



## AN INVESTIGATION OF THE IMMEDIATE CAUSES OF FIRE DISASTERS IN BOARDING SECONDARY SCHOOLS IN TANZANIA

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### **Abstract:**

The purpose of this study was to explore the immediate causes of Fire Disasters (FDs) in Boarding Secondary Schools (BSSs) in Tanzania. The study adopted a qualitative approach so as to allow the researcher to interact socially with respondents in the construction of meanings related to the immediate causes of FDs in BSSs. The study employed a descriptive case study design so as to enable the researcher collect in-depth information for detailed description of the immediate causes of FDs in BSSs in their natural settings. Purposively sampling was used to select 4 heads of schools, 8 teachers, 3 dormitory patrons, 2 dormitory matrons and 20 students, while convenience sampling was used to select 4 easily accessible BSSs from three easily reachable regions namely; Iringa, Njombe and Mbeya. Data was collected through documentary review and face to face interviews. Results indicated that the immediate causes of FDs in BSSs were: indiscipline and riots among students, the use of kerosene lamps and candles for studying during night and electric faults. The researcher recommends the Tanzanian government to ensure that BSSs have reliable electric supply systems so as to eliminate the use candles and kerosene lamps among students.

**Keywords:** immediate, causes, fire disasters, boarding secondary schools

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## 1. Introduction

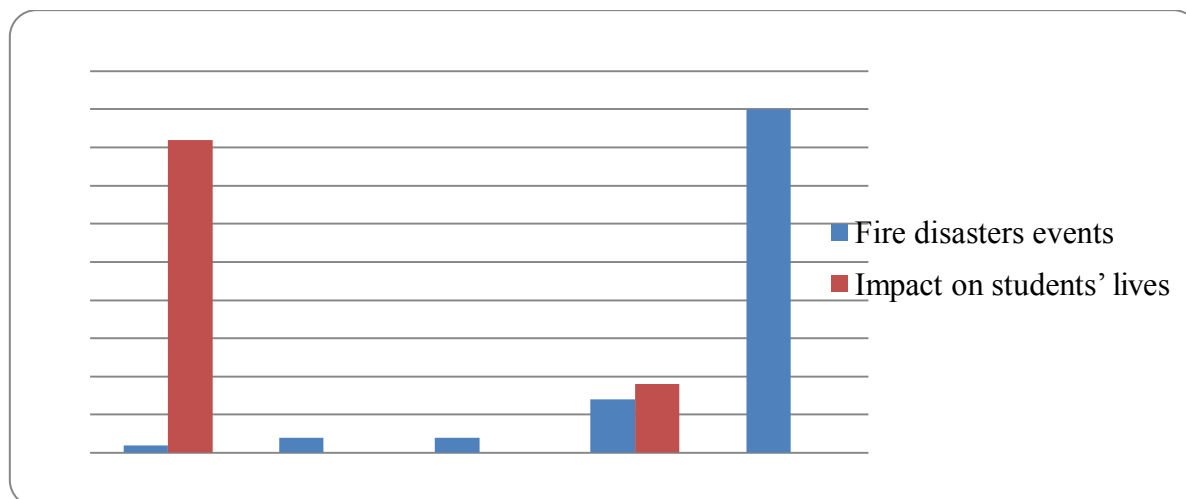
### 1.1 Background to the Problem

Fire disasters (FDs) in Boarding Secondary Schools (BSSs) are a critical educational concern. They cause students deaths, injuries, trauma, damage and loss of property as well as educational infrastructures in both developed and developing countries (Shibutse, Omuterema & China, 2007; 2014; Kukali & Indosh, 2009). For instance, in United States of America (USA), fire outbreak at Our Lady of Angels School in 1958 killed 92 school children and 2 adults (National Fire Incidence Reporting System (NFIRS), 2007). In addition to that, from 2000 to 2015 the fire teams in USA responded to 5,690 school fires annually (Fire Emergency Management Agency [FEMA] 2015, Campbell 2013). The fires caused 118 students' fatalities, 85 injuries and property damage worth 92 Million US Dollars (FEMA 2015). In United Kingdom (UK), the Department for Communities and Local Government (DCLG) (2015) reveals that the period between 2012 and 2013, there were 34 school fires in every 1000 fires countrywide. The school fires damaged educational facilities worth 115 million Great Britain Pounds (DCLG, 2015).

However, the impacts of FDs on lives have been worse in developing countries of Asia and Africa than developed countries. In India, in 1995 fire killed 400 students while in another school fire killed 90 school children in 2008 (Reuter, 2004). Beyond deaths, school fires in India have been causing injuries and damage of property and educational infrastructures (Reuter, 2004; Petal, 2008). Research based in Nigeria indicates that, 23 girls died while 67 others were injured when fire gutted their dormitory in a secondary school in Gindiri village in Plateau State in 2001 (Kahwa, 2009; Onyango, 2013). Research unveils further that the causality was high because students were trapped inside the dormitory which was locked up and fortified with iron bars (Kahwa 2009). In Kenya school fires are common, for instance in 1998 dormitory fire killed 26 students at Bombolulu Girls School in Coast province (Rowan, 2001). Another fire incidence killed 67 boys in Kyanguli secondary school dormitory in Machakosi County in 2001 (Rowan, 2001; Ndetel *et al*, 2004).

Boarding Secondary Schools in Tanzania have never escaped FDs especially in dormitories. FDs in BSSs in Tanzania have increased significantly over the past decade (Kahwa, 2009; Nelson & Kahango, 2012; Mwambona, 2014; Matandiko, 2015). For instance, FDs increased from one event in the periods between 1990 and 1995 to 45 events in period between 2010 and 2017 (Damian, 2017). A total of 50 students have lost their lives due to fire outbreak in BSSs since 1994. The most deadly FDs in Tanzanian history involved Shauritanga secondary school in Kilimanjaro region where 41 girls

died of fire in 1994, and Idodi secondary school in Iringa region where 9 girls died in 2009. The trend of fire disasters in Boarding Secondary schools and impact on students' lives is indicated in figure 1:



This upward trend of fire disasters events in BSSs in Tanzania leaves a puzzle concerning that: What are the immediate causes of those fire disasters? This puzzle demanded an empirical investigation so as to establish the immediate causes fire disasters in BSSs in Tanzania.

## 1.2 Statement of the problem

The Educational Circular Number 4 of 2011 of the Ministry of Education and Vocational Training (MoEVT) recognises the increasing risks of fires in BSSs in Tanzania and its impact on educational development (MOEVT, 2011). In attempt to reduce fire risks and disasters in schools, the circular insists school administrators to take the following measures: Ensure availability of regularly serviced, inspected and tested fire extinguishers and smock detectors in schools; ensure reliable electrical wiring systems in school buildings; ensure presence of emergency doors which open outwards in dormitories, libraries, laboratories, classrooms and dining halls. Moreover, it insists schools' administrators to: prohibit the use of fire sources such as candles, kerosene lamps, ironing materials, heaters and cookers or boilers in dormitories; prohibit overcrowding in dormitories, conduct regular fire safety training and drills in schools so as to prepare for fire emergency.

Despite the government's directives towards reducing fire risks and impact in BSSs, fire disasters are increasingly causing considerable impact on students' lives, safety of teaching and learning resources and school property. Therefore the question is: Why are fire disasters increasing in Boarding Secondary Schools in Tanzania? This

study strived to answer that question by investigating the immediate causes of fire disasters in Boarding Secondary Schools in Tanzania so as to recommend for further actions to reduce fire risks, disasters and impacts.

### **1.3 The Objective of the study**

The main objective of this study was to investigate the immediate causes of fire disasters in boarding secondary schools in Tanzania.

## **2. Literature review**

### **2.1 Theoretical perspectives on the causes of fire disasters in schools**

There are many theories which explain the causes of fire disasters in general. However, for the sake of this study, only four theories are discussed.

#### **2.1.1. Fire disaster as act of God**

This theory views fire disasters in boarding secondary schools as events brought by God (White, Kates & Burton, 2001). The theory views fire disasters as divine retribution against human misdeeds. It considers fire disasters as God's warnings for human misdemeanor. The theory calls for repentance and schools members' adherence to good deeds in order to prevent fire disasters in the community including in schools (McEntire, 2003). Nevertheless, the theory is criticized for ignoring planned and unplanned human actions which may cause fire disasters in schools. The theory ignores the roles of educational stakeholders in preventing the occurrence and impact of FDs in secondary schools (McEntire, 2003).

#### **2.1.2. Fire disaster as physical natural event**

This theory perceives fire disasters in schools as naturally occurring physical events (Tobin & Montz, 1997). It assumes that, fire disasters in BSSs are not caused by God or human beings, rather by natural forces (Tobin and Montz 1997). In other words the preceding assumptions, suggest that fire disasters in schools are inevitable and unavoidable. Of course, some fire disasters occur naturally, however, the theory overlooks the reality that most fire disasters in schools result from human activities. In short, the theory ignores the role of human actions in starting fires in schools.

#### **2.1.3. Fire disasters as social actions**

This theory assumes that fire disasters in schools are results of social actions (Carr, 1932). This is simply to say fires outbreak in schools are caused by human actions. If

that is the case fire disasters in schools can be mitigated. The theory suggests further that fire disasters in schools occur due to carelessness and irresponsibility of school members in controlling occurrence of fires (Carr, 1932). Fire disasters occur in schools due to lack of effective practical measures to control sources of fires. However, this theory ignores the role of natural fire hazards which generally occur without any warning.

#### **2.1.4. Fire disasters as a prism of societal injustices and vulnerability**

The theory assumes that fire disasters in schools originate from social actions and structural systems which orient people to fire hazards differently (Cannon, 1994). The theory describe that the causes of fire disasters is the existence of unequal development of social systems which allocates income, human and material resources to schools differently, thus creating unequal vulnerabilities to fire risks among schools (Cannon, 1994). This means fire disasters in schools are caused by poverty, low income and inequity to resources which are needed for eradicating fire risks and vulnerabilities (Cannon, 1994). Because of poverty, low income, lack of skilled fire safety personnel, some schools are unable to implement fire safety standards accordingly. The theory believes that in order to address fire disasters, educational authorities should eradicate poverty and income equities among schools.

## **2.2. Conceptualizing fire and fire disasters**

Fire is a multi-faceted concept whose meaning varies based on individual scholar's context and interpretations. Sena and Michael (2006) define fire is an oxidation process of combustible materials which results in evolution of heat, lightening and products such as smoke and carbon-dioxide. Kimathi (2011) adds that fire is an inferno which may cause damage of properties, injuries and loss of life due to emission of smoke, heat and carbon-dioxide. However, not all fires are disastrous to lives, properties and infrastructures. Actually, a normal fire is a good source of heat energy which serves domestic and non-domestic purposes. Fire is disastrous only if it results to disruption of the functioning of a society due to widespread human and/or material losses to the extent of exceeding the ability of affected society to cope using its own resources (Jha, *et al*, 2010; Saltbones, 2006; Sena & Michael, 2006; Tuay, 2002; United Nations Disaster Reduction Organization (UNDRO), 1992; Prime Minister's Office (PMO), 2003; 2012). In most cases FDs are unforeseen overwhelming fire events which result in a major illness, injuries, deaths and socio-economic interruptions to the extent of requiring external intervention (Saltbones, 2006; Sena & Michael, 2006).

Fire disasters occur when fire hazards and vulnerabilities converge (Sena & Michael, 2006). Fire hazards are events which trigger negative effects of fire on a community (PMO, 2012). It can be natural or manmade (Sena & Michael, 2006). Natural fire hazards emanate from natural forces such as lightning, earthquake and extreme temperatures whereas manmade fire hazards originate from human activities such as electric short circuit, cooking and arson (Sena & Michael, 2006). Fire vulnerability is described as susceptibility of an individual or community to fire hazards (PMO, 2012).

### **2.3. The impact of fire disasters on education and national development**

Fire disasters have negative impact on access to education, quality of education and national development as described below.

#### **2.3.1. Access to education**

The United Nations Education Scientific and Cultural Organization (UNESCO, 2011) describes that FDs in schools can lead to closure of schools due to insecurity after fire events thereby denying children's right to education which is a fundamental Human Right (United Nations, (UN), 1948). School fires result to irregular school attendance, dropout and low completion rates (UNESCO, 2011). As UNESCO (2011) highlights, FDs may cause parents to withhold or prevent children from enrolling in school due to threat of fire in schools. Globally, about 175 million children were out of schools in by 2011 due to disasters (UNESCO, 2011).

#### **2.3.2. Quality of education**

A report by UNESCO (2011) shows that school fires compromise quality of education by interrupting teaching and learning processes as well as school timetable. On the other hand, fire disasters damage educational infrastructures and learning materials, dormitories, laboratories, libraries, classrooms, reference and textbooks, exercise books, schemes of works and lesson notes (UNESCO, 2011). The physical and emotional trauma among victimized students reduces morale, results to school absenteeism and low academic achievement (UNESCO, 2011). Ultimately, schools fail to achieve intended educational goals.

#### **2.3.3. National development**

Research shows that fires disasters obstruct nation's efforts to achieve education policy goals including achievement of Universal Primary Education and Education for All by wiping out educational achievement obtained through years of investments (UNESCO, 2011). In so doing, it retards efforts to reduce poverty, children mortality, malnutrition,

ignorance and attainment of macro policy stipulated in the Millennium Development Goals. By affecting the mother sector (education) negatively, FDs in schools directly and indirectly delay sustainability of other development sectors such as health, agriculture, trade, industry, science and technology.

#### **2.4. Legal framework on fire disaster management in schools in Tanzania**

Management of FDs in schools in Tanzania is generally guided by Fire and Rescue Force Act (FRFA) of 2007 (FRFA, 2007). Section 15(3) gives power to Fire and Rescue Officers to inspect fire safety in public premises including schools and issue certificate of compliance (FRFA, 2007). The section mandates fire and rescue officers to conduct fire safety in schools (FRFA, 2007). Section 24 (1) of FRFA of 2007 requires school administrators to designate a qualified fire protection manager who should perform fire safety management activities. Some of the activities mentioned in Section 24(1) include; to prepare a fire and rescue action plan, conduct fire drills, report fire incidences, inspect and maintain fire fighting and protection equipment, supervise the use and handling of fire fighting facilities, control the number of persons to be admitted in specific school premise such as dormitories, libraries and laboratories (FRFA, 2007).

#### **2.5. Empirical studies on the causes of fire disasters in schools**

Studies by FEMA (2007; 2014) outline the main causes of fires in schools in USA as cooking heating and lighting equipment. Others causes of FDs include smocking, candles, clothes washer dryers, electrical faults and arson. In his study, Petal (2008) found that the cause of the fire which killed 90 school children in Indian school was an explosion of cooking gas cylinders in the classroom. However, Petal (2008) describes other causes of school fire in India as lighting and heating equipment, arson and electrical faults and ineffective implementation of fire safety policy. Describing the causes of fire disaster which killed 23 secondary school girls in dormitory in Nigeria, Kahwa (2009) says that it occurred after kerosene lamps overturned and exploded into fire.

Studies carried out in Kenya highlights several causes of fires in schools. For instance, Shibutse *et al* (2014) found that the causes of fire in secondary schools in Kenya were: burning of rubbish, arson, students' unrest, gas leakage, faulty electrical appliance, lack of training among students and teachers. In his study, Rowan (2001) describes electric faults as the cause of fire which killed 26 students at Bombolulu secondary school. A study by Ndetel *et al* (2004) describe the causes of FDs which killed 67 students at Kyanguli secondary school as a petrol bomb which was thrown inside the dormitory by an unknown person (arson).

The literature reveals diverse causes of FDs in schools in different countries. However, the specific immediate causes of FDs in BSSs particularly in Tanzanian context are not known. Therefore, lack of empirical evidences about the immediate causes of FDs in BSSs in Tanzania formed the base for conducting this research.

### **3. Research Methodology**

A qualitative research approach was adopted in this study so as to obtain in-depth information about the immediate causes of FDs in BSSs. Data was collected through researcher's interaction with respondents in their natural settings (Cohen, Manion & Morrison, 2007). A descriptive case study design was adopted so as to enable the researcher to obtain multiple evidences through varieties of methods, instruments and respondents (Cohen et al., 2007). Through descriptive case study, the researcher was able to make a thick description concerning the immediate causes FDs in BSSs in their natural context (Cohen et al., 2007; Yin, 2003).

The researcher used faced to face interview and documentary search to obtain information on the immediate causes of FDs in BSSs. Interviews were used to obtain data from Heads of Schools, teachers, patrons, matrons and students. Through interviews, the researcher was able to collect exhaustively diverse information related to the research objective (Cohen, *et al*, 2007). Interviews were supplemented by document reviews in which specific information about the immediate causes of FDs in BSSs were obtained. Such documents involved reports of previous FDs in respective schools. Document search method enabled the researcher to collect the readily available information more easily (Cohen et al, 2007).

The researcher employed purposive and convenience sampling procedures to select participants and schools respectively. Using purposive sampling the researcher was able to select only respondents who had rich information about causes of FDs in selected BSSs by virtue of their professional experiences and roles (Cohen *et al*, 2007; Hatch, 2002). The sample size involved thirty seven respondents. The sample included; four (4) Heads of Schools, eight (8) teachers, three (3) patrons, two (2) matrons and twenty (20) students. Convenience sampling was used to those four (4) BSSs which had experienced FDs but were easily accessible by the researcher due to cheap and easy transport as the researcher had limited financial and time resources. Thus, the researcher was able to select four (4) accessible schools from three (3) different but easily reachable regions from the researchers work station (Mkwawa University College



of Education). The schools and regions in their brackets included Idodi (Iringa), Njombe and Wanike (Njombe) and Iyunga (Mbeya).

Qualitative data obtained from interviews and document reviews was subjected to content analysis through computer based software known as Nvivo Version 11. Content analysis involved transcribing, coding and categorizing data based on emerging themes (Creswell, 2012). The finding for every specific them was presented in narrative form and verified by a direct quotation.

#### **4. Research Findings and Discussion**

The purpose of this study was to explore the immediate causes of FDs in BSSs in Tanzania. The findings revealed various immediate causes of FDs in BSSs as presented and discussed below.

##### **4.1. Indiscipline and riot among students in BSSs**

Information obtained from reports of the previous FDs in BSSs and interviews with headmaster, teachers, patrons and students revealed that indiscipline among students was among the immediate causes of FDs in BSSs. It was found that the fire which destroyed one dormitory in October, 2014 in one of the selected BSSs was set deliberately by some students. Students set fire in the dormitory after the School Managing Board suspended 27 students who were caught by police officers while in a night club. Describing how students' indiscipline and riots caused a FD in school "A" the Head of School had this to say:

*"That dormitory was burned by students after the School Managing Board had suspended from study 27 students due to indiscipline. The suspended students were caught by police officers for creating chaos in a night club in the city centre during night. The police took them to police station. Then, the police officers informed me that my students were in custody at the policy station. When the police released them, the School Managing Board decided to suspend them for a month. Surprisingly, after their suspension from studies, few of the remaining students organized and mobilized their fellow students to boycott classes. This led to a riot and a stage of setting fire into the dormitory in attempt to express their dissatisfaction to the decision of School Managing Board" (Headmaster School A 13.04.2017).*

While students in schools are required to abide to school by-laws and regulations (United republic of Tanzania (URT, 2015), the quotation above was an evidence that

some students did not adhere to school by-laws and regulations. They escaped during night and went to city centres or other places outside the school regardless of the consequence of doing so. Still, when they were punished for their misdeeds they reacted to the extent of burning dormitories and other educational infrastructures. Such indiscipline actions jeopardized school's welfare, destroy property and educational infrastructures.

The finding was similar to studies conducted in Kenya where indiscipline actions especially students' boycott or unrest have been resulting to FDs in schools (Shibutse *et al*, 2014; Gichuru, 2013). For instance, according to Shibutse *et al* (2014), 21.5% of BSSs fire in Kenya, result from students' unrest. Gichuru (2013) supports that students riots in BSSs in Kenya has taken both violent and destructive trend. According to the Ministry of Education, Science and Technology (2001), FDs caused by students' riots in Kenya have been deliberately planned and executed hence yielding maximum destruction of properties, loss of life and injuries.

#### **4.2. Kerosene lamps**

Through interviews with respondents and reviews of previous FDs reports, the researcher discovered that kerosene lamps were among the immediate causes of fire outbreak in BSSs. Interviews with the headmasters, teachers, patrons and students and document search in school "B" uncovered that FDs which destroyed two dormitories in 2009 and 2012 originated from exploded kerosene lamps. Respondents revealed that students used kerosene lamps as sources of light when studying during night. This situation was common among form II and IV classes as they prepared themselves for national examinations. Students used kerosene lamps to study during night especially when the school generator was switched off. Illustrating how kerosene lamps caused a fire disaster in 2012 in school "B" a teacher said that:

*"Due to lack of electric light, students use kerosene lamps to study during night hours. However, the lamps are very risk as they can explode to fire as it happened here. In 2012 a kerosene lamp which was being used by a student fell down and fuel exploded and caused fire outbreak which damaged the dormitory and all properties inside it"* (Teacher, 17. 04. 2017)

Although the Ministry of Education and Vocation Training prohibited the use of kerosene lamps in dormitories in Tanzania since 2011, the quotation above was a vivid verification that students continued to use kerosene lamps in dormitories in 2012 for studying during night especially when there was no electricity. Students who use

kerosene lamps in their dormitories increased their vulnerability to FDs. Kerosene lamps as fire hazards continues to pose a serious fire safety concern on students' life and properties in most secondary schools especially in rural areas where there is lack of reliable electricity. The kerosene lamps explosion as a cause of FDs in dormitories is not only a phenomenon of Tanzania but also in other developing countries. Studies conducted in Nigeria, Kenya and India indicate that kerosene lamps have previously causes FDs in BSSs in those countries (Gichuru, 2013; Petal, 2008; Reuter, 2004)

### **4.3. Candles**

Through interviews with Heads of Schools, teachers, patrons, matrons and students the researcher found that candles were also amongst the immediate causes of fire outbreak BSSs. Respondents described that fire which killed students in school "C" was initiated by a candle. The respondents described further that due to lack of reliable sources of light, for a years, students have been using candles, lamps or torch for night study. Elaborating how the candle caused a deadly disaster in that school "C" the Head of School had this to say:

*"The deadly fire disaster in the dormitory of this school was caused by a candle. The student who was using the candle light for studying near her bed in the dormitory fall asleep before setting the candle light off. Then, the candle overturned towards the mattress thus making it catch fire. Fire from that mattress spread throughout the dormitory thereby killing, injuring many students and damaging dormitory and properties in it" (Head of School, 24.04.2017).*

Even though, the MoEVT (2011) prevented the use of candle in dormitories in BSSs in Tanzania, the findings of this research verify that candles are still used by students as a source of light in BSSs dormitories. Mishandling of candles among students in dormitories leads to fire outbreaks which eventually do not only kills students but also causes unnecessary injuries and trauma among students, teachers and parents. The role of candles in starting FDs in dormitory has been also acknowledged in developed countries especially USA. A study by FEMA (2007) and (2014) based in USA report that candles were among the several instantaneous causes of FDs in schools.

### **4.4. Electric faults**

The reviews of fire disasters reports in schools and interviews with respondents uncovered that electric faults was an immediate cause of fire disaster which burned a dormitory in one of the sampled schools. The fire disaster report by the Fire and Rescue

Force and interviews with respondents unveiled that electrical faults caused the fire outbreak in school "D". Interviewees elaborated that the fire resulted from an electric short circuit which occurred in the morning when students were in the classrooms. Although the fire did not cause fatalities and injuries, it damaged six rooms of the dormitory and all property and infrastructures inside it. Demonstrating and describing how the electric faults occurred, the Head of School "D") said that:

*"Two hours before the fire outbreak, the electricity was cut off for unknown reason. When electricity returned later on, it caused short circuit in one the electric lines in the dormitory hence causing fire outbreak. The fire spread very rapidly in various rooms of the dormitory. It was even more difficult to save students and school property"* (Headmaster, School D. 20.01.2016)

In an interview, the patron of that dormitory said that:

*"I was in this my office, when I saw smoke coming from the dormitory. I called teachers and students to so that they could assist to extinguish fire and rescue property. Yet, as the fire spread rapidly, we did not succeed to rescue property. The fire damaged all property inside the dormitory. Because there were no any other fire hazards in the dormitory, I am sure the fire was caused by electric short circuit in one of its lines"* (Patron, School D, 20.01.2016).

Interviews with students revealed that, they knew that their life and properties were in danger due to frequent and abrupt electric cut off and in their schools. When asked if there has been regular inspection of the electricity systems in the dormitory, the student dormitory leader said that:

*"There is no regular inspection of electricity system in the dormitory. After all, the school does not have electricians. Electricians come only when there is an electric problem. However, they do not inspect the whole electric system in the school to ensure fire safety. As a result, electric short circuit has caused the recent fire disaster in our dormitory"* (Student, School "D". 20.01.2016).

Despite the MoEVT (2011) directive that schools should ensure reliable electrical wiring and conduct regular inspection of their electrical systems, school "D" seemed not to implement it seriously. Ineffectiveness in handling electrical related issues in dormitory in schools is a common problem in both developed and developing countries

(FEMA (2014). Research shows that electrical faults have been the sources of FDs in BSSs in both developing and developed countries USA, UK, Russia, Zimbabwe, Ghana, Rwanda and Botswana (FEMA, 2007; 2014; Arson Control Forum, 2006; Shibutse *et al* 2014).

## 5. Conclusion and Recommendation for Actions

Based on the research purpose, it is concluded that the immediate causes of fire disasters in the sampled boarding secondary schools in Tanzania were: students' indiscipline or riots, kerosene lamps, candles and electrical faults. Based on research findings, the researcher recommends the following actions. First, the government should ensure that all BSSs in Tanzania have reliable electric supply systems so as to minimize or eliminate the use candles and kerosene lamps in dormitories. Second, the government should ensure that electrical systems in schools are frequently inspected and tested so as to prevent unnecessary occurrence of electric short circuit. Third, Heads of schools, teachers and students should avoid reckless use of candles, kerosene lamps when there is no electricity. Finally, students should follow school rules, by-laws and regulations accordingly.

## References

1. Arson Control Forum. (2006). Surveys of School Fires. *Research Bulletin, Number 10*. Retrieved from <http://www.stoparsonuk.org/documents/resources/school.pdf>
2. Campbell, R. (2013). School safety. In *Fire Analysis and Research US: NFPA*.
3. Cannon, T. (1994). Vulnerability analysis and the explanation of natural disasters. In, Varley, A. (ed.). *Disaster, development and environment*. Chapter 2, p13-30. London: Wiley.
4. Carr, L. (1932). Disasters and the sequence pattern concept of social change. *American Journal of Sociology*, Vol. 38. p 207–218.
5. Cohen, L., Manion, L., and Morrison, K. (2007). *Research methods in education*, (6<sup>th</sup> ed). London: Routledge.
6. Creswell, J.W. (2012). *Educational research: Planning, conducting and evaluating quantitative and qualitative research (4<sup>th</sup> ed)*. Boston: Pearson.
7. Department for Communities and Local Government. (2015). *Fire statistics, Great Britain April 2013 to March 2014*. London: National Statistics.

8. Fire Emergency Management Agency. (2007). School fires: *Topical fire research series*. 8(1), p.13-20.
9. Fire Emergency Management Agency. (2014). School buildings fires 2009-2011. *Topical fire report series*. 4 (14), p.1-6.
10. Fire Emergency Management Agency. (2015). *Campus fires fatalities in residential buildings (2000-2015)*. United States Fire Administration.
11. Fire and Rescue Force Act. (2007). *The fire and rescue act of 2007: An act to provide for the better organization, administration, discipline and operation of fire and rescue force*. Dar es Salaam. United Republic of Tanzania.
12. Gichuru, J.N. (2013). *Fire disaster preparedness strategies in secondary schools in Nyeri central district, Kenya*. Published Masters of Education in Education in Emergence, University of Nairobi.
13. Hatch, J. A. (2002). *Doing qualitative research in education settings*. New York: New York State University Press.
14. Jha, A.K., Barenstein, J.D., Phelps, P.M., Pittet, D., & Sena, S. (2010). Disaster types and impacts. *Safer homes, strong communities. A handbook for reconstructing after natural disasters*. Washington DC: World Bank.
15. Kahwa, R. J. (2009). *Fire emergency preparedness at schools. A case study for secondary schools in Moshi rural district. Kilimanjaro region, Tanzania*. Published Masters Thesis, Department of Agricultural Economics, University of the Free State, South Africa.
16. Kimathi, J. (2011). *Disaster preparedness in public secondary schools in Githunguri district, Kiambu County, Kenya*. Unpublished Thesis for Master of Education University of Nairobi.
17. Kukali, A. N., & Indoshi, F.C. (2009). An Evaluation of the State of Fire Safety Policy Implementation in Girls Boarding Secondary Schools in Bungoma East District. In Onkware, K., Waswa, G. W., & Neyole E.M. (ed.). *Proceedings of the workshop on institutional fires*. Masinde Muliro University of Science and Technology, Kakamega Kenya 25<sup>th</sup> June 2009.
18. Matandiko K. (March 16, 2015). Moto wateketeza bweni Dar es Salaam. *Mwananchi*.
19. McEntire, D, A. (2003). *Disaster response operations and management: FEMA emergency management higher education project instructor guide*. Emmitsburg, MD: FEMA.
20. MoEST, (2001). *A report of the task force on student discipline and unrest in secondary schools*. Nairobi: Jomo Kenyatta Foundation.

21. MoEVT. (2011). *Waraka wa elimu na 4. Wa mwaka 2011 kudhibiti janga la moto katika shule na vyuo vya ualimu nchini*. Dar es Salaam: MOEVT
22. Mosha, H.J. (2006). *Planning education systems for excellence*. Dar es Salaam: E&D Limited
23. Mwambona, L. (2014) *Athari za moto masoko ya Mbeya bado zipo*.
24. Ndetel, at al. (2004). *Alleged guardian of victim burned Kyanguli secondary school*. Nairobi: Associated Press.
25. NFIRS. (2007). School fire. In *Topical Fire Research Series, Vol 8, Issues 1*. Retrieved from <http://files.eric.ed.gov/fulltext/ED498391.pdf>
26. Nelson, B., & Kahango, G. (2012). *Moto wateketeza tena soko la Mwanjelwa. Mwananchi*.
27. Onyango, M.A. (2013). *Disaster awareness and preparedness of secondary schools in Homa Bay count, Kenya*. Unpublished PhD Thesis in Education Planning, University of Nairobi.
28. Petal, M. (2008). *Disaster prevention for schools: Guidance for education sector decision maker. Consultation version, November 2008*. Geneva: UNISDR.
29. Prime Minister's Office. (2003). *National operational guidelines for disaster management*. Dar es Salaam: Prime Minister's Office.
30. Prime Minister's Office. (2012). *Tanzania emergency preparedness and response plan (TEPRP)*. Dar es Salaam: Prime Minister's Office.
31. Reuters. (2004). *Indian school fire kills 90 children*. Retrieved on 14/6/2015 from [www.reuters.com](http://www.reuters.com)
32. Rowan, D. (2001). *School fire kills at least 56 students*. Retrieved from <http://www.wsws.org/en/articles/2001/03/keny-m30.htm>
33. Saltbone, O. (2006). *Disaster definitions*. Java Indonesia: The John Hopkins International Federation of Red Cross and Red Crescent Societies).
34. Sambo, W.A. L. (1997). *Determinants of frequent students' crisis in educational institutions of higher learning in Dar es Salaam, Tanzania*. Unpublished Master Dissertation, Dar es Salaam: University of Dar es Salaam.
35. Sena, L., & Michael, K.W. (2006). *Disaster prevention and preparedness*. Ethiopia: Ethiopia Public Health Initiative.
36. Shibutse, P. I., Omuterema, S., & China, S. (2007). Frequency and severity of fire disasters in secondary schools in Kenya. *International Journal of Innovative Research in Science, Engineering and Technology*.
37. Shibutse, P. I., Omuterema, S., & China, S. (2014). Causes of fire disaster in secondary schools in Kenya. *Research on Humanities and Social Sciences*, 4(25)66-70.

38. Tobin, G.A., & Montz, B.E. (1997). *Natural hazards: Explanation and integration*. New York and London: The Guilford Press.
39. Tuay, E.C. (2002). Disasters. *The State of the Environment and Policy Retrospective 1972– 2002*. Topsham Picturepoint: United Nations Environmental Programme.
40. United Nation. (1948). *Universal declaration on human right*. Retrieved from <http://www.un.org/en/documents/udhr/index.shtml>
41. United Nations Disaster Reduction Organization. (1992) *Disaster management training programme: An overview of disaster management*. (2<sup>nd</sup>) Edition. UNDP.
42. United Nations Education Scientific Cultural Organization. (2011). *Integrating conflict and disaster risk reduction into education sector planning*. Paris. International Institute for Education Planning.
43. White, Gilbert F., R. W. Kates., & Burton, I. (2001). Knowing better and losing even more: The use of knowledge in hazards management. *Environmental Hazards*. 3 (3), p. 81-92.
44. Yin, R. K. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks. Sage Publication



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