ASSESSMENT OF AWARENESS, KNOWLEDGE AND ATTITUDE ON IMPACTS OF FIRE OUTBREAK TO STANDARD SEVEN PUPILS AT MOROGORO MUNICIPAL AND MVOMERO DISTRICT, TANZANIA

ATHUMANI SALUMU AMASI

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE

REQUIREMENTS FOR THE DEGREE OF MASTER OF ENVIRONMENTAL

STUDIES (MANAGEMENT)

DEPARTMENT OF ENVIRONMENTAL STUDIES

THE OPEN UNIVERSITY OF TANZANIA

2021

CERTIFICATION

The undersigned certifies that he has read and here by recommends for acceptance by the Open University of Tanzania a dissertation entitled: "Assessment of Awareness, Knowledge and Attitude on Impacts of Fire Outbreak to Standard Seven Pupils at Morogoro Municipal and Mvomero District, Tanzania", in partial fulfillment of the requirements for the Degree of Master of Environmental Studies (Management) of the Open University of Tanzania.

.....

Dr. Josephat A. Saria

(Supervisor)

.....

Date

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DECLARATION

I, **Athumani Salumu Amasi**, do hereby declare that this research report is my own original work and that it has not been presented to any other Universities for a similar or any other degree award.

.....

Signature

.....

Date

DEDICATION

This work is dedicated to my beloved wife Hadija A. Mwimi and my sons Jasmini A. Salumu and Ramadhani A. Salumu. Thanks a lot for their patience, moral support and encouragement during the study period.

ACKNOWLEDGEMENT

I am indebted to many people who in one way or another assisted me for the successful completion of my study. The list is extensive to acknowledge but the following deserve special attention.

Foremost, I would like to express my deepest gratitude to my supervisor, Dr. Josephat A. Saria who through his tireless supervision, advice, directives and encouragement, the dissertation got to its accomplishment. I feel privileged to have a supervisor who could genuinely uncover both the sweet and bitter tastes of my work. Indeed, he was a critical friend without whom it would have taken too long for me to accomplish this dissertation.

I am grateful to my employer, the National Examination Council of Tanzania (NECTA), for granting me with both study time and resources despite other priorities of the Council. Dr. Charles E. Msonde, you made this all possible; I am indebted to you and I cannot say all my thanks in this acknowledgement.

I also express my gratitude to Dr. Alfred D. Mdima, who offered editorial inputs at different stages of this study, which were helpful in writing this dissertation.

I honestly thank Ms. Ester Thomas from NECTA for assisting me in translating some of the questionnaires and interviews from English to Kiswahili.

Finally, I wish to thank my family, specifically, my beloved wife Hadija and my sons Jasmin and Ramadhani for providing me with moral support, encouragement and prayers.

ABSTRACT

Fire incidents in schools costs properties as well as human life of innocent people. Much of the discussions about fire disaster in schools is centering on rumors relating to sabotage, politics, misfortune, religious differences or negligence. By using descriptive survey method to sample of 389 standard seven pupils (49.1% boys and 50.9% girls), we determine the level of awareness, knowledge and attitudes towards the impacts of fire outbreak among pupils in Morogoro municipality and Mvomero district. Both quantitative and qualitative data were collected by means of questionnaires, interviews and observation schedule and analyzed by using Statistical Package for Social Sciences (SPSS). The results showed that, majority of respondents 287 (73.8%) know that fire accident can happen even in the school premises and 290 (74.6 %) are aware that fire outbreak can cause damage to home, school or market properties. Majority of respondents 321 (82.5%) indicated that there is little they can do to prevent fire incidence because there is no training done in school in case of fire emergence. The study concludes that though majority of respondents 316 (81.2%) understand the effect of wildfire on environment, the community around are the source of environmental destructors as they are using fire for animal hunting and cultivation. The study suggests that, public education on fire prevention is very important and must be included in the school curriculum so as to reduce the fire risks. School community including pupils and parents must be trained on steps to be taken in case of fire outbreak and according to the type of fire.

Keywords: Fire Ourbreak, oxygen, Triangle, combustible, Msamvu, extinguisher

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LIST OF ABBREVIATIONS

BBC	British Broadcasting Corporation
СО	Carbon Monoxide
CO ₂	Carbon Dioxide
CPR	Cardiopulmonary Resuscitation
DFRR	Department of Forestry Range Resources
EAM	Eastern Arc Mountains
EM-DAT	Emergency Events Database
FAO	Food and Agriculture Organization
FDs	Fire Disasters
IUFRO	International Union of Forest Research Organizations
MoE	Ministry of Education
MoEST	Ministry of Education, Science and Technology
NFPA	National Fire Protection Association
NO ₂	Nitrogen Dioxides
RSPM	Residual Suspended Particulate Matter
SO_2	Sulfur Dioxide
SPM	Suspended Particulate Matter
SPSS	Statistical Package for Social Sciences
TAP	Toxic Air Pollutants
UNFR	Uluguru Nature Forest Reserve
URT	United Republic of Tanzania

CHAPTER ONE

INTRODUCTION AND BACKGROUND OF THE PROBLEM

1.1 Introduction

Fire can be a remarkable disaster not only because of its distressing effects on property and individuals life but also because of the panic it engenders in all those who suddenly find themselves face to face with the extend of flames. In the presence of fire outbreak, a certain degree of panic is the most natural to all who are involved, almost physiological reaction, occurring in every living creature from insect to human being (Masellis, *et al.*, 1992).

Fire outbreak has a potential impact on people, property and the environment in all countries around the world. In some cases, the resulting losses are extraordinary, causing hundreds of deaths, widespread damage to property and contents and significant impacts on the environment (Hadjikyriakou, 2000). More often, fires may cause a single casualty or affect a single home, though the effects are still highly significant to those affected and collectively are substantial.

Fire is a natural phenomenon that can transform forest ecosystems (Dale, *et al.*, 2000), because it may lead to the loss of seed bank, mortality of mature trees and plants that are not fire resistant, shifts in succession direction and ultimately habitat loss, particularly when plants fail to recover after a fire event (Whelan, 1995).

Several studies indicated that fires impose adverse consequences on the natural environment including contamination of the air via the fire cloud and its subsequent diffusion, with deposition of particulate and other materials likely to contaminate water and soil (Anders, *et al.*, 2017; Davies and Unam, 1999). Contamination of soil and water from fire suppression runoff, which might contain toxic or hazardous materials like heavy metal and other persistent organic pollutants like pesticides and direct exposure to soil and water from hazardous materials whose containers containment systems may fail due to fire (Wuana and Okieimen, 2011).

Wildfires produce harmful smoke, which can cause fatalities and destroy the biodiversity (FAO, 2001). Fire outbreak produce pollution in terms of fine particle in air, which is directly, threatens human health even during relatively short exposures (Dennis, *et al.*, 2001). Close to the fires, smoke is a health risk because it contains a mixture of hazardous gases and particles that can irritate the eyes and the respiratory system. According to Dennis, *et al.*, (1996), the effects of smoke exposure and inhalation range from eye and respiratory tract irritation to more serious disorders, including reduced lung function, bronchitis, exacerbated asthma and premature death.

In developed countries, they have created awareness to school children through providing fire safety education and give advice on fire prevention, risk assessment, evacuation and anti-arson measures (Arson Control Forum, 2006). They have taken initiatives and precautions like people are told to store matches and lighters out of the reach of young children and matches should not be used or kept in homes with young children (Goodman, 1994). Despite the prevention and protection measures in place, fire and rescue services in most countries schools have increased every year (Arson Control Forum, 2006).

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In developing countries, a study of preschoolers showed the capacity of very young children to learn some of the key messages about disaster safety (Izadkhah and Gibbs, 2015). However, the strength and range of types of evidence of the effectiveness of disaster education programs is limited and in some cases contradictory and so more rigorous studies are required to determine what works and for whom, when, and why and to understand children's experiences of the program (Ronan, *et al.*, 2015).

Studies examining the impacts of disaster education programs on children's critical thinking, decision making, and emotional response to an actual disaster are absent from the current literature (Johnson, *et al.*, 2014; Ronan *et al.*, 2015). While a great deal of research has been published (Kramp, *et al.*, 1983) on the quantification of the environmental impact of fire, the information has not previously been consolidated in a manner that facilitates identification of the research focus. This indicates that the gaps remain.

This study investigates the level of awareness, knowledge and attitudes towards the impacts of fire outbreak among the standard seven pupils. In order to understand how the community is involved in efforts to help the awareness of fire outbreak, it's important to get younger generations involved in the study. The better understanding of the children on consequences of fire outbreak, human risks, environment degradation and sustainable habits means parents raised their children more aware of environmental issues. Though some green living habits won't come into play until a child gets older, there are plenty of habits for them to learn and witness in their parents and elders. Benson, *et al.*, (1998), indicated that there is no one who can

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guarantee that young adolescents will grow into responsible and competent adults without their parents influence on them.

To achieve the study objectives, a survey research was designed in which a good number of scale questions was prepared and applied to a selected sample of primary school standard seven pupils in Morogoro Municipal and Mvomero district. This area was selected because over the past four decades, the Uluguru Nature Forest Reserve (UNFR) has experienced frequent drought (Maack, 1996) and this period has experienced more frequent fires than in prior decades (Lyamuya, et al., 1994). Every year humans cause fire in the Uluguru Nature Forest Reserve (UNFR), particularly in the sub-mountain zone (Lyamuya, et al., 1994). The fire is said to have been caused by people living and human activities around the mountain strips, which are found in Morogoro Municipal and Mvomero district. Fire on Uluguru Nature Forest Reserve (UNFR) and the Eastern Arc Mountains (EAM) as a whole are known to have caused some plants species to go extinct about 10,000 years ago (Mumbi, et al., 2008). Moreover, the fire outbreak occurred at Msamvu Morogoro region in August 10, 2019, caused hundreds of people to be killed and many injured after a fuel tanker exploded on the highway from Dar es Salaam City (Msowoya, 2019). A fuel tanker crashed and people gathered at the accident site to loot the fuel.

1.2 Background to the Problem

Human being needs a favorable environment for effective and fruitful living, but fire outbreak from different sources is increasingly thereby making environment unhealthy for human life. Fire outbreak is one of the great threats facing human kind today and has lots of implications for the survival of mankind. The lives and people property around the scene is often affected by fire accidents, which could occur as a result of inadequate fire safety considerations (Dennis, *et al.*, 2011).

Apart from lives of people caught with fire, environment is threatened by the fire outbreak impact. Outbreak of fire can have devastating environmental impacts. Fires destroy leaf litter and its associated arthropod community, further reducing food availability for omnivores and carnivores (Kinnaird and O'Brien, 1998). Also, the existing vertebrates and invertebrates in the scene not only killing them directly, but also leading to longer term indirect effects such as stress and loss of habitat, territories, shelter and food. The loss of key organisms in ecosystems, such as invertebrates, pollinators and decomposers, can significantly slow the recovery rate of the forest (Boer, 1989).

Human health might be at the receiving end as a result of the environmental degradation. Toxic air pollutants (TAP) are a major concern for air pollution scientists, yet our state of knowledge concerning these contaminants is not comprehensive. Areas exposed to toxic air pollutants can cause respiratory problems like pneumonia and asthma (Kim, *et al.*, 2018). Millions of people are known to have died due to indirect effects of air pollution. Developing cities are among the most polluted in the world. Air in metropolitan cities has become highly polluted and pollutant concentrations exceeds limit considered safe (Garg, *et al.*, 1995). The urban air pollution has grown across most of developing countries cities in the last decade are alarming. Some of the most important air pollutants are residual suspended particulate matter (RSPM), suspended particulate matter (SPM), nitrogen dioxides (NO₂), carbon monoxide (CO), lead (Pb) and sulfur dioxide (SO₂) (Rajak, 2019).

Another example is contamination of air by mercury. Mercury is a bio accumulative, persistent, toxic pollutant element. When released into the environment, it accumulates in water laid sediments where it is converted into toxic methylmercury which is highly toxic and enters the food chain (Saria, 2016). Mercury contamination is a significant public health and environmental problem because methylmercury easily enters the bloodstream and affects the brain.

Due to many years mercury deposition, mercury contamination in freshwater organisms like fish is widespread and significant enough to warrant fish consumption advisories all over to some places. Mercury concentrations tend to be higher in larger, older fish and in fish from tea-colored and relatively acidic waters (Anicetus, *et al.*, 2020).

1.3 Global Fire Outbreak

Fire outbreak can be divided into two categories: Natural causes: These are like many forest fires which start from natural causes such as lightning which set trees on fire. Another one is man-made causes: These are fire caused when a source of fire like naked flame, cigarette, electric spark or any source of ignition comes into contact with flammable materials. Both natural and human-caused, have played a critical, and persistent, role in shaping our environment.

According to International Union of Forest Research Organizations (IUFRO, 2018), although the global annual area burned has been decreasing for several years, the occurrence of extreme wildfire events with catastrophic consequences has been increasing. Global fire activity mostly affects savannas and woodlands in the tropical

belts, temperate steppes, Mediterranean shrub lands, equatorial peat lands and boreal forests. Due to variable combinations of natural and anthropogenic factors, there is always a fire burning somewhere on the planet (IUFRO, 2018).

At a global scale, fires are largely anthropogenic, lightning-caused fires being outliers in comparison. Scientific evidence suggests that more than 90% of all ignitions are linked, directly or indirectly, to human activities (IUFRO, 2018). Many customary rural practices, such as small-scale pasture maintenance, rely on broadcast burning and can be considered rather safe and sustainable, despite possible localized ecological changes. Conversely, many human-caused wildfires originate from largescale and often illegal land clearing, arson, and outdoor accidents that cause an ignition to escape, though accurate records of causes are globally unavailable. It was estimated by National Fire Protection Association (NFPA), that more than 30% of these fires were directly attributable to human negligence or maliciousness (Horatio, *et al.*, 1960).

1.3.1 Fire outbreak in Africa

According to FAO, (2003), Africa especially Sub-Saharan Africa leads the world in the number of wildfires and area burned almost every year. It is estimated that 175 million hectares of savannah woodlands, forest and grasslands were burned Sub-Saharan Africa (Bellamy, 1997). Many of these fires were intentionally set to clear land for agriculture, and many of these went out of control to burn much larger areas than were originally intended (Persha and Blomley, 2009).

According to Makhanu (2009), fire is one of the commonest disasters in the learning institutions in Africa. Like any other disaster, whenever it happens, it causes a serious

disruption of the functioning of the institutions since it results into widespread human, material, economic or even environmental losses, which exceed the ability of the affected institutions to cope using their own resources. Giwa (2012) cited by Amoako (2014) found that over 90% of fire outbreaks that occur in Nigeria are initiated by people's carelessness, and this could be stopped by changing that values, cultures and practices of the people. In Ghana, study indicated a total of 6,214 fire outbreaks occurred in the country in 2015 leading to 67 injuries and 32 deaths (Harriet, 2017).

1.3.2 Fire Outbreak in Tanzania

Like many other African countries, Tanzania wild fires are reported to being increasing at an alarming level due to insufficient plans and programs to control fire, inadequate human and financial resources; insufficient extension programme for local communities and lack of or weak integration of informal (indigenous) knowledge and policy implementation relating to forest fires management (URT, 2008).

Fire causes many environmental problems (URT, 2001), including resource depletion, with major developmental and environmental implications. The major environmental problems facing Tanzania are land degradation, loss of wildlife habitats and biological diversity, environmental pollution, good quality water for urban and rural inhabitants, deterioration of aquatic systems and deforestation (Madulu, 1999).

However, awareness and attitude about the environmental problems associated with fire outbreak as well as the health of the environment has not been fully studied. It is clear that government of Tanzania is aware of environmental sustainability as useful and critical tool so as to meet the need of food, health and other needs of the people.

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However, one of the weaknesses observed among Tanzanian community is discussion among members with each other and young generation about environmental degradation caused by fire outbreak (URT, 2001).

1.3.3 Fire Outbreaks Due to Inflammable or Combustible Liquid

The occurrence of fire disasters due to inflammable or combustible liquid is not a new phenomenon in African history (Gakpe and Mahama, 2014). According to Addai, *et al.*, (2016), Class B fire which include flammable liquids like oil and gas fires often involve inflammable or combustible liquids such as natural gas which is divided into two sub-classes which are class II and class IIIB. Class II are combustible liquids which include fuel oils (Fig 1.1) such as kerosene and petrol having flashpoint (the temperature at which a fire can ignite) above 37.8°C. The second sub-Class IIIB combustible liquids have a flashpoint of above 93.3°C and include animal oils, glycerin, hydraulic fluids and vegetable oils.



Figure 1.1: Fuel tanker blast into Fire, at Anthony inward Gbagada, (Odutola, 2020)

A good example of fire outbreak by Class B material was observed in different African countries like Ghana where of the recent fire outbreaks have taken place in state facilities that are of great strategic value, thereby making fires an issue of public concern and debate. Most of these fires whether domestic, institutional, industrial, vehicular, commercial, or bush come with devastating consequences, including loss of lives and properties. Addai, *et al.*, (2016) observed that one of the main causes of fire outbreak in country like Ghana has been electrical problems resulting from faulty wiring and misuse of electrical gadgets.

According to Simpson (2010), electrical faults originate from poorly designed and poorly constructed electrical circuits, and the electrical wiring found in many domestic buildings in Ghana is designed not by an electrical engineer, but by an artisan with scant knowledge of electrical circuit design.



Figure 1.2: Fuel Tanker Burst into Flames at Msamvu- Morogoro (Msowoya, 2019)

In Tanzania, fire outbreaks for the past twenty years have repeatedly caused remarkable damages to public institutions whose occurrence had impact to psychosocial-economic development of the affected communities (Ndibalema, 2015). A good example is the incidence of August 2019 (Fig 1.2), where more than one hundred people died and many more were seriously injured at Msamvu- Morogoro, Eastern part of Tanzania as a result of fuel tanker burst into flames (Msowoya, 2019).

1.3.4 Fire Outbreaks in Tanzania Schools

Tanzania has been experiencing a number of fire outbreaks in its secondary schools for years resulted into losses of lives, properties and destruction of environment. Example is the incidence of Shauritanga secondary school in Kilimanjaro region which was gutted by fire and more than 40 pupils died in one school dormitory (Nestory, 2017). The death of pupils mostly come from smokes, effects of toxic smokes generated by electrical burning materials, flames, crushed during leaving the scene and other die asleep within the fire disaster scene. As per studies made by Gahwa (2009), in July 2005, Nsumba Secondary school in Mwanza had its dormitories gutted by fire on different days in the same week whereby pupils lost all their properties.

In 2006, fire gutted Kilimani primary school in Iringa region destroyed buildings, furniture and teaching material. In 2007, Bigwa secondary school in Morogoro region was gutted by fire and two student dormitories were burnt to ashes. In August 2008, Imalilo secondary school in Kwimba District, Mwanza was gutted by fire. In July 2008, nineteen children of between eight and fourteen years died in a disco hall in Tabora town due to suffocation. In August, 2009, twelve girl's pupils died and fifteen

were injured at Idodi secondary school in Iringa region after the school dormitory was gutted by fire.



Figure 1.3: Member of the Public Viewing the Smoldering Remains of the Idodi Secondary School Dormitory (Ippmedia, 23/08/2009)

In September, 2009, the fire gutted Tubuyu day secondary school in Morogoro municipality, some classes were damaged and some pupils fainted and rushed to the hospital, no one was killed. In September 2009, fire gutted Same secondary school in Kilimanjaro region, administration office, teacher's offices and important documents were destroyed. The effort to suppress the fire proved futile due to lack of fire tender in the district (Gahwa, 2009).

On Monday, 14 September, 2020, school dormitory gutted by fire at Byamungu English Medium Primary School in Kyerwa district north-western Tanzania's Kagera region and ten pupils died in a fire (BBC- Sep 14, 2020). Kyerwa District Commissioner Rashid Mwaimu told the BBC that the bodies were burnt beyond recognition and will need DNA tests to confirm the victims' identities.



Figure 1.4: School Dormitory Gutted by Fire at Byamungu English Medium Primary School in Kyerwa District North-Western Tanzania's Kagera Region (BBC- Sep 14, 2020)

According to Nyirenda (2012), most of these fire disasters have been due to poor fire management systems and lack of awareness to community around. Despite the killings of innocent pupils, which caused irreplaceable damages and psychosocial problems to the victims, fire outbreaks have been occurring repeatedly in different institutions. Fire outbreaks for the past decades have repeatedly caused remarkable damages to public institutions whose occurrence had impact to psychosocial-economic development of the affected communities (Nyirenda, 2012). This has increased doubt unto the level of fire emergency preparedness of the institutions and the public in general. It also leave questions of levels of community awareness on issues related to fire outbreak protection. Since those incidences have mostly been happening in secondary schools, do primary schools, public institutions, colleges, universities and our houses safe and free of fire? The state of awareness, understanding and altitudes of fire outbreak risks has been one among the reasons of increased damages.

Safety for pupils and staff from hazards that can be created by unsafe conditions, behaviors, disasters or emergences in schools cannot be guaranteed because of inadequate preparedness and awareness programs for safety needs (Kipngelo, *et al.*, 2009). In order to reduce the risk of live, injuries and property damages, the knowledge and preparedness of preventing and mitigating undesirable fire outbreak, which is also known as fire safety must be understood (Kobes *et al.*, 2010, Lo *et al.*, 2000).

Study by Wade, *et al.*, (2007), revealed that, despite a downward trend in the number of school fires (malicious and accidental), there remain a substantial number of fires in schools each year. The significant impact of fires on the social and emotional experiences of pupils, staff and the wider community and on teaching and learning in the affected schools cannot be underestimated (Wade, *et al.*, 2007). Study conducted among secondary schools in Nyeri central District in Kenya on fire disaster preparedness found that majority of the head teachers (77.8%) were not trained and 39.3% of teachers who participated in the study reported that the members of staff were trained. Further results shows that 58.3% of the schools had trained personnel to handle fire disaster in case of an emergency. Over 60% of the teachers reported to have fire alert procedures (Gichuru, 2013).

A household survey conducted in Tanzania on awareness of police and fire emergency numbers, results showed that 96% of participants were not aware of fire emergency number (Twaweza, 2014). One cause of this situation can be attributed to the lack of systematized knowledge in the firefighting and safety field. Very little is known about the factors which cause the fire outbreaks and how to fight different types of fire like petrol, oil, wood and grasses both in terms of the physical dynamics of fires and human behavior in relation to fires. This state of affairs is related to the lack of research interest in the fire field and the lack of funds available for such research and methodological problems associated with fire research (Alexander, 2015). This motivate to fill up the gap exist by investigating the level of awareness, knowledge and attitudes towards the impacts of fire outbreak among the standard seven pupils in Morogoro Municipal and Mvomero District. There are opportunities of assessing standard seven pupils' awareness, understanding and attitudes on fire outbreak impacts within their environment. This will enable us to project community preparedness and awareness about the problems associated to fire incidences in our community.

1.4 Statement of the Problem

Fires outbreak are reported to be increasing at an alarming rate in Tanzania (Kachenje *et al.*, 2010). The problem of fire outbreak is complex and should not be addressed on a sectorial level as it concerns all the aspects related to school management, prevention, suppression, and other managerial sections. Despite the magnitude of threat suggested, hard data on cause are lacking, most statements on the fire issue are based on story and opinions (Madoffe, *et al.*, 2005). It is well known that fire outbreak and accidents can be deadly, destroying homes, wildlife habitat and timber and polluting the air with emission of toxic gases, which are harmful to human health.

There is very little understanding of the extent to which Tanzania community is fostering a sense of environmental responsibility and a greater commitment towards environmental sustainability. Also, there is unawareness of the community about the

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problems associated with environmental pollution as well as the health issues as related to fire outbreak.

Understanding how the community is involved in efforts to help the environmental awareness due to fire outbreak, is important to get younger generations involved in the study. There is a need to understand the levels of knowledge of students on fire accidents as this may help to plan some courses for students in first aid and basic life support skills as the students can effectively manage such situations in many places. The awareness, knowledge and attitudes towards environmental degradation due to fire outbreak, environment and sustainable habits the child has, means parents raised their children more aware of environmental issues. There are early indications that child and parent discussions about the children's improvement in a disaster education program predict increased home-based preparedness activities (Roman, *et al.*, 2015). There is spoonful research on Tanzanian primary school pupils' awareness, knowledge and attitudes on impacts of fire outbreak, hence, this study intend to fill the gap.

1.5 General Objective

The general objective of this study was to assess the level of awareness, knowledge and attitudes on impacts of fire outbreak among standard seven pupils in Tanzania.

1.5.1 Specific Objectives

The specific objectives, which this study has covered are:

 To determine level of knowledge and attitudes of standard seven pupils on the impacts caused by fire outbreak.

- (ii) To identify sources of information on prevention of fire outbreak to standard seven pupils.
- (iii) To determine level of awareness of standard seven pupils on first aid rendering of fire outbreak victim.

1.6 Research Questions

- (i) A what level do standard seven pupils in Morogoro Municipal and Mvomero District are knowledgeable on impacts caused by fire outbreak?
- (ii) What are the sources of information on prevention of fire outbreak to standard seven pupils in Morogoro Municipal and Mvomero District?
- (iii) What is a level of awareness on first aid rendering of fire victims among standard seven pupils in Morogoro Municipal and Mvomero District?

1.7 Scope of the Study

This study focused only to standard seven pupils' level of awareness, knowledge and attitudes on impacts of fire outbreak in Morogoro Municipal and Mvomero District, Tanzania. The study was also delimited to its three specific objectives. In terms of sample, the study delimited to standard seven pupils in Morogoro Municipal and Mvomero District, Tanzania. Standard seven pupils are the ones who were expected to be knowledgeable on impacts of fire outbreak. For the case of area of study, it was limited in two districts councils (Morogoro Municipal and Mvomero District).

1.8 Rationale

The findings obtained from this study have contributed to assessment the level of awareness, knowledge and attitudes towards impacts of fire outbreak among the primary school pupils in Morogoro Municipal and Mvomero District. The study has provided recommendations to education stakeholders and community at large so as to be in position to improve their levels of understanding fire hazards and safety precautions in Tanzania. Also, the study has generated awareness, knowledge and attitudes to primary school pupils on the best ways to act in case of fire outbreak through improving holistic mechanisms on fire safety awareness, knowledge and attitudes and therefore reduces fire incidences and their predictable consequences in the society. Moreover, it raised an alarm to school curriculum developers to take into considerations all the issues related to fire as hazardous to environment and human health in preparing school curriculum.

1.9 Organization of the Study

This study was organized into five chapters excluding the appendixes and the bibliography.

- Chapter one: This chapter consists of introduction, background, statement of problem, research objectives and questions, scope of the study and rationale of the study.
- Chapter two: This chapter presents literature review of the study, whereas different concepts and available literature materials concerning impacts of fire, sources of information on prevention of fire outbreak, first aid rendered of fire victims and damage control are presented. The chapter also presents a conceptual framework of the study to show how the key issues are interacted in the study.

- Chapter three: The research methodology section, wherein, researcher discussed the type of study he decided to undertake and the reasons for doing it. The chapter consists of research design, population and sampling, data collection methods and instruments, data analysis methods and research ethics.
- Chapter four: This chapter presents the findings of the study, analysis and discussion of the findings, which lead the researcher to the conclusion of the study.
- Chapter five: This chapter presents a conclusion and recommendations, policy implications and directions for future research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents review of the related literature that has been drawn from different readings concerning the impacts of fire outbreak. It aimed at identifying what other researchers have done in the past concerning awareness, knowledge and attitudes on impacts of fire outbreak, sources of information on prevention of fire outbreak; first aid rendered to fire victims and damage control. The chapter also presents a conceptual framework of the study to show how the key issues are interacted in the study.

2.2 Definitions of Key Concepts

2.2.1 Awareness

Dourish and Belloti (1992) have given one of the best-known definitions for awareness which states that awareness is an understanding of the activities of others, which provides a context for your own activity. Gutwin and Greenberg (1999) stated that, awareness is knowledge about a state of the work environment in a limited portion of time and space, which provides knowledge about changes in that environment and which is maintained by all the interactions between the team-mates and the environment. Awareness is a part of an activity (completing a task, working on something). Maintaining awareness is not the purpose of an activity but rather it is used to complete a task. Therefore, awareness is a process that sums up the knowledge extracted from an environment and updates it thanks to the interaction between the participants and their environments.

2.2.2 Knowledge

Alexander *et al.* (1991) define knowledge as "an individual's personal stock of information, skills, experiences, beliefs and memories". Knowledge encompasses all that a person knows or believes to be true, whether or not it is verified as true in some sort of objective or external way (Alexander, *et al.*, 1991). That is, knowledge was described as factual or objective information that comes about as a result of formal learning (Alexander and Dochy, 1995). One may conclude that, the necessary and sufficient conditions for knowing that something is the case are first that what one is said to know be true, secondly that one be sure of it, and thirdly that one should have the right to be sure (Ayer, 2009).

2.2.3 Attitude

Eagly and Chaiken (1993, 1998) provided a simple and intuitive definition of attitude that wins on ease and broad endorsement. According to them, an attitude is "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" Others have agreed that the concept of evaluation is central to the definition of attitude, noting that "attitudes have been defined in a variety of ways, but at the core is the notion of evaluation" (Petty, *et al.*, 1997).

Likewise, Crano and Prislin (2006) brought together diverse characterizations of attitudes through their definition: "Attitudes are the evaluative judgments that integrate and summarize cognitive/affective reactions". Among the changes that the concept of attitude has undergone over the century, none is as clear as the stripping away of all ancillary items to leave the core idea of "favor and disfavor" intact. Greenwald and Banaji (1995) defined an implicit attitude as introspectively

unidentified (or inaccurately identified) traces of past experience that mediate of qualities to members of a social category.

2.2.4 Fire Outbreak

Fire is the rapid oxidation of a material in the exothermic chemical process of combustion, releasing heat, light, and various reaction products (Charles, 2000). It is a rapid, self-sustaining oxidation process accompanied by the evolution of heat and light in varying intensities. Fires start when a flammable and/or a combustible material, in combination with a sufficient quantity of an oxidizer such as oxygen gas or another oxygen-rich compound is exposed to a source of heat or ambient temperature above the flash point for the fuel and is able to sustain a rate of rapid oxidation that produces a chain reaction (Yusuf, 2012).

This is commonly called the fire tetrahedron. Fire is believed to be based on four elements being present: fuel, ignition source, oxidizing agent (usually atmospheric oxygen), and mechanism of the reaction. The most common fuels that causes fires include flammable gases used for cooking in homes, furniture, clothing, solvents used in our daily activities, such as kerosene and gasoline, and combustible dusts, such as toners used in offices and starch sold in markets.

2.2.5 Basic Concept of Fire Triangle

The starting of a fire involves three elements fuel, oxygen, and ignition temperatures. These elements may be compared to the three legs of a triangle (Fig. 2.1). Fire cannot occur until all three are brought together.


Ignition Temperature

Figure 2.1: Fire or Combustion Triangle

The fire triangle (which is also known as the combustion triangle) is a simple model for understanding the chemical reaction, which must occur to create fire. This triangle is composed of three elements, which are oxygen heat and fuel, which must all be present for a fire to ignite. It also demonstrates the interdependence of these ingredients in creating and sustaining a fire that in extinguishing the fire you must remove any one of these elements (Moritz, *et al.*, 2005).

In order for a fire to start there must be a material to burn and this is referred to as the fuel. Fuel is any kind of combustible material, including paper, oils, wood, gases, fabrics, liquids, plastics and rubber (Moritz, *et al.*, 2005). The fuel for a fire is usually characterized by its moisture content, size, shape and quantity and this will determine how easily the fuel will burn and at what temperature.

In addition to a fuel source, heat must be present in order for ignition to take place. All flammable materials give off flammable vapours which, when heat is present, combust (Moritz, *et al.*, 2005). Heat is also responsible for the spread and maintenance of fire as it removes the moisture from nearby fuel, warming the surrounding area and pre-heating fuel in its path, enabling it to travel and develop with

greater ease. As well as fuel and heat, fires also need oxygen to stay alight. Ambient air is made up of approximately 21% oxygen and, as most fires only require at least 16% oxygen to burn, it acts as the oxidizing agent in the chemical reaction (Miller, *et al.*, 2004). This means that when the fuel burns, it reacts with the oxygen to release heat and generate combustion.

2.2.6 Types of Fire

According to Sravan *et al.*, (2016), fire can be classified into four types which are; Class A these are caused by ordinary combustible materials such as wood, cloth, paper, and some rubber and plastic materials. Class B these are caused by flammable liquids, gases, greases, and some rubber and plastic materials. Class C these are caused by live electrical equipment and Class D these are caused by combustible metals such as magnesium, titanium, sodium, potassium, lithium, phosphorus or zirconium.

2.2.7 Fire Extinguishers

Referring to the fire triangle, to extinguish a fire, it is necessary to break up the triangle by taking away one of its members. This may be accomplished in various ways. All extinguishers of a portable type act as a "first-aid" appliance for extinguishing fires in their incipient stage, and they cannot be expected to be effective after a fire has spread to involve a large amount of combustible material. The action of all extinguishers is by cooling the burning substance below its ignition temperature and by excluding the air supply (blanketing out the oxygen), or by a combination of these methods. Also, some types tend to inhibit oxidation by chemical action.

For class A type of fire, the recommended fire extinguishers are multipurpose dry chemical, foam extinguishers and loaded stream extinguishers. For class B type of fire, the recommended type of fire extinguishers is multipurpose dry chemical, foam carbon dioxide (CO₂), dry chemicals, loaded stream extinguishers and bromotrifluoromethane - Halon 1301 (a brominated fire suppressant). For class C type of fire the recommended type of fire extinguishers are multipurpose dry chemical, bromotrifluoromethane - Halon 1301, carbon dioxide (CO₂) and dry chemicals. For class D type of fire, the recommended type of fire extinguisher shall be type approved for use on the specific combustible metal.

2.2.8 Fire Safety

According to John, *et al.*, (2016), A "fire safety system" is defined as any mechanism or system related to the detection of a fire, the warning resulting from a fire, or the control of a fire. This may include sprinkler systems or other fire extinguishing systems, fire detection devices, stand-alone smoke alarms, devices that alert one to the presence of a fire, such as horns, bells, or strobe lights; smoke-control and reduction mechanisms; and fire doors and walls that reduce the spread of a fire. According to experts, fire safety is considered to be dependent on: How individuals behave, how organizations behave, the vulnerability of the people exposed to the fire, the fire properties of products, the technical fire safety in the building, the fire service's ability to respond to fire hazards. Focusing on any one of these points and neglecting the others will lead to suboptimal safety (Yusuf, 2012).

2.2.9 Fire Protection

Fire protection within a facility relies on system components to detect and prevent fires and mitigate their consequences. Licensed and reputable life safety providers install the proper devices to make sure the building is in the best possible position to fight a blaze should a fire break out.

2.2.10 Fire Prevention

This is the proactive method of preventing emergencies and reducing the damage caused by fire to human. Fire prevention requires inspection, testing, and maintenance of systems to ensure they are operating properly and they are effective during a fire. Systems need to be periodically inspected for mechanical deficiencies, proper function, valve actuation, water flow, sprinkler clearances, etc. Fire prevention also involves eliminating the risks that may cause fire to occur (Brady, 2019).

2.2.11 Fire Fighting

Firefighting is the act of attempting to prevent the spread of and extinguish significant unwanted fires in buildings, vehicles, woodlands, etc. Firefighters suppress fires to protect lives, property and the environment. The firefighting is risky job to perform, as firefighters are exposed to hazards at incident site firefighting profession is highly technical, structured and supplied with various artifacts, which help to decide actions in unpredictable and complex situation.

The skills related firefighting can usually be learnt from formal trainings so that risk could be minimized by practicing safety procedures and get command over them. Firefighting occupation cannot be practiced without formal trainings and till the expertise get assured from those institutions. Firefighters perform unique and risky job as emergency response personnel. They take risk most of the time to save lives and properties of others (Taber, *et al.*, 2008).

2.2.12 First aid Render to Fire Victim

According to Safe Work Australia (2012), first aid is the immediate treatment or care given to a person suffering from an injury or illness until more advanced care is provided or the person recovers. First Aid can be described as the immediate primary care provided to the injured prior to the arrival of medical assistance (Mansoura University, 2009).

Therefore, Fist Aid is an emergency care or treatment given to an ill or injured person before regular medical aid can be obtained. The efforts towards this should render to a victim right from the scene of the burn accident, at the time of first interaction between the casualty and the first responder (Shrivastava and Goel, 2010). The care the victim receives within the first few hours after sustaining a burn injury largely determines the final outcome of the management. According to Cuttle, *et al.*, (2009), the first aid must be easy to use by the general public, readily available, halt the progression of the injury and should not hinder professional examination or treatment of the wound at a later date.

2.3 Knowledge and Attitudes on the Impacts of Fire Outbreak

2.3.1 Global Perspective of Fire Outbreak

Fire has been an important factor in the dynamics of the Earth's climate and in the development of biomes since its widespread occurrence began million years ago (Scott, 2000; He, *et al.*, 2015). In fire-prone ecosystems, humans have always coexisted with fire in the landscape, and its use can be seen as the first anthropogenic tool that has affected ecosystem dynamics beyond the very local scale (Santin, *et al.*, 2015). Whether as open biomass burning or as the relatively recent practice of

combusting fossil fuels in engines and power stations, fire has been a key factor in the rise of human societies (Scott, *et al.*, 2014; Gowelett, 2016). Fire in the landscape (commonly termed wildfire, wild land fire or landscape fire) has been typically considered as 'bad' and the focus on the whole has been on eliminating or at least containing it (Raftoyannis, *et al.*, 2014, Kyriazopoulos, *et al.*, 2013). The 'command and control' attitude of most Western societies neglects the fundamental role that fire has in sustaining biodiversity and ecosystem health (North, *et al.*, 2015., Moritz, *et al.*, 2014).

Until very recently, governments refused to present fire as a potential negative ecological factor out of concern that any admission of a negative role for fire would sound contradictory (Donovan, *et al.*, 2007). Nowadays, the perception of fire in Western communities living in high fire risk areas is slowly moving towards the recognition of fire as a valuable natural factor (McCaffrey, *et al.*, 2015). However, in many other regions fire is still perceived by the whole society as a natural hazard with only negative implications. This Western perception of fire currently dominates the world. In this same issue, other contributions discuss societies which have long coexisted with fire and continue to do so sustainably, such as the aboriginal people of the Western Desert of Australia (Bliege, *et al.*, 2015) or indigenous communities in Venezuela, Brazil and Guyana (Mistry, *et al.*, 2016).

Unlike other natural hazards such as earthquakes or volcanic eruptions, fire is perceived as an avoidable risk and enormous resources are directed towards fire suppression efforts, particularly in the more developed world (Donovan, *et al.*, 2007). Yet the now widely acknowledged consequence that fire suppression often comes at

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the cost of an increased risk of more severe or extensive future fire within fire-prone landscapes (Stephens, *et al.*, 2014) has to date only led to limited changes to fire suppression practice in most regions (North, *et al.*, 2015).

Human losses aside, the direct financial costs, such as the damage to homes and other infrastructures, often dominate the perception of the fire impacts and an increase in these is often highlighted in the media (González, *et al.*, 2012, Futuro, 2014). The annual global values (adjusted to 2015 US\$ value) ranging from US\$4.6 million to US\$12 318 million (annual average US\$2677 million), showing no apparent temporal trend. These estimates of losses only include damage to property, crops and livestock and do not reflect losses from fire events not classified as disasters (Guha-Sapir, *et al.*, 2013). Other important economic parameters not included here are the costs arising from human losses, injuries and longer-term health implications (Kochi *et al.*, 2010).

Furthermore, fire suppression costs are not considered in these figures. For example, Greece, France, Italy, Portugal and Spain together invest \in 2500 million each year in fire management, with most of this budget dedicated to fire detection and suppression (Raftoyannis, *et al.*, 2014). Human and economic losses from wildfire 'disasters' by global region from 1984 to 2013 is shown in Table 2.1. From that table, it is clear that the outbreak of fire pose a significant threat to all persons within a building and it can have serious financial and psychological implications (Kimmie, *et al.*, 2009).

According to Kumara, *et al.*, (2016), in United State of America, approximately 403,000 residential structure got fires which resulted into 2780 deaths and 13,560 injuries. For children less than 14 years of age, 509 children died. This accounted for about 13% of the fire deaths.

	No. Events	People Killed	Total People Affected	Death Rate/Event	Economic Costs (Million US\$)	
Africa	25	272	21 672	11	440	
Oceania	21	224	74 320	9	2121	
America	118	234	1 229 175	9	25 229	
Asia	50	748	3 188 257	30	11 892	
Europe	89	462	1 295 562	18	12 619	
Total	303	1940	5 808 986	78	52 301	

Table 2.1: Human and Economic Losses from Wildfire Disasters

Source: EM-DAT, (2013 Guha-Sapir, et al., http://www.emdat).

A study by Sravan, *et al.*, (2016), to assess the knowledge and attitudes of fire safety among dental students and staff to find any association between education level and knowledge regarding fire safety found that more than 90% of students were at a higher risk of fire accidents and this might be attributed to the fact that most of the participants were students and all were exposed to preclinical prosthodontics work which involves the use of Bunsen burners. Overall, it was found that only nearly half of the participants have a positive attitude towards fire safety and control measures. It was also observed that very few study participants knew about the way to use correct fire control measures in case of fire accidents. But more than half of participants knew the correct method to escape and alert people in case of fire accidents.

It was recommended that capacity building orientation programs involving fire safety specifically developed to dentistry should also be included in the curriculum to acclimatize students about the same and much emphasis should be given for regular mock drills. Although there was an appreciable level of positive attitude towards fire safety and control amongst students and staff, there were deficits in their knowledge about fire control measures in most areas (Sravan, *et al.*, (2016). Mere display of

emergency exits and fire extinguishers may not be useful without the basic knowledge about the basic firefighting skills. Such developed skills may be useful later to incorporate into their clinics and other needful areas.

Kumara, *et al.*, (2016) conducted a study in the Polonnaruwa district, India on knowledge, attitudes and practices on fire safety amongst office workers to find the current level amongst government officers. The study indicated that 427 (92.4%) have poor knowledge on fire safety, without statistical correlation to age, education level or rank/grade of officer. Also 435 (94.2%) offices agreed that their office should have a fire safety plan. About 64.9% (300 officers) worked in an office without a fire safety plan and 357 officers (77.3%) worked in an office without a fire exit. The study concluded that it is an immediate necessity to develop a fire prevention plan and establish a fire safety drill for government offices (Kumara, *et al.*, 2016). Comprehensive and contemporary educational seminars should be launched in government offices with routing fire safety drills for reinforcement of knowledge, attitude and practices. Also, the study revealed that the knowledge on fire safety is important to workers.

2.3.2 African Perspective of Fire Outbreak

Fires in Africa occur mostly in the wilderness and this combined with the practice of undervaluing ecosystems plus the low capacity to assess impacts of disasters contributes to lack of information on fires in general and mega fires in particular. This however, is improving with the gradual use of earth observation data (Giglio *et al.*, 2005, Giglio *et al.*, 2006).

While poorly resourced, fire management in Africa has since the colonial period become more central government oriented and suppression-centric, alienating rural communities for whom fire continues to be an important land use management tool and daily source of energy (Chuvieco, *et al.*, 2008, Albertyn, *et al.*, 2012).

African savannas burn frequently mostly because they have so far sustained fire depended land use systems such as slash and burn agricultural practices, livestock rearing that use fire for pasture and pest control and the prevalence of high reliance on veld products (Laris and Wardell, 2006). Most of these activities occur during the dry season and their intensity is usually elevated in periods of average to above average rainfall when fuel load is also abundant. As a result despite compelling evidence on the role of climate, about 90% are by humans as has been noted for different parts of the world (Dube, 2007, 2009). Not all of these ignitions are directly linked to land use activity, for instance fires due to arson, careless disposing of smoked cigarettes are related to social behavior (Trejo, 2008, Hoffmann *et al.*, 2009). But the role of land use in contemporary burning patterns in Africa is also linked to poverty, which results in heavy direct reliance on immediate environmental resources and low levels of technology for land management.

Further, policies that create insecurity in land ownership, pay lip service to land use related fire needs, and or culminate in accumulation of fuel load and a focus on fire suppression have a major role in wild land fire outbreaks (Kepe, *et al.*, 2005). Land use fire needs include requirement to burn for supporting livelihoods as in controlling weeds, pests and diseases, harvesting veld products, hunting and stimulating growth of fresh pasture.

The dichotomy for rural areas in Africa is that while for majority fire offers the cheapest mechanism of land management, at the policy level wild land fire is largely a hazard prohibited by law and if resources permitted it would have been mostly banned (DFRR, 2009). A better understanding of how, at the local level, communities engage with land resources with or without the medium of fire and also understanding of social behaviors that drive ignitions and incorporating these in fire management may provide the basis for sustainable approaches to the threat of fire risk (Myers, 2006, Laris and Wardell, 2006). This is particularly the case for developing countries where resource constraints restrict investment in fire suppression (Trejo, 2008, Willis, 2006) and poor management systems leads to inefficient use of whatever resources are available.

South Africa has witnessed several fire disaster events in secondary schools in recent years. The recurrence of fire outbreaks in South Africa prompted the government to establish the Disaster Management Framework for guiding communities in the fight against the problem (Pasipamire, 2011). In Kenya, fire outbreaks have interrupted community life after occasioning damages and loss of life, despite the government issuing of emergency preparedness guidelines for managing disaster events, including fire outbreaks (Nasimiyu, *et al.*, 2017).

Furthermore, their Ministry of Education (MoE) has been insisting on cultivating a culture of safety for rescuing secondary schools from fire disaster events (Shibutse, *et al.*, 2014). Efforts to mitigate fire outbreaks in Kenya's secondary schools notwithstanding, the problem have persisted. In fact, the problem of fire disaster

events generally remains critical in Kenya's secondary schools (Gichuru, 2013, Kanyi, 2014).

On prevention of fire outbreak, studies conducted in Africa revealed that lack of facilities, poor conditions of the available facilities and lack of knowledge and awareness among users are among the factors for high fire risks (Kachenje *et al.*, 2010; Mfinanga *et al.*, 2007). The study conducted in Ghana revealed forest fires are strongly linked with livelihoods and caused mainly by human activities. Those impacted negatively on sustainability of agricultural and forest land uses (Harriet, 2017). It was also indicated that the ecological position of the forest brought about by previous use was a recipe for more fires. The research identified fuel treatment, fire detection, and training of fire volunteers as the methods and procedures for effectively controlling forest fires in Ghana as well green firebreaks, tree planting and forest aggradation as means for rehabilitating fire-degraded forests.

The study by Ahenkorah-Marfo and Borteye (2010) revealed that about 90% very familiar with the library setting, there was lack of knowledge of the members of staff preventing, fighting and managing disasters such as fire outbreaks and flooding when they occur. This was as a result of inadequate basic training for members of staff.

2.3.3 Tanzania Perspective of Fire Outbreak

To investigate the level of fire disaster preparedness in Tanzania, it is necessary to consider the availability and condition of fire fighting facilities as well as the knowledge on fire management among the selected 10 higher learning institutions. One of the study indicated that 69% of the fire fighting facilities were not regularly

serviced; about 50% stored some hazardous materials; about 70% of them had not enough water storage for fire fighting purposes; 60% had no identifiable fire assembly points; and 90% of the sessions conducted in the buildings involved more than 100 people in a single venue (Kihila, 2017).

Further results indicated that 51% of the respondents were not able to operate the installed fire fighting facilities; about 80.7% of the respondents had never received any training on fire fighting and prevention and 95.6% of the respondents had never participated in any fire drills; and 81.5% of them were not aware of the fire responder's contacts (Kihila, 2017). General situation indicated that higher learning institutions are not well prepared to manage fire outbreaks suggesting that plans to rectify the situation are imperative.

Study by Nestory, *et al.*, (2017) show that fire incidences in schools in Tanzania have been repeatedly occurring notwithstanding the damages that were caused. Such fire incidents resulted from negligence and lack of communities' awareness on availability and proper using of fire fighting facilities (Kahwa, 2009). The existing literature further indicates that in most public buildings there is limited fire management capacity particularly low public awareness and availability of means and facilities that may facilitate fire fighting (Kachenje, *et al.*, 2010). On experience and from literatures, the fire incidences kept on occurring repeatedly in different public and secondary schools since 2010 to 2015 (Mwakanosya, 2015). Previous studies on fire disasters in schools relied mostly on the causes of fire incidents and fire preparedness in secondary schools (Nestory, 2017; Nyagawa, 2017).

2.4 Awareness of First Aid Rendering on Fire Outbreak Victims

First aid is the initial assistance or treatment given at the site of an accident to someone who is injured or suddenly taken ill, before the arrival of the paramedics (Perkins, *et al.*, 1999; Graham *et al.*, 1994). A first aid provider should be able to assess the situation quickly and calmly, and deal with life-threatening conditions outside the facilitated environment of a hospital (Raje, *et al.*, 2017). The goals of a first aid provider include preserving life, alleviating suffering, preventing further illness or injury and promoting recovery (Shinde, *et al.*, 2018). First aid of the minor injuries and accidents that any one of the general population may face at any time and in any place is one of the most important public demands (Joseph, *et al.*, 2015).

Citizens may find it difficult to provide first aid during accidents due to less confidence as they lack proper knowledge and skills in this area. Some of the most commonly used first aid techniques include cardiopulmonary resuscitation (CPR), control of bleeding, burn and fracture management (Jensen, *et al.*, 2018). Studies report that past experiences in first aid during emergency situations are associated with better awareness and knowledge (Al-Khamees, 2006; Al-Turki *et al.*, 2008). Attending courses on first aid has helped students to increase their knowledge regarding first aid skills and helped them to confidently manage life-threatening situations (Raje, *et al.*, 2017; Shinde, *et al.*, 2018).

An institution like schools needs to provide resources to increase the awareness of first aid among its students as this could help the students to understand the importance of basic life support that should be given to any person (Raneem, *et al.*, 2019). School and its environment is the best place to impart awareness and

knowledge regarding first-aid in students (Bruce, & McGrath, 2005). Today's world requires students to have awareness of first aid in order to help others or themselves in event of any accidents or emergencies (Kalaiyarasan, G. 2015).

Halawani, *et al.*, (2019) in his study reported that 65.3% of female university students couldn't provide first aid because of the lack of knowledge and other issues. Hsiao, *et al.*, (2007) in his study found out that about 7% knew how to stop fire by rolling on the ground. The study also revealed that more than 82% of participants knew that the first thing is to stop, drop, and roll when body clothes catch fire, 43.8% knew to apply cold water if hot oil spills on hands and 41.0% knew that all burn injuries must be treated at hospital. In another study by Gyedu, *et al.*, 2015 in community-based study caregivers, it was revealed that when all initial treatment of all injuries was considered, burns were associated with the highest percentage about61% of potentially harmful practices.

According to Roman, *et al.*, (2011) study conducted in Tanzania, it was found out that children were the most common victims of burn injury. It was indicated that burns made up 16.3% of reported injuries; the 1-month prevalence was calculated as 1.73% overall, and 3.05% in children ages 0 to 4 years. (Most burns are suffered by toddlers, who are scalded in the home kitchen or cooking area (Roman, *et al.*, 2011; Outwater, *et al.*, 2013). In spite of the importance of this healthcare needed, limited data exist on the initial care received by burn-injured patients in Tanzania. In an initial study, Temu et al., (2008) found that a variety of substances were applied to burns, from water and honey to dung and kerosene (Temu *et al.*, 2008). A wide variety of materials were

applied to the burn wound; a similar finding has been used in majority of African countries as shown in table 2.2.

 Table 2.2: Common Materials Applied to the Burn Wound

Material	Reason	Reference
Honey	 The honey especially produced by bees (<i>Apis mellifera</i>) has a bactericidal and fungicidal action. Therefore can rapid set up and wide spectrum, even under the unfavorable situations of heavy exudation or wound infection. The honey can enhance and accelerate the physiologic process of wound healing (epithelialization, granulation, and contraction). 	Kramer, <i>et al.</i> , (2004).
Cold water	 Decreased wound depth, reduced time for wound re- epithelialization, decreased requirement for grafting and scar management. Ice is not recommended as can lead to frequently serious and potentially fatal hypothermia, particularly with larger surface area burns. 	Cuttle, et al., (2009). Hammett. (2019).
Oil or sun- flower oil	Antioxidant and anti-inflammatory therapy have been known to be beneficial in the treatment of burns, if consumed olive oil in diet it increases the healing of burns	Olaitan, et al., (2004).
Raw eggs	 The egg yolk eliminates the edema, inflammation, and red blood cells from the wound surface. Egg whites induce a positive effect on the recovery of burn wound via increasing blood flow and reducing inflammation or infection. 	Hasanzadeh et al., (2005). Hasanzadeh and Mehdikhanloo, (1983)
Table Salt	 Salt controls osmotic balance in living things. Salt on a wound draws water out of the area (by osmosis) and drying the area out (microbes require water to survive), no water= no life. No microbes on the infected area mean no infections. This ability of salt to dehydrate also reduces swelling (which is mostly fluid) and therefore pain. 	Wijnker et al., (2006).
Vaseline	 Vaseline should never be applied to a fresh burn where the superficial part of the skin is missing. In addition to being occlusive, it is non-sterile, promotes bacterial proliferation on the surface of the wound, and may lead to infection. Vaseline should not be used as an immediate first aid measure for burns, but can be used as a subsequent dressing for minor burns. 	Attia, and Nair, (2003).
Cow dungs	Cow dung possesses antiseptic and prophylactic or disease preventive properties. It has the highly effective antibacterial features, nematicidal activity and probiotic activities along with antibacterial activity	Sathasivam, <i>et al.</i> , (2010).

The incidence of burn is a type of injury to skin, or other tissues even bone, caused by heat, chemicals, cold, electricity, friction, or radiation (like sunburn). Most burns are due to heat from hot liquids (called scalding), solids, or fire which may be caused by different things including petrol or oil.

There are four different categories of the wound caused by burns; the first is superficial burns also termed as first-degree burns. This type affects the outermost layer of skin. The signs and symptoms disappear once the skin cells shed (Brink, *et al.*, 2019). The second type is called partial thickness burns (Second-degree burns). Normally this affects the epidermis and the dermis (lower layer of skin) (Tintinalli, 2010). They cause pain, redness, swelling, and blistering. For the first aid of the second-degree burns, it is recommended to running keep the skin under cool water for 15 minutes or longer and applying antibiotic cream to blisters. The patients need extra fluids to maintain blood pressure and prevent shock. The third one is full thickness burns (Third-degree burns). This goes through the dermis and affects deeper tissues. They result in white or blackened, charred skin that may be numb (Marx, 2010). The last category is called fourth-degree burns, which goes deeper than third-degree burns and can affect victim muscles and bones.

2.5 Conceptual Framework for Creating Awareness, Developing Knowledge and Building Positive Attitudes on Impacts of Fire Outbreak

A conceptual framework is a structure, which the researcher believes can best explain the natural progression of the phenomenon to be studied (Camp, 2001). It is the researcher's explanation of how the research problem would be explored. It is arranged in a logical structure to aid provide a picture or visual display of how ideas in a study relate to one another (Grant and Osanloo, 2014). The framework makes it easier for the researcher to easily specify and define the concepts within the problem of the study (Luse, Mennecke & Townsend, 2012). It also assists the researcher in identifying and constructing his/her worldview on the phenomenon to be investigated (Grant & Osanloo, 2014). In addition, conceptual framework is the simplest way through which a researcher presents his/her asserted remedies to the problem s/he has defined (Liehr & Smith, 1999). It is the process of creating new ideas that aim at tackling situations. It is a simplified view of the world that a researcher wishes to represent (Kisilu and Tromp, 2006). Figure 2.1 indicated the conceptual framework used in this study.



Figure 2.2: Conceptual Framework

It is the conceptual framework, which bases on answering the specific objectives of this study and adherence to the principles of managing fire outbreak. This conceptual framework is used as a guide that the public can use to prevent and control fire outbreak. First, the pupils should have awareness and adequate knowledge on both prevention and management of fire outbreak. This will enable every pupil to take precaution especially to adhere to preventive measures against fire outbreak.

Second, in order for the pupils to create awareness on fire outbreak impacts, there must be teaching and learning to them. However, to develop skills on management of fire outbreak, there must be various trainings on how to prevent and manage fire outbreak. For that case, the pupils are supposed to have competences on preventing and fighting against fire outbreak as well as providing first aid for the fire outbreak victims.

Third, pupils should have positive attitude towards matters related to fire outbreak. This will enable them to take responsibility on learning seriously, self-prevention, protection, fighting against fire outbreak as well as first aid rendering. Also, the pupils should have willingness to report the fire outbreak events to the authority concerned immediately when they happen. Lastly, all the matters explained above should result to effective fire outbreak preventive measures and management performances among pupils.

No study has been done in Tanzania that determines the level of awareness, knowledge, attitude and practices regarding first aid skills among standard seven pupils. This study aimed to assess the level of awareness, knowledge and attitude of standard seven pupils on first aid rendering of fire outbreak victim in Tanzania.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Study Design

This study adopted a descriptive survey design, which requires the respondent to respond to research questions. The descriptive (survey) method is based on studying the phenomenon as it exists in reality, describes it accurately and expresses it quantitatively and qualitatively (Thuqan *et al.*, 2003). The data collection instrument was prepared and administered to the sample from standard seven primary school pupils in Morogoro Municipal and Mvomero District. The instrument covered different aspects in accordance with the objectives of the study (appendix 2a, 2b and 3).

3.2 Population and Sampling

The focus population for the study was standard seven primary school pupils in Morogoro Municipal and Mvomero District, Tanzania. The sample size was determined according to Yamane (1967).

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

Where n = sample size, N is the population size, and e is the level of precision. At 95% confidence interval level the value of p = 05% = 0.05 for single tail. From the formula above the sample size was drawn from a population of 15,935 standard seven pupils (7,507 from Mvomero district and 8,428 from Morogoro Municipal) in the year 2020. The sample was obtained from 20 sampled primary schools (10 from Morogoro

Municipal and 10 from Mvomero district). Each sampled primary school provided 20 standard seven pupils (10 boys and 10 girls) who were obtained through systematic sampling from the list of standard seven boys and girls, respectively. The sample of 20 primary schools was also obtained through systematic sampling from the list of primary schools in Morogoro Municipal and Mvomero District.

Therefore $n = \frac{15,935}{1+15,935 (0.05)^2}$

= 390

Table 3.1 indicates the names of primary schools in Morogoro Municipal and Mvomero Distrct used for the data collection.

S /	Name of School	Morogoro Municipal	Mvomero District	Total
Ν				Respondents
1	Baptist	20	-	20
2	Bernhard	21	-	21
3	Bungo	20	-	20
4	Changala	-	20	20
5	Fransali	20	-	20
6	Kichanga	-	20	20
7	Kikundi	20	-	20
8	Leena	20	-	20
9	Mafiga B	20	-	20
10	Masanze	-	20	20
11	Mchikichini	20	-	20
12	Melela	-	20	20
13	Misufini	20	-	20
14	Mlali	-	20	20
15	Mlandizi	-	20	20
16	Mtibwa	-	20	20
17	Mvomero	-	20	20
18	Mwere A	20	0	20
19	Nazareth	-	9	9
20	Sokoine	-	19	19
	TOTAL	201	188	389

Table 3.1: Primary Schools used for the Data Collection

3.3 Instruments' Validity and Reliability

To get data validity and reliability of the questionnaire, a pilot test of 20 samples of pupils was done. The schools involved in a pilot test were not used in actual data collection. This was done to ensure that the questionnaires are focused and relevant to obtain the right information. The study ensured that the questionnaires were accurate by making the necessary adjustments after conducting a pilot study and ensured that the questions were getting the right responses to measure what was intended. A Test – Retest was carried five days after the first exercise to guarantee that the information initially given was reliable. From the findings, the correlation coefficient was 0.925 which is greater than the recommended 0.85 and therefore the instrument was deemed as highly reliable in data collection.

3.4 Data Collection Methods and Instruments

In achieving the set objectives of the study, different methods and instruments of collecting data were employed. Those included structured and semi-structured questionnaires, interviews and observations.

2.4.1 Questionnaires

This study used structured and semi-structured questionnaires, which were designed specifically to examine the level of awareness, attitudes and knowledge of standard seven pupils on impacts of fire outbreak. English version (Appendix 2a) questionnaires were used for private (English medium) primary schools and Swahili version (Appendix 2b) were used for public schools. The designed questionnaires were administered to 389 respondents between 18th September to 30th September, 2020. The questionnaires were rated on a 5 point Likert Scale with category of *strong*

agree, agree, strong disagree, disagree and *don't know* or no answer in order to efficiently elicit the exact responses from the respondents. Some questionnaires required respondent to supply the answers according to their knowledge on impact of fire outbreak.

3.4.2 Interviews

Face to face interviews were held between the researcher and the standard seven pupils and teachers from the sample schools. Interview questions were based on the interview guide (Appendix 3) with the focus to explore issues related to their level of awareness, attitudes and knowledge on impacts of fire outbreak.

3.4.3 Observations

The observation checklist (Appendix 4) was used to check for the availability and status of important elements of the study, which are physically tangible. In this study the observations played a part in confirming the availability and status of fire safety equipment at schools and check the compliance of schools building to the school fire safety standards, that is, emergency doors, fire extinguishers, assembly points and firefighting equipment among others.

3.5 Data Analysis Methods

The application of both qualitative and quantitative statistical data analysis techniques encompassing descriptions, graphs, tables, charts and statistics were applied to determine standard seven pupils' level of knowledge and attitudes on the impacts caused by fire outbreak, the sources of information on prevention of fire outbreak and the level of awareness on first aid rendering of fire outbreak victims. Numerical data were analyzed with the help of the Statistical Package for Social Sciences (SPSS) computer software and content analysis was specifically applied to analyze non-numerical data.

3.6 Research Ethics

This study followed and adhered to all research ethics by firstly, seeking the permission to conduct research in Morogoro Municipal and Mvomero District from the authority concerned (Appendix 1). Secondly, the study asked the consent from the respondents as well as assuring them that the data that they were asked to provide are confidential and were to be used for academic purposes only and not otherwise. All the respondents were given a free will to participate and contribute voluntarily to the study.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the findings of the study, analysis and discussions of the findings based on the data collected from the field in relation to the objectives of the study (the level of awareness, knowledge and attitudes on impacts of fire outbreak among standard seven pupils in Tanzania). Standard seven pupils' demographic characteristics, their level of knowledge and attitudes on impacts of fire outbreak, sources of information on prevention of fire outbreak and their level of awareness on first aid rendering of fire outbreak victims are also analyzed.

4.2 Demographic Profile of Respondents

The demographic characteristics allow us to determine whether we reach our target audience or not. The aim for determining a representative sample of the population and knowing the distribution of the demographic characteristics of our respondents helped us to determine how close the sample replicates the population. Generally, the characteristics such as age, gender, income of the family were considered as demographic profile in this study.

4.2.1 Age of Respondents

Figure 4.1 indicates the varying categories of standard seven pupils' age between eleven to fourteen years (93.8%) and fifteen years and above (6.2%). The age profile of pupils shows that eleven to fourteen years constituted 93.8% of the sample population due to the fact that most pupils start standard one at the age of five to seven years.



Figure 4.1: Age of Respondents and their Percentages Source: Field Data, 2020

4.2.2 Sex of Respondents

In this study, the male respondents constituted 49.1% while female respondents constituted 50.9% of the sample (Figure 4.1). The male and female respondents were almost equal because the sample population from standard seven had equal number of male and female pupils. Therefore, the data collected were not biased against gender as gender balance was effectively covered.



Figure 4.2: Gender Distributions of Respondents Source: Field Data, 2020

4.3 **Pupils' Attitude towards the Impact of Fire Outbreak**

Attitudes when combined with other factors such as awareness, education level and preparedness are considered to be useful in analyzing human behavior. The attitude of pupils towards the impact of fire outbreak was evaluated using spellings survey based on ten items as shown in Table 4.1.

S/N	Questions	Strongly agree (%)	Agree (%)	Disagree (%)	Strongly disagree (%)	Don't Know (%)
1.	Fire outbreak can occur in areas such as Home, Buildings, Schools or Markets	287 (73.8%)	99 (25.4%)	3 (0.8%)	0	0
2.	Fire Outbreak can cause damage to Home, School or Market properties.	290 (74.6%)	92 (23.7%)	6 (1.5%)	1 (0.3%)	0
3.	Fire Outbreak can cause injuries and death to people and other living organisms.	336 (86.4%)	51 (13.0%)	1 (0.3%)	1 (0.3%)	0
4.	People should not light cigarettes and smoke closer to petrol stations as it can cause fire outbreak.	322 (82.8%)	64 (16.4%)	2 (0.5%)	1 (0.3%)	0
5.	Every Pupil should be trained in what to do and not to do in case of fire outbreak.	297 (76.3%)	81 (20.8%)	6 (1.5%)	4 (1.0%)	1 (0.4%)
6.	Fire sources such as ash trays, smoking materials, heaters, hot plates, tea pots etc. should be kept well and away from beds and bedding.	226 (58.6%)	107 (27.5%)	34 (8.7%)	20 (5.1%)	2 (0.6%)
7.	It is important for pupils to prepare for fire fighting in case of fire outbreak instead of escaping it.	180 (46.3%)	96 (24.7%)	70 (18.0%)	42 (10.8%)	1 (0.2%)
8.	Every Pupil should be trained in using fire extinguishers.	284 (73.0%)	93 (23.9%)	11 (2.8%)	1 (0.3%)	0
9.	Teaching pupils about fire safety in schools is a waste of time.	4 (1.0%)	3 (0.8%)	97 (24.9%)	285 (73.3%)	0
10.	There should be a Law requiring all schools to train staff and pupils about fire accident.	250 (64.3%)	117 (30.1%)	13 (3.3%)	8 (2.1%)	1 (0.2%)

 Table 4.1: Responses of Pupils for Questions Regarding Attitude towards the

 Impact of Fire Outbreak

4.3.1 Adequacy of Firefighting Facilities and Preparedness within School Premises

To determine the adequacy of fire fighting facilities and preparedness of pupils in case of fire disasters within the schools' premises, pupils were asked questions like; do they know where fire can occur and what impacts can be caused by fire outbreak? The responses show that majority of pupils (99.2%), agreed that fire outbreak can occur in areas such as home buildings, schools, market places and petrol stations. In addition to that, 98.3% of respondents agreed that fire outbreak can cause damage at home, school or market properties. The observation report obtained from all schools showed that there was no firefighting equipment like fire extinguisher or assembly point sign in case of fire.

Though the majority of pupils know fire accident can happen even in the school premise, but they are not prepared for the incidence. One of standard seven pupils from Mafiga B primary school was asked how he was prepared in case of fire outbreak.

He responded that:

"The best option is to run away from the scene. We have never being trained what to do"

This was evident that there is no training done at school in case of fire emergence. Also, there was no sign of assembly point in any school premises in case of fire outbreak. Therefore, pupils don't know the area as an emergency assembling point and in some cases during fire incidents the pupils can flee to other area instead of the fire assembly point. The lack of preparedness was also observed earlier (Ayonga, 2016), where 73.5% of the head teachers indicated that there was no assembly points in their schools, hence, this is evident that there is lacking of fire disaster preparedness in most of our schools.

Majority of respondents (99.4%) agree that fire outbreak can cause injuries and death to people and other living organisms. This was in line with what was reported earlier (Hadjikyriakou, 2000) who indicated that fire outbreak has a potential impact on people, property and the environment all over the world. He went further indicating fire outbreak can result into losses as well as deaths, widespread damage to property and contents and significant impacts on the environment.

According to Shibutse, *et al.*, (2014), fire disasters (FDs) in both developed and developing countries schools are a critical educational concern. They cause students deaths, trauma, injuries, and loss of properties as well as educational infrastructures. In this study, majority of students (99.2%) agreed that people should not lighten fire closer to petrol stations as it can cause fire outbreak. Also, the majority of respondents (86.1%) agreed that fire sources such as ashtrays, smoking materials; heaters, hot plates and teapots should be kept well and away from beds and bedrooms.

4.3.2 Capacity Building in Case of Fire Outbreak

Majority of respondents (97.1%) agreed that every pupil should be trained on what to do and not to do in case of fire outbreak while 71% agreed that it is important for pupils to prepare for firefighting in case of fire outbreak instead of escaping it. This was contrary to what have been observed earlier in another study (Nakitto *et al.*, 2010) where about 50% of school surveyed had ever been trained on fire safety. The fire extinguishers usage, firefighting and causes of fires were part of training course

according to Nakitto *et al.*, (2010). In their study, in Uganda, it indicated that 60% of schools had persons in charge of fires though about 84% of schools had no fire safety plans in place and 34% of schools had fire assembly place. Das, *et al.*, (2001) indicated that leaders like head of schools with knowledge about fire safety purchased fire devices (like fire extinguisher) and also prepared their students and employees to take immediate action to prevent death, injury and destruction of properties whenever disaster strikes. In another occasion, the interview with the head teacher of Changarawe Primary School about safety and training in case of fire accident he argued that:

"The Ministry of education, science and technology has not provided us with fire extinguisher cylinders for our school. Even if they were available, our pupils and teachers do not know how to use them. No training has been conducted here. We lack persons responsible for fire outbreaks. We do not have fire safety inspection in schools and nonexistence of fire emergency plans as well".

It was observed that fire and safety departments in all Tanzania learning institutions are non-existent or members are not trained or equipped to fight fire in their schools. This could either be as a result of naturalist attitude that God would take care of all unpredictable disasters or could be as a result of sheer negligence or both. During interview with head of school at Mvomero Primary School about the school

safety in case of fire he had this to say:

"The safety of school occupants will be enhanced if staff knows what to do both before and during an outbreak of fire or other emergency. This can be achieved by ensuring that staff including temporary and part-time personnel receives appropriate instruction and training. All new entrants to a school should be trained be pupils, staff or support staff training on firefighting. The training should be conducted around the school. All of them should also receive instruction on the school fire evacuation routine and receive instruction and training appropriate to their responsibilities in the event of any emergency".

4.3.3 Law Enforcement about Fire Accidents

Although the Tanzanian school administration might be ignoring this important requirement about fire accident in schools, the Tanzania Fire and Rescue Force Act, 2007 and fire precaution in buildings regulations, require in school buildings fire detection and alarm systems and automatic fire sprinklers to be installed. Also, considering the classrooms and offices, the act requires that exit doors to be those that can be opened without using a key and that they should be opened in the direction of exit travel. This is not the case for the schools visited. There was no any sign of direction or alarm. Even the setup of doors is to open inside contrary to the act.

The study also revealed that 94.4% pupils were aware with a by law requiring all schools to train staff and pupils about fire out break accident and only twenty one pupils (5.4%) think there is no need of having school by law or government law enforcement to schools for fire outbreak. Amuli (2019) indicated in his study that fire outbreaks continued to occur in schools due to the existence of critical issues, which were not resolved on time despite the government issued policy directives. This means, the fire disaster management policies issued by the MoEST's for mitigating the problem in schools did not properly work primarily because of lack of accountability, sabotage, irresponsible school managements and unreliable sources of electrical power.

4.4 Knowledge and Practices Regarding Fire Safety amongst Pupils

Knowledge and practices of pupils about fire safety prevention can save many lives. The objective of this study was to assess the knowledge and practices on fire safety amongst health pupils. Issues assessed here were if pupils knew different types of fire causes like; fuel fire and grass fire as they need different types of firefighting. Pupils need to have knowledge on how to remove one of component of a triangle.

4.4.1 Knowledge about Types of Fire Outbreak

An effective fire prevention strategy in Tanzania schools is an essential feature of fire protection. In this study, results from Table 4.2 found that 92.8% of the respondents agreed that they know about the different types of fire outbreak while 96.1% agree that they know about the causes of different types of fire outbreak. This correspond clearly with earlier study by Rohini *et al.*, 2016 in their study they found that 96.4% had correct knowledge about what to do when there is fire accident while 87.13% had correct knowledge about where is evacuation map displayed.

S/N	Question	Strongly agree N (%)	Agree N (%)	Disagree N (%)	Strongly disagree N (%)	Don't know or no answer N (%)
1.	I know about the different types of fire outbreak.	212 (54.5%)	149 (38.3%)	12 (3.1%)	5 (1.3%)	11 (2.8%)
2.	I know about different types of fire extinguishers.	216 (55.5%)	139 (35.7%)	14 (3.6%)	7 (1.8%)	13 (3.4%)
3.	I know about the causes of different types of fire outbreak.	240 (61.7%)	134 (34.4%)	10 (2.6%)	3 (0.8%)	2 (0.5%)
4.	I know about fire triangle and its components.	80 (20.6%)	101 (26.0%)	100 (25.7%)	57 (14.7%)	51 (13.0%)
5.	There is little I can do to prevent fire in my home.	200 (51.4%)	121 (31.1%)	46 (11.8%)	20 (5.1%)	2 (0.6%)
6.	It is good to open the windows in a room containing fire to keep the smoke from filling the hallway.	243 (62.5%)	89 (22.9%)	27 (6.9%)	30 (7.7%)	0
7.	I know about the use of fire extinguishers.	207 (53.2%)	134 (34.4%)	24 (6.2%)	12 (3.1%)	12 (3.1%)
8.	I know about dos and don'ts in case of fire outbreak.	226 (58.1%)	129 (33.2%)	18 (4.6%)	10 (2.6)	6 (1.5%)
9.	When a fuel tanker get an accident and crushed, people should avoid gathering at the accident site to loot the fuel.	246 (63.2%)	46 (11.8%)	35 (9.0%)	61 (15.7%)	1 (0.3%)
10.	Most people who die of fire are killed by smoke, gases or lack of oxygen and not by the flames.	121 (31.1%)	105 (27.0%)	83 (21.3%)	76 (19.5%)	4 (1.1%)
11.	Educating the public about fire prevention will do much to reduce the number of fire out breaks.	320 (82.3%)	56 (14.4%)	6 (1.5%)	5 (1.3%)	2 (0.5%)

Table 4.2: Responses of Pupils for Questions Regarding Knowledge on Impact of Fire Outbreak

4.4.2 Knowledge about different Types of Fire and Fire Triangle

The study revealed that 355 pupils (91.2%) know about the different types of fire extinguishers while 21 pupils (5.4%) they don't know. This is in line with results obtained earlier by, Rohini *et al.*, (2016), where 77.72% healthcare workers had knowledge about one type of firefighting equipment available in institution. Another study conducted by Ronoh and Kyalo (2009) showed that most elementary students had knowledge, attitudes and practices on firefighting by 361 (57.8%), 405 (64.8%) and 356 (57%) respectively. The knowledge application performance level of students indicated that the students have average knowledge, attitudes and practices.

More than half of respondents (53.4%) don't know or they do not have knowledge about fire triangle. Surprisingly, the curriculum of science in primary school requires pupils to be taught about fire triangle (which is also known as the combustion triangle). This was not surprising because the majority of respondents (82.5%) had indicated that there was little they could do to prevent fire in their homes. This shows that pupils do not have an idea on how to stop fire. That means one of the three elements of the fire triangle must be removed.

According to Caplan *et al.*, (2008); if fire runs out of fuel, it will smolder out; if you can cool fire down, it will lose heat and go out; and if the oxygen is removed it will suffocate. Therefore, attempts at combating fire and also preventing fire are based upon these principles. The process can be done by using either fire blankets, for example, suppress a fire by blankets, removing the oxygen by applying carbon dioxide fire extinguishers and as a result, putting it out. Similarly, fire extinguishers are developed to eliminate one of the three elements such as water fire extinguishers, which cool the fire down and remove any heat (Caplan *et al.*, 2008).

4.4.3 Knowledge about what to do in Case of Fire

Majority of respondents (91.3%) indicated that they have an idea of what to do in case of fire while 7.2% don't know what they can do (Table 4.2). This was also shown by 24.7% of the respondents who disagreed that people should avoid gathering at the accident site to loot the fuel when a fuel tanker get an accident and crush. Eight five point four percent (85.4%) agreed that it is good to open the windows in a room containing fire to keep the smoke from filling the hallway. Also, 87.6% agreed that they know about the use of fire extinguishers and 91.3% agree that they know about dos and don'ts in case of fire outbreak. In addition 41.8% disagreed that most people who die of fires are killed by smoke, gases or lack of oxygen and not by the flames. Ninety six point seven percent (96.7%) agreed that educating the public about fire prevention will do much to reduce the number of fires.

4.4.4 Fire Prevention and Public Education

It is known that most effects of fire outbreak are caused by correctable human errors, negligence or lack of safety systems such as electric default, unattended cooking, sprinklers and smoke alarms and many others. Therefore, educating the public about fire prevention will do much to reduce the number of fires. It is important to know if the pupils understand if they can play a big role in fire prevention.

When pupil were asked if it is important to educate the public about fire prevention as this may reduce the number of fires, majority of respondents 320 (82.3%) strongly supported the idea while 11pupils (2.8%) disagree that it is not important. Though the number of those opposing the need of public education seem to be low (2.8%), still the education on fire prevention is very important and must be included in the curriculum so as to reduce the risk. It was also noted earlier that schools whose programs focus primarily on fire and burn prevention demonstrated improvement in fire safety knowledge among students (Varas *et al.*, 1988). Also, McLoughlin (1982) indicated that young pupils when they got education about fire prevention, there will be a positive improvement in behaviour sub-scores among the pupils which suggest that families which received the fire prevention intervention positively changed some household fire safety practices.

Majority of pupils 332 (85.4%), argued it is good to open the windows in a room containing fire to keep out the smoke from filling the hallway. However, 57 (14.6%) disagreed and they do not think it is important. This shows that there is a need of educating the pupils and community at large about steps to take in case of fire. According to Lewis and Dailey (2000), people who have been trained on fire safety do change attitude and behaviour easily in a fire situation by instructing others to evacuate by following proper known evacuation procedures. This change will lead to the best chance of a safe and methodical evacuation being conducted during emergencies.

4.4.5 Different Types and Classes of Fire and how to Extinguish

It is well known that different fire outbreaks can have different hazards and risks. Therefore, using the wrong type of fire extinguisher could do more harm than good. Results in Table 4.2 shows that when pupils were asked about fire caused by a fuel tanker that get an accident and crushed, if people should avoid gathering at the accident site to loot the fuel, majority of pupils 246 (63.2 %) strongly agree while 46 (11.8 %) agree. Surprisingly, 96 pupils (24.7%) think it is not a bad idea for people to gather around the scene. The response of pupils on how to fight the fuel fire is given on Figure 4.3.



Figure 4.3: Response of Pupils on Fuel Fire

Source: Field Data, 2020

Figure 4.3 indicated that water (24.4 %) and fire extinguishers (27.2) can extinguish all fires. Figure 4.4 shows results of respondents when fire is wood or grass.



Figure 4.4: Responses of Pupils on Wood and Grass Fire

Source: Field Data, 2020
These results show that majority think water is the best option followed by fire extinguisher. That means majority of respondents cannot differentiate type of fire. Respondents don't have basic elements of fire prevention and protection. Kerber, (2012) indicated that if the fire is not extinguished with appropriate fire fighting method/equipment, through active fire protection systems, extinguishing or controlling fire as well as ensuring life safety comes down to the role of fire fighting department. The time required by the fire fighting department to reach the site and begin fire fighting operations play a key role in fire fighting and is known as response time. With our infrastructure and city plans, the causality and damage will increase.

According to Proulx, *et al.*, (2012), education on effect and risk of different types of fire, training on how to deal with and risk communication are essential in preparing people for an effective emergency response. Investing in fire safety training is a significant approach towards comprehension and acceptance of risks, prevention knowledge and development of response capacity.

4.4.6 Perception of Girls Versus Boys towards Understanding of Fire Outbreak It is well known that subordination of women by men, an experience found everywhere, results in a distinction between roles of men and women and their separate assignment to domestic and public spheres. Table 4.3 shows the perception of female pupils versus male pupils towards understanding of fire outbreak. It was indicated that 83.2% and 81.2% of female pupils and male pupils respectively had an understanding of fire outbreak. The study revealed that, there is no significance difference between female and male pupils in their perception towards understanding of fire outbreak; however, female pupils seem to have an extensive understanding than boys. This was inline with what was observed earlier (Ariyabandu, 2009), showing that women tend to be largely excluded from official emergency response agencies.

	Question	Scale	Gender				
S/N			Male		Female		
			Ν	%	Ν	%	
1.	I know about the different types of fire outbreak.	Strongly agree	97	50.8%	115	58.1%	
		Agree	79	41.4%	70	35.4%	
		Disagree	6	3.1%	6	3.0%	
		Strongly disagree	2	1.0%	3	1.5%	
		Don't know or no answer	7	3.7%	4	2.0%	
		Total	191	100.0%	198	100.0%	
2.	I know about the causes of different types of fire outbreak.	Strongly agree	109	57.1%	131	66.2%	
		Agree	73	38.2%	61	30.8%	
		Disagree	7	3.7%	3	1.5%	
		Strongly disagree	1	0.5%	2	1.0%	
		Don't know or no answer	1	0.5%	1	0.5%	
		Total	191	100.0%	198	100.0%	
	I know about fire triangle and its components.	Strongly agree	42	22.1%	38	19.3%	
		Agree	50	26.3%	51	25.9%	
3.		Disagree	51	26.8%	49	24.9%	
		Strongly disagree	23	12.1%	34	17.3%	
		Don't know or no answer	24	12.6%	25	12.7%	
		Total	190	100.0%	197	100.0%	
4.	I know about different types of fire extinguishers.	Strongly agree	100	52.4%	116	58.6%	
		Agree	79	41.4%	60	30.3%	
		Disagree	6	3.1%	8	4.0%	
		Strongly disagree	2	1.0%	5	2.5%	
		Don't know or no	4	2.1%	9	4.5%	
		Total	191	100.0%	198	100.0%	
5.		Strongly agree	91	47.6%	109	55.1%	
		Agree	60	31.4%	61	30.8%	
		Disagree	28	14.7%	18	9.1%	
	There is little I can do to prevent fire in my home.	Strongly disagree	12	6.3%	8	4.0%	
		Don't know or no answer	0	0.0%	2	1.0%	

Table 4.3: Responses of Female Pupils versus Male Pupils for QuestionsRegarding Knowledge on Impact of Fire Outbreak

	Question		Gender				
S/N		Scale	Male		Female		
			Ν	%	Ν	%	
		Total	191	100.0%	198	100.0%	
		Strongly agree	109	57.1%	134	67.7%	
6.	It is best to open the windows in a room containing a fire to keep the smoke from filling the hallway.	Agree	45	23.6%	44	22.2%	
		Disagree	20	10.5%	7	3 5%	
		Strongly discores	17	P 00/	12	5.570	
			1/	0.9%	100	100.0%	
			191	100.0%	198	100.0%	
	I know about the use of fire extinguishers.	Strongly agree	95	50.0%	112	56.9%	
		Agree	73	38.4%	61	31.0%	
		Disagree	11	5.8%	13	6.6%	
7.		Strongly disagree	7	3.7%	5	2.5%	
		Don't know or no	4	2.1%	6	3.0%	
		answer	100	100.00/	107	100.00/	
			190	100.0%	197	100.0%	
	I know about dos and don'ts in case of fire outbreak.	Strongly agree	101	52.9%	125	63.1%	
		Agree	71	37.2%	58	29.3%	
		Disagree	8	4.2%	10	5.1%	
8.		Strongly disagree	6	3.1%	4	2.0%	
		Don't know or no	5	2.6%	1	0.5%	
		answer					
		Total	191	100.0%	198	100.0%	
		Strongly agree	117	61.3%	129	65.2%	
	When a fuel tanker got an accident and crushed, people should avoid gathering at the accident site to loot the fuel.	Agree	27	14.1%	19	9.6%	
		Disagree	16	8.4%	19	9.6%	
9.		Strongly disagree	31	16.2%	30	15.2%	
		Don't know or no	0	0.0%	1	0.5%	
		answer	101	100.00/	100	100.00/	
			191	100.0%	198	25.5%	
	Most people who die in fires are killed by smoke, gases or lack of oxygen and not by the flames.	Strongly agree	51	26.7%	/0	35.5%	
		Agree	52 45	27.2%	53 29	26.9%	
10		Strongly disagree	43 42	23.0%	30 34	19.3%	
10.		Don't know or no	1	0.5%	2	1.0%	
		answer	1	0.570	2	1.070	
		Total	191	100.0%	197	100.0%	
11.	Educating the public about fire prevention will do much to reduce the number of fires.	Strongly agree	155	81.2%	165	83.8%	
		Agree	29	15.2%	27	13.7%	
		Disagree	2	1.0%	4	2.0%	
		Strongly disagree	5	2.6%	0	0.0%	
		Don't know or no	0	0.0%	1	0.5%	
		Total	191	100.0%	197	100.0%	

4.5 Sources of Information on Fire Outbreak and Fighting

Respondents' sources of information on fire outbreak and how to fight fire outbreak is shown in Figure 4.5



Figure 4.5: Responses of Pupils on Sources of Information on Fire Problems Source: Field Data, 2020

It was found that peer mates (33.0 %) play key role in discussing about fire outbreak and how to fight the fire followed by teaching in classroom sessions (24.0 %). It seems very few parents discuss the issue with their children (11.4 %). This is in line with previous study (Zhang, 2011), which shows that about 96% of the students obtained basic knowledge of fire safety through the promotion from school and organization of fire-drill but not from the active learning. In another study (Tan, 2007), it shows that majority of students (61%) did not take the propaganda and the exercise of school fire safety seriously and did not take the practical methods of the rescue's security theory into consideration. The interview with a teacher from Melela Primary School showed that pupils depend

on information of their class mates upon fire outbreak. He narrated by saying:

"In fighting and educating pupils about fire outbreak, we need to focus on practical and not on syllabus only. We have lost so many young people in the incidences of fire outbreak especially that one at Msamvu due to ignorance. Misinformation of peer groups lead to loss of many lives. Parents and community at large has role to play."

Another teacher from Mchikichi A Primary School indicated that:

"Student's need hands-on operation in firefighting and not depending on lecture in classroom Not only can they avoid the frequent use of human resources, but also can make a substantial increase in the scope of practice to be more - effective".

The use of radio and media channels like internet also seems to play key role in getting the information to young people (15.2 %). Menga *et al.*, (2016), indicated that nowadays the network and internet systems have become the pulse; it is the first source of information in society. Using the advantages of network platform to spread quickly, wide audience, combined with fire video, safety lectures, questionnaire and other means to carry out fire promotion from a number of angles, both to save the budget for the firefighting, hardware construction, and can greatly improve the efficiency of publicity.

4.6 First Aid Rendering to Victim from Different Types of Fire

According to Gennarelli and Kotapa (1992), the first aid is the immediate care given to victims of accidents before trained medical workers arrive. The aim of first aid is to stop and, if possible, reverse harm. It involves rapid and simple measures such as clearing the air passageway, applying pressure to bleeding wounds or dousing chemical burns to eyes or skin. The need to bring relief to bum victims within a very limited time interval and the importance of specific first-aid techniques make it necessary to consider, even during the planning stage, three distinct phases of relief operations: immediate assistance, first aid, and organized relief (Sorensen, 1979).

Awareness of first aid rendering on different types of fire victims is shown in Table 4.4. This section is divided into three subsections: (i) To determine if the pupils know how to extinguish fuel fire (ii) Appropriate first aid steps rendered victims (iii) Awareness of the impact of wild fire to environment.

S/N	Question	Strongly agree N (%)	Agree N (%)	Disagree N (%)	Strongly disagree N (%)	Don't know or no answer N (%)
1.	If my friend's clothes catch on petrol fire I will ask him/her to run away	61 (15.7%)	76 (19.5%)	101 (26.0%)	143 (36.8%)	8 (2.0%)
2.	To extinguish my friend's clothing due to spill of petrol, I will use a jet of water directly to his/her body.	85 (21.9%)	89 (22.9%)	111 (28.5%)	93 (23.9%)	11 (2.8%)
3.	I can use water or wet clothes to cool the burned parts of my friend's body.	134 (34.4%)	121 (31.1%)	74 (19.0%)	52 (13.4%)	8 (2.1%)
4.	Burned part should not be medicated with oilments or other drugs as these would only mask the part.	74 (19.0%)	92 (23.7%)	126 (32.4%)	86 (22.1%)	11 (2.8%)
5.	Wild fire like what happens at Mount Uluguru in Morogoro Region increases scarcity of water at my place due to drying of water source.	183 (47.0%)	112 (28.8%)	49 (12.6%)	34 (8.7%)	11 (2.9%)
6.	We should stop burning forest as it causes many environmental problems like scarcity of rainfall.	316 (81.2%)	48 (12.3%)	6 (1.5%)	15 (3.9%)	4 (1.1%)
7.	Prolonged dry season, scarcity of drinking water and food to animals are resulted from the burning of forests and mountains.	240 (61.7%)	88 (22.6%)	31 (8.0%)	26 (6.7%)	4 (1.0%)

 Table 4.4: Responses of Pupils for Questions Regarding Awareness on First Aid Rendering on Different Types of Fire Victims

4.6.1 Awareness on how to Extinguish Fuel Fire

The question was to determine if respondents can rescue a person whose clothes catch on petrol fire and if it is possible to instruct him or her to run. The study shows that 36.8% of respondents strongly disagreed and 26.0% disagreed. Substantial number of respondents agree that it is appropriate to run away (19.5% agree and 15.7% strongly agree.

According to Voelkert, (2009), fire is the chemical reaction where four elements heat, fuel, oxygen and chain reaction must be present in order for fire to exist. This chemical reaction is dependent upon a material rapidly oxidizing, or uniting with oxygen so rapidly that it produces heat and flame (John, 1996). Therefore, running will be increasing the availability of oxygen, hence more risk to victim. The best option according to Voelkert (2009) is the using foam on a flammable liquid fire, a wet blanket on a trash fire, or a tight fitting lid on a skillet fire. Agents such as CO₂, nitrogen, and steam are often used to displace the oxygen.

Respondents do not have an idea on how to extinguish fuel fire. Where 85 (21.9%) and 89 (22.9%) strongly agree and agree respectively that spill of water to the body of burning fuel fire victim is a good option. The majority of remaining 52.4% think this is not good idea while 2.8% they don't know what to do. By using principle of density, the density of water is heavier than that of petrol. Therefore, water will slip down and permitting the petrol to rise to the surface and continue to burn. Besides, the existing temperature is so high that the water poured on the fire evaporates even before it can extinguish the fire (Thomas, 1959).

4.6.2 First Aid Rendered to Victims

According to Tiwari (2012), the burn wounds are considered to be sterile in the beginning in comparison to most of other wounds like sharp cut, laceration or abrasion, though, the death in extensive burns is mainly because of wound infection and septicemia, because of the immune compromised status of the burn patients. Therefore, Management of burnt wound inflicted by the different chemical agents and physical require different regimes which chuck the progress of this wound apart from the regimes used for any of the other traumatic wounds.

When responding, the first step to be carried out when a victim has a burnt on the part of the body, majority of respondents (34.4% and 31.1%) strongly agreed and agreed respectively that use of water or wet clothes to cool the burned parts of victim is first step. This is followed by 19.0% and 13.4% who disagreed and strongly disagreed respectively that use of water or wet clothes to cool the burned parts of victim is not first step.

According to Arturson (1996), it is important to place the burned area under running cool water for at least not less than five minutes to reduce swelling. Other experts (Caison's 1981; Werner and Grose, 2003), consider other risks and environment of accident that make sure the victim who's burned are safe and out of harm's way. Move them away from the source of the burn and if the source of fire is electrical burn, there is a need to turn off the power source before touching the victim. This is followed by removing restrictive items from their body, such as belts and jewels in or near the burned areas. Then this is followed by covering the burned area with clean moistened cloth or bandage using cool and clean water.

3.6.3 Effect of Fire on Environment and Ecosystem

Fire can injure or kill part or the entire organisms depending on intensity of the fire and how long the living organism is exposed to high temperature. Also, the plan or animal characteristic such as bark thickness and stem diameter influence the susceptibility of fire. Fires have a range of less immediate and obvious adverse consequences on the natural environment (Holemann, 1994). These include air contamination from the fire plume (whose deposition is likely to subsequently include land and water contamination).

4.6.4 Environmental Problems Caused by Forest Burning

When respondents were asked if we should stop burning forest as it causes many environmental problems their responses were as shown on Figure 4.6.



Figure 4.6: Burning Forest as it Causes Many Environmental Problems Source: Field Data, 2020

Majority of respondents (81.2% and 12.3%) strongly agree and agree respectively seem to understand the effect of fire on environment. The rest of respondents 1.5% and 3.9% disagree and strongly disagree respectively think that burning of forest does not cause environmental problems like scarcity of rainfall.

This was contrary to what has been observed earlier (McCool and Stankey, 1985) on visitor attitudes toward wilderness fire management demonstrate that about 50% of the visitors felt that manager-ignited fire would be beneficial to wilderness, while about 16% felt these types of fire would be detrimental and about 33% were unsure. According to Gardner, *et al.*, (1987), shows that there is an increasing number of people into the wild land-urban interface, creating fire hazard. Urban residents have very low awareness of fire severity and assign low probabilities to occurrences. There is a need of policy strategies initiatives that shift the hazard management responsibility to public resource managers.

This was evident to the interviewed with a student from Melela Primary School who said:

"Slash, burn and shifting cultivation are common in our area. This is very important as sometimes it chases the wild animals and easy to cultivate"

Another student from Mvomero Primary school argued:

"Hunting on the hand is carried out around the forest. We normally set fire in order to drive animals towards the snares or towards the direction of the hunters for easy catching of the animals."

Mostly, at Uluguru Mountains, the fires turn into wildfires, which are uncontrolled and hence cause a great destruction to the forest. Most of the forest areas in Morogoro are ecologically in various stages of retrogression. The Uluguru forest ecosystems are reeling under acute form of degradation, which has adversely affected the Morogoro society, both socially and economically.

According to Kilawe *et al.*, (2020), many factors lead to deterioration of the Uluguru Mountain forest which is the major cause for increase in both physical as well as socio-economic vulnerability of country to disasters. It has been widely accepted that deforestation at most part of Morogoro region increases the intensity of natural disasters and is often the factor that transforms a natural hazard or climatic extreme into a disaster.

4.6.5 Prolonged Dry Season, Scarcity of Drinking Water and Food to Animals Due to Burning of Forests and Mountains



Figure 4.7: Prolonged Dry Seasons, Scarcity of Drinking Water and Food to Due to Burning of Forests and Mountains

Source: Field Data, 2020

Majority of the respondents 240 (61.7%) and 88 (22.6%) strongly agree and agree respectively that fire has more pronounced effect on prolonged dry season scarcity of water and hence food availability. This was in line with another study (Everson and Tainton, 1984), which shows the fire treatments had significant effects on this vegetation type, with the largest effects apparent between frequent fires in the dormant (dry) season on the one hand and fires in the wet season or exclusion of fire on the

other. Grass community structure, as characterized by the evenness, diversity or dominance of grass species, differed significantly among the fire frequency and season treatments. This was also observed elsewhere in Africa (van Wilgen *et al.*, 2007) found that the most marked effects on vegetation were found in extreme treatments (annual burning, burning in the summer wet season, or long periods of fire exclusion), and were greater in areas of higher rainfall. Different studies (Anderson and Anderson 2010, Fontaine *et al.*, 2012) have shown that very low moisture content of the fuel and the dry air create favorable conditions for very rapid fire spread and higher fire intensity.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter gives the conclusion and the recommendation of the study based on the findings. Also, this chapter proposes the areas potential for further study.

5.2 Conclusion

The study was guided by three specific objectives; determining level of knowledge and attitudes of standard seven pupils on the impacts caused by fire outbreak, to identify sources of information on prevention of fire outbreak to standard seven pupils and to determine level of awareness of standard seven pupils on first aid rendering for fire outbreak victim.

The study concludes that, majority of respondents had knowledge that fire accidents are common and can happen even in the school premises. The majority respondents are also aware that fire outbreak can cause damage to home, school or market properties. Moreover, the majority of respondents have little to do to prevent fire incidence because there is no training done in school in case of fire emergence.

The study also concludes that though majority of respondents know the effect of wildfire on environment, the community members are the source of fire outbreak and environmental destructions. The major causes of fire outbreak are people who set fire to simplify animal hunting and for clearing forest for cultivation.

Lastly, the study concludes that if young pupils are trained on education about fire prevention, there will be a positive improvement in safeguarding properties, human life as well as our environment.

5.3 **Recommendations**

The following recommendations are made based on the study findings and they are targeted to different stakeholders as follows:

5.3.1 Ministry of Education, Science and Technology

Fire safety programs should be mainstreamed from the lower education curricula to enable pupils to understand how to avoid and respond in case of fire outbreak. Teachers and pupils not only need the basic knowledge and ability to embed on fire risk education into their classroom teaching, but also they need instruction and training about fire health and safety in the school environment as well as to their homes.

To develop a safety culture in schools and their working environment, teachers need to be able to play an active role, and to be able to encourage their pupils to participate too. The knowledge gained is vital for both their own safety, school community members, their pupil in addition to their pupils' education that they need the knowledge and skills to make occupational safety and health part of their daily working life.

Fire safety Instructions should be made available in all the schools and other institutions and shall be implemented by all the stakeholders before and after the

school or institution becomes operational. Fire safety plans as a measure of fire disaster preparedness is needed so that majority of schools must have evacuation plans in case of fire disaster.

Fire emergency education and awareness programs for teachers, pupils and parents from the surrounding villages should be provided every year. Training should cater for among other things, fire prevention and use of fire extinguishers and other fire protection equipment.

5.3.2 School Quality Assurers and School Committees

School Quality Assurers should ensure the availability of the following during school inspections:

- (i) Standards for fire prevention must be incorporated and made sure that they are observed before giving recommendations to the Ministry for the new school to be registered.
- (ii) All schools should develop an emergency plan, which among other things should include: Emergency assembly point, Evacuation/escape routes, Emergency alarm, Protection equipment, and Emergency telephone numbers.
- (iii) Install firefighting equipment proportional to the number of buildings, which should be regularly serviced to keep them in proper working condition and located at strategic points where they can easily be accessed and used. The equipment should include among others fire extinguishers, hose reels, sand buckets, fire blankets, fire hydrants and stocked first aid kit.
- (iv) All schools dormitories and classroom doors and windows should be enough and easily accessible for escape in case of fire emergency.

5.4 Suggestion for Further Research

The researcher suggests the following for the further studies

- (i) Establish the level of awareness, knowledge and attitudes on impacts of fire outbreak among out of school young people including house girls and boys. This new study can be extended to more districts/regions to explore more information.
- (ii) To school compliance with Tanzania Fire and Rescue Act (2007). The envisaged study would aim to inform school members and community at large about how the issue could be resolved and make a significant impact in reducing the school fire causalities. The study can focus on best options for implementing the Act to meet the intended goals without significantly affecting school operations.

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APPENDICES

Appendix 2(a): Questionnaires:

The purpose of this questionnaire is to collect data which will be used to assess the level of awareness, knowledge and attitudes on impacts of fire outbreak among Standard Seven pupils in Tanzania. The information provided through this questionnaire will be used purely and exclusively for academic purpose and will be treated with top most confidentiality. Your co-operation and assistance will be highly appreciated.

Section A: Pupils Details (please put a tick against your answer [$\sqrt{}$] and also write your answer in the space provided)

1 .Age:	10 years and below []	11 – 14 years []	15 and above [
2. Gender:	Male [] Female []		
3. District:	Morogoro Municipal []	Mvomero []	
4. Name of Sc	chool:		

Section B: Pupils attitude towards the impact of fire Outbreak

Instruction: Please put a tick against your answer [$\sqrt{}$].

 Fire outbreak can occur in areas such as Home, Buildings, Schools or Markets.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

2. Fire Outbreak can cause damage to Home, School or Market properties.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]

(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

3. Fire Outbreak can cause injuries and death to people and other living organisms.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

4. People should not light cigarettes and smoke closer to petrol stations as it can cause fire outbreak.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

5. Every Pupil should be trained in what to do and not to do in case of fire outbreak.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

6. Fire sources such as ash trays, smoking materials, heaters, hot plates, tea pots etc. should be kept well away from beds and bedding.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]

(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

7. It is important for pupils to prepare for fire fighting in case of fire outbreak instead of escaping it.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

8. Every Pupil should be trained in using fire extinguishers.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

9. Teaching pupils about fire safety in schools is a waste of time.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

10. There should be a Law requiring all schools to train staff and pupils about fire accident.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

Section C: Pupils knowledge on impact of fire outbreak

Instruction: Please put a tick against your answer [$\sqrt{}$] and also write your answers in the spaces provided.

1. I know about the different types of fire outbreak.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

2. I know about the causes of different types of fire outbreak.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

3. I know about fire triangle and its components.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

4. I know about different types of fire extinguishers.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

5. I here is little I can do to prevent fire in my nom	n do to prevent fire in my home.
--	----------------------------------

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

6. It is best to open the windows in a room containing a fire to keep the smoke from filling the hallway.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

7. I know about the use of fire extinguishers.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

8. I know about dos and don'ts in case of fire outbreak.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

- 9. When a fuel tanker got an accident and crushed, people should avoid gathering at the accident site to loot the fuel.
 - (a) Strongly agree []

(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

10. Most people who die in fires are killed by smoke, gases or lack of oxygen and not by the flames.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

11. Educating the public about fire prevention will do much to reduce the number of fires.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

- 12. Suppose one member of your family is having a motorbike and he store petrol in his sleeping room, and the daughter came with lighter and house got fire; can you tell what steps are you going to take to fight the fire? Give three.
 - (i) _____
 - (ii)_____
 - (iii) _____
- 13. Suppose one member of your family is having a house roofed with grasses and the daughter came with lighter and house got fire; can you tell which steps are you going to take to fight the fire? Give two steps.
 - (i) _____
 - (ii)_____

- 14. Suppose one member of your family is using gas in cooking and the daughter came with lighter and house got fire; can you tell what steps are you going to take to fight the fire? Give three steps.
 - (i) ______(ii) ______(iii) ______

Section D: Pupils accessibility to sources of information on fire outbreak

Instruction: Please put a tick against your answer [$\sqrt{}$].

_

1. I get information on Prevention of Fire Outbreak through Parents and Guardians.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

2. I get information on Prevention of Fire Outbreak through schoolmate and friends.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

3. I get information on Prevention of Fire Outbreak from the subject taught.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

4. I obtain information on Prevention of Fire Outbreak through excursions and field trips.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

5. I obtain information on Prevention of Fire Outbreak through books that I read.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

6. I obtain information on Prevention of Fire Outbreak through school posters and reading material.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

7. I obtain information on Prevention of Fire Outbreak through programs on Radio and Television.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

8. I get information on Prevention of Fire Outbreak through Newspapers and Magazine.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

9. I obtain information on Prevention of Fire Outbreak through Computer networking and Internet.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

10. I obtain information on Prevention of Fire Outbreak through mobile phones.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

Section E: Pupils awareness on first aid rendering on different types of fire victims

[]

Instruction: Put a tick against your answer [$\sqrt{}$].

- 1. If my friends' clothes catch on petrol fire I will ask him/her to run away.
- (a) Strongly agree

(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

2. To extinguish my friend's clothing due to spill of petrol, I will use a jet of water directly to his/her body.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

3. I can use water or wet clothes to cool the burned parts of my friend's body.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

4. Burned part should not be medicated with oilments or other drugs as these would only mask the part.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

5. Wild fire like what happens at Mount Uluguru in Morogoro Region increases scarcity of water at my place due to drying of water source.

(a)	Strongly agree	[]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

6. We should stop burning forest as it causes many environmental problems like scarcity of rainfall.

(a)	Strongly agree	[]
(b)	Agree	[]

(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

Prolonged dry season, scarcity of drinking water and food to animals are resulted from the burning of forests and mountains.
 (a) Strongly agree

(a)	Strongly agree	Ĺ]
(b)	Agree	[]
(c)	Disagree	[]
(d)	Strongly disagree	[]
(e)	Don't know or no answer	[]

Appendix 2 (b): Dodoso

Madhumuni ya dodoso hili ni kukusanya taarifa ambazo zitatumika kutathmini kiwango cha ufahamu, Maarifa na mtazamo kuhusu athari za mlipuko wa moto miongoni mwa wanafunzi wa Darasa la Saba nchini Tanzania. Taarifa zitakazotolewa kwa kupitia dodoso hili zitatumika kwa madhumuni ya kitaaluma tu na zitashughulikiwa kwa usiri wa hali ya juu. Ushiriki wako na msaada wako utathaminiwa sana.

Sehemu A: Taarifa za Mwanafunzi (Tafadhali weka alama ya vema [$\sqrt{}$] katika nafasi uliyopewa)

- 1. Umri: Miaka 10 na chini ya miaka 10 [] Miaka 11 14 [] Miaka 15 na zaidi []
- 2. Jinsia: Mwanaume [] Mwanamke []
- 3. Wilaya: Manispaa ya Morogoro [] Mvomero []
- 4. Jina la Shule: _____

Sehemu B: Mtazamo wa mwanafunzi kuhusu mlipuko wa moto

Maelekezo: Weka alama ya vema [$\sqrt{}$] katika jibu utakalochagua []

1. Mlipuko wa moto unaweza kutokea katika mazingira kama vile nyumbani, kwenye majengo, shuleni au sokoni.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

2. Mlipuko wa moto unaweza kusababisha uharibifu wa mali nyumbani, shuleni au sokoni.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

3. Mlipuko wa moto unaweza kusababisha majeraha na kifo kwa watu na viumbe hai vingine.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

4. Watu hawatakiwi kuwasha sigara na kuvuta karibu na vituo vya mafuta kwa sababu itasababisha mlipuko wa moto.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

5. Kila mwanafunzi anapaswa kupewa mafunzo kuhusu nini cha kufanya na nini kisifanywe unapotokea mlipuko wa moto.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

6. Vyanzo vya moto kama vile trei za majivu, vifaa vya kuvutia sigara, kipashamoto, sahani za moto, birika za chai n.k, vinapaswa kuwekwa vyema mbali na vitanda na matandiko.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

7. Ni muhimu kwa wanafunzi kujiandaa kupambana ukitokea mlipuko wa moto badala ya kuukimbia.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

8. Kila mwanafunzi anapaswa kupewa mafunzo kuhusiana na matumizi ya vifaa vya kuzima moto.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

9. Kuwafundisha wanafunzi shuleni kuhusu usalama wa moto ni kupoteza muda.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

10. Kunapaswa kuwa na sheria inayozitaka shule zote kufundisha watumishi na wanafunzi kuhusu ajali za moto.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

Sehemu C: Maarifa ya wanafunzi kuhusu athari za mlipuko wa moto

Ninajua kuhusu aina tofauti za mlipuko wa moto.

1.

Maelekezo: Weka alama ya vema [$\sqrt{}$] katika jibu lako pia andika majibu yako katika nafasi ulizopewa.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

2. Ninajua kuhusu vitu vinavyosababisha milipuko mbalimbali ya moto.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

3. Ninajua kuhusu pembe tatu ya moto na vipengele vyake.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

4.	Ninajua kul	nusu aina tofauti za vizima moto.	
	(a)	Nakubali kabisa	[]
	(b)	Nakubali	[]
	(c)	Sikubali	[]
	(d)	Sikubali kabisa	[]
	(e)	Sijui au hakuna jibu	[]
5.	Ninaweza k	cufanya kidogo kuzuia moto nyumbani kwang	gu.
	(a)	Nakubali kabisa	[]
	(b)	Nakubali	[]
	(c)	Sikubali	[]
	(d)	Sikubali kabisa	[]
	(e)	Sijui au hakuna jibu	[]
6.	Ni vizuri z	zaidi kufungua madirisha kwenye chumba	kinachowaka moto ili
	kuzuia mos	hi usijae.	
	(\mathbf{a})	Nakuhali kahisa	ГЛ
	(a)	Ivakubali kabisa	Ĺ
	(a) (b)	Nakubali	[]
	(a) (b) (c)	Nakubali Sikubali	[]
	(a) (b) (c) (d)	Nakubali Sikubali Sikubali kabisa	[] [] []
	(a) (b) (c) (d) (e)	Nakubali Sikubali Sikubali kabisa Sijui au hakuna jibu	[] [] [] []
7.	(a) (b) (c) (d) (e) Ninajua kul	Nakubali Sikubali Sikubali kabisa Sijui au hakuna jibu nusu matumizi ya vifaa vya kuzima moto.	
7.	(a) (b) (c) (d) (e) Ninajua kul (a)	Nakubali Sikubali Sikubali kabisa Sijui au hakuna jibu nusu matumizi ya vifaa vya kuzima moto. Nakubali kabisa	
7.	(a) (b) (c) (d) (e) Ninajua kul (a) (b)	Nakubali Sikubali Sikubali kabisa Sijui au hakuna jibu nusu matumizi ya vifaa vya kuzima moto. Nakubali kabisa Nakubali	
7.	(a) (b) (c) (d) (e) Ninajua kul (a) (b) (c)	Nakubali Sikubali Sikubali kabisa Sijui au hakuna jibu nusu matumizi ya vifaa vya kuzima moto. Nakubali kabisa Nakubali Sikubali	
7.	(a) (b) (c) (d) (e) Ninajua kul (a) (b) (c) (d)	Nakubali Sikubali Sikubali kabisa Sijui au hakuna jibu nusu matumizi ya vifaa vya kuzima moto. Nakubali kabisa Nakubali Sikubali Sikubali kabisa	[] [] [] [] [] [] [] []
7.	(a) (b) (c) (d) (e) Ninajua kul (a) (b) (c) (d) (e)	Nakubali Sikubali Sikubali kabisa Sijui au hakuna jibu nusu matumizi ya vifaa vya kuzima moto. Nakubali kabisa Nakubali Sikubali Sikubali Sikubali kabisa Sijui au hakuna jibu	[] [] [] [] [] [] [] [] [] []

8. Najua kuhusu nini ninapaswa kufanya au kutofanya ukitokea mlipuko wa moto.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]

(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

9. Ikiwa Lori lenye tanki la kubeba mafuta limepata ajali na tanki likapasuka, watu wanapaswa kuepuka kukusanyika kwenye eneo la ajali kwa ajili ya kupora mafuta.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

10. Watu wengi wanaokufa kwa moto wanauawa na moshi, gesi au kukosa oksijeni na sio kutokana na moto.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

11. Kuelimisha Umma kuhusu kuzuia moto kutasaidia sana kupunguza majanga ya moto.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

12. Endapo mtu mmoja katika familia anamiliki pikipiki na anahifadhi petroli katika chumba chake cha kulala, binti akaja na kiwashia moto kisha nyumba kuwaka moto; Unaweza kueleza ni hatua zipi utachukua kupambana na moto? Eleza hatua tatu.

- 13. Endapo mtu mmoja katika familia ana nyumba iliyoezekwa kwa kutumia nyasi na binti akaja na kiwashia moto na kisha nyumba ikawaka moto; Unaweza kueleza ni hatua zipi utachukua kupambana na moto? Taja mbili.
 - (i) _____ (ii)
- 14. Endapo mtu mmoja katika familia anatumia jiko la gesi na binti akaja na kiwashia moto kisha nyumba ikawaka moto; Unaweza kueleza ni hatua zipi utachukua kupambana na moto? Eleza hatua tatu.

Sehemu D: Upatikanaji wa vyanzo vya taarifa za mlipuko wa moto kwa wanafunzi

Maelekezo: Weka alama ya vema [$\sqrt{}$] katika jibu lako [].

1. Ninapata taarifa kuhusu namna ya kuzuia mlipuko wa moto kupitia kwa wazazi na walezi.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

2. Ninapata taarifa kuhusu namna ya kuzuia mlipuko wa moto kupitia kwa wanafunzi wenzangu na marafiki.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

3. Ninapata taarifa kuhusu namna ya kuzuia mlipuko wa moto kutokana na masomo yanayofundishwa.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

4. Ninapata taarifa kuhusu namna ya kuzuia mlipuko wa moto kupitia matembezi na ziara.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

5. Ninapata taarifa kuhusu namna ya kuzuia mlipuko wa moto kupitia vitabu ninavyosoma.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

6. Ninapata taarifa kuhusu namna ya kuzuia mlipuko wa moto kupitia mabango ya shule na vifaa vya kusomea.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

7. Ninapata taarifa kuhusu namna ya kuzuia mlipuko wa moto kupitia programu katika redio na televisheni.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

8. Ninapata taarifa kuhusu namna ya kuzuia mlipuko wa moto kupitia magazeti na majarida.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

9. Ninapata taarifa kuhusu namna ya kuzuia mlipuko wa moto kupitia kompyuta na mtandao.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

10. Ninapata taarifa kuhusu namna ya kuzuia mlipuko wa moto kupitia simu ya mkononi.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

Sehemu E: Ufahamu wa wanafunzi kuhusu utoaji wa huduma ya kwanza kwa aina tofauti za waathirika wa moto.

Maelekezo: Weka alama ya vema $[\sqrt{}]$ katika jibu utakalochagua [].

1. Ikiwa nguo ya rafiki yangu imedaka moto wa petroli nitamwambia akimbilie mbali.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

2. Kuzima moto kwenye nguo za rafiki yangu iliyoungua moto unaotokana na petroli, nitatumia mpira wa maji moja kwa moja mwilini mwake.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

3. Ninaweza kutumia maji au nguo iliyoloweshwa kupoza sehemu za mwili wa rafiki yangu zilizoungua moto.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

4. Sehemu iliyoungua haipaswi kutibiwa na dawa zenye asili ya mafuta au dawa nyinginezo kwa sababu itafunga sehemu ndogo tu ya jeraha.

	e	
(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

5. Moto wa msituni kama unaotokea Milima ya Uluguru Mkoa wa Morogoro unaongeza uhaba wa maji katika eneo ninaloishi kwa sababu ya kukauka kwa chanzo cha maji.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

6. Tunapaswa kuacha kuchoma misitu kwa kuwa inasababisha matatizo makubwa katika mazingira kama vile ukosefu wa mvua.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

7. Kiangazi cha muda mrefu, uhaba wa maji ya kunywa na chakula cha wanyama ni matokeo ya kuchoma misitu na milima.

(a)	Nakubali kabisa	[]
(b)	Nakubali	[]
(c)	Sikubali	[]
(d)	Sikubali kabisa	[]
(e)	Sijui au hakuna jibu	[]

Appendix 3(a): Interview Guide

- 1. Have you ever witnessed any fire outbreak incidence in your lifetime?
- 2. Do you know the precautions to be taken in case of a fire outbreak?
- 3. Do you have firefighting equipment like extinguisher cylinders in your school?
- 4. Do you know how to use fire extinguishers in case of fire outbreak?
- 5. Have you attended any training program on the use of fire safety facilities?
- 6. Do you know why other people do set fire to burn the forest?
- 7. What can be done to prevent the fire outbreak in our community?

Appendix 3 (b): Mwongozo wa Mahojiano

- 1. Je, ulishawahi kushuhudia mlipuko wa moto maishani mwako?
- 2. Je, unafahamu tahadhari za kuchukua mlipuko wa moto unapotokea?
- 3. Je, kuna vifaa vya kuzima moto kama vile mitungi ya kuzimia moto shuleni kwako?
- 4. Je, unafahamu jinsi ya kutumia vifaa vya kuzima moto mlipuko wa moto ukitokea?
- 5. Je, umewahi kuhudhuria mafunzo yoyote ya kutumia vifaa vya usalama wa moto?
- 6. Je, unafahamu sababu za baadhi ya watu kuchoma misitu?
- 7. Je, nini kifanyike kuzuia milipuko ya moto katika jamii yetu?

Appendix 4: Observation Checklist

- 1. Emergency doors and windows.
- 2. Emergency assembly point.
- 3. Emergency exits/ escapes routes.
- 4. Fire extinguishers (availability and accessibility).
- 5. Fire Fighting and Protection gears (sprinkler systems, hose reels, sand buckets, alarm systems/ fire detectors and water supply) availability and functionality.

Appendix 5: Research Clearance Letter

THE OPEN UNIVERSITY OF TANZANIA

DIRECTORATE OF POSTGRADUATE STUDIES

P.O. Box 23409 Dar es Salaam, Tanzania http://www.openuniversity.ac.tz



Tel: 255-22-2668992/2668445 ext.2101 Fax: 255-22-2668759 E-mail: <u>dpgs@out.ac.tz</u>

REF: PG201801768

Regional Administrative Secretary, Morogoro Region, P. O. Box 650, **MOROGORO.** 12th August, 2020

RE: RESEARCH CLEARANCE

The Open University of Tanzania was established by an Act of Parliament No. 17 of 1992, which became operational on the 1st March 1993 by public notice No.55 in the official Gazette. The Act was however replaced by the Open University of Tanzania Charter of 2005, which became operational on 1st January 2007. In line with the Charter, the Open University mission is to generate and apply knowledge through research.

To facilitate and to simplify research process therefore, the act empowers the Vice Chancellor of the Open University of Tanzania to issue research clearance, on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology, to both its staff and students who are doing research in Tanzania. With this brief background, the purpose of this letter is to introduce to you **Mr. Amasi**, **Athumani Salumu, Reg No: PG201801768** pursuing **Master of Science and Environmental Studies**. We here by grant this clearance to conduct a research titled "Assessment of Standard Seven Pupils Awareness, Knowledge and Attitude on Impacts of Fire Outbreak: A Case of Morogoro Municipal and Mvomero District, Tanzania". He will collect his data in your region at Morogoro Municipality and Mvomero District between 15th August to 10th September 2020.

In case you need any further information, kindly do not hesitate to contact the Deputy Vice Chancellor (Academic) of the Open University of Tanzania, P.O. Box 23409, Dar es Salaam. Tel: 022-2-2668820.We lastly, thank you in advance for your assumed cooperation and facilitation of this research academic activity.

Yours Sincerely,

a Su dans.

Prof. Hossea Rwegoshora For: VICE CHANCELLOR THE OPEN UNIVERSITY OF TANZANIA