Nabeta, 2012). The resultant hue and cry in local media reports about the devastating impacts of flood disasters on schools raised the researcher's interest in examining the factors that have influenced implementation of flood disaster safety standards in schools. While studies have focused on gaps in training of stakeholders in fire disaster preparedness in secondary schools (Kikuvi 2011), no study has focused on the under-lying factors influencing implementation of flood safety standards in primary schools in Kenya, despite concerns for the safety of pupils of tender ages in primary schools. Also, no study has so far been undertaken to examine the factors influencing implementation of flood disaster safety standards in public primary schools in Uranga Division, Siaya County in Kenya, and this study was intended to fill this gap.

2.8 Theoretical framework

The study was based on Bronfenbrenner's Ecological System Theory proposed by Urie Bronfenbrenner in 1990. The theory saw child development within the context of the system of relationships that form the child's environment, each layer of relationship having an effect on the child's development (Berk, 2000). It defines the child's own biology as a primary environment influencing the child's development. The direct interaction between factors in the child's maturing biology, his immediate environment, community environment and the societal

and cultural landscape influences the child's development. Changes or conflict on any one layer will ripple throughout other layers. To study a child's development then, one must not only look at the child and the immediate environment, as it interacts with the larger environment. According to the theory, the direct bi-directional relationships and interaction that the child has with his immediate surroundings have the strongest influence his development. However, the child does not function directly with the larger social system, although it impacts the child's development by interacting with some structures with which he interacts.

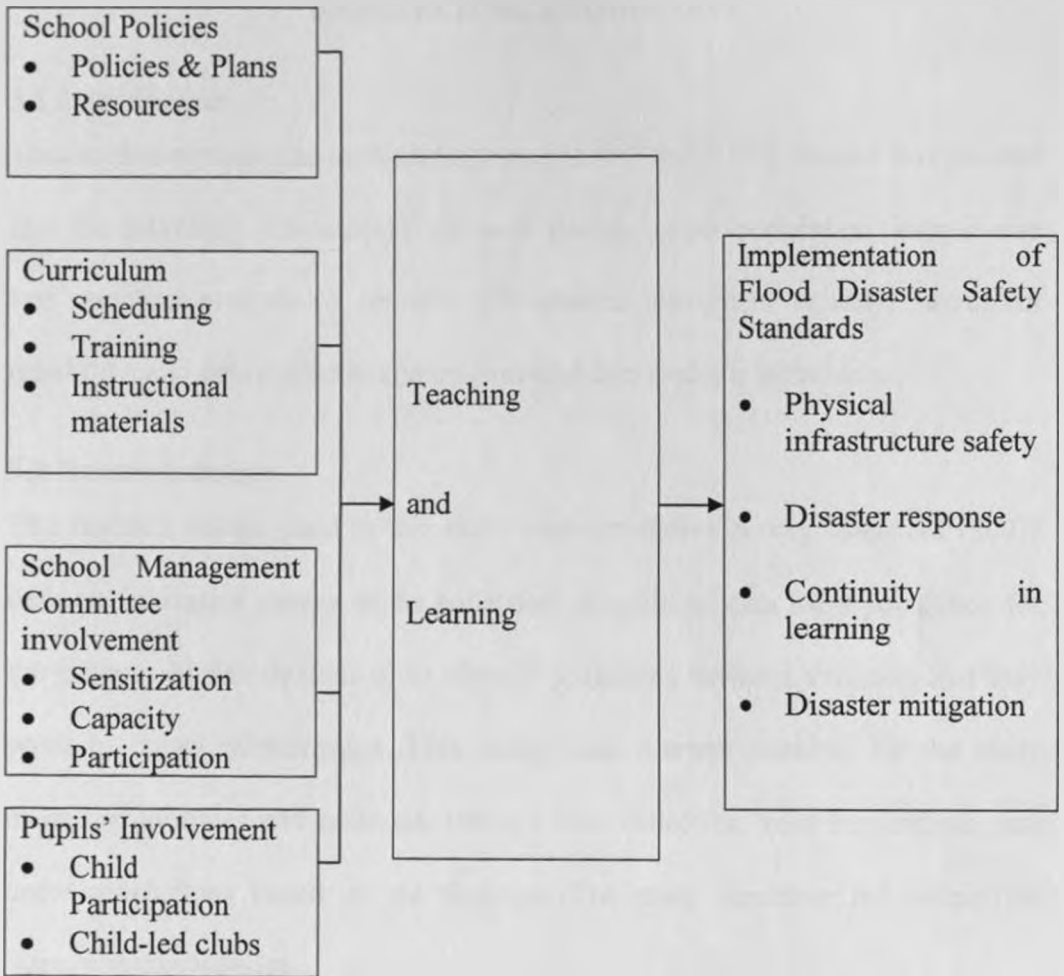
The implementation of flood disaster safety standards in schools is part of community-wide effort, occurring at different levels of the community, and aimed at enhancing school safety. Effective implementation of flood disaster safety standards can be understood in the context of a complex system of relationships between factors in a pupil's environment that influence the level of child safety in school, each layer of relationship having an effect on the child safety in school. The direct interaction between child-led flood safety initiatives with the school curriculum will establish strong bi-directional influence on the child's flood disaster safety. While the child will not interact directly with global developments in principals on disaster safety and national policy changes on implementation of disaster safety standards in school, such changes will have a cascading impact on structures with which the child interacts, for example the level of school resources allocation for implementing flood disaster safety measures.

Bronfenbrenner's Ecological System theory was found suitable in examining the interaction between child participation in implementation of flood disaster safety measures, integration of DRR into the school curriculum, levels of community awareness and participation, and school-level policies as they influence implementation of flood disaster safety standards, and thus child safety in schools.

2.8.1 Conceptual framework

Conceptual framework gives an idea of the variables to be covered by the study, (Best & Khan, 2011). The relationship school-based factors have with implementation of flood disaster safety standards can be represented diagrammatically.

Figure 2.1 Relationship of factors influencing implementation of flood disaster safety standards in public primary schools



The conceptual framework put forth the relationship between school policies on flood disaster safety standards, SMC participation in implementation of flood disaster safety activities in their schools, the level of integration of flood DRR into the school curriculum, and role of pupils in implementing flood disaster safety measures, as they influence the process of implementing flood disaster safety standards in schools in order to give the output to schools in terms of effective implementation of flood safety standards.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section outlines the methodology used in this study. The chapter is organized into the following sub-sections: research design, target population, sample size and sampling procedures, research instruments, instrument validity, instrument reliability, and data collection procedures and data analysis techniques.

3.2 Research design

The research design used in this study was descriptive survey. Sapsford (2007) defines descriptive survey as the collection of qualified data for a population for the purpose of descriptions or to identify variations between variables that may point to causal relationships. This design was deemed suitable, for the study examined attitudes and opinions, through data collection from respondents, and drew conclusions based on the findings. The study therefore fell within the Survey research design.

3.3 Target population

The target population will consist of 15 flood-affected public primary schools and the 15 head-teachers of the same schools, 105 members of the SMCs, who ordinarily are community stakeholder-managers of public primary schools in Kenya, and 117 teachers and 5796 pupils currently found in the 15 schools.

3.4 Sample size and sampling procedure

A multi-stage sampling technique was used in this study, in which the first stage involved selecting 15 flood-affected schools from the 36 public primary schools in the flood-prone Uranga Division. From the 15 schools, random sampling was used to select 5 schools, in order to obtain a sample size of at least 10 percent to allow for good representation. According to Mugenda and Mugenda (2003), a sample size of 10 percent or more is enough for descriptive surveys. In the second stage, stratified random sampling was used in all cases to select respondents from sub-groups of respondents, being the School Management Committee, school head-teachers, teachers, and pupils, in order to ensure representation of both genders. Purposive sampling was used to include all the 5 head-teachers of the sampled schools. In order to obtain at least 10 members of the SMC, 2 of the 7 members of SMC in each of the 5 sampled schools were selected. 2 teachers from approximately 8 teachers from each of the 5 sample schools were selected. Purposive sampling was used to select all pupils in Grade 5-8, since there was a high probability that they had been members of their schools for sufficiently long, at least 4 years, to be able to effectively respond to questionnaire items that were to be presented to them. Random sampling was then used to select at least 10 of the approximately 49 pupils in each grade in each school, to obtain a sample of 200 pupils for the study. Therefore the sample size of the main study constituted 225 respondents. Table 3.1 below summarizes the sample size for the main study.

Table 3.1 Sample frame

Respondent	Target population	Sample Size
SMC	35	10
Head – teachers	15	5
Teachers	40	10
Pupils	980	200
Totals	1070	255

3.5 Research instruments

The study used questionnaires as the main instrument to gather relevant data from each sub-group of respondents. The questionnaires had two main sections, both consisting of both open-ended and closed-ended items. Items in Section A sought background information on the respondent and the sampled school. Items in Section B sought the opinion of the respondent on ways in which school policies prioritized flood DRR as basis for safety in their school, extent to which flood DRR had been integrated into the school curriculum, ways in which the SMC participated in implementing flood disaster safety standards in school, and the role pupils played in implementing flood disaster safety measures in their schools. Instructions to guide respondents were provided in both sections. According to Kothari (2004), questionnaires can be used to collect dependable and reliable data since the respondents are given adequate time to give well thought out answers in their own words.

3.6 Pilot study

Before the actual data collection, a pilot study was conducted on a selected sample of schools identical to the actual sample that was used in the study, but which was excluded from the main study, in order to test the validity and reliability of the instruments.

3.6.1 Instrument validity

Orodho (2005) opines that instrument validity concerns itself with the establishing whether the question is measuring what they are to measure. Expert content validity was used to review the instruments for their suitability of format and content, recommendations of the supervisors of which were incorporated. The instruments were further subjected to pre-testing, using Split-half technique. After analyzing the results of the pre-testing parts that did not measure adequately to help source information were modified and some discarded and as a result the tools were improved (Mugenda and Mugenda, 2003).

3.6.2 Instrument reliability

Mugenda and Mugenda (2003), defines instrument reliability as the measure of the degree to which a research instrument yields consistent results or data after repeated trials. The study used Split-half technique to measure the reliability of the instrument used. This involved splitting statements of the questionnaire selected for pre-testing into two halves, for example into odd and even items. The instrument was then administered to a select number of schools. To obtain the reliability co-efficient, scores of the odd statements were correlated with scores of

even statements facilitated by use of Statistical Package for Social Sciences (SPSS) to obtain the Cronbach alpha co-efficient. According to Mugenda & Mugenda (2003), an instrument reliability co-efficient alpha of 0.80 or more will imply a high degree of reliability of the instruments.

3.7 Data collection procedures

The researcher sought written permission from the National Commission for Science, Technology and Innovation (NACOSTI) to enable him conduct research in the selected schools. Preliminary arrangements were then made with the school head-teachers two weeks before the material day for data collection, in order to create sufficient rapport with the respondents, inform them of their freedom to make informed choice and allow for possible adjustments to the data collection schedule where need arose. Four sets of questionnaires were then self-administered concurrently in all the 5 sampled schools, with the help of four assistants, to the unit of analysis who were; the School Management Committee, school head-teachers, teachers, and pupils. The respondents then filled in their opinions on the items of the questionnaires, which were then be collected by the researcher.

3.8 Data analysis techniques

Responses obtained from the both open-ended and closed-ended items in the questionnaires were systematically organized and checked for completeness and accuracy. Quantitative data were then analyzed by assigning codes to responses from closed-ended items, for instance, numerical values 1 and 0 were assigned to

'YES' and 'NO' responses respectively. Quantitative data was then analyzed using descriptive statistics, such as frequency counts and percentages. Qualitative data was analyzed by assigning open-ended responses to specific response categories, each of which was assigned a specific value. The values obtained from both quantitative and qualitative data were entered into the computer and further analyzed to establish the correlation between the outcomes of the study, facilitated by the Statistical Package for Social Science (SPSS) using the Cronbach alpha test. A Cronbach alpha co-efficient of 0.82 was obtained, indicating that the research instruments were reliable hence were acceptable for collecting data for the study. According to Mugenda & Mugenda (2003), an instrument reliability co-efficient alpha of 0.80 or more implies a high degree of reliability of the instruments.

3.9 Ethical considerations

The researcher observed ethical considerations throughout the study, particularly during the process of data collection. The researcher sought written permission from the relevant authorities, first from the National Commission for Science, Technology and Innovation (NACOSTI), then from the County Director of Education, Siaya County, both of whom issued the authorization to conduct research.

All the four research assistants were briefed on the requisite ethical considerations to be adhered to during the data collection process. During the actual data collection, the researcher informed the all respondents of their freedom of choice

of participation in the study. The researcher further informed the respondents that their identity and opinions on issues under study would be kept confidential, and that any information gathered from them would be used for the purpose of the study only. Having thus ascertained the respondents' informed consent, the researcher proceeded to administer the research instruments.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND DISCUSSIONS

4.1 Introduction

This chapter presents findings of the study, with focus on the questionnaire return rate, the demographic information of respondents, data interpretation and discussions on the findings. First the respondents return rate was analyzed and the outcome presented below. The data collected was then analyzed as per the research objectives and research questions under the following sub-headings: findings on ways in which school policies and plans prioritized flood DRR as a basis for safety in schools, findings on the extent to which flood DRR had been integrated into the school curriculum, findings on ways the SMC participated in implementation of flood disaster safety standards, and findings on the role pupils played in implementing flood disaster safety measures. Descriptive technique was used to organize, summarize and interpret qualitative information. Quantitative information was subjected to content analysis, involving the analysis of emerging themes, the findings of which were then presented in form of frequency tables.

4.2 Questionnaire return rate by respondents

The study sought to analyze the response rates of the respondents based on the categories of respondents. As per the sample frame in Table 3.1, 225 respondents were expected; 10 SMC members, 5 head-teachers, 10 teachers and 200 pupils.

The study established that the SMC, head-teachers, teachers and students all had a questionnaire return rate of 100 percent, thus the average questionnaire return rate

of this study was 100 percent, which was considered by the researcher to be acceptable for the purpose of the study and a reliable representation of the target population.

4.3 Demographic information of respondents

The study sought for demographic information of the respondents which was analyzed and presented in Table 4.1. The study sought to analyze the characteristics of the personal attributes of individual respondents, including gender, duration of stay of the respondents in their schools in terms of number of years, and the respondents' professional qualifications.

4.3.1 Gender of the respondents

The findings on the gender of the School Management Committee are as shown in Table 4.1 below:

Table 4.1 Gender of the respondents

Gender	S M C		H/Teachers		Teachers		Pupils	
	n	%	n	%	n	%	n	%
Male	3	30	5	100	7	70	82	41
Female	7	70	0	0	3	30	118	59
Totals	10	100	5	100	10	100	200	100

As indicated in Table 4.1 above, it can be noted that a majority, 70 percent, of the SMC involved in the study were of female gender, while only 30 percent were male. All the Head-teachers 100 percent were male. 70 percent of teachers sampled were male, while 30 percent of the teachers were female, as opposed to

59 percent of the pupils who were female, while 41 percent were male. Head-teachers and teachers are the main implementers of safety programmes in school.

Although the majority of the SMC were female, the fact that all the head-teachers and a majority of teachers sampled for the study were male may impact negatively for the effective design and implementation of gender-responsive aspects of flood safety measures. According to Van der Gaal (2013) female teachers are crucial in evaluating the specific needs of girls in disaster situations, the absence of who can potentially lead to gender-blind programming and increased risk of SGBV such as sexual violation and rape of adolescents in camp settings. In view of the fact that a majority of the pupils were female, gender-sensitive programming of flood safety measures may be crucial in the flood-affected schools.

4.3.2 Duration of stay of the respondents in their schools

The study sought to analyze findings on the duration of stay of the SMC, Head-teachers, teachers and pupils in their schools in terms of number of years. The findings on duration of stay of the SMC in their schools is as shown in Table 4.2.

Table 4.2 Duration of stay of the respondents in their schools in years

Duration	S M C		H/Teachers		Teachers		Pupils	
	n	%	n	%	n	%	n	%
Below 1 year	0	0	1	20	2	20	26	13
1-4 years	4	40	1	20	2	20	24	12
5-10 years	6	60	3	60	5	50	150	75
Over 10 years	0	0	0	0	1	10	0	0
Totals	10	100	5	100	10	100	200	100

From Table 4.2 above, it can be noted that 60 percent of the SMC had stayed in their schools for between 5 to 10 years, while 40 percent had stayed in their schools for between 1 to 4 years. None of the SMC had been in their schools for below 1 year and none over 10 years. The above fact may imply that a majority SMC had stayed in their schools for a sufficiently long time to have witnessed flood disasters and to enable them have sufficient knowledge of the flood disaster safety measures that have been employed in the past flood disasters.

Majority, 60 percent, of Head-teachers had been in Head-teachers in their schools for between 5-10 years, indication that a majority of the Head-teachers had been in administrative positions in the schools for a sufficiently long period to have witnessed flood disasters and to enable them have significant knowledge of the flood disaster safety measures that have been employed in the past flood disasters. No Head-teacher had been in his school for over 10 years. However, it is the view of the researcher that a five-year period is sufficient for Head-teachers to implement a flood disaster safety project.

A majority, 50 percent, of teachers had been teaching in their schools for between 5-10 years, indication that they had been working in the schools for a sufficiently long period to have witnessed flood disasters and to have enabled them have sufficient knowledge of the flood disaster safety measures that have been employed in the past flood disasters. Only 10 percent of the teachers had stayed in the school for over 10 years. From Table 4.2 above, it can be seen that 75 percent

of pupils involved in the study had stayed in their schools for between 5-10 years, while only 13 percent had been in the schools for below 1 year, implying that the majority of the pupils had been in their schools for a sufficiently long time to have experienced flood disasters. The majority of pupils, having been sampled from the upper grades 5-8, were presumed to have been in their schools for at least 5 years thus had better grasp of the items under study.

4.3.3 Level of professional training of Head-teachers and teachers

The study sought to analyze the professional training of the teachers under the categories Degree in Education, Diploma in Education, S1 Certificate in Education, P1 Certificate in Education or Untrained. Table 4.3 below summarizes the findings on the level of professional training of teachers and teachers.

Table 4.3 Level of professional training of Head-teachers and teachers

Level of Training	Head-Teachers		Teachers	
	n	%	n	%
Degree	1	20	1	10
Diploma	2	40	4	40
S1 Certificate	1	20	2	20
P1 Certificate	1	20	1	10
Untrained	0	0	2	20
Totals	5	100	10	100

Professional training imparts in teachers pedagogical skills necessary for disseminating skills-based information such as flood DRR to pupils and fellow teachers. The majority, 40 percent, of both the Head-teachers and teachers

sampled possessed a Diploma in Education. 20 percent of the Head-teachers possessed a Degree in education, while none was untrained.

The above findings indicate that the majority of Head-teachers had training in education that could enable them to implement safety programmes in schools. The study also established that 40 percent of the teachers had a Diploma in education, while 20 percent had an S1 Certificate in Education. 10 percent of the teachers possessed a Degree in Education while a similar proportion had a P1 Certificate. The survey revealed that the majority of teachers had a Diploma in Education, thus were capable of disseminating flood safety information to pupils and their fellow teachers. However, a significant 20 percent of the teachers had no training, an indication that there was need for regular in-service training for teachers in order to equip them with requisite pedagogical skills for disseminating flood safety information since the absence of training could partly be responsible for the level of implementation of safety standards in their schools.

4.4 Data presentation by objectives

This section analyzed the responses of respondents based on questions related to the research objectives and making references in relation to the components of flood disaster safety standards in schools.

4.4.1 Ways in which school safety policies prioritized flood DRR

The respondents were asked to indicate whether flood disasters had affected their schools in the past five years. The responses were analyzed and have been presented in Table 4.4 below. In response to the question whether the school been

affected by flood disasters in the past five years, all 100 percent of the respondents indicated that their schools had recently experienced flooding in the past five years, implying that all the schools under study had suffered frequent flooding in recent times.

The study then sought to establish whether flood disasters affected learning in their school in the recent past. All 100 percent of the respondents indicated that flood disasters affected learning in their schools. This implies that learning in all public primary schools had been adversely affected by recent flood disasters. The study also sought the opinion of the respondents on how flood emergencies affected learning in their schools. Table 4.4 below summarizes the findings.

Table 4.4 Responses on how flood disasters had affected schools

How learning was affected	S M C		H/Teachers		Teachers		Pupils	
	n	%	n	%	n	%	n	%
Schools closed	4	40	2	40	3	30	25	12.5
Sanitation affected	2	20	2	40	3	30	68	34.0
Schools distant	1	10	0	0	2	20	15	7.5
L/facility occupied	1	10	1	20	1	10	7	3.5
Playfields unusable	1	10	0	0	0	0	64	32.0
Roads inaccessible	1	10	0	0	1	10	21	10.5
Totals	10	100	5	100	10	100	200	100

40 percent of both the SMC and the Head-teachers concurred in indicating that schools had closed in response to flood emergencies, implying that pupils often

had no access to learning opportunities during flood emergencies. This opinion was supported by a majority, 30 percent, of teachers and 12.5 percent of the pupils. 20 percent of the SMC indicated that Water and Sanitation facilities were rendered unsafe, a view supported by a majority 40 percent of Head-teachers. 20 of Head-teachers sampled indicated that IDPs occupied learning facilities during floods, implying that pupils may have faced additional risks to safety in the when facilities in their schools are converted to IDP, for instance Sexual and Gender-Based Violence (SGBV).

That 34 percent of pupils indicated Water and Sanitation as being affected by flood implies pupils have grave concerns for the condition of water and sanitation facilities during flood emergencies. Similarly 34 percent of the pupils indicated that playfields were affected by floods. The findings also show that pupils who were evacuated to IDP camps that were far away from their schools may have missed out on schooling for the duration of flood emergency due to the increased distance to school.

The respondents were asked whether they received Early Warning Systems alerts on impending floods from sources other than their own observations. In response, 100 percent of the teachers, 100 percent SMC and another 100 percent Head-teachers and 68.5 percent of the pupils indicated that they received Early Warning Systems alerts on impending floods from sources other than their own observation. The above findings indicate that there were Early Warning Systems

alerts on impending flood emergencies. However, the findings were contradicted by 31 percent of the pupils sampled who reported that they did not receive Early Warning Systems alerts, implying that a significant proportion of the pupils were not aware of Early Warning Systems alerts. The study then sought to establish the most common means by which the Early Warning Systems alerts were received. Table 4.5 below summarizes the responses.

Table 4.5 Responses on the most common means by which EWS alerts were received

Means EWS alerts rec'd	SMC		H/Teachers		Teachers		Pupils	
	n	%	n	%	n	%	n	%
Radio	6	60	2	40	5	50	110	55.0
Television	1	10	1	20	2	20	10	5.0
Internet	0	0	0	0	0	0	4	2.0
Newspaper	3	30	2	40	1	10	8	4.0
Mobile Phone	0	0	0	0	1	10	11	5.5
No response	0	0	0	0	1	10	57	28.5
Total	10	100	5	100	10	100	200	100

From the findings in Table 4.5 above a majority, 60 percent, of the SMC indicated that the radio was the most common means through which they received early warning alerts, while thirty percent of the SMC indicated newspapers as the most common means the respondents received Early Warning Systems alerts. Similarly a majority 40 percent of the Head-teachers indicated radio as the most common means by which they received Early Warning Systems alerts, an equal proportion to 40 percent of Head-teachers who indicated newspapers as the most common

means by which Early Warning Systems alerts were received. 50 percent of the teachers and 55 percent of the students also indicated radio as the most common means by which Early Warning Systems alerts were received.

Curiously none of the SMC, Head-teachers and teachers, and only 2 percent of the pupils indicated internet as the most common means by which Early Warning Systems alerts were received, despite the existence of the Radio and Internet Project (RANET) EWS in the area. These findings might be an indication of poor internet connectivity in the study region. According to ActionAid (2011), disaster-prone areas are also the same ones for whom there is poor provision of infrastructure, such as communication infrastructure, necessary for implementing flood disaster mitigation measures.

The above findings indicate that radio is the most common means by which a majority of respondents received Early Warning Systems alerts. This could be attributed to the widespread use of the radio in many parts of Kenya, thus its likelihood of being a preferred means used by the Meteorological department to broadcast weather forecasts to reach many people. The findings of the study resonate with studies by Gachuhi (2013) in whose finding respondents indicated that the least likely means by which the respondents could receive Early Warning Systems alerts was by mobile phone.

The study further sought to establish whether policy guidelines on school safety were available in the schools under study. From the findings, 80 percent of both

the SMC and Head-teachers indicated there were policies guiding flood safety in their schools, while 20 percent of the same categories indicated that there were none. On the converse, 50 percent of the teachers reported that there were safety policy guidelines while a similar proportion of teachers indicated that there were no flood safety policy guidelines, an indication that teachers were of divided opinion on whether or not flood safety policy guidelines were available in schools.

The above implies that a majority of respondents confirmed that there were safety policy guidelines in school. However, it was apparent that a significant proportion of teachers, 50 percent, were unaware of the existence of policy guidelines, such as the Safety Standards Manual for Schools in Kenya (2008), in their schools despite the MoE distributing the said documents to all schools in the country. This could imply that Head-teachers, ordinarily the custodian of policy documents in schools, may have been in possession of flood safety policy guidelines of which existence teachers may have had no knowledge.

The study further required the respondents to indicate which safety measures have been put in place in their schools. The responses were analyzed and have been presented in Table 4.6 below.

Table 4.6 Responses on which safety measures were operationalized

Operationalized safety measures	S M C		H/Teachers		Teachers	
	n	%	n	%	n	%
Buildings retrofitted	3	30	3	60	4	40
Drills held	0	0	0	0	0	0
EWS operationalized	5	50	2	40	2	20
Emergency team trained	0	0	0	0	0	0
Documents secured	0	0	0	0	0	0
None	2	20	0	0	4	40
Total	10	100	5	100	10	100

In response, a majority of 40 percent of the respondents indicated that buildings were repaired and retrofitted, while 36 % indicated that flood EWS had been operationalised. The majority, 50 percent, of the SMC reported that EWS had been operationalised. 30 percent of the SMC indicated that flood-damaged buildings had been repaired and retrofitted, while 20 percent indicated that no flood safety measures had been put in place. This is in contrast to the response of the majority, 60 percent, of Head-teachers and 40 percent of teachers indicated that flood-damaged buildings had been repaired and retrofitted. From the researcher's observation, the above findings can be attributed to the existence of approximately 30 percent of buildings in a majority of schools constructed to flood-resilient standards. 40 percent of the teachers reported that no flood safety measures had been operationized, reinforcing earlier opinion of teachers in which 50 percent indicated that there were no safety policies in their schools.

The study revealed that, while an Early Warning Systems mechanism was in place, and flood-affected buildings had been repaired and/or retrofitted, most flood safety components, such as operationalization of safety drills, had not been put in place.

The respondents were asked to whether or not resources were available for implementing flood disaster measures. Their responses were analyzed in frequencies and percentages. On whether resources were available for implementing flood disaster safety measures, 80 percent of the respondents indicated “NO” implying that funds had been unavailable while 20 percent of the respondents indicated “YES” implying that funds were available. The respondents were then asked to indicate the extent to which resources hindered implementation of flood disaster safety measures. In response to the above question, the respondents ranked as either ‘extreme’, ‘moderate’, ‘minimal’ or ‘none at all’ the extent to which resources constituted a major hindrance to implementation of flood disaster safety measures. Their responses were analyzed in frequencies and percentages and presented in Table 4.7 below.

Table 4.7 Responses on extent resources hindered implementation of flood safety measures

Extent of resource hindrance	S M C		H/Teachers	
	n	%	n	%
Extreme	5	50	3	60
Moderate	3	30	2	40
Minimal	2	20	0	0
None at all	0	0	0	0
Total	10	100	5	100

From Table 4.7 above, it is evident that the majority, 50 percent, of the SMC indicated that resources extremely hindered implementation of flood safety measures, while 20 percent indicated that resources minimally hindered implementation of flood safety measures. 60 percent of the Head-teachers sampled indicated that resources extremely constituted a major hindrance while 40 percent indicated that resources moderately constituted a major hindrance to implementation of flood disaster safety measures. The above findings on resonates with the findings of a study by Ong'idi (2013) which indicated that funding for flood mitigation efforts in schools had been inadequate and not commensurate with the magnitude of flood disasters in the areas under study.

4.4.2 Extent to which the school curriculum integrated flood DRR

Integrating DRR into the school curriculum links short-term mitigation efforts with long-term development efforts, thereby ensuring that children are safe, education services continue to be provided, and educational developments are secure during emergencies. The respondents were asked to indicate ways in which the school curriculum addressed flood DRR. The majority, 80 percent, of Head-teachers indicated that the curriculum addressed flood DRR, while 20 percent of the Head-teachers indicated that the curriculum did not include flood DRR, implying that the majority of Head-teachers were of the view that flood DRR had been included in the curriculum. On the other hand, 50 percent of the teachers responded indicated that the curriculum addressed flood DRR, while the other 50

percent of the teachers indicated that the school curriculum did not include flood DRR.

The above finding may imply that, although flood DRR may have been implemented in policy, some teachers may not have been aware of policy requiring them to include flood DRR into the curriculum. From the researcher's observation, a significant proportion of teachers were unaware of the existence of policy guidelines, such as the Safety Standards Manual for Schools in Kenya (2008), in their schools, despite the MoE distributing the said documents to schools. Respondents gave their view aimed at answering the question "where has flood DRR been included in the curriculum of your school?" Table 4.8 below presents the results of the findings.

Table 4.8 Responses on where flood DRR was included in the curriculum

Where flood DRR was included	H/Teachers		Teachers	
	n	%	n	%
In Social Studies	2	40	4	40
In Science	2	40	2	20
In G/Counseling	0	0	1	10
In Life-Skills	0	0	1	10
No response	1	20	2	20
Total	5	100	10	100

From the above table, it can be seen that 40 percent of both the Head-teachers and teachers indicated that flood disaster safety was taught as part of Social Studies, while another 40 percent of Head-teachers indicated that flood disaster safety was taught as part of science subjects as opposed to 20 percent of teachers who

indicated that flood DRR was taught as part of Science subject. None of the Head-teachers, however, indicated flood DRR as having been included in either Guidance and Counseling sessions or in Life-Skills. On the other hand, 10 percent of the teacher indicated that flood DRR was included in Guidance and Counseling sessions, while another 10 percent indicated that flood DRR was included in Life-Skills. 20 percent of both the Head-teachers and teachers gave no response on the above question.

The above findings show that flood disaster safety was more likely to be taught in as part of Social Studies and Science subjects and less likely to be taught as part of Life-Skills or Guidance and Counseling. The findings agree with the findings of Nyambala (2006) who observes that teachers in schools in Kenya have often perceived the task of including non-examinable subjects, such as DRR, as an unwelcome add. The study required the respondents to indicate whether there were specific teachers assigned to disseminate information on flood DRR.

From the responses, the majority, 60 percent, of Head-teachers indicated that no teachers had been specifically assigned to disseminate flood DRR information, as opposed to 40 percent of Head-teachers who indicated that specific teachers had been assigned. Similarly, 80 percent of the teachers indicated that specific teachers had not been assigned, as opposed to 20 percent of the teachers who indicated that specific teachers had been assigned to disseminate information on

flood DRR, an implication that no specific teachers had been assigned the task of disseminating flood DRR information to fellow teachers and pupils.

On whether teachers had been trained to disseminate information on flood DRR, 80 percent of the Head-teachers indicated that teachers had not been trained to disseminate information on flood DRR, while 20 percent of the Head-teachers indicated that teachers had been trained, an opinion also held by the teachers, of whom 90 percent indicated that teachers had not been trained while 10 percent of the teachers indicated that teachers had been trained.

The above findings implied that teachers had low training levels in ways of disseminating information on flood disaster risk reduction. The findings agree with the findings of studies by Ong'idi (2013) which indicated that a majority of teachers had no training on DRR and were traumatized by their experience of flood disasters. According to INEE (2010) teachers in disaster contexts were often withdrawn, had a low attention span, poor memory and low self-esteem, and thus needed specialized Psychosocial training if they were to efficiently disseminate information on flood DRR to pupils and their colleagues.

4.4.3 Level of SMC participation in flood safety activities

It was important for the study to establish whether SMC participated in safety activities in schools. The study sought to establish the extent to which the SMC participated in flood disaster activities in their schools. The findings have been summarized in table 4.9 below:

Table 4.9 Response on Level of SMC participation in flood disaster safety activities

SMC Participation	S M C		H/Teachers		Teachers	
	n	%	n	%	n	%
Often	1	10	1	20	0	0
Occasionally	5	50	2	40	2	20
Rarely	3	30	2	40	6	60
No response	1	10	0	0	2	20
Total	10	100	5	100	10	100

From the findings in Table 4.9 above, it can be seen that 50 percent of the SMC indicated that the SMC 'occasionally' participated in flood disaster safety activities, 30 percent indicated that they 'rarely' participated in the flood disaster safety activities, while only 10 percent indicated that the SMC participated often. However, 10 percent of the SMC did not respond to the question item in discussion.

From the above responses, it is clear that the majority of the SMC were of the opinion that they only 'occasionally' participated in flood safety activities. This may imply that the SMC had not been sufficiently involved in flood disaster safety activities in school. The opinion is shared by the Head-teachers most, 40 percent, of whom indicated that the SMC 'occasionally' participated in flood disaster safety activities. The majority of teachers were of the opinion that the SMC rarely participated in school flood disaster safety activities. 20 percent of the teachers did not, however, respond to this questionnaire item. The study sought to

establish the ways in which the SMC participated in flood disaster safety activities in their schools. Table 4.10 below summarizes the findings:

Table 4.10 Responses on ways the SMC participated in flood safety activities

Ways SMC participated	SMC		H/Teachers		Teachers	
	n	%	n	%	n	%
Resource mobilization	5	50	3	60	4	40
Emergency activities	2	20	2	40	3	30
Community advocacy activities	2	20	0	0	1	10
No response	1	10	0	0	2	20
Total	10	100	5	100	10	100

From the findings in Table 4.10 above, 50 percent of the SMC indicated that they participated in resources mobilization, 24 percent indicated that they participated in emergency team activities. 20 percent of the SMC indicated they participated in advocacy activities, while 10 percent of the SMC did not respond to the questionnaire item. From the findings 60 percent of the Head-teachers indicated that the SMC participated in resource mobilization activities, in contrast to 40 percent of the Head-teachers who indicated they participated in school emergency team activities. None of the Head-teachers indicated that the SMC participated in community advocacy activities on flood disaster safety. Of the teachers sampled, the majority, 40 percent, indicated that the SMC participated in resource mobilization, 30 percent indicated emergency activities while 10 percent indicated community advocacy activities. However, 20 percent of the teachers did not respond to this questionnaire item. From the fore-going discussion, it is clear that the SMC dominantly participated in resource mobilization for supporting flood

disaster safety activities. It is also apparent that the SMC least participated in community advocacy activities on flood disaster safety.

4.4.4 Role of pupils in implementing flood disaster safety measures

The respondents were asked whether there were child-led clubs in the schools under study that participated in flood disaster safety activities. The responses were analyzed, and Table 4.11 below summarizes the findings.

Table 4.11 Role of pupils in implementing flood safety measures

Pupil's Activities	SMC		H/Teachers		Teachers		Pupils	
	n	%	n	%	n	%	n	%
Safety awareness	2	20	1	20	1	10	2	1.0
Funds mobilization	5	50	3	60	2	20	60	30.0
Info dissemination	1	10	0	0	1	10	33	16.5
Emergency activities	0	0	0	0	1	10	10	5.0
No response	2	20	1	20	5	50	95	47.5
Total	10	100	5	100	10	100	200	100

From the findings 80 percent of the SMC indicated that child-led clubs participated in flood disaster safety activities in school, while 20 percent indicated that child-led clubs did not participate. The finding on the responses of the Head-teachers were similar, with 80 percent indicating that child-led clubs participated while 20 percent of the Head-teachers indicated that child-led clubs did not participate. However, 70 percent of the teachers indicated that child-led clubs did not participate in flood disaster safety activities, an opinion also held by the majority, 60 percent, of pupils who indicated that child-led clubs did not participate. 40 percent of the pupils indicated that there were child-led clubs

who participated in flood safety activities in school. This may imply that participation of pupils in flood disaster safety activities may have been engrained in the school flood safety policies, but which in actual fact had not been implemented.

The study further sought to establish the flood disaster safety activities in which pupils participated most. From the findings in Table 4.16, above, the majority, 50 percent, of the SMC indicated that the pupils participated most in mobilizing funds for safety activities, while 20 percent indicated that the pupils facilitated in flood safety awareness activities. 10 percent of the SMC indicated that pupils participated in most in dissemination of flood DRR information. According to the response, no pupils participated in emergency team activities. However, 20 percent of the SMC did not respond to the questionnaire item in discussion. However, the majority of teachers, 50 percent, and pupils, 47.5 percent, did not respond to the question, reinforcing the earlier held opinion that pupils did not participate in flood disaster safety activities. 30 percent of pupils indicated that pupils participated in resource mobilization as opposed to 20 percent of teachers who held the same view. The majority of the Head-teachers, 60 percent, indicated that pupils participated most in mobilizing funds for safety activities.

The above findings may imply that pupils mostly participated in mobilization of funds for flood disaster safety activities. The findings may also indicate a lack of innovation in the ways pupils participated in flood disaster activities. According to Valasquez & Pierce (2012), child initiatives can enhance their participation as

facilitators in school- and community DRR awareness-raising activities, as well as mitigate the prevalent shortage of specific. The respondents were then asked to rate the extent to which clubs contributed to flood disaster safety in their schools.

Table 4.12 below summarizes the findings:

Table 4.12 Responses on the extent to which child-led clubs contributed to flood disaster safety

Club Contribution	S M C		H/Teachers		Teachers		Pupils	
	n	%	n	%	n	%	n	%
Extreme	0	0	0	0	0	0	0	0.0
Moderate	2	20	1	20	2	20	97	48.5
Minimal	2	20	3	60	6	60	61	30.5
Slight	4	40	0	0	2	20	8	4.0
No response	2	20	1	20	0	0	34	17.0
Total	10	100	5	100	10	100	200	100

From the findings in table 4.17 above, the majority of SMC, 40 percent, indicated that clubs 'slightly' contributed to the enhancement of flood safety in their schools, while both the majority of Head-teachers and teachers, 60 percent, indicated the contribution of clubs as 'minimal'. However, the pupils rated the contribution of child-led clubs as 'moderate'. The foregoing findings indicate that a majority of respondents rated the contribution of child-led clubs as 'minimal' implying that child-led clubs only had a slight contribution to the enhancement of flood safety in their schools.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the main findings of the study on factors influencing implementation of flood disaster safety in public primary schools. This is followed by conclusions drawn from the findings and thereafter recommendations for policy directions targeting to improve implementation of flood disaster safety standards in schools. Finally the chapter suggests areas for further research envisaged to contribute toward creating safe, child-friendly learning environments in the school.

5.2 Summary of the study

The study focuses on factors influencing implementation of flood disaster safety in public primary schools. The purpose of the study was to determine factors influencing implementation of flood disaster safety standards narrowed down to school policies and plans, integration of flood DRR into the school curriculum, SMC participation in implementation of flood disaster safety standards, and role of pupils in implementation of flood disaster safety measures. The main findings of the study indicated that most schools lacked comprehensive flood disaster safety policies. Further, the study revealed that poor curriculum integration of flood DRR was a major contributor to the low level implementation of school safety standards in public primary schools. A majority of schools sampled did not involve the SMC and the pupils in implementation of flood disaster safety measures.

5.3 Major findings of the study

The study revealed that, although there were policy guidelines on flood disaster safety in a majority of schools, inadequate resources posed a major hindrance to operationalization of flood disaster safety measures.

The findings also show that, while a majority of schools taught flood DRR as part of examinable subjects such as Social Studies and Science, most schools lacked specific, trained teachers to disseminate DRR information appropriate for the local contexts of flood disasters.

Further, the study revealed that, although the SMC participation was crucial in mobilization of resources for flood disaster safety activities, SMC participation had minimal impact on efforts to enhance flood disaster safety standards.

Finally, the findings show that, even though pupils in a majority of schools participated in resource mobilization for flood safety activities, child-led clubs made slight contribution to flood disaster safety effort.

5.3.1 Findings based on factors influencing implementation of flood disaster safety

The study focuses on factors influencing implementation of flood disaster safety in public primary schools. The purpose of the study was to determine the factors influencing implementation of flood disaster safety standards narrowed down to school policies and plans, integration of flood DRR into the school curriculum, SMC participation in implementation of flood Disaster Safety Standards, and role of pupils in implementation of flood disaster safety measures. Literature was reviewed on the basis of these factors and the conceptual framework formulated

to describe the relationship between the variables. A sample of five schools was used to conduct this study. Descriptive survey design was employed and four sets of questionnaires used to collect data from the 10 members of the SMC, 5 head-teachers, 10 teachers and 200 pupils, constituting 225 respondents.

5.3.2 Finding on the ways in which school policies prioritize DRR as a basis of flood disaster safety

All 100 percent of the respondents affirmed that floods had indeed recently been a regular occurrence in their schools, an indication that flood disasters were a regular occurrence in the area. Similarly, all the respondents also indicated that floods had devastating effects on the safety of pupils in the schools in the area. A majority of the respondents were of the view that poor implementation of flood safety policies was a major contributor to the low flood safety standards in schools.

The study revealed that there were policy guidelines on flood disaster safety in a majority of schools. However, most schools had not operationalised key flood safety. The fact that a majority of schools had no operational EWS may have made most schools highly susceptible to the effects of floods, especially when flood waters rose suddenly. It is clear from the findings that comprehensive EWS based on locally available communication mechanism should be put in place. According to the findings, unsafe construction posed a significant threat to pupil's flood safety in a majority of schools. While 30 percent of buildings in a majority of schools had been constructed to flood-resilient standards, most schools had insufficient resources for construction of more flood-resilient building, and

repairing and retrofitting existing flood-damaged buildings. Although a key requirement in the implementation of flood safety standards, drainage systems were found lacking in a majority of schools or were constructed without regard to expert advice. For instance, poorly oriented drainage culverts in one school channeled flood waters into the school grounds during flood incidents. According to the findings of the study, insufficient allocation of resource stood out as the main policy challenge to implementation of flood safety measures in schools. Findings of the study also indicate a weak link between the provision of adequate water and sanitation in schools during flood emergencies, with negative implications for health safety of pupils in schools and, in the long-term, negative implications for levels of access and retention of pupils.

The above finding imply that poor implementation of flood disaster safety measures may have negatively influenced the level of pupil safety and - participation in school, especially so for the highly vulnerable pupils of tender ages in the lower grades.

5.3.3 Findings on extent the school curriculum had integrated flood DRR

The findings of the study show that, while flood DRR was addressed in the school curriculum in a majority of the sampled schools, flood Disaster Risk Reduction was more likely to be taught as part of examinable subjects such as Social Studies and Science subjects rather than being discussed as part of non-examinable skills-based subjects such as Life-Skills or Guidance and Counseling.

The findings also revealed that, in a majority of schools, no specific teachers were assigned to disseminate information on flood DRR to fellow teachers and pupils. Similarly, a majority of the respondents indicated that no training had been provided to teachers on the on flood DRR. According to INEE (2010) teachers in disaster contexts were often withdrawn, had a low attention span, poor memory and low self-esteem, and thus needed specialized Psychosocial training if they were to efficiently disseminate information on flood DRR to pupils and their colleagues.

On the availability of instructional materials for supporting flood disaster reduction education, a majority of the respondents disagreed with the statement that instructional materials were available. Of the respondents who indicated that instructional materials were available, a majority of them indicated that the said materials were not relevant to the local contexts of flood disasters. The above findings indicate that flood DRR had been insufficiently integrated into the curriculum of the flood-affected schools.

5.3.4 Findings on the level of SMC participation

From the findings of the study, the majority of the respondents indicated that the SMC participated in flood disaster safety implementation in their schools, particularly in resource mobilization activities. However, the study reveals that that the SMC participation in emergency team activities was not 'quite often'. This implies that the SMC was minimally involved in the flood disaster safety activities of their schools.

5.3.5 Findings on the role of pupils in implementing flood safety measures

From the findings of the study it can be deduced that pupils participated in flood disaster safety activities. The majority indicated that indicated that pupils mostly participated in mobilization of funds for flood safety activities. The findings indicate that pupils least participation in flood disaster awareness activities. The study also reveals that child-led clubs had 'slight' contribution to flood disaster safety in schools. That pupils least participated in flood disaster awareness activities implies that pupils did not engage in innovative ways of contributing to implementation of flood disaster safety in schools.

5.4 Conclusions

Based on the findings, the study concludes that level of prioritization of DRR in flood disaster safety policy and the level of integration of flood DRR into the school curriculum had strong influence on the efficiency with which flood disaster safety standards were implemented in flood-affected schools. However, the study also revealed that the low level of participation of the SMC and pupils in flood disaster safety activities had significantly contributed to the low implementation of flood disaster safety standards in schools.

According to the study, most schools had not put in place the recommended flood disaster safety measures, even though their operationalization could go a long way in ensuring pupils were protected from the ravages of floods. That insufficiency of resources ranked highly as the main hindrance to implementation of flood

disaster safety measures is a wake up call to duty bearers to increase allocation of resources for flood DRR in schools.

The study also revealed that flood DRR had not been fully integrated into the curriculum of a majority of schools. Most schools lacked specific, trained teachers with the requisite pedagogical skills for adapting instructional materials and disseminating information on flood DRR to pupils and fellow teachers. The study concludes that assigning specific, trained teachers for flood DRR education was crucial to the full integration of flood DRR in the curriculum of flood-affected schools.

The study further reveals that both the SMC and pupils mostly participated in mobilization of funds for flood safety activities. However, both the SMC and pupils made slight contribution to implementation of flood disaster safety standards in schools. It is, therefore, important that more innovative ways of engaging the SMC and pupils in the implementation of flood DRR be found.

From the foregoing, it is clear then that prevention and mitigation of flood disasters is a challenge to school communities flood and that flood disasters have had devastating effects on the educational developments in public primary schools. Challenges that hamper efforts at ensuring the safety of pupils in schools in flood-prone areas must therefore be eradicated if the goal of ensuring all pupils are safe and free access to quality education is to be realized.

5.5 Recommendations

In view of the above findings and conclusions, the following recommendations are made in order to ensure issues of policy are overcome and the safety of pupils in schools during flood emergencies is enhanced.

- (i) In order to enhance the capacities of all school stakeholders in public primary schools to implement flood disaster safety policies, regular sensitization and training on implementation of flood disaster safety standards should be organized for all MoE officials, school SMCs, Head-teachers, teachers and pupils.
- (ii) Sufficient resources should be allocated to facilitate operationalization of flood disaster safety measures, with particular emphasis on safe construction of flood resilient infrastructure in schools, such as flood shelters-in-place.
- (iii) Education stakeholders, including the MoE and the Kenya Institute of Curriculum Development (KICD) should put mechanisms in place for full integration of flood DRR education into the school curriculum, in order that the safety of pupils in schools is enhanced.
- (iv) In order to increase stakeholder buy-in and invite child innovation in efforts at enhancing flood disaster safety in schools, education actors at the local- and national levels should mobilize inclusive school-wide participation in implementation of flood disaster safety measures in schools.

5.6 Suggested areas for further research

Taking into consideration the delimitations and the findings of this study, the paragraph below presents areas the researcher recommends further research:

- (i) The research concentrated on factors influencing implementation of flood disaster safety measures. It may be necessary for another study to be conducted to highlight the impact of flood disasters on school access and on educational achievement of pupils since issues pertinent to child access to quality education have been found prevalent.
- (ii) A study should be conducted to examine factors influencing implementation of flood DRR education in schools in flood-prone areas. Although integral to implementation of flood disaster safety standards, the study revealed that flood DRR education was more likely to be integrated into the curriculum as part of examinable subjects rather than as stand-alone skills-based subjects.
- (iii) A study on community-based determinants of implementation of flood disaster safety standards is worth conducting. The study revealed that community-wide participation was crucial for effective implementation of flood disaster safety standards in schools.

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APPENDICES

APPENDIX A: INTRODUCTORY LETTER

University of Nairobi,

Department of Educational Administration and Planning,

P.O. Box 92,

KIKUYU.

November 2013.

Dear Sir/ Madam,

RE: DATA COLLECTION:

I am a Master of Education in Education in Emergencies student in the University of Nairobi conducting research on Factors Influencing Implementation of Flood Disaster Safety Standards in Uranga Division, Siaya County.

Your school has been selected to participate in this study. I hereby humbly request you to respond to all the items in the questionnaire provided to the best of your knowledge. The questionnaire is meant for the research only and the identity of the respondents will be treated with utmost confidentiality.

Your assistance will generate information that will help improve strategies for implementing flood disaster safety standards in Uranga Division and Kenya at large.

Yours faithfully,

George Odhiambo Tallo.

APPENDIX B

QUESTIONNAIRE FOR SENIOR MANAGEMENT COMMITTEE

INSTRUCTION: The purpose of this questionnaire is to gather information on factors influencing implementation of flood disaster safety standards in public primary schools in Uranga Division, Siaya County. Kindly respond to each question by ticking (✓) the appropriate response or by giving your own opinion as honestly as possible.

SECTION A: BACKGROUND INFORMATION

PART 1: Respondents' Personal Information

1. Please indicate your gender: Female Male
2. How long have you been a member of the School Management Committee in this school?
 Below 1 year 1-4 years 5-10 years Over 10 years

SECTION B: *This section seeks your opinion on factors influencing implementation of flood disaster safety standards in your school*

PART 1: Extent to which school policies and plans prioritize Disaster Risk Reduction as a basis of flood disaster safety

3. (a) Has your school been affected by flood emergencies in the past five years?
 Yes No

(b) How would you rate the level of safety of physical infrastructure in your school during flood emergencies?

Physical infrastructure	Highly safe	Safe	Unsafe	Highly unsafe
Roads & Bridges	()	()	()	()
Drainage systems	()	()	()	()
Buildings	()	()	()	()
Playfields	()	()	()	()
Water and Sanitation	()	()	()	()
Other (Specify) -----	()	()	()	()

4. (a) Do you receive Early Warning Systems alerts on impending floods from sources other than your own observation? () Yes () No

(b) If yes, what is the most common means by which the EWS alerts were received? -----

5. (a) Have flood disasters affected learning in your school in the recent past?

() Yes () No

(b) If yes, how was learning affected? -----

6. (a). Are there policies that guide implementation of flood safety in your school? () Yes () No

(b) If yes, have the following safety measures been taken to ensure safety of physical infrastructure during emergencies?

Buildings and other physical infrastructure have been reinforced and retrofitted

Flood safety drills are regularly held

Evacuation map is displayed on all buildings

First Aid kits & emergency supplies are stock-piled and prepositioned

First Aid and emergency response teams have been formed and trained

School records, guides, textbooks and work-books secure and safeguarded

7. (a) Are resources available for implementing flood disaster safety measures in your school? Yes No

(b) If yes, which are the main sources of funding for flood disaster safety programmes in your school? -----

8. (a) In your opinion, did resources constitute a major hindrance to the implementation of flood disaster safety standards in your school?

Yes No

(b) If yes, kindly indicate the extent to which resource constituted a major challenge to implementation of flood disaster safety standards in your school:

Very greatly

Greatly

Slightly

Very slightly

PART 2: Extent to which Flood Disaster Safety is part of the curriculum

9. (a) Do activities in your school address flood disaster safety?

() Yes () No

(b) If yes, please indicate how has flood Disaster Risk Reduction been included in the curriculum of your school? -----

10. (a) Are there specific teachers assigned to disseminate information on flood disaster risk reduction in your school? () Yes () No

(b) If yes, have teachers been trained to disseminate information on flood Disaster Risk Reduction? () Yes () No

11. Are instructional materials available to support instruction on flood disaster risk reduction in your school? () Yes () No

PART 3: Extent to which School Management Committee participates in implementing flood disaster safety standards in school.

12. (a) Have the SMC participated in disaster safety activities in school?

() Yes () No

(b) In your opinion, to what extent has the SMC participated in flood disaster activities your school?

	Rarely	Seldom	Often	Quite often
--	--------	--------	-------	-------------

Community advocacy activities	()	()	()	()
-------------------------------	-----	-----	-----	-----

Resources mobilization	()	()	()	()
------------------------	-----	-----	-----	-----

School emergency team activities	()	()	()	()
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Others (Elaborate) -----

PART 4: The role of pupils in implementing flood disaster safety standards

13. (a) Are there child-led clubs in your school that participated in flood disaster safety activities? Yes No

(b) In which flood disaster safety activities did pupils participate most?

- Facilitated in flood safety awareness activities
- Helped mobilize funds for safety activities
- Participated in developing instructional materials on flood DRR
- Disseminated flood DRR information
- Participated in flood emergency team activities

Others (Elaborate) -----

THANK YOU FOR YOUR COOPERATION

APPENDIX C

QUESTIONNAIRE FOR SCHOOL HEAD-TEACHERS

INSTRUCTION: The purpose of this questionnaire is to gather information on factors influencing implementation of flood disaster safety standards in public primary schools in Uranga Division, Siaya County. Kindly respond to each question by ticking (✓) the appropriate response or by giving your own opinion as honestly as possible.

SECTION A: BACKGROUND INFORMATION

PART 1: Respondents' Personal Information

1. Please indicate your gender: Female Male

2. How long have you been the Head-teacher of your school?

 Below 1 year 1-4 years 5-10 years Over 10 years

3. Kindly indicate the level of academic and professional training you have attained.

 Degree Diploma Kenya Advanced Certificate of Education (
 Kenya Certificate of Secondary Education (Kenya Certificate of Education
Others (Specify) -----

Part 2: Please fill in the following details on your school

4. How many pupils are enrolled in your school? Girls-----Boys-----

5. How many teachers are in your school? Females-----Males-----

PART 1: Extent to which school policies and plans prioritize Disaster Risk Reduction as a basis of flood disaster safety

6. (a) Has your school been affected by flood emergencies in the past five years?

() Yes () No

(b) How would you rate the level of safety of physical infrastructure in your school during flood emergencies?

Physical infrastructure	Highly safe	Safe	Unsafe	Highly unsafe
Roads & Bridges	()	()	()	()
Drainage systems	()	()	()	()
Buildings	()	()	()	()
Playfields	()	()	()	()
Water and Sanitation	()	()	()	()
Other (Specify) -----	()	()	()	()

7. (a) Do you receive Early Warning Systems alerts on impending floods from sources other than your own observation? () Yes () No

(b) If yes, what is the most common means by which the EWS alerts were received? -----

8. (a) Have flood disasters affected learning in your school in the recent past?

() Yes () No

(b) If yes, how was learning affected? -----

9. (a) Are there policies and plans that guide the implementation of flood disaster safety in your school? () Yes () No

b) If yes, which policy guidelines are available in your school? -----

(c) Have the following measures have been taken to ensure safety of physical infrastructure during emergencies?

() Buildings and other physical infrastructure have been reinforced and retrofitted

() Flood safety drills are regularly held

() Evacuation map is displayed on all buildings

() First Aid kits & emergency supplies are stock-piled and prepositioned

() First Aid and emergency response team have been formed and trained

() School records, guides, textbooks and work-books secure and safeguarded

10. (a) Are resources available for implementing flood disaster safety measures in your school? () Yes () No

(b) If yes, which are the main sources of funding for flood disaster safety programmes in your school? -----

11. (a) In your opinion, did resources constitute a major hindrance to the implementation of flood disaster safety standards in your school?

() Yes () No

(b) If yes, kindly indicate the extent to which resource constituted a major challenge to implementation of flood disaster safety standards in your school:

Very greatly Greatly Slightly Very slightly

PART 2: Extent to which Flood Disaster Safety is part of the school curriculum

12. (a) Do activities in your school address flood disaster safety?

Yes No

(b) If yes, please indicate how have flood safety activities been included in your school curriculum? -----

13. (a) Are there specific teachers assigned to disseminate information on flood disaster reduction in your school? Yes No

(b) If yes, have teachers been trained to disseminate information on flood Disaster Risk Reduction? Yes No

14. (a) Are instructional materials available to support instruction on flood Disaster Risk Reduction in your school? Yes No

(b) If yes, to what extent do you agree that the instructional materials available in your school are appropriate for delivering information on flood safety?

Greatly Barely Not at all

Materials address local context of flood disasters

Are adapted to specific levels of the pupils

Language of the catchment has been used

Pupils were involved in developing materials

PART 3: Extent to which School Management Committee participates in implementing flood disaster safety standards in school.

15. (a) Has the SMC participated in disaster safety activities in school?

() Yes () No

(b) If yes, to what extent has the SMC participated in flood disaster activities your school?

	Rarely	Seldom	Often	Quite often
Community advocacy activities	()	()	()	()
Resources mobilization	()	()	()	()
School emergency team activities	()	()	()	()

Others (Elaborate) -----

PART 4: The role of pupils in implementing flood disaster safety standards

16. (a) Are there child-led clubs in your school that participated in flood disaster safety activities? () Yes () No

(b) In which flood disaster safety activities did pupils participate most?

- () Facilitated in flood safety awareness activities
- () Helped mobilize funds for safety activities
- () Participated in developing instructional materials on flood DRR
- () Disseminated flood DRR information
- () Participated in flood emergency team activities

Others (Elaborate) -----

THANK YOU FOR YOUR COOPERATION

APPENDIX D

QUESTIONNAIRE FOR TEACHERS

INSTRUCTION: The purpose of this questionnaire is to gather information on factors influencing implementation of flood disaster safety standards in public primary schools in Uranga Division, Siaya County. Kindly respond to each question by ticking (✓) the appropriate response or by giving your own opinion as honestly as possible.

SECTION A: BACKGROUND INFORMATION

PART 1: Respondents' Personal Information

1. Please indicate your gender: Female Male

2. How long have you been a teacher in your school?

Below 1 year 1-4 years 5-10 years Over 10 years

3. Kindly indicate the level of professional qualification you have attained.

Degree Diploma Kenya Advanced Certificate of Education

Kenya Certificate of Secondary Education Kenya Certificate of

Education Others (Specify) -----

PART 1: Extent to which school policies and plans prioritize Disaster Risk

Reduction as a basis of flood disaster safety

4. (a) Has your school been affected by flood emergencies in the past five years?

Yes

No

(b) How would you rate the level of safety of physical infrastructure in your school during flood emergencies?

Physical infrastructure	Highly safe	Safe	Unsafe	Highly unsafe
Roads & Bridges	()	()	()	()
Drainage systems	()	()	()	()
Buildings	()	()	()	()
Playfields	()	()	()	()
Water and Sanitation	()	()	()	()
Other (Specify) -----	()	()	()	()

5. (a) (a) Do you receive Early Warning Systems alerts on impending floods from sources other than your own observation? () Yes () No

(b) If yes, what is the most common means by which the EWS alerts were received? -----

6. (a) Have flood disasters affected learning in your school in the recent past?
() Yes () No

(b) If yes, how was learning affected? -----

7. (a). Are there policies that guide implementation of flood safety in your school? () Yes () No

(b) If yes, which policy guidelines are available in your school? -----

(c) Have the following measures have been taken to ensure safety of physical infrastructure during emergencies?

- Buildings and other physical infrastructure reinforced and retrofitted
- Flood safety drills are regularly held
- Evacuation map is displayed on all buildings
- First Aid kits & emergency supplies are stock-piled and prepositioned
- First Aid and emergency response teams have been formed and trained
- School records, guides, textbooks and work-books secure and safeguarded

PART 2: Extent to which Flood Disaster Safety is part of the school curriculum

8. (a) (a) Do activities in your school address flood disaster safety?

Yes No

(b) If yes, please indicate how has flood Disaster Risk Reduction been included in the curriculum of your school? -----

9. (a) Are there specific teachers assigned to disseminate information on flood disaster risk reduction in your school? Yes No

(b) If yes, have teachers been trained to disseminate information on flood Disaster Risk Reduction? Yes No

10. (a) Are instructional materials available to support instruction on flood disaster risk reduction in your school? Yes No

(b) If yes, to what extent do you agree that the instructional materials available in your school are appropriate for delivering information on flood safety?

	Greatly	Barely	Not at all
Materials address local context of flood disasters	()	()	()
Are adapted to specific levels of the pupils	()	()	()
Language of the catchment has been used	()	()	()
Pupils were involved in developing materials	()	()	()

PART 3: Extent to which School Management Committee participates in implementing flood disaster safety standards in school.

11. (a) Has the SMC participated in disaster safety activities in school?

() Yes () No

(b) If yes, to what extent has the SMC participated in flood disaster activities your school?

	Rarely	Seldom	Often	Quite often
Community advocacy activities	()	()	()	()
Resources mobilization	()	()	()	()
School emergency team activities	()	()	()	()

Others (Elaborate) -----

PART 4: The role of pupils in implementing flood disaster safety standards

12. (a) Are there child-led clubs in your school that participated in flood disaster safety activities?

() Yes () No

(b) If yes, in which flood disaster safety activities did pupils participate most?

- () Facilitated in flood safety awareness activities
- () Helped mobilize funds for safety activities
- () Participated in developing instructional materials on flood DRR
- () Disseminated flood DRR information
- () Participated in flood emergency team activities

Others (Elaborate) -----

THANK YOU FOR YOUR COOPERATION

4. (a) Do you receive Early Warning alerts on impending floods from sources other than your own observation? () Yes () No

(b) If yes, what is the most common means by which the EW alerts were received? -----

5. (a) Have flood disasters affected learning in your school in the recent past?

() Yes () No

(b) If yes, how was learning affected? -----

6. (a) Which of the following measures have been taken to ensure safety of physical infrastructure during emergencies?

() Buildings and other physical infrastructure have been reinforced and retrofitted

() Flood safety drills are regularly held

() Evacuation map is displayed on all buildings

() First Aid kits & emergency supplies are stock-piled and prepositioned

() First Aid and emergency response team have been formed and trained

() School records, guides, textbooks and work-books secure and safeguarded

PART 2: Extent to which Flood Disaster Safety is part of the school curriculum

7. (a) Do activities in your school address flood disaster safety?

() Yes () No

(b) If yes, please indicate how have flood safety activities been included in your school curriculum? -----

8. (a) Are instructional materials available to support learning on flood Disaster Risk Reduction in your school? Yes No

(b) If yes, to what extent do you agree that the instructional materials available in your school are appropriate for delivering information on flood safety?

	Greatly	Barely	Not at all
Materials address local context of flood disasters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are adapted to specific levels of the pupils	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Language of the catchment has been used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pupils were involved in developing materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART 3: Extent to which School Management Committee participates in implementing flood disaster safety standards in school.

9. (a) Have the SMC participated in disaster safety activities in school?

Yes No

(b) In your opinion, to what extent has the SMC participated in flood disaster activities your school?

	Rarely	Seldom	Often	Quite often
Community advocacy activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Resources mobilization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
School emergency team activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Others (Elaborate) -----

PART 4: The role of pupils in implementing flood disaster safety standards

10. (a) (a) Are there child-led clubs in your school that participated in flood disaster safety activities? Yes No

(b) In which flood disaster safety activities did pupils participate most?

- Facilitated in flood safety awareness activities
- Helped mobilize funds for safety activities
- Participated in developing instructional materials on flood DRR
- Disseminated flood DRR information
- Participated in flood emergency team activities

Others (Elaborate) -----

THANK YOU FOR YOUR COOPERATION

APPENDIX F
AUTHORIZATION TO CONDUCT
RESEARCH



**NATIONAL COMMISSION FOR SCIENCE,
TECHNOLOGY AND INNOVATION**

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

6th Floor, Utafa House
Uhuru Highway
P.O. Box 44211 00100
NAIROBI KENYA

Ref. No:

Date:

NACOSTI/P/14/9777/942

1st April, 2014

George Odhiambo Tallo
University of Nairobi
P.O. Box 30197-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*School - based factors influencing implementation of flood disaster safety standards in public primary schools in Urunga Division, Siaya County, Kenya.*" I am pleased to inform you that you have been authorized to undertake research in Siaya County for a period ending **28th December, 2014.**

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

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

DR. M. K. RUCUTT, PhD, HSC.
FOR: SECRETARY/CEO

Copy to:

The County Commissioner
The County Director of Education
Siaya County.

APPENDIX G

RESEARCH CLEARANCE PERMIT

**THIS IS TO CERTIFY THAT:
MR. GEORGE ODHIAMBO TALLO
of UNIVERSITY OF NAIROBI, D-100
NAIROBI, has been permitted to conduct
research in Siaya County**

**Permit No : NACOSTI.P 14/9777 942
Date Of Issue : 1st April, 2014
Fee Received :ksh 1,000 00**

**on the topic: SCHOOL-BASED FACTORS
INFLUENCING IMPLEMENTATION OF
FLOOD DISASTER SAFETY STANDARDS
IN PUBLIC PRIMARY SCHOOLS IN
URANGA DIVISION, SIAYA COUNTY,
KENYA**

**for the period ending:
28th December 2014**

**Applicant's
Signature**



**Secretary
National Commission for Science,
Technology & Innovation**

**COUNTY COMMISSIONER
SIAYA COUNTY
P. O. Box 83
SIAYA - 40600**

RECEIVED - 15/5/2014

APPENDIX H

LIST OF FLOOD-AFFECTED SCHOOLS IN URANGA DIVISION

Bukhoba Primary School

Dibuoro Primary School

Goro Primary School

Kabura Primary School

Mahero Primary School

Nyakado Primary School

Nyambare Primary School

Nyandheho Primary School

Pap Olengo Primary School

Sidundo Primary School

Udamayi Primary School

Uhembo Primary School

Uhuyi Primary School

Ulwan Primary School

Uwasi Primary School