

Resource Management for Disaster in Secondary Schools in Ruiru Kiambu County, Kenya

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A survey to determine preparedness for disasters in Secondary School in Ruiru Division of Thika District Kenya was conducted with 120 (students, teaching staff and the supportive staff) respondents. School administrators, disaster managers, researchers, scholars, policy makers and the funding Agencies were to utilise the study to improve the livelihood of the Secondary School community and those in the school's environs Simplified and closed ended questionnaire, in-depth interview and observation check list were used. Obtained data was entered and analyzed using statistical package for social sciences (SPSS) version twelve where results on Knowledge on the use the first aid kit element was very low. Best location for first aid kit was not known. Respondents confessed lack of preparedness for disasters. Where information was highlighted in the media and the daily nations like the collapse of the building along Ronald Ngala in 2006 street, knowledge was significantly high, hence the importance of information education and communication (IEC) in disaster management. The respondent knew the common disasters in Ruiru Division. Ministry of Education to adopt a wide range of strategies to mitigate and prepare for disasters in schools by increasing required resources and their operationalisation at all times.

KEY WORDS

Disaster an event that occurs with little or no warning causing destruction that the affected people cannot recover with their only available resources

Risk susceptibility ie
Vulnerability x hazard

Resources that which can be utilized to achieve set goals

Management utilization of available minimum resources to achieve set goals

INTRODUCTION

Disasters are an increasing Global health concern with an average of one disaster per week requiring external and international assistance, this emphasizes mankind vulnerability to disasters and the necessity for preparedness (Lloyd, 2005). Recent disasters throughout the globe have shed new light on the vulnerability of life on earth. Whether caused by natural or technical hazards they have become part of our every day experiences sparing no communities in our increasingly interconnected world (UNDRO, 1998). The devastating disasters that afflicted numerous communities in 2004 and 2005 were the killings in Beslan, Russia, The Indian Ocean Tsunami, the earth quake in Pakistan, and the damaging hurricanes along the Gulf coast (Nonny, 2006).

Kenya has experienced simple and complex disasters caused by drought, fires, floods, industrial accidents, the HIV/AIDS, traffic accidents, terrorist attacks, and collapse of building among others. Disasters constitute to real threat in every sphere of human development. The causes of disasters can be divided into two distinct categories: those due to man-made hazards and those due to natural hazards. Natural hazards are principally the result of geophysical interactions between atmosphere, hydrosphere and lithosphere. Any changes in these interactions may lead to changes in the normal frequency and cause disasters of high magnitude.

Disasters are low-probability events caused by the interaction of social processes and the physical environment. They compete for attention with priorities of daily living (Mutisya, 2004). The poor are more vulnerable to disasters than the rich because they live in unsafe areas such as flood plains, slopes of steep hillsides and river beds. The poor daily struggle to survive takes priority over investment in mitigating the impact of potential disaster events (Alcira and Margaret 2002).

One of the serious and growing problems in the Secondary School was the increase of disasters. Records showed an increase in the number of fires, rape, collapse of buildings, roof blown off by wind, floods, drought and HIV/AIDS which was declared a National disaster in 1998 by the then President of Kenya. Systemic assessment of losses, social and economic impact of disasters and particularly mapping of risks are fundamental in understanding where to take action (Valancy, 2004).

Disaster management is a planned, deliberate, organised, directed and visualised effort to mitigate, prepare for, respond to and recover from a disaster or emergency situation or its effect. Disaster preparedness involves an integrated combination of planning, training personnel qualification, drills, acquisition of equipments and standard certification (WHO, 1999). Planning is how personnel, equipment, and other resources are used to support incident management and emergency response activities. Plans provide mechanisms and systems for setting priorities, integrating multiple entities and functions, and ensuring that communications and other systems are available and integrated in support of a full spectrum of incident management requirements.

Equipment Acquisition and Certification is necessary for emergency responders to perform their work effectively. A critical component of operational preparedness is the acquisition of equipment that will perform to certain standards, including the capability to be interoperable with similar equipment used by other jurisdictions. Reducing disaster is possible not only by modifying the hazard but by reducing the vulnerability (Varley, 1994).

PROBLEM STATEMENT

Disasters cause a lot of damage and they are expensive to manage, they strike quickly without warning. Records have shown an increase in the number of disasters in Kenyan Secondary Schools causing deaths and a lot of suffering (Lumbasio, 2004).

At Bombolulu high school, twenty six (26) girls perished in a fire inferno and hundreds of others got maimed. In Nyeri high school four (4) prefects died in unexplained fire inferno in 1999, and in Kyanguli high school sixty eight (68) students perished in a fire inferno leaving hundreds maimed (Lumbasio, 2004).

Students of Gateway High School, (one of the sampled secondary school) salvaged whatever remained of their belongings after a fire gutted down their dormitories, though nobody was injured property worth thousands of shillings were destroyed by fire (Avuyefu, 2007). A disaster event in a Kenyan Secondary School would affect quite a population and destroy the infrastructures like classrooms, roads, dormitories, sewer systems, lighting systems, water systems etc.

The destruction might be so severe that recovery may take time or it may become inevitable depending on the economic powers of the managers and the associates of such a school. The school would also get stigmatised.

A host of records in the problem statement has shown an increase in the number of disasters in Kenyan Secondary Schools in the recent past, the commonest being fire which has caused a lot of deaths and destruction of infrastructures like the classrooms, dormitories, office blocks and water sewage systems among many others.

Disasters have a negative effect in any country and they interfere with the economy of the affected countries where resources must be diverted to meet the sudden demand raised by the disaster effect. They cause trauma, loss of life, loss of work and study hours, and property damage, raises court cases and affects the reputation of the affected organizations (WHO, 1999).

Children are the nation's most valuable assets; this fact places a tremendous responsibility upon us all to provide safety to the children (Florio *et al.*, 1999). No school is immune to disasters; therefore it is important that each school establishes administrative procedures for handling emergencies (Minnesota health council, 1964).

Disaster activities require carefully managed resources (personnel, time materials) if the needs of the affected are to be met. Disaster resource management should be flexible and scalable in order to support any incident and be adaptable to changes.

Effective preparedness for disasters is of paramount importance if reduction of the suffering and deaths of the students, teachers and the supportive staff among others is to be achieved and tragedies will not be catching us flat footed in future (Kabaria, 2009).

MATERIALS AND METHODS

Study Area

The study was carried out in Ruiru of Kiambu county Kenya (appendix i). The other Divisions of Thika District are, Thika municipality, Kakusi, Gatundu north, Gatundu south and Gatanga. Administratively the Ruiru Division is divided into two locations namely Ruiru and Juja.

The division has eight Secondary Schools. One of the schools is for boys; two for girls and five are mixed, that is for boys and girls. Four of these Secondary Schools are privately managed and the other four are Government managed (Muthoni, 2006).

Ruiru division has many industries and most of the industrial workers are from within this division, which is in the outskirts of Nairobi with most of its residents working in the city.

Sample Size Determination

A sample is part of the target population that has been procedurally selected to present that particular population (Oso and Onen, 2005). To obtain a representative sample, the method recommended by Mugenda and Mugenda (1999) for social sciences, Fisher *et al.* (1998) standard formula was used:

$$N = \frac{Z^2 Pq}{d^2}$$

Where, N = maximum sample size required

Z = standard normal deviate (1.96) which corresponds to the 95% confidence interval.

p = 0.1 proportion of respondents with the desired characteristics

q = 0.9

d = degree of accuracy set at 0.05

$$N = \frac{1.96^2 \times 0.01 \times 0.09}{0.05^2} = 138$$

Sampling technique

Sampling technique is a strategy used by the researcher to select representative respondents from the target population for this study (Oso and One, 2005). A stratified random sampling was employed to identify the various Secondary School communities in Ruiru Division which are managed either by private administrators or by the Government officers.

This sampling procedure was used which made the existing sub-groups in Ruiru Secondary Schools population reproduced in the sample (Mugenda and Mugenda, 1999). This method made the researcher get the right proportions from each Secondary School community.

The eight Secondary Schools were also exposed to site assessment and spot check using an observation checklist (O. C. L) where the availability of disaster management equipment and their serviceability was assessed.

For proportional distribution from the eight (8) Secondary Schools, 138 participants were divided among the 8 giving sixteen participants for each school which was then divided by 3 giving five for each sub group. A simple random sampling was used to get the equal number of teachers, students and support staff from each secondary school by having five (5) folded papers with yes and the rest with no, depending on the number of teachers, students and the support staff in each Secondary School. A sample size of one hundred and twenty (120) was realised.

More information was gathered from six (6) secondary schools managers and sixteen (16) community representatives who were selected as key informants for an in-depth interview. Snowball sampling was applied to get the secondary school administrators while two (2) community representatives were also selected from each Secondary School environs through snowball sampling to participate in this study.

Research Instruments:

The instruments used to elicit relevant information from the participants were, a pre-tested structured questionnaire which was divided into five (5) sections namely: common disasters, lessons on disaster management taught, available facilities to counteract disasters, level of knowledge and skills among the communities in secondary schools in Ruiru Division.

To observe what was on the ground for disaster management, an observation check list was used to compliment the questionnaire and an in-depth interview was carried out on key informants guided by secondary school health and safety guidelines helped the researcher to gather relevant information which gave a clear lack of preparedness for disasters in secondary schools.

Pre- Testing of Research Instruments:

Pre-testing of the questionnaire was done in two secondary schools where the questionnaire was administered to five students for validity and reliability. Validity is concerned with the extent to which a technique measures what it is intended to measure (Borg and Gall, 1989) and reliability is a measure of the degree to which a research instrument yields consistent results after repeated trials (Gitonga, 1999). The observation check list was also tested in the two secondary schools.

These two secondary schools were excluded from the study. Omissions and corrections from the pre-testing exercise were incorporated in the final questionnaires and the observation check list for improvement.

Data Collection Methods

To assess' disaster preparedness and resource utilisation in the secondary schools, the researcher gathered detailed information about disaster management from the hundred and twenty respondents (120). Methods used were administration of detailed questionnaire which had questions based on the specific objectives.

An in-depth interview was done under the guidelines in appendix 6, on the key informants who included the District education officer (D. E. O), Provincial Education Officer (P. E. O), National Disaster Coordinators, Ministry of Education officials, Occupational Health and Safety officers, the National Environmental Management Authority (N. E. M. A) official and the community representatives.

Data Entry and Analysis

All of the responses to the questionnaires were entered into a computer spread sheet, Data was analyzed using statistical package for social sciences version twelve (12) and the analyzed data was presented in bar graph, pie charts, tables, percentages, frequencies and statements. Descriptive statistics was used to summarize the data. This included frequency distribution tables which were used to give a record of the times a response occurred, mean, range, percentages.

Inferential statistics particularly chi-square was used to establish relationship between variables such as availability of guidelines, level of training, availability of supplies and equipments. This helped the researcher to draw conclusions and make recommendations on the study.

RESULTS**Socio-economic demographic characteristics**

The demographic characteristic of the respondents included: level of education, profession, age and sex and marital status.

Education Level

The level of knowledge was looked at, with the hope to establish whether people of higher education had more knowledge on disaster management. The study had 29 (24.17%) graduates, 24 (20%) diploma holders and 20 (16.67%) certificate holders. The rest 40 (33.3%) were form two students.

Sex, Marital Status and Age of the Respondents

Gender age and marital status were looked at to establish whether there was any category that would have been more knowledgeable in disaster management. It came out clearly that majority (Eighty eight (73.3%) of the respondents were female while thirty two (26.7%) of the respondents were male.

Forty four (36.7%) respondents were single while seventy six (63.3%) were married. It was also observed that forty (33.3%) of the respondents were teenagers while eighty (66.7%) were adults.

RESOURCE MANAGEMENT

Respondents Trained in First Aid

There were no lessons taught on disaster management to Secondary School community in Ruiru Division. The researcher looked at first aid training which was expected and almost all the respondent 102 (85%) were not trained in first aid and 18 (15%) have had the training with no refresher courses. Of the 18 (15%) who were trained 8 (44%) were supportive staff 6 (33%) teachers and 4 (22%) students. Elements in the first aid kit were known by 45 (37.5%) whereas 75 (62.5%) did not know them.

Use of First Aid Kit Elements

First aid kits and their elements are important in institutions like secondary schools where a big number of people life and knowledge on their proper use is of paramount importance. It was shown that 75 (62.5%) of the respondents had never used a First Aid kit while 45 (37.5%) of the respondents had used a First Aid kit.

Location of First Aid kit

A first Aid Kit should be kept in the open where it can be used in case of an emergency. Fifty two (48%) of the respondents indicated that the First Aid kit should be stored in a locked cabinet while sixty two (52.0%) indicated that the First Aid kit should be stored in the open (table 4.6).

There was a statically significant relationship between the location of a First Aid kit and the knowledge of disaster preparedness which includes knowledge of the ideal place for a first aid kit. Respondents who cited location of a First Aid kit in a closed cabinet were less likely to be knowledgeable about disaster preparedness.

Location of a First Aid Kit against the Different Categories of Respondents

Among the teachers 19 (15.8%) thought that the kit should be located in the open while 12 (17.5%) felt that it should be located in a locked cabinet. Nineteen (15.8%) of the students felt that the kit should be located in the open while 21 (17.5%) thought that it should be locked in a cabinet.

Among the support staff, 20 (16.7%) thought that the kit should be located in the open while 20 (16.7%) felt that the kit should be located in a locked cabinet.

Facilities to Counteract Disasters if they occurred in Ruiru Division Secondary Schools

Objective three was to establish the availability of facilities to counteract disasters in Ruiru division Secondary Schools which were to be known by the respondents. The aim here was to see what was in place and their efficiency to have bases for recommending additional replacement or even rehabilitation. Through observation check list most of the schools did not have the facilities to counteract disasters if the occurred and where the first aid kits were present the respondents were informed on their uses.

Schools Preparedness for Disaster:

Seventy five (62.5%) of the respondents rated their school disaster preparedness as poor, 37 (30.8%) rated their school disaster preparedness as good while 8 (6.7%) rated the preparedness as excellent (table 4.8). There was a statistically significant relationship between rating the schools' disaster preparedness as poor and the knowledge on disaster preparedness.

Fire Fighting Equipments':

Out of the 120 respondents, only 9 (7.5%) were able to identify two of (sand, blankets, carbon dioxide) as fire fighting materials while 61 (50.8%) named only one of fire fighting materials and 50 (41.7%) could not name any.

Keeping off the crowd

Almost all the respondents 101 (84.2%) articulated that they would use barriers (tape/rope) to keep off the crowd from a disaster site where as 13 (10.8%) indicated that they would use a bus to ferry the onlookers. Only 6 (5%) would use a bulldozer to keep off the crowd.

Attitude of the Respondents towards Disaster Management

The importance of disaster management among the secondary school communities was sought with the findings as indicated.

First Aid Kit

It was indicated that 94 (62%) of the respondents thought that it was very important to have first aid kit in the schools, 40 (33%) felt it was important to have first aid kit in schools and only 6 (5%) felt it was not important.

Trained First Aid Personnel

It was indicated that 90 (75%) of the respondents thought that it was very important to have trained first aid personnel in the schools, 30 (25%) felt it was important to have trained first aid personnel in schools and none felt it was not important.

Include Disaster Management in Secondary Schools curriculum.

It was indicated that 62 (52%) of the respondents thought that it was very important to include disaster management in secondary schools curriculum, 48 (40%) felt it was important to include disaster management in secondary schools curriculum and 10 (8%) felt it was not important.

Three in every four 90 (75%) indicated that curriculum workload contributes to stress which sometimes lead to unwarranted actions that lead disasters in secondary schools whereas 30 (25%) disagreed with the same. Three in every five 72 (60%) could identify at least three great challenges that could hinder them in managing a disaster situation, whereas 18 (15%) named two and 30 (25%) indicated none. All the respondents indicated that kiosks and bars should be nowhere near the schools in bid to fight drug abuse, which contribute to strikes that leads to disasters in schools.

Install Fire Fighting Equipments in Schools.

It was indicated by 80 (67%) of the respondents who indicated that it was very important to include disaster management in secondary schools curriculum, 30 (25%) felt it was important to include disaster management in secondary schools curriculum and 10 (8%) felt it was not important.

DISCUSSION**Common Disasters in Ruiru Division**

Sixty three which was (53%) of the respondents could not name any of the disasters that had occurred in Ruiru Division within the last five years, thirty five which was (29%) could name at least 3 while twenty two which was (18%) named less than 3. This finding indicated that the level of knowledge regarding disasters was low. This observation was supported by the finding that the respondents who were knowledgeable about the common disasters were likely to be prepared against disasters.

Disasters have been occurring in this division but due to lack of knowledge, the respondents could not remember them. This observation revealed that the respondents were vulnerable to future disasters. This calls for rapid measures to educate the Ruiru Secondary School community on disaster management. An in-depth interview of a senior quality assurance and standards officer brought to light that, though there were measures to be undertaken to ensure health and safety in education institutions as per legal notice number 56 of 13th March 2001 (Kosgey, 2001).

The Minister of Education administrators recommended all doors to open outward in all dormitories, windows to have grills, laboratories and kitchen to have fire fighting equipments, story buildings to have staircase as an escape routes, all food handlers to have varied medical certificates among others.

Negligence by the administration to implement the safety measures, lack of qualified personnel to carry out standard assessment of the schools and the lack of resources to implement the measures were cited as the major challenges for implementing health and safety programs in schools (Maluki, 2007).

Lessons Taught on Disaster Management to Community of the study area.

There were no lessons taught on disaster management to Secondary School community in Ruiru Division. However despite first aid training being a basic component in disaster management and preparedness, 85% of the respondents was not trained.

This finding indicated the need to offer basic disaster management training in schools as a measure of creating awareness (Achoka and Maiyo 2008). They emphasised on disaster reduction initiatives to be rooted in schools and communities.

However, an in-depth interview of secondary schools managers revealed that including disaster management in secondary schools would increase the work load to the students and the teaching staff who are already over whelmed by the examinable subjects. Curriculum workload contributed to stress which sometimes lead to unwarranted riots that lead to disasters in secondary schools. It was also clear that there were intensions to train disaster managers for schools but training dates are not yet known (Maluki, 2007). It was also clear from the findings that, 62.5% of the respondents had not used a First Aid kit which indicated a high level of knowledge deficiency in the area of disaster preparedness.

This observation was supported by the finding that the respondents who had never used a first aid kit were less likely to have knowledge about disaster preparedness. It was also revealed that respondents who cited location of a First Aid kit being in a closed cabinet were less likely to be knowledgeable about disaster preparedness.

Although the first aid kit should be kept in the open where it can be accessible when needed, these respondents seemed not to be aware about this. They had fear that it would be vandalised by the students and some staff.

This indicated that education regarding disaster management was a necessity. An in-depth interview of a secondary school manager positioned as a district officer one in the provincial administration and internal security revealed that there were organisations which could respond to disasters one of them being Thika Municipality. It was ranked the best compared to the police force during a hospital disaster mock in 2007. Gatundu town caught fire in 2007 and Thika Municipal staff responded within 30 minutes (Shizue, 2005).

Challenges in the Municipals office were lack of enough trained personnel, lack of resources to maintain the available machinery, lack of awareness by the public to pass the information using police or the council's hotlines and lack of knowledge to use the available resources and not to cause problems of overcrowding in a disaster site where they would cause blockages (Mwenda, 2007).

Facilities to Counteract Disasters if they occurred in Ruiru Division secondary

Majority of the respondents (62.5%) rated their schools' disaster preparedness as poor. The finding showed that the respondents who rated the state of disaster preparedness in their schools as poor were less likely to be knowledgeable on disaster preparedness. This finding indicated that majority of the Ruiru Division Secondary Schools community were highly vulnerable to future disasters due to lack of the basic facilities to counteract disasters.

The country lacked policies to address to the increasing incidences and emergencies which resulted into serious human distress and suffering, destruction of property and infrastructure, disruption of environment and overall welfare of the society (Cheruiyot, 2002).

Level of Knowledge with study area community on Disaster Management

Majority of the respondents (94.2%) knew collapse of a building along Ronald Ngala Street was a disaster. This observation was supported by the finding that the relationship between knowledge about disaster preparedness and the knowledge of whether collapse of that building was a disaster was not statistically significant.

However, different opinions were presented with regard to understanding whether disasters where a major problem. (75%) indicated that disasters are made to happen, they don't just happen. It was noted that all support staff found no benefit of disaster management program in schools to reduce disasters and disaster effect. This observation indicated that the support staff should also be a primary target in disaster management, training programs.

Knowledge is a precious national resource that can facilitate the process of disaster prevention, preparedness and response in cost effective participatory and sustainable ways (Durgadas, 2008).

Level of skills the community had on disaster victims

The findings indicated lack of basic skills in managing the disaster victims. Majority of the respondents (78.3%) had no idea of arresting bleeding, 56% had no idea of managing an unconscious patient, 75% had no idea of managing a victim with a broken bone, 90% had no idea of managing a victim who was caught up in a building that was on fire while 62.5% of the respondents indicated that a bulldozer could be used to manage any disaster. This was a clear indication that the skills of the respondents were far below any desired standard.

Education and awareness seemed to be a necessity in order to reduce the vulnerability of the society to future disasters (Josefani, 2008).

CONCLUSIONS

There were no lessons taught on disaster management to Secondary School community in Ruiru Division. Despite first aid training being a basic component in disaster management and preparedness, 85% of the respondents did not have this basic training. Respondents who had never used a first aid kit were less likely to have knowledge about disaster preparedness.

The study also revealed a number of respondents who cited location of a First Aid kit to be in a closed cabinet. These were less likely to be knowledgeable about disaster preparedness and the schools lacked facilities to counteract disasters if they occurred.

More than half of the respondents (62.5%) rated their Secondary schools' disaster preparedness as poor. These respondents were less likely to be knowledgeable on disaster preparedness. Majority 94.2% of the respondents (94.2%) knew the collapse of the building along Ronald Ngala Street was a disaster. This showed a positive relationship between knowledge about disaster and highlighting about disasters through proper information education and communication. This was supported statically by a chi result.

The findings also indicated lack of basic skills in managing the disaster victims. According to the study findings, the researcher rejected the null hypothesis and concluded that the respondents were less knowledgeable about disaster preparedness in Ruiru Division.

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Competing Interests

The authors declare that they have no financial or personal relationship that might have inappropriately influenced them in writing this article.

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