GHANA INSTITUTE OF JOURNALISM

ACHIEVING EFFECTIVE RISK COMMMUNICATION FOR DISASTER PREVENTION IN GHANA – A STUDY OF GHANA NATIONAL FIRE SERVICE

PRINCE BILLY ANAGLATE

A DISSERTATION SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES AND RESEARCH, GHANA INSTITUTE OF JOURNALISM IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF ARTS IN PUBLIC RELATIONS

OCTOBER, 2015

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DECLARATION

I declare that, except the acknowledged sources, I personally, under supervision, undertook the study herein submitted.

..... 26/02/2016

Signature Date

PRINCE BILLY ANAGLATE

(Student)

I declare that I have supervised the student in undertaking this dissertation and I confirm that the student has my permission to present this work for assessment.

..... 26/02/16

Signature Date

MISS PAULINA KURANCHIE

(Supervisor)

DEDICATION

I dedicate this work to the Almighty God for His gift of life and provision of knowledge and wisdom during this period of study. Also to all fire fighters who have dedicated their lives to save others.

ACKNOWLEDGEMENTS

I would like to express my utmost gratitude to the Almighty God for helping me through with this dissertation. My deepest appreciation goes to my supervisor, Miss Paulina Kuranchie, for her excellent guidance, care, patience, motivation, enthusiasm, immense knowledge and providing me with an excellent atmosphere for doing the research. I say God richly bless her.

Additionally, I appreciate all my lecturers at the Ghana Institute of Journalism. I am very grateful. I would also like to thank my family, who supported and encouraged me in spite of all the time it took me away from them.

Finally, I would like to thank my wife, Veronica Anaglate for all her prayers and care. She was always cheered me up and stood by me through the good and bad times.

And to all who contributed in one way or the other, you are dearly remembered.

ABSTRACT

This research aimed to determine the Disaster Risks Communication and Reduction activities, particularly early warning, education being implemented in Accra metropolis especially the market areas. The findings from this research delved into the various risks communication channel through which hazards are communicated. The research also focused on the various stakeholders responsible for communicating hazards. This thesis addresses this uncertainty via a qualitative research study that sheds light on the meaning of risk communication, despite such uncertainty, by revealing a discrete number of qualitatively different ways in which disaster managers and disaster educators experience and understand public education. Transcriptions of interviews of three such senior Accra disaster managers (GNFS, AMA, ECG) and sixty traders from the market were analyzed using qualitatively different ways of experiencing public education on risk communication. The results suggested multiple ways to improve public education within the fire disaster management community and more widely. The need for clarity in communication amongst educators and professionals in regard to public communication channels and education was confirmed by the research findings.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The devastating nature of fire outbreaks in Ghana has brought in its wake various schools of thought about how disasters should be managed in this country. It is against this backdrop that disaster management institutions like the Ghana National Fire Service should in corporate risk communication process into their operations. The Ghana National Fire Service has been mandated by ACT 537 of 1997 to manage and prevent undesired fires in the country .In line with this mandatory requirement and framework, the G.N.F.S. finds itself as one of the disaster oriented organizations with the responsibility to protect people, national and strategic installations against the ravages of fire and any other live threatening situations.

In recent times, Ghana has witnessed numerous fire out-breaks which has brought untold hardships to the victims. The recent fire outbreak at the Central Stores of the Ghana Health Service in Tema, is a classic example of how fire as a disaster, can cripple national development. This and other issues such as the Kantamanto Fire, Makola Fire and Tamale Teaching Hospital Stores fires bring on the discussion table the essence of risk communication in disaster prevention. Risk communication is concerned with the scientific evaluation of risks, the perceptions lay people have to them, and actions that are warranted light of the degree of risk and people tolerance of them "(Palancher & Health, 2002, p.127). Fire is a disaster and its risky nature brings about destruction of properties and human lives.

Available statistics at the Ghana National Fire Service indicated that property lost through fire outbreaks in 2014 amounted to sixteen million ,four hundred and eighty –four thousand, three hundred and fifty-six Ghana Cedis (GH¢ 16,484,35 6). The wanton loss of property through fire outbreaks and other interrelated factors have led to the emergence of interest in risk communication as a disaster prevention tool.

Risk communication may have the goal of encouraging a particular behaviour to guard against an immediate individual risk (e.g. Switching off electrical equipment when not in use) or in the context of large-scale society risk, such as those of a fire outbreak, communication may be a statutory part of emergency planning process (Handmer and Penning-Roswell, 1990).

The study and practice of risk communication is relatively new development, with most relevant literature appearing after the publication of the original Royal Society Report in 1983. The increased interest in this particular topic indicated by the many papers published and conferences held in a very short time span, represents a significant proportion of the more general expansion of social science activity in the risk field since 1983. Examples of such published reports are Daily Graphic, Monday June 17, 2013. Ghana records 265 fires in two weeks of 2013 Daily Graphic; Saturday June 15, 2013. 2,201 fires recorded in first quarter of the Year.

Although most of the available literature purports to give practical advice to risk managers, to date few definitive empirical studies of risk communication, and in particular of its consequences and effectiveness are available.

General interrelated factors have led to the emergence of interest in risk communication research. In practical terms, there is an increasing requirement both in legal as well as moral terms, placed upon government and private industry to inform populations about the environmental, technological and health hazards to which they might be exposed. Risk communication may have the goal of encouraging a particular behaviour to guard against an immediate individual risk (for example, wearing of seatbelts when travelling in a car) or in the context of large-scale societal risks, such as those of fire outbreaks, communication may be a statutory part of the emergency planning process (Handmer and Penning,1990).

Risk communication is concerned with the "Scientific evaluation of risks, the perceptions lay people have to them, and actions that are warranted in light of the degree of risk and people tolerance of them" Palancher & Heath (2002: p127). Risk communication is thus vital in the risk management process. This dissertation examines risk communication in Ghana with focus on fire outbreaks in the major central markets of Accra, Makola and Katamanto.

1.2 Statement of the Problem

Generally, substantial funds are expended annually world-wide on risk communication programmes to promote natural hazard preparedness. The adoption of these measures facilitates a capacity for coping with the temporary disruption associated hazard activity and with minimizing damage and insurance costs. Despite these efforts, the level of preparedness with communities has fallen short of expectations (Lindell and Whitney 2000), leaving households, and industries vulnerable to subsequent hazard effects.

The Ghana National Fire Service has been mandated to organize public fire educational programmes to sustain and create awareness of the dangers of fire as well as to heighten the role of the individual in the prevention of fire (ACT, 537 of 1997). This policy requirement underscores the need for the G.N.F.S. to use risk communication processes as a disaster (fire) prevention mechanism. Although most of the available literature purports to give practical advice for risk managers, to date few definitive empirical studies of risk communication, and in particular of its consequences and effectiveness are available. Risk communication is thus vital in the disaster prevention process.

Although a number of studies have been conducted on risk communication in developed countries, there is limited research on risk communication in developing countries, and most especially in Ghana. It is to address the dearth of information that this study is being undertaken to examine risk communication in Ghana with particular focus on fire in the Accra metropolis.

1.3 Research Objectives

The study seeks to address the following objectives;

1. To ascertain the perception and attitudes of traders in fire prevention
2. To ascertain fire prevention approach by Authorities.
3. To investigate if the G.N.F.S. uses risk communication as a fire disaster prevention tool
4. To examine the types of risk communication techniques used by the G.N.F.S.
5. To assess the effectiveness of risk communication techniques used by G.N.F.S. in fire disaster prevention
6. To ascertain the challenges encountered in risk communication as a fire disaster prevention tool by the G.N.F.S.
7. To examine problems which militate against effective management of domestic fires in the Accra Metropolis?

1.4 Research Questions

1. What is the process of Risk Communication and what techniques are used by the G.N.F.S.?
2. What are the roles played by the relevant institutions in the management of domestic fires in Accra Metropolis?
3. How effective are Risk Communication as a disaster prevention tool?
4. Which department in the G.N.F.S. uses risk communication processes and how?

5. What problems militate against effective management of domestic fires in Accra Metropolis?

1.5 Scope of the Study

This study focused on fire outbreaks in Makola and Kantamanto markets in Accra.

1.6 Organization of the Study

The study is divided into five main chapters; chapter one discusses the introduction of the study, background to the study, statement of the problem statement, objectives of the study, research questions, significance of the study, and organization of the study.

Chapter two presents a review of relevant literature on the topic outlining other empirical studies on the subject. Chapter three includes the methods to be employed for the study. It contains the research design, population, sample and sampling procedures as well as data collection procedures. Chapter four presents research findings and discussions. Finally, chapter five discusses the summary of findings, conclusions and recommendations that can be adopted to for further studies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature on existing body of knowledge and recorded work produced by researchers and scholars relevant to the current study. The literature review helps researchers to identify research gaps in order to come out with research problem. It also helps to underpin the research work against existing body of knowledge to come out with their strength and weaknesses. Literature review further provides an opportunity to learn more about a given topic and also to create support or a rationale for engaging in a particular area of proposed research. The literature also contextualize within existing knowledge and consideration of the relevant theoretical perspectives and models that apply to communication in multiple risk phases such as global perspective of Risk Communication and its Significance, the Processes of Risk Communication, Reasons For Conducting Risk Communication, the various factors that affect Risk Communication as well as the Risk Communication Models.

2.2 Risk Communication

Risk Communication is of essential significance to the management of risks. It allows people to partake in, or be efficiently represented in decisions about managing risks. And it plays a fundamental part in putting decisions into practice-whether helping people to comprehend regulations, informing them and advising them about risks they can manage themselves, or dissuading them from antisocial activities.

The US National Academy of Science defines risk communication as' an interactive process of exchange of information and opinion among individuals, groups and institutions. It involves multiple messages about the nature of risk and other message, not strictly about risks, that express concerns, opinions, or reactions to risk message or to legal and institutional arrangements for risk management. '' Cited in Covello, 1998. Risk communication is thus concerned with the "scientific evaluations of risks, the perceptions lay people have of them, and actions that are warranted in light of the degree of risk and people's tolerance of them" (Palanchar and Heath 2002, p. 127).

Risk Communication in general aims at influencing a particular perception of risk and subsequently behaviour. Palanchar & Heath argue that the objective of risk communication is an attempt to take into consideration the diverse perception of risk to basically minimize conflict. They further indicate that the essential feature of risk communication is not to create some all-encompassing solution but to enhance dialogue and cooperation by establishing realistic common goals for people with differing expectations. Finding the appropriate form of communication between different groups with different perceptions contribute to a butter mutual comprehension of a given risk, thus there is an interface between risk perception and risk communication.

Risk means different things to different people and it is imperative that the risk associated with hazards is effectively communicated. Risk Communication aims at persuading individuals to change their attitude towards a specific hazard.

Effective risk communication depends on the actual and perceived characteristics of the communicators, the message communicated and the recipients. If the message is inappropriately presented or framed for the audience and / or the risk issue discussed, the risk communication process is likely to be unsuccessful (The University of Leicester, 2001). Risk Communication may in other words be defined as the techniques used by risk managers to inform the general public of the risk pertaining to products and / or activities, with a view to influencing behaviour.

The aims of risk communication should therefore be, to enable the effective participation and/or representation of all interested and affected parties in making decisions about how to manage risks and also to support the most effective implementation of risk management decisions. Effective risk communication is thus a professional discipline whose application requires knowledge, planning, preparation, skills, and practice (US National Research Council, 1989). As part of this process, non-experts acquire information about the risk in question and about the assessment and management of the risk. Experts and risk management authorities acquire, in turn, information about the interests and concerns of stakeholders (Nelkin, 1989). Despite this interactive perspective, evaluation studies indicate that personnel from many agencies and organizations involved in risk controversies, lack the knowledge, sensitivity and skills needed for effective risk communication (Fischoff, 1995; Chess, Salomone, Hance and Saville, 1995)

In many countries, the development of legislation in the risk area has led to increased pressure on local communities to inform the public about hazards and emergency plans in their area. The question of how people should best be informed and how they may react to this information has

thus come to be an issue for both practitioners and researchers (Gow & Otway, 1990; Fisher, 1991). Communication activities and approaches are framed principally in the milieu of policy and management, rather than in the framework of staff "in the field" integrating with the public. (Inter-Department Liaison Group on Risk Assessment (ILGRA), Risk Communication: A Guide to Regulatory Practice, 1998).

An Authority decides if the management should be the prefecture of personal choice, regulation, or a combination of the two. Whichever route is taken, risk communication is vital to the two key regulatory activities: making and executing decisions about risk management. Communication is essential in choosing the right route and in doing the job well, and is a risk management alternative in its own right. In this situation, communication is often the foremost instrument of putting policy into practice. Communication is an option to regulation. It can mollify the emotions of minority pressure groups, and eradicate the need for unwarranted legislation. (Inter-Department Liaison Group on Risk Assessment (ILGRA), Risk Communication: A Guide to Regulatory Practice, 1998).

As regards the regulation of the activities of individuals or industries to protect those exposed to the risk, there is a more intricate set of communication requirements including:

- Gaining a compromise on the level of risk one person/group may impose on another
- Devising regulations generally accepted as open-minded and even-handed
- Ensuring all involved comprehend the regulation and how to conform to them
- Enforcing compliance on those who disregard regulations.

- Making sure that those at risk have access to information about: the risks, the controls put in place by those who generate them, and what they themselves can do to reduce the risk.
- Monitoring and upgrading the rules, their significance and recognition, and compliance with them. (Inter-Department Liaison Group on Risk Assessment (ILGRA), Risk Communication: A Guide to Regulatory Practice, 1998).

High-quality regulation depicts a society's informed resolves and preferences. It enables people to partake in decisions and to lend a hand readily with compliance. This can only be done by communication-listening to and engaging people, as well as informing them . (Inter-Department Liaison Group on Risk Assessment (ILGRA), Risk Communication: A Guide to Regulatory Practice, 1998).

Good regulation should:

- Allow people to make and participate in their own decisions about risks
- Make provision for people's views and preferences in decisions about risks which affect them
- Execute decisions about risk management efficiently, once they have been made.

From the above discussion it is clear that risk communication ought to be multidirectional rather than directional, a discussion instead of a sermon. The judgement that risk communication should be multi-directional is well established in the literature about risk communications but not yet in its practice. Whether the process is one-directional or multi-directional, and whether the objective is persuasion or information, risk communications typically start out with a fissure they

hope to bridge between their assessment of a particular risk and their audience's assessment (Sandman, 1994).

Risk Communication therefore, plays a very essential and significant role in management of risk. It enables people to partake in, or be efficiently represented in decisions about managing risks. Risk communication also plays a fundamental part in putting decision into practice-whether helping people to comprehend regulations, informing them and advising them about risks they can manage or mitigate themselves, or dissuading them from antisocial activities.

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In many countries, the development of legislation in the risk area has led to increase pressure on local communities to inform the public about hazards and emergency plans in their area. The question of how people should best be informed and how they may react to this information has thus come to be an issue for both practitioners and researchers (Gow and Otway, 1990; Fisher, 1991). Communication activities and approaches are framed principally in the milieu of policy and management, rather than in the framework of staff "in the field" integrating with the public. (Inter-Departmental Laison Group on Risk Assessment (ILGRA), Risk Communication: AGuide to regulatory Practice, 1998).

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2.3 Process of Risk Communication

The 1992 Royal Report identifies four (4) main conceptual approaches to risk Communication. The first approach describes risk communication framework, that is, in terms of a "top-down" one way dissemination of some messages about a hazard or risk from a particular expert communicator devalues the perspectives and knowledge of the risk bearers as well as masks the political aspects to many of the risk conflict in society (Otway and Wynne, 1989; Stern 1991)

ILGRA found many examples of good and improved practice in risk communication in government department, but it also found that communication sometimes engages people in discussion and debate. Furthermore, there is time when communication is "bolted on" rather than into decision making process. That risk communication is fundamentally one- way endeavour with a recognized audience to be warned or reassured and a source to do the warning or reassuring effectively is a crucial and very contentious assumption. For the assumption to be less controversial, at least other interrelated assumptions must be accepted as well:

1) That the source knows more about the risk than the audience;

2) That the source has the audience's welfare at heart,

3) That the source's recommendations are high and dry in real information, not just in values or preference.

In many risk communication interactions, these stipulations are not fulfilled. The criterion for effective risk communication stresses the process of communication as two way exchange dialogue. This approach characterizes risk communication as an interactive process of exchange of information and opinion among individuals, groups and institutions. This approached emphasizes the crucial role that feedback and interaction play in any intricate communication between groups to a risk issue in the search for mutual comprehension.

This approach is preferred by the US National Research Council (NRC 1989). They have four principal reasons for conducting risk communication.

These are the:

i. Desire by government to inform

ii. Desire by government or industry to overcome opposition to decision

iii. Desire to share power between government and public

iv. Desire to develop effective alternative to direct regulatory control.

Another approach to risk communication goes beyond the exchange information between actors only, but stretches to the wider institutional, cultural and regulatory contexts within which risk messages are developed, evolutionalized and entrenched. This approach implies that all hazards have history, and that this will influence interpretations of risk messages (Frescenden, 1987; Krimsky and Plough, 1988). The only most important result of such an endeavour is to have a clear and an agreed statement of the minimum communication objectives necessary for regulatory success.

Many of the issues to be articulated when defining risk communication activities needed for the regulatory approach have been discussed by the Inter-Departmental Liaison Group on Risk Assessment.

They are:

What are some of the issues to be articulated when defining risk communication activity? Is it in response to a specific event, a new circumstance or a general concern?

- What are the objectives of your regulatory activities, both quantitative and qualitative?
- How does your regulatory activities with existing regulation and the risk communication already in place.
- How do you intend to give people information to enable them to protect themselves from risks and also ensure protection for people exposed to risk by the action of others?
- Determine who will be affected by or might believe have a legitimate interest in either the risk involved or the process that might be used for their control.
- Ascertain how each of the stakeholders will participate in the decision process, either directly or through representatives
- Determine who decision maker is. Will it be the regulator, public representatives, or a wider audience affected by the risks or with duties to control the risks?
- Determine the communication implications of each alternative you are taking into account.

As regards developing good risk communication practice, the Inter-Department Liaison Group on Risk Assessment (1998) has further indicated that three principles related to the input, output, and management of the process of risk communication by a regulatory organization. The principals are listening to the stakeholder, tailoring risk messages appropriately and managing the risk communication.

On the issues of listening to stakeholders, the regulatory Agencies need to identify and engage with all those stakeholders concerned and affected by each risk issue. They need to endeavour to comprehend their attitudes to risk and risk control measures. Their views and preference should be integrated into policy and practice. Where practical and suitable, those affected should be involved in or empowered to take decisions about risks and their control. (Inter-Departmental Liaison Group on Risk Assessment (ILGRA), Risk Communication: A Guide to Regulatory Practice, 1998).

On tailoring risk messages, government messages and communications about risk, should be tailored to their audience and purpose. It is recommended that attention be paid to:

- Engaging and demonstrating empathy with the audience
- Displaying openness and responsiveness to audience emotions fears and apprehension.
- Demonstrating trustworthiness, competency and dedication.
- Articulating the benefits of proposed and/ or different options for the audience.

Tailoring the message relates to outward communication, from Government to the public. There should be a good understanding of people's current knowledge, beliefs and opinion these are absolute prerequisite for effective outward communication. As regards the management of the process, ILGRA (1998) indicates that Risk communication is always imperative for policy success. Thus clear, well- defined risk communication management processes and procedures are needed.

These should cover setting goals, allocating responsibilities, planning, implementing, monitoring and evaluation. Since risk communication matters enormously to a risk regulator, it is important to have well defined process to establish the necessary risk communication objectives, and to deliver against them.

The final risk communication approach assumes that risk communication is viewed as an important prerequisite to empower the risk- bearing parties in society, this enables people to take part adequately in decision making about risks. Although all hazardous events are unique, the community response may possess sufficient similarity for this process to be modelled (Lindell and Whitney 2000; Paton and Bishop 1996; Tobin, 1959; Van den Eyde and Vens, 1999).

An important issue here concerns the risk which underpins the conceptualisation of the problems to be understood and the strategies implemented to contain or resolve them. The oriented of work in this area has progressively moved from a deficit loss paradigm to one emphasising community resilience (Omar and Alon, 1994; Tobin, 1999; Van den Eyde and Veno, 1999, Violent, 2000). This alternative paradigm has been described using terms such as resilience. (Authonovsky, 1993; dunning, 1999; Tobin, 1999), competency (Cottrell, 1976) or strengths (Bravo, 1990).

The term "resilience (Dunning, 1999) encapsulates a paradigm shift that accommodates the analysis and facilitation of growth. Resilience describes an active process of the self-righting, learned resourcefulness and growth – the ability to function psychologically at a level far greater

than expected given the individuals capabilities and previous experiences. Dunning (1999) further described resilience as comprising three components: dispositional, cognitive, and environmental. Dispositional resilience reflects how personal characteristics (hardness) affect adjustment. The cognitive components are concerned with the individual's sense of coherence and meaning. The final element is the environment that fosters and sustains resilience.

Community resilience should be conceptualized and managed in a contingent rather than a prescriptive manner. Comprehending the nature of these contingent relationships has implications for managing the allotment of finite resources and for scheming risk reduction and communication strategies (Paton & Johnston, 2001)

A universal denominator should be conceptualization of the response to adversity is an acknowledgement of communities being able to draw upon internal resources and competencies to manage the demands, challenge and adjustments encountered (Paton & John, 2001). Furthermore, several of these conceptualizations acknowledge the possibility that exposure to disaster and adversity can result in personal, community and professional growth and development (Bravo, 1990; Holman and Silver, 1998 Kreps, 1984; Schwarzer, 1994).

Testing the utility of this framework requires the identification of variables capable of predicting of community resilience to hazard effects. Variables that fall into this category are "sense of community" "coping style", self – efficacy' and 'social support" (Patson & Johnsom, 2001). Self – efficacy describes individual's appraisal of what they are capable of performing , and influences people receptivity to information and the likelihood of their acting to deal with hazard

consequences (Bacharach and Zantra, 1985; Bisop, 2000; Bandura 1997; Lylons, 1991; Yates 1999).

Supplementary to promoting the competence and resilience of community members, the espousal of a growth-oriented strategy may provide a context favourable to supporting resilience overtime. For example, a deficit or loss of paradigm leads to strategies where community members are urged to spend money and reinforce their houses or build to reduce losses from floods (Paton & Johnson, 2001)

Maintaining empowerment and as a result, the competencies that underpin resilience to adversity, will involve consolidating collective effectiveness, and maintaining a sense of community identification and belonging. This will not only improve risk communication effects on the community, but also promote and maintain an ability to respond to adversity in a manner that minimizes loss and disruption and promoted growth. This can be more readily accomplished through projects and activities that maintain community participation in problem solving (Paton, Smith and Violanti, 2000)

Bennet and Murphy (1997) describe a model linking risk perception and risk reducing behaviour. They articulate the point that while perception of a threat remains a relevant precursor, the key factors are action- outcome expectancies (consideration of whether risk may be reduced) and self-efficacy (whether the required actions are within the capabilities of the individual)

judgements. Because people make assumptions about the possible ramifications of their actions before considering engaging in that behaviour, action-outcome expectancies precede self-efficacy judgments (Paton and Johnston 2001).

The number and quality of action plans is strongly dependent on one's perceived competence and experience. Self-efficacy also determines the amount of effort and perseverance invested in risk reduction behaviours. Finally, this behaviour is more likely to be sustained if supported by the social and structural environment. This suggests that the effectiveness of this model will be enhance by integrating it with the community development process (Tobin, 1999)

The process is also consistent with all hazards management framework. The emergency management role involves assimilating and coordinating the perspectives/ needs derived from community discussions within a strategic context , and seeking , as far as possible , to make available the information and resources necessary to sustain empowerment, self-help and resilience. Emergency management agencies thus act as consultants to communities rather than directing the change process (Paton & Johnson, 2001)

As regards hazards education, communities should be provided with hazard scenarios that describe the possible challenges, opportunities and threats faced by a community from hazards activity, and promotion of strategies to manage or control them. That scenario can be used to extract their hazard perceptions and the information and resources requirements necessary for

their formulation and adoption of mitigation strategies, consistent with their beliefs, needs and goals.

2.4 Factors that affect Risk Communication

It is frequently assumed that providing, informing and educating the public on hazards and how to mitigate their consequences to the public will encourage preparation. This assumption is unfounded (Smith, 1993). Despite considerable efforts and expenditure on public hazard education, levels of preparedness remain low (Ballantyne, Paton, Johnston, Kozuch, and Daly, 2000; Duval and Mulilis 1999; Lindell and Whitney, 2000, McClure, Walkey and Allen, 1999).

In other words, while considerable work has been directed to understanding how to construct effective risk messages care must be taken with regard to assuming that the provision of information on hazards or risk will facilitate the adoption of preventive measures (Nathe, et al 1999). It is important to take into consideration factors affecting people's willingness to avail and prepare themselves in the design of risk communication and information to the public.

Public hazard education progrmmes may actually minimise perceived risk and levels models of preparedness (Bellentyne, 2000). Furthermore, a significant discontinuity between people's risk beliefs and their levels of preparation suggest that acceptive decisions are predisposed to additional motivational and interpretational process. These findings underscore the need for a more methodical comprehension of the reasoning and judgment that underpin decision regarding disaster preparedness.

Several models of protective behaviour describe how the relationship between motivating factors and risk reduction behaviour is mediated by intentions. (Abraham, Sheran and Johnson, 1998; Ajen, 1991; Bagozzi, 1992; Bennett and Murphy, 1997; Gollwitzer, 1993). It can be inferred from this that adoption process will comprise three phases, each influences by a specific set of variables.

Risk perception represents a vital precursor variable (Lindell and Whitney, 2000; Lindell and Perry, 1992; Sjoberg, 2000). However, while people may acknowledge the fact that a given hazard can pose a threat, the natural hazards will be reflected in the regularity with which people discuss them. This renders a vital awareness, a potentially essential precursor variable. Only when natural hazards are perceived as significant or grave, by a person, that they are likely to stimulate protection behaviour.

As a result of natural hazards' random and irrepressible characteristics and their potential for creating significant obligation and death, natural hazards is a key contender as a source of anxiety. It has been argued that natural hazards create anxiety that diminish the likelihood people will prepare for them (Duval and Mullis, 1999; Lamontaigne La Rochelle , 2000). There thus exist unassailable reasons for the inclusion of anxiety or fear as a motivating or demotivating factor.

The presence of these factors, risk perception, critical awareness of hazards, and hazard and anxiety are proposed as variables required to motivate protection behaviour (Lindell and Whitney; 2000, Lindell and Perry; 1992 Sjober, 2000). Again, some level of their presence is required for the change adoption process to begin. If present at sufficient levels, people will advance to the next phase, having intentions to adopt.

To develop a full understanding of the preparedness process, it is important and necessary to be confounded by factors that affect adjustment adoption but which are beyond the control of a given individual. The inclusion of "intentions"fufils, this function also introduces a need to consider the possible existence of variables that affect whether intentions are converted into actual behaviour.

Even if favourable hazards preparedness intentions are forms after risk messages are sent, they may not be acted on. The intention-preparedness link could be disrupted if people lack resources for implementation (low response efficacy), if they transfer responsibility for their safety from themselves to other (low perceived responsibility), or if they do not feel a sense of belonging (low sense of community) to their neighbourhood. It has to be pointed out that even if overwhelming (low outcome expectancy) or do not perceive themselves as having the capability to act (low self-efficacy). (Bishop, 2000;Paton 2000;Ballantyne, 2000; Dural and Mullis, 1999; Lindell and Whitney, 2000; Mullis and Dural, 1995;Paton, 2000; Bishop, 2000).

The random and sporadic nature of natural hazard activity means that beliefs regarding the anticipated timing of the next damaging hazard event could moderate the relationship between

intentions and adjustment adoption and thus affect any risk communication process. The longer this time interval is perceived to be, the less likely people are to perceive any urgency to act on their intentions (Mullis and Duval, 19995).

No one strategy will be capable of facilitating change in all variables. For instances, the provision of information based on sound risk communication doctrine would be suitable for facilitation fundamentals such as risk perception, outcome expectancy, and for exchanging perception of the timing of hazards events (Tierney, 2001)

It is however less appropriate as a means of influencing elements such as self-efficacy, problem-focused coping or trust, here strategies based on participation and empowerment would be more appropriate (Dalton , 2001 ; Paton, 2002). Commenting on the assumption that recipients of risk communication automatically assimilate. Comprehend and utilize information in forming and following action plans. John (1999) noted that individuals described themselves, relative to others in their community, as being better prepared to deal with natural hazard effects. He indicates further that by attributing improved preparedness to self, relative to the community as a whole, individuals may accept the need for greater preparedness, but perceived this as applying to others but not to themselves thus the likelihood of their attending to information or acting on warning will be minimized.

Risk communication effectiveness can also be influenced by beliefs regarding existing knowledge. In his research Ballanyne (2000) found that, while 41% of respondents stated a belief in their ability to recite the information on what to do in the event of hazard activity, only 6% could correctly recite it. Thus if people over –estimate their existing knowledge, the likelihood of their attending to public information will be reduced.

This observation also suggests that, while people may recognize the existence of information, this not automatically mean that they will be able to recall and use it when required. It is imperative that the appraisal of message effectiveness in enhancing knowledge and preparedness should Centre on assessing recall and behaviour (Ballantyne, 2000).

Bishop (2000) and Millar (1999) assert that extra technical hitches are introduced by difference in perception, and support for collective mitigation initiatives, was driven less by hazard characteristics and more by their current implications for livelihood. This opinion implies that focusing communication on tangible factors such as actions calculated to protect economic integrity rather than uncontrollable threats such as natural hazards will facilitate action.

As has been indicated above during the discourse on risk communication process, diversity in the manner in which perceived risk is disperse throughout a community adds further difficulty to the communication process and provides materials upon which social strengthening processes can operate (Kasperson, 1992). This process can both diminished communication effectiveness

and lessen the perceived credibility of emergency management, administrative and scientific agencies (Johnson and Paton, 1998).

In the urban contexts, the task of creating effective communication strategies that is consistent with the recipients' beliefs, calculated to meet their requirements and motivate appropriate action is rendered more intricate by the diversity and distribution of vulnerable groups throughout a city (Paton, 1999). As a result, the most cost efficient approach to the fabrication and diffusion of risk messages is rendered less successful, because it assumes a level of community homogeneity with regards to factors like demographics, beliefs resources etc. that is impractical. Evolving effective messages in this context would require taking into consideration, individual and community vulnerability factors, defining relationships between them and hazard effects and then adapting information for complicated task of translating and presenting it in way that accommodates the preconceptions of every group, correct any flaws and in the final analysis make it practically and resource implications of this approach render the whole process unachievable (Paton, 1999).

The evaluation literature has also demonstrates the major barriers to successful risk communication, including conflicts and lack of coordination among stakeholders and inadequate risk communication planning , preparation ,resources, skill and practice (Covello, McCallum and Pavlova 1989; Fischhoff 1995; Chess, Salomone Hance and Saville 1995).

Government officials, industry representatives, and scientist often complain that non-experts and lay people irrationally respond to risk information and do not accurately perceive and evaluate

risk information (Us National Research Council. 1989; McCallum and Pavlova 1989). Representation of citizen groups, worker group, and individual citizens, in turn, often question and argues that government officials, industry representatives, and scientist are often apathetic to citizens concern or unwilling to take action to solve apparently straight – forward problems.

These conflicts are often exacerbated by complicated, puzzling, incoherent, or imperfect risk messages (Cavello , McCallum and Pavlova, 1989) lack of trust in information sources (Renn and Levine, 1991), selective and biased reporting by the media; and psychological factors (heurostic) that affect how risk information is processed (US Environmental Protection Agency ,1990; Sjoberg, 1984). Researchers have indicated that risk communication is based on four theoretical models that explain how risk perceptions are formed, and how risk decisions are made (Covello, 1998, Covello, 1998 and Sandam, 2001). Together, these models provide the groundwork for thinking about and coordinating effective communication in high – concern situations.

2.5 The Risk Perception Model

Many factors affect how risks are perceived and factors can alter risk perception in varying degree of magnitude (Slovic 1987; Covello 1998; Rogers, 1997; Wildavsky and Dake, 1990; Rem, Rums, et al. 1992). Research done by the US National Research Council (1989), and academic like Slovic (1987) have revealed some risk perception factors that have direct relevance to risk communication. These factors play a large role in determining level of concern,

worry, anger, anxiety, fear, hostility, and outrage which, in turn can significantly change attitudes and behaviour (Slovic, 1989; Sandman, 1989).

Levels of concern tend to be most extreme when the risk is perceived to be involuntary, discriminatory, and not beneficial, not under personal control, linked with unreliable individuals or organizations, and associated with dreaded adverse, irreparable outcome (Covello, et al. 2001)

Because of the strong feelings that such perception can generate the risk communication literature often refers to these characteristics as "Outrage" factors (Sandman, 1989). When present, outrage factors take on a resilient moral and emotional overtime, predisposing an individual to react emotionally who can in turn, significantly intensify levels of perceived risk.

Risk perception research suggests that specific activities should ideally be undertaken as part of a risk communication effort (Fischoff, 1989; Wilson and Crouch, 1987). It is imperative to collect and appraise empirical information obtained through surveys, focus groups, or interviews about stakeholders judgments of each of the risk perception factors , in particular trust , benefits, control , fairness and dread. Continuous communication and exchange of information with stakeholders about acknowledged areas of concern is also comprehension of the interested or affected parties regarding stakeholder perceptions and the expected levels of concern, worry , fear , hostility , stress and outrage is essential (Fischoff, 1989).

2.6 The Mental Noise Model

This model focuses on how people process information under stress and how changes in how information is processed affect their communication. When people are in a state of high concern because they perceive significant threat, their ability to process information efficiently is impaired (US National Research Council, 1989; Baron, Hershey and Kunreuther, 2000; Fischoff, 1989).

Where people feel that what they value is being threated, they experience a wide range of emotions, ranging from anxiety to anger. The emotional arousal and/ or mental agitation generated by these strong feelings create mental noise. Exposure to risk associated with negative psychological attributes for example, risk perceived to be involuntary, not under one's control, low in benefits , unfair , or dreaded are also often accompanied by severe mental noise which in turn can interfere with a person's ability to engage in rational discourse (Newirth, Dunwoodry, and Griffin, 2000; Goulf and Walker , 1982).

2.7 The Negative Dominance Model

The negative dominance model describes the processing of negative and positive information in high- concern situations. In general, the relationship between negative and positive information is asymmetrical, with negative information receiving significantly greater weight. (Covello et al., 2001). The negative dominance theory is consistent with a central theorem of modern

psychology that people put greater value on losses (negative outcomes) than on gains (positive outcomes) (Maslow, 1970).

One practical implication of negative dominance theory is that a negative or solution-oriented messages (Covello, 1998). As a result , the use of unnecessary negative dominance theory is that communication that contains negatives, for example , the words , not , never , nothing , non and other words with negative connotations- tend to receive closer attention , and are remembered longer, and have larger effect than positive in dialogue with stakeholders in high-concern situations can be extremely damaging, having the unintended consequence of drowning out positive or solution –oriented information or undermining trust by stating an absolute that is impossible to defend or sustain . More explicitly, risk communications are most effectual when they concentrate on what is being done rather than on what is not being done in response to the potential event. An all – embracing risk communication training opportunities must be identified and provided by all stakeholders in advance of the crisis event.

2.8 The Trust Determination Model

A universal thread in all risk communication strategies is the need to establish trust. Without trust, effective risk communication is not possible (Renn and Levine, 1991; Slovic, 1999, Peters, Cavello and McCalluum, 1997). Only when trust has been established can other goals, such as education and consensus – building, be achieved. Trust can only be built overtime and it's the result of on-going actions, listening, and communication skills (Peters, Covello, McCallum, 1997)

Because of the importance of trust resolving risk controversies, a significant part of the risk communication literature focuses on the application of establish or sustain trust, third party endorsements from trustworthy sources should ideally be undertaken, as it tells the use of four trust determination factors: caring and empathy; dedication and commitment; competence and expertise; and honesty and openness (Slovic, 1999). Evaluation studies reveal that individual or small group settings, such as information exchange and public Workshop, are most effective venue for communicating these trust factors (Covello, 1998; Fishhoff, 1989).

The principle of trust transference states a lower trusted source typically takes on the trust and credibility of the highest trusted source that takes the same position on the issue (Covello, 1999). An advantage of being from a trusted group is that it enables a person to communicate effectively, even when communication barrier exist, however, individuals trust overrides organizational trust. Trust of individuals from a highly trusted organization may significantly increase or decrease depending on how they present themselves (verbally and non- verbally) and how they interact with other (US National Research Council, 1989, Chess, et al. 1995).

Perception of trust is decrease by activities or communications that indicates: disagreement among experts; lack of coordination among risk management organization; inconsideration by risk management authorities to the need for effectives listening dialogue, and public participation; a reluctance to acknowledge risks; an unwillingness to divulge or management responsibility or laxity in fulfilling.

2.9 Communication During the Preparedness Phase

This section reviews dominant theories and models related specifically to communication during the preparedness phase: actionable risk communication, mental models, the affect heuristic, the extended parallel process model, the theory of reasoned action and planned behaviour, and risk information seeking and processing model. Risk communication at the preparedness phase is designed to understand and address the public's awareness and knowledge gaps related to risk events, to elicit desired preparedness behaviours through identifying and utilizing effective communication channels, to ensure adequate understanding, and to educate about what actions to take when messages are issued.

2.9.1 Actionable Risk Communication

The actionable risk communication model encourages action by the general public to limit the risks they face from potential threats, and can inform education campaigns to encourage desired public preparedness (Wood et al., 2011). According to the model, the most effective communicators and motivators for preparedness are not public officials, but rather community members who share information about what actions they have taken to guard against risks with others who are less prepared (Wood et al., 2011). While there still needs to be guidance from emergency planners on how to prepare, the most effective communicators to convey that guidance are community members who themselves have followed ready government's recommended actions, such as preparing an emergency kit.

The actionable risk model is supported by survey evidence that provides insights into communication channels that are effective for risk communication. Empirical studies have shown that to be effective in prompting risk-reduction behaviours, preparedness information must come from multiple sources (Basolo, Steinberg, Burby, Levine, Cruz, & Huang, 2009; Mileti & Fitzpatrick, 1992), be communicated over multiple channels (Rogers, 1985; Smarick, 2010; Turner, Paz, & Young, 1981), and be frequently repeated (Mikami & Ikeda, 1985; Mileti & O'Brian, 1992; Turner, Nigg, Paz, & Young, 1979). For example, a telephone survey of 504 residents of Los Angeles County and the vicinity impacted by an August 2009 wildfire found that people were more likely to follow evacuation messages when they received multiple warning messages over diverse communication channels; specific guidelines about what to do and when further enhanced evacuation behaviours (Smarick, 2010).

Actionable risk communication is most effective for a short period of time following an event when people are most receptive to preparedness communications having just experienced a disaster. This is often referred to as the window of opportunity, as the traumatic experience can be the strongest motivator for people to prepare for future disasters (Mileti, Bourque, Wood, & Kano, 2011). At the same time, individuals who have experienced near-miss events (escaping a risk by chance) may be less likely to prepare for a future event, viewing their good fortune as resiliency (Dillon, Tinsley, & Cronin, 2011). Communicators trying to encourage mitigation activities may need to supplement risk information such as statistics with stories of resilience that counteract lack of preparation encouraged by any near-miss experiences (Dillon et al., 2011).

2.9.2 Mental Models

Effective risk communication requires understanding where the public is coming from in order to convince them to prepare better for risks. Mental models provide a framework to understand pre-existing public perceptions of less-familiar and higher-dread risks and what communication messages can be developed and tested to improve awareness, understanding, and preparedness. These messages can then be ready to release should an event occur (Morgan, Fischhoff, Bostrom, & Atman, 2002). The model examines the choices people face, the beliefs they hold, and experts' relevant knowledge to better understand what information gaps and misperceptions need to be addressed. It also offers a way for the general public to understand how the risks they face are created and controlled, how well science understands those risks, and how significant they seem to be (Morgan et al., 2002).

Mental models are significant at the preparedness stage for two reasons. First, undertaking a mental models approach takes time (weeks or months) and can be resource intensive. It is not a rapid reaction approach. While its outputs can guide communication during the response phase by knowing upfront how the public may perceive the risk event, the process needs to be completed prior to an event so the messages are ready to release. Second, mental models can be effective in assessing the public's understanding of risks to capture the gap between how experts versus the public assess a risk and what are the areas of convergence and divergence. This information can help communicators frame their education preparedness campaigns and inform the public about what the risks are having first established what they know already and areas of misperception.

Morgan et al. (2002) outlined a five-step process for using the mental models method:

1. Review current scientific knowledge to determine the nature and magnitude of a risk to create an influence diagram that visually represents the pooled knowledge of the expert community.
2. Conduct open-ended interviews to elicit the public's beliefs about the hazard, expressed in their own terms.
3. Conduct structured interviews through a confirmatory questionnaire to estimate the populations' prevalence of those beliefs expressed in the open-ended interviews.
4. Draft messages based on the results of the interviews and questionnaire.
5. Evaluate the communications through testing and refining the messages with individuals selected from the target population using one-on-one read-aloud interviews, focus groups, and questionnaires. The last step should be repeated until the message is understood as intended.

Empirical studies that have tested the mental models approach include a study by Decision Partners funded by the Water Environment Research Foundation (WERF) to develop strategic communications for bio-solids professionals. The WERF study mapped stakeholder perceptions (including landowners, residents, and regulators) to inform communication strategies, plans, and draft materials (Eggers et al., 2011).

2.9.3 Affect Heuristic

The term affect heuristic is used to explain how people make risk decisions based on what they have previously experienced and how they analyze a situation. Understanding the affect heuristic is critical for three reasons. First, it allows communicators to better understand how people perceive risk. Second, it can inform how risk communication can elicit desired perceptions of a risk and desired behavioural responses such as preparation for an event. Third, it assists in conveying probabilities of a risk in the face of uncertainty.

Risk perception research on affect heuristic has identified that people make risk judgments using two approaches.

- *First, the experiential*: Individuals recall prior experiences and recollected images (from first hand or media reporting) of a risk, which influence perceived feelings (goodness or badness) about a risk or an event.
- *Second, the analytical*: Individuals analyze the risk to inform their judgment.

Research on the affect heuristic found that when people make risk decisions, the experiential precedes the analytical. Strong emotional experiences related to hazards may increase publics' perceptions of risks (Slovic, Finucane, Peters, & MacGregor, 2004). For example, if you mention terrorism, the first thing that individuals may think of is the September 11th attacks and the World Trade Centre being hit rather than analyzing the probability of terrorism impacting them.

Research on the affect heuristic research has also found that communicating the benefits of an activity such an infant receiving their mumps, measles and rubella vaccine can change the perception of risk and vice versa (Slovic et al., 2004).

- Communicating the positive benefits of an activity will lead to the message recipient inferring the risk to be low;
- Communicating the negative benefits of an activity will lead to the message recipient inferring the risk to be high;
- Communicating the risk of an activity to be high will lead to the message recipient inferring the benefits to be low; and
- Communicating the risk of an activity to be low will lead to the message recipient inferring the benefits to be high.

At the preparedness phase this can be fundamental should communicators need to elevate the perceived risk and reduce complacency towards preparing for a possible event. This is called the evocation of negative affect (Keller et al., 2006) and can be helpful, for example, in getting the public in regions less prone to natural disasters to prepare a basic disaster supply kit so they can be more self-sufficient following a major event. Conversely communicators may need to reduce the perceived risk that may be over amplified in the public's eye. This is called the evocation of positive affect. For example, during the 2001 anthrax attacks the positive affect was evoked to reduce the perceived risk of anthrax to encourage Americans not to acquire the antibiotic ciprofloxacin unless advised by CDC that they may have been exposed to anthrax spores. At the time, there were limited supplies of ciprofloxacin and its extensive use possibly risked changing the bacteriological environment rendering some organisms resistant to ciprofloxacin (Shine, 2001).

Research has also confirmed that publics that can more easily recall particular risks are more likely to prepare for those risks than for risks that they cannot easily recall. For example, Siegrist and Gutscher (2006) found that past experience with flooding was the most important factor in predicting publics' risk perception of future floods.

When conveying the probability of an event in the face of uncertainty, research on affect suggests three possible approaches:

- *Present frequencies versus probabilities*: Problems should be formulated in terms of frequencies rather than probabilities (Gigerenzer & Hoffrage, 1995). For example, one study found that participants rated a disease that kills 24.14% of the population as more dangerous than one that would kill 1,286 people out of 10,000 even though the 1,286 rate would equal only 12.86% of the population (Yamagishi, 1997).
- *Discuss longer time periods*: Low-probability risks that are presented in the context of a longer time period are likely to elicit desired behavioral change. For example, Slovic, Fischhoff, and Lichtenstein (1978) identified that car driver who received risk information about a 50-year period favored stronger, mandatory protection than participants exposed to the risk of a single trip.
- *Use risk comparisons:* Empirical research shows that low-probability (including lower familiarity events) can also be communicated using risk comparisons where new hazards are compared with risks that are more familiar to the public (Johnson, 2003, 2004; Roth, Morgan, Fischhoff, Lave, & Bostrom, 1990; Slovic, Kraus, & Covello, 1990). For example, the probability of becoming a victim of a terrorist attack versus being in a car accident.

2.9.4 Extended Parallel Process Model

The concept of preparedness as a process fits within the extended parallel process model, which deals with perceived threats and perceived efficacy of behaviour change (Witte, 1992). Designing risk messages emphasize fear such as the fear of another terrorist attack cause one of two reactions in an audience: (1) A moderate or high perception of threat, which causes the individual to evaluate the efficacy of the proposed solution or (2) a low perception of threat, which negates any motivation the individual has to continue processing the message. If perceived threat is high, but perceived efficacy—that is, an individual's belief about his/her power to control the event—is low, individuals attempt to control and respond to the fear instead of to the danger itself (Witte, 1992), which often occurs when an individual is in denial about the presence of a threat or reacting against it. An increase in threat perception coupled with high efficacy leads to message acceptance and attitude, intention, or behaviour changes to control the danger.

The model has been expanded recently to include perceived collective efficacy (perceptions of how well prepared a family unit is, instead of how well prepared each individual member is) and perceived societal risk (perceptions of risk to a unit or group larger than one individual or a family unit). These types of perceptions can be seen in publics as both logic-based and emotion-based (Roberto, Goodall, & Witte, 2010). There is also evidence of a connection between social perceptions of risk and collective efficacy and how a lack of social threats can combine with a sense of efficacy to motivate intentions and actions (Smith, Ferrara, & Witte, 2007). This study looked at individuals dying from AIDS-related illnesses who had children that would be orphaned as a result. Those in the community not infected with HIV often responded to this

community issue with collective efficacy, or the belief that there are effective or necessary collective actions that can be taken to address a social or public health predicament, which often took the form of adopting the orphaned children (Smith, Ferrara, & Witte, 2007). Fear appeals should be carefully monitored to ensure effective usage and to inform message construction decisions of risk communicators as fear appeals are only recommended for messages that can be cognitively, and not emotionally, processed by a public (Witte, 1992).

2.9.5 Communication During the Response Phase

Two dominant theories and models have been identified related to communication during the response phase: image restoration and repair and the situational crisis communication theory (SCCT). Communication objectives during the response phase include issuing pretested warning messages designed during the preparedness phase and employing crisis communication best practices to effectively communicate actions the public can take to minimize harm and how organizations can maintain the public's trust. There are two dominant theories and models related to communication during the response phase: image restoration and repair and the situational crisis communication theory (SCCT). Communication objectives during the response phase include issuing pretested warning messages designed during the preparedness phase and employing crisis communication best practices to effectively communicate actions the public can take to minimize harm and how organizations can maintain the public's trust.

2.9.6 Image Restoration and Repair

Organizational responses to crises often begin with a focus on how they can restore and repair their tarnished images (Benoit, 1997). Options for strategically restoring and repairing images, range from denial (when the organization is not to blame for the crisis) to blame shifting (when someone else is responsible for the crisis) to correcting the issue that caused the crisis and apologizing (when the organization is to blame for the crisis). All crisis messages and responses should be targeted and tailored directly to the salient audience(s), and if necessary, unique messages should be sent to distinct segments of that audience. For more on relevant audience characteristics relevant for risk communication see the *Best Practices* document.

One organizational crisis response strategy in particular, the apology, has received great attention because it can be viewed as scripted rather than as an honest response (Hearit & Roberson, 2010, p. 552). Thus, using an apology simply to remove the organization from an unflattering glare of media attention shows a lack of understanding of image restoration and repair. An apology should be utilized when guilt is easily established, the costs of the wrongdoing are clearly known, and continuing to speak about the issue is a logical, strategic step forward, not backward, such as the apologies offered by the White House in February 2012 after the burning of Qurans at an Air Force base in Afghanistan. If all of the facts surrounding the issue are not yet clear or known, or if the act of apologizing would put an organization out of business, an apology may be a misstep (Hearit & Roberson, 2010).

When a risk communicator is responding to criticism, highlighting positive actions taken in response to the crisis can reduce the offensiveness of the event even without an apology (Liu, 2007). This is often most effective when paired with an action that corrects the problem that caused the crisis or a discussion of what the organization will do to ensure an issue never occurs again (Benoit, 1997). Risk communicators and spokes people should consider both public expectations of organizational crisis responsibility and the organization's ability to prevent future occurrences of the same crisis when crafting response strategies (Liu, 2007). Often, when publics have high rates of negative emotion toward the responsible organization, this can significantly decrease the effectiveness of taking corrective action (Muralidharan, Dillistone, & Shin, 2011).

Image repair and restoration is most frequently studied through qualitative case studies, with analysis of strategies utilized by a spokesperson or organization and discussion of best (and worst) practices and their impacts. These strategies can be helpful when discussed and analyzed prior to risks or crises, when communicators can determine which strategies may be effective or influential based on case studies of similar organizations, communities, and risks that they face.

2.9.7 Situational Crisis Communication Theory (SCCT)

Beyond image repair, the situational crisis communication theory (SCCT) supports organizational efforts to select the most effective crisis response strategies based on publics' crisis perceptions and the goals of the organization. Goals can involve changing perceptions of the organization or of the crisis, and should include an understanding of the crisis type, the organization's crisis history, and its reputation prior to the crisis event, where a favourable prior

reputation is often seen as an asset in a crisis (Ulmer, 2001). Coombs (2012) noted that crisis management should be a proactive function of an organization; institutions and organizations should be in a continual process of learning from previous crises to be better prepared for or to prevent future crises entirely, and this includes having a current and vetted crisis communication plan. Once this process is understood, organizations and individuals faced with a crisis should consider using at least one of SCCT's response strategies.

These strategies are grouped into four groups, or what SCCT refers to as postures: *denial*, during which the organization attempts to distance itself from the crisis (strategies include attacking the accuser and scapegoating), *diminishment*, which aims to reduce the impact of control attributions or negative effects (strategies include excusing the organization's behaviour or responsibility and justification or reduction of the perceived damage), *rebuilding*, which attempts to improve the organization's reputation (strategies include compensation toward victims and apology or acknowledgement of responsibility), and *bolstering*, which supplements the other three by aiming to improve the connection between the organization and stakeholders (strategies include reminding stakeholders of prior good works, ingratiation through praising stakeholders, and victimizing the organization as well) (Coombs, 2012). Coombs (2012) sees SCCT as identifying the most common strategies and encourages an organization to choose wisely when attempting to repair reputational damage. SCCT has mainly been tested with college students (Coombs, 2004; Coombs, 2006; Coombs & Holladay, 2002), with some attempts at reaching adult community members (Coombs, 2004), often through the use of constructed crisis scenarios and surveys aimed at evaluation of participants' perceptions of organizations and strategies utilized.

2.9.8 Communication During the Recovery Phase

This section reviews the dominant theories and models related to communication during the recovery phase: the CAUSE model, the precaution adoption process model, the social amplification of risk framework, and the systems dynamic model. The recovery phase may last weeks or years, and risk communication objectives in this phase aim to: (1) accelerate recovery, (2) minimize adverse secondary effects, and (3) ensure that the recovery process does not create or replicate vulnerabilities that contributed to the risk in the first place such as inadequate flood protection. In this phase, successful communication engages a wide audience in a collaborative and interactive process toward recovery (Seeger & Padgett, 2010). This process values relationships with communities and publics to help with addressing the needs as a crisis evolves and is resolved.

CAUSE model. This model suggests that in the face of physical hazards, publics struggle with the following factors: **C**onfidence, **A**wareness, and **U**nderstanding of a message. They also are unsure of their feelings toward **S**olutions and wait for clear **E**nactment of action. Thus, the CAUSE model postulates that effective handling of each of these factors can lead to more effective risk and crisis resolutions. This model has been applied through case studies of local emergency managers and specifically with Southeast Louisiana emergency managers prior to Hurricane Katrina. These emergency managers' concerns ranged from evacuation plans to public perceptions of vulnerability. Additionally, the model aims to increase the amount of confidence, awareness, and understanding that the publics (message recipients) have in risk communicators and emergency managers in order to produce more effective solutions and actions and to aid in

moving people into action after a crisis has occurred (Rowan, Botan, Kreps, Samoilenko, & Farnsworth, 2010).

Public confidence can be bolstered through the use of established credible organizations and infrastructure as part of the crisis management team. Publics are often skeptical of those who manage risk and crisis situations (Heath & Palenchar, 2000). Therefore, linking unknown crisis managers to familiar organizations and institutions can imbue the managers with additional credibility. When it comes to awareness, emergency warnings must be detected, decoded, interpreted, and confirmed (Perry, 1988), each step of which is fraught with the potential for problems. These problems can often be overcome through simple message repetition through a variety of sources and routine testing to see if the messages have been understood and absorbed. People tend to appreciate additional information to facilitate understanding when they voluntarily seek it out.

When trying to improve public satisfaction and safe action in the aftermath of a crisis, leaders and communicators need to be willing and able to see all relevant points of view within the community in which they are working. There is also a clear relationship between message success, which is impacted by relationships with publics, and message quality, which impacts relationships with publics. Finally, publics are most likely to follow risk recommendations when the public perceives the recommended behaviour as easy, quick, inexpensive, and/or more fun to do than not to do (Clark, 1984). Crisis managers should consider the frequency of message presentation and should attempt to align messages with similar behaviours that already exist in

publics' routines such as helping them organize emergency kits while already out back-to-school shopping (Booth-Butterfield, 2003; Rowan et al., 2010).

2.9.9 Precaution Adoption Process Model

The precaution adoption process model details seven stages of public understanding and perception of a risk from the lack of awareness to adoption and/or maintenance of behaviour such as becoming attentive to and engaged in discussions. This model can guide risk communicators to understand and address an audience's information needs to help elicit desired behavioural responses by publics. While the model can be applied to all phases of an event, it has particular value during the recovery stage by providing a systemic process for understanding the level of awareness and desired behaviours sought in the weeks and months after an event. In the first stage, an individual may be completely unaware of a hazard. The person may subsequently become aware of the issue but remain unengaged by it (Stage 2). Next, the person faces a decision about acting (Stage 3); may decide not to act (Stage 4), or may decide to act (Stage 5). The stages of action (Stage 6) and maintaining the desired behaviours such as using a previously attacked transportation system); (Stage 7) follow (National Cancer Institute, 2003). Appendix F, in the Appendices document, outlines the stages of the model. The model, however, has not been subjected to empirical testing and is conceptual in development. Thus, recommendations from the model may be updated as they are tested.

In sum, theories and models relevant to risk communication in the recovery phase highlight the importance of understanding factors that affect how publics recover from risks including the context of these risks and their secondary effects. Taken as a whole, the theories and models reviewed in this document provide insights into the complicated process of developing and disseminating risk messages before, during, and after crises.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter discusses the research design appropriate for the study, the population sample and the sampling technique. The Chapter also chapter aims at providing a brief background detail of the study area. Most importantly, it captures a discussion on the location and size of Makola and Katamanto, its physical geography as well as the socio-economic characteristics of the study area.

3.2 Research Approach

There are two major approaches to research, namely Quantitative and Qualitative research. However, for the purposes of this study, the qualitative research approach was used. Qualitative research is the type of research that adopts an interpretive and naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, and attempt to make sense of, or interpret, phenomena in terms of the meanings people bring to them (Newman & Benz, 1998). According to Sarantakos (1998) the use of qualitative approach in a study brings the researcher closer to reality. Furthermore, Macmillan and Schumacher (1997) contend that qualitative approach enables the researcher to capture the richness and complexity of behaviour that occurs in natural setting and analyses inductively the data to generate findings. This would give the researcher valuable insight of the problem and the results drawn from this story will be in firm grasp of essential characters.

The qualitative research approach was chosen because the nature of the problem under study lends itself to that. Since the study is concerned with exploring the importance of Risk Communication to organizations, with specific focus on Ghana National Service, it is deemed appropriate that the qualitative approach will help establish this effectively. This approach helped in gathering in-depth information on the problem under study.

3.3 Research Design

The research design adopted for this study was a case study. This is because the study sought to study a particular phenomenon within a specific organization. According to Wimmer and Dominick (2006), a case study uses as many data sources as possible to systematically investigate individuals, groups, organizations or events. A case study is chosen for this study because it affords the researcher the opportunity of discovering a complete description of the phenomenon under study and provides objectivity and in-depth study within a limited time frame. This is in line with the views of McMillan and Schumacher (1997) who stated that case studies can provide a detailed description and analysis or processes or themes voiced by participants in a particular situation. Many researchers also use it when there is the need to understand or explain a phenomenon. For the purpose of this research, Ghana Fire Service, Accra Metropolitan Assembly, Electricity Company of Ghana as well as victims of the Makola and Katamato fire out-break will be the focus of the study. In collecting the data, the researcher collected extensive data on the organizations and their programmes on which the investigation was focused.

The exact research method that was used under the case study was the in-depth interview. An interview is a purposive conversation to elicit response, information or answers to an issue (Wimmer and Dominick, 2006:135). This method is chosen in order to gain insights into the interviewees" responses on the topic under discussion. Interviews are considered useful data sources which is properly applied could help unearth unspoken information and provide rich research material for understanding the phenomenon being studied. From Bell (1995) perspective, the interview is a unique technique which helps "puts flesh on the bones of responses" and "can provide information that a written response could conceal" (Bell, 1999:135)".

3.4 Population

Polit and Hungler (1999: 37) refer to the population of a study as an aggregate or totality of all the objects, subjects or members that conform to a set of specifications. The population of this study is the G.N.F.S. Headquarters, Accra Metropolitan Assembly, Electricity Company of Ghana and traders of Makola and Katamanto Markets.

3.5 Sample and Sampling Technique

Since the researcher cannot study the entire population of traders who were victims at the market, it is important to select an aspect of the population to study. A sample is derived from the population, which makes the former a subset of the latter. For the purposes of this study, the sample size of the study was 3 officials, made up of the operations manager form AMA, external

and communication from G.N.F.S and one official from E.C.G and 60 traders from the Makola and Katamato traders.

The samples were selected through the non-probability method of sampling. There are two general approaches to sampling: probability and non-probability sampling. Under probability sampling all elements in the population have a chance (greater than zero) of being included in the sample, and the mathematical probability that any one of them will be selected can be calculated (Wimmer and Dominick, 2011). Non-probability sampling on the other hand, refers to any sampling method where some elements of the population have no chance of selection or where the probability of selection cannot be accurately determined (Ibid). The selection of the three (3) officials, made up of the operations manager from AMA, external and communication from G.N.F.S and one official from E.C.G and market traders were determined convenience and purposive sampling methods, which fall under the non-probability system.

3.6 Data Collection Instrument

A semi-structured interview guide was used as the instrument for data collection. With semi-structured interview guide, the interviewer has more freedom to pursue hunches and can improvise the questions. Semi-structured interview guides enable researchers to ask follow up questions to give "greater breadth" to responses that require clarification (Fontana and Frey, 2005: 706). These justify the reasons behind the use of semi-structured interview guides to collect data from the respondents. The guide was administered to the operations manager from AMA, external and communication from G.N.F.S and one official from E.C.G. The interview

questions centered on the reasons behind the execution of Risk Communication programmes, as well as the benefits and the type of Risk Communication media. Also, 60 of the sampled traders were administered with questionnaires centered on the reason behind the causes of the market fire out-breaks.

3.7 Data Analysis

Thematic analysis was used to analyze the data from the interview. After the data were gathered, the interviews were transcribed and coded for themes. The themes were derived based on the research aims and objectives and the interview guide, with the aim of identifying the effectiveness of Risk Communication on organizations.

Physical Geography of the study area

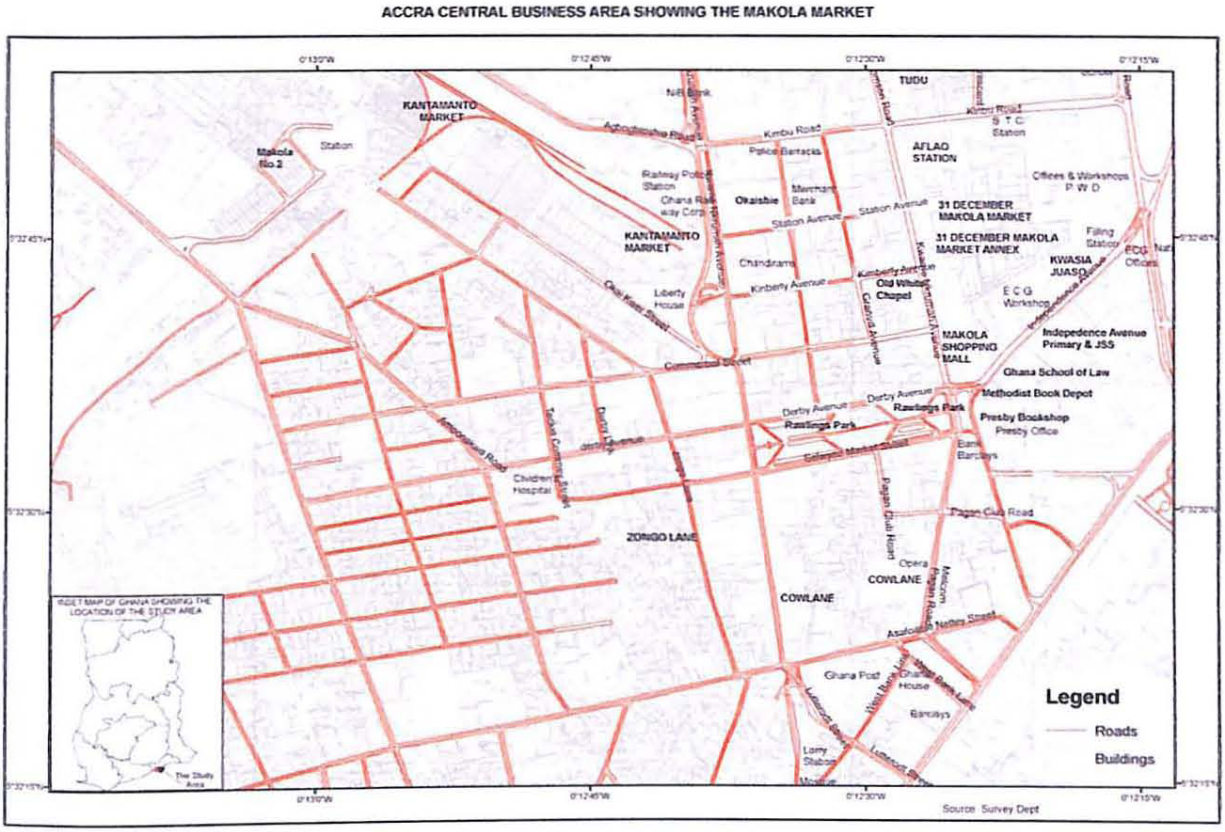

Figure 3.7 Map of Accra Central Business Area Showing the Study Area.

Source: Survey Dept.

3.8 Location and Size

Makola and Katamanto Market is a renowned market place and shopping district in the centre of the city of Accra, the capital of Ghana. Makola and Katamanto Market is located next to the Kwame Nkrumah memorial park over the High Street, and bounded by Kinbu, Thorpe Road (which becomes Kojo Thompson Avenue to the North), and Pagan Road. Makola Market is located within the Ashiedu Keteke Sub Metro, Accra Metropolitan Assembly. Makola Market is located on latitude and longitude of 5° 32′ 52.05″ N and 0° 12′ 24.71″ W respectively. In terms of land size, Makola market has an area size of about 6.84 acres (MoF, 2014).

3.9 Physical Geography and Socio-economic Characteristics

3.9.1 Climate

In terms of weather, Makola is a little more humid and slightly hotter. Makola has an average annual precipitation of approximately 6.04 cm. With regards to temperature, Makola has an average annual maximum temperature of about 29.7^{O}C as well as of an average annual minimum temperature of about 23.4^{O}C. Furthermore, Makola has a mean annual humidity of about 96%.

3.9.2 Sanitation

Currently, Makola and Katamanto market faces all the serious problems confronting all rapidly growing areas. Sanitation generally in the area is very poor. There are visible unsightly scenes of heaps of rubbish in containers along the road, which are ever flowing. Besides refuse containers being loaded with garbage along the road, heap of filth are found in front of some shops and stores at the market during the night. With regards to drainage, Makola and Katamanto market has a poor drainage system. The market lack adequate drains, however, the very well-constructed ones along roads are in deplorable state with most of them caving in. Along the road there is an overpowering stench from the drains. These drains are dirty and filled with rubbish which serves as ground for mosquitoes as well as the source of terrible smell. The market also floods regularly during the rainy season.

3.9.3 Housing Condition

At night Makola serves as a place of residence for some people; especially the head potters who are usually found sleeping helplessly in front of shops and on pavements. The saddest part of this

situation is that kids below the ages of 3 and 4 are also found with their parents on the pavements, sleeping at the mercy of the weather.

3.9.4 Congestion

From time immemorial congestion continues to be a major challenge confronting the study area. Makola attracts enormous volume of both human and vehicular traffic commuting daily to the center to trade in goods and services. The usual brisk business at Makola and Katamanto makes it impossible for pedestrians to walk freely on the pavements. Therefore most of the pedestrians resort to using the streets instead of the pavements.

3.9.5 Economic Activity

Makola and Katamanto market is mostly characterized by the informal economy with most of their activities not regulated as well as not demanding any qualification. The market facilitate wholesale and retail trading of all kinds of goods and services including foodstuffs, cookware, clothing, medications, detergents, building materials, car parts, shoes, tools, pots, pans and almost anything else that is a legally traded commodity. These goods are both homemade and imported. Furthermore, jewellery made from locally handcrafted beads can also be found for sale in the market. With regards to the current economically active population, female traders constitute the greatest share engaged in these economic activities. Moreover, financial institutions such as banks, microfinance and savings and loans companies are a major characteristic of this market.

CHAPTER FOUR

DATA PRESENTATION ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter is concerned with presentation of the results and discussion. The findings are grouped under the following themes; the demographic characteristics of the market operators, the perception of the market operators towards fire management, risk communication and fire management approach used by the GNFS, AMA and ECG as well as the challenges of fire management in the study area. The results are then discussed.

4.2 Demographic Characteristics

The traders' survey was conducted to capture the demographic profile of Makola and Katamanto. It also provided a snapshot of the socio-demographic characteristics of respondents such as education, religious affiliation, ethnic group, age and gender size which play a vital role in explaining some of the causes of fire at the household level. According to the Ministry of Finance (MoF) (2014), Makola and Katamanto market had a total estimate population of about 6000. During the study a total of 60 traders were surveyed as well as all questions were properly answered and could be used for the analysis. This gave a response of 100%. The gender distribution of the sample is presented in Table 4.1. The data shows that about 76.7% of the total respondents were female while 23.3% of the total respondents were male. This representation was expected since women tend to engage more in trading activities than men.

Table 1: Gender Distribution of Respondents

SEX	FREQUENCY	PERCENTAGE (%)
MALES	14	23.3
FEMALES	46	76.7
TOTAL	60	100

Source: field survey, 2016

Table 2: Age of Respondents

AGE RANGE	FREQUENCY	PERCENTAGE
UNDER 20	7	11.7
20-30	20	33.3
31-40	16	26.7
41-50	11	18.3
50 AND ABOVE	6	10
TOTAL	60	100

Source: field survey, 2016

The age distribution of the respondents is presented in the figure 4.2. It was also revealed that 11.7% respondents were under age 20 years;33.3% were between the age bracket of 20 and 30; 26.7% were between the age range 31 to 40 years; 18.3% were adults aged between 41 and 50

years; and 10% of respondents were at least 50 years old. These figures are not unexpected. The response of the sampled population is an indication of the diversified age distribution in the Makola and Katamanto area.

4.3 Educational Level of Respondents

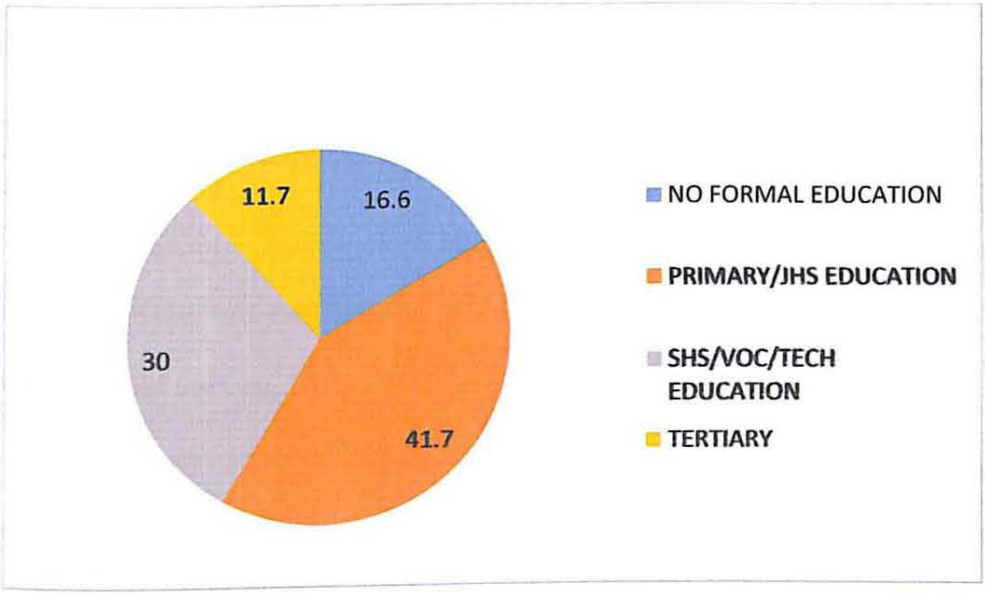

Figure 1: Educational Level of Respondents

Source: Field survey, 2016

Education plays a vital role in smooth and efficient running of every community. Low level of education is associated with low literacy skills which may significantly limit the ability to understand and respond to fire safety messages (Comolotti, 2004). Again, low education may also inhibit the ability to read instruction manuals and warning labels for cooking and heating devices, thereby increasing their risk to fire (Comolotti, 2004). As is clearly evident in figure 4.3, 16.6% respondents had no formal education and majority of the respondents (41.7%) had completed primary and JSS/JHS education. It was therefore not surprising that, majority of the respondents are in the informal sector.

4.4 Religious Affiliations of Respondents

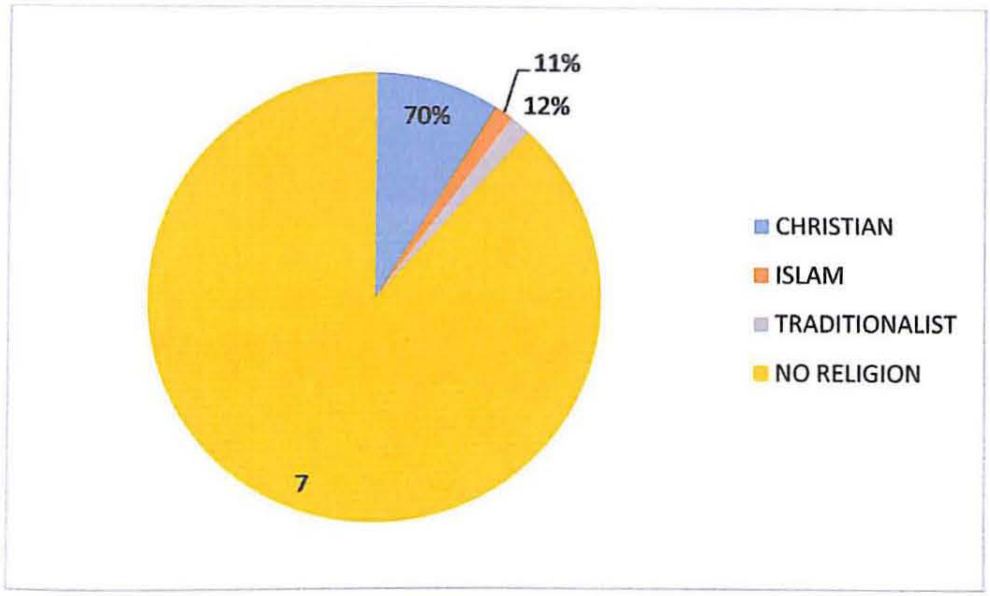

Figure 2: Religious Affiliations of Respondents

Source: field survey, 2016

The religious diversity of Makola and Katamanto traders was best represented by the various religious groups in the area. Figure 4.4 presents the religious background of respondents with about 70% being Christians, with both Islam and Traditionalist equaling response of 11% and with 7% having no religious affiliation.

Table 3: Ethnic Groupings of Respondents

ETHNIC GROUP	FREQUENCY	PERCENTAGE
AKAN	7	7
EWE	74	74
GA- ADANGME	10	10
NORTHERNER	7	7
TOTAL	60	100

Source: field survey, 2016

From the results of the field survey, it was evident that the study area was made up of people with different ethnic background. Table 4.5 presents the ethnic background of the respondents with about 41.7% being Akan,13.3% were Ewe, 30% were Ga-Adangme and with 15% representing Northerners.

4.5 Perceptions and Attitudes of Traders/Market Operators

Table 4: Causes of market fire by respondents who have experienced fire in the market

CAUSE OF FIRE	FREQUENCY	PERCENTAGE
ELECTRICAL WIRING	32	65.3
ARSON	5	10.2
GAS EXPLOSION	2	4.1
DON'T KNOW	1 0	20.4
TOTAL	60	100

Source: Field survey, 2016

On the awareness of the cause of fire in the market, from the result of the survey, the traders who had experienced an outbreak had different perception on the cause of fire in the market; however most of the respondents attributed the cause to illegal electrical wiring/faulty electrical appliance. From the table below 49 out of 60 respondents who have experienced fire in the market, 32 (65.3%) attributed the cause of fire to illegal wiring/faulty appliance, 5(10.2%) of the respondents attributed the cause to arson, 10(20.4%) of the respondents did not know the cause of fire while 2(4.1%) of the respondents indicated gas explosion as a result of leakages from gas cylinders as another cause of fire. However, from the responses of the focus group discussions, it was revealed that some of the causes of fire were not related to the causes above. For instance one of the traders indicated cooking with naked fire as a cause of fire in the market. According to the respondent, some traders due to negligence after cooking do not properly extinguish the fire

as a result when they come into contact with a combustible material it ignites into fire in the market.

4.6 Stakeholders Responsibility Towards Fire Management

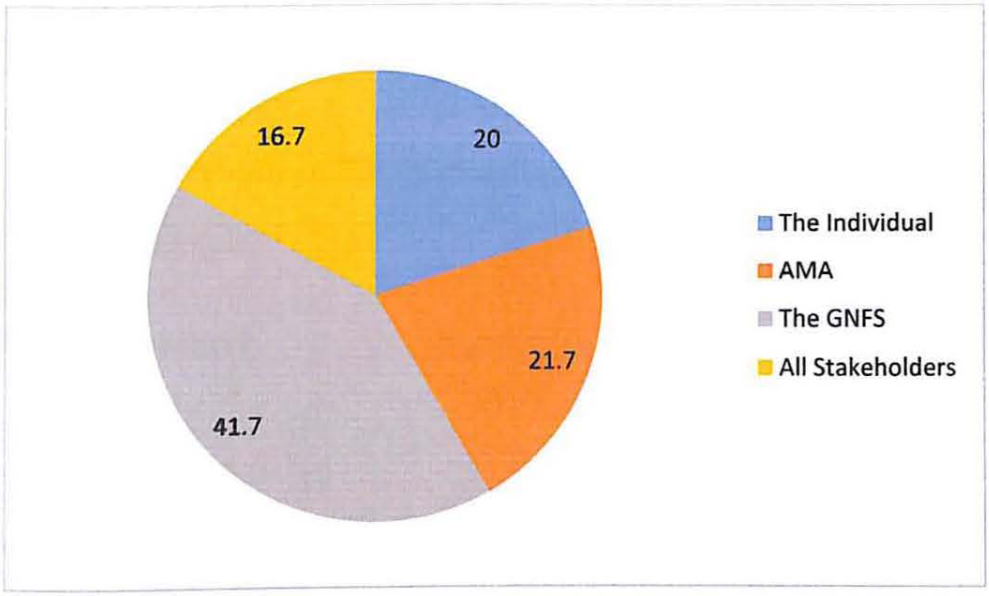

Figure 3: Stakeholders responsibility towards fire management by respondents

Source: Field survey, 2016

With regards to whose responsibility to management market fire, from the survey it was revealed that a majority of the respondents (41.7%) indicated it is the responsibility of the GNFS to manage market fire, while 21.7%, 20% and16.7% of the respondents indicated AMA, individual and all stakeholders respectively. From these responses, it indicates that there is no collaboration as well as adequate participation of all key stakeholders with regards to fire management in the market.

4.7 Availability of Fire Fighting Equipment by the Market Operators

With regards to the attitudes of the traders, results of the survey indicated that most market operators or traders do not have firefighting equipment. From the table below, it shows that 15% of the total sampled respondents were in possession of firefighting equipment as against 85% of respondents not having any firefighting equipment, hence making them vulnerable to fire incidence.

Table 5: Availability of Firefighting Equipment of Respondents

AVAILABILITY OF EQUIPMENT	FREQUENCY	PERCENTAGE (%)
YES	51	85
NO	9	15
TOTAL	60	100

Source: field survey, 2016

4.7.1 Level of Accessibility

From the results of the survey, it was revealed that access to the market by vehicle or fire tenders was a problem. Out of the total number of respondent (60), 93.3% of the respondent indicated that the market was not accessible while 6.7% of the respondent indicated the market was accessible. These responses indicated a high level of response difficulty by the emergence services (GNFS) during a fire incidence in the market. In conjunction with responses from the focus group discussions held in the market, one of the respondent noted that the inaccessible of

the market was as a result of overpopulation and overcrowding coupled with poor market structured. This confirms Aidoo (2013) findings with regards to overpopulation and overcrowding as a cause of fire in market as stated in the literature review.

Table 6: Accessibility of the market by fire fighting vehicle

ACCESS OF VIHICLES	FREQUENCY	PERCENTAGE (%)
YES	4	6.7
NO	56	93.3
TOTAL	60	100

Source: Field survey, 2016

4.7.2 Level of Satisfaction of the Available number of Equipment

The respondents were asked to give their view on the existence of the firefighting equipment.

Table 7: Level of Satisfaction of the available number of equipment

AVAILABILITY OF EQUIPMENT	FREQUENCY	PERCENTAGE (%)
NO	6	10
DO NO KNOW	54	90
TOTAL	60	100

Source: Field survey, 2016

Out of the 60 respondents studied, a majority 54(90%) stated that they are dissatisfied while 6(10%) expressed neither their dissatisfaction nor satisfaction. From the study, it can be concluded that satisfaction from the availability of fire equipment in the market is low.

4.7.3 Fire Management Approach by the Authority

During the interview I asked if the Accra Metropolitan Authority have any approach to fire management. From the study, it was evident that the Accra Metropolitan Authority (AMA) in charge of the market does not have any fire management approach required to prevent, mitigate as well as cope with the adverse impacts that come as a result of fire in the market. In an in-depth interview with the legal and security officers at AMA, Mr. Yaw Twumasi, noted that AMA as an authority have no fire management approach but however the authority thinks it is the duty of the Ghana National Fire Service to have such an approach and therefore they rely on the GNFS for fire management approach in the market.

In conjunction with this, Mrs. Helena Duku (fire service personnel) noted that the GNFS have only two methods used in dealing with fires in the market namely; education and sizing-up approach.

With regards to the education approach, Mrs. Helena Duku noted that this approach was employed before and after a fire incidence. She further noted that the approach involves educating traders on safe management practices such as the usage of fire extinguishers, switching of electrical appliance before leaving the market as well as avoiding illegal electrical

connections. Nevertheless, she also noted that this approach was not often used due to financial constraints facing the institution.

With sizing-up approach, according to Mrs. Duku it is only employed during the advent of a fire. She also noted that the sizing-up involves the detection and identification of the source of the fire before the GNFS personnel apply the appropriate fire equipment to quench or stop the fire. Furthermore she noted that this approach was often used however it is confronted with some challenges including time consuming which sometimes increases the rave of fire victims to an extent that these victims resort to beating and attacking of firefighting official as well as the destruction of fire tenders.

4.7.4 Challenges of Fire Management

During the study, some of the challenges of fire management in Makola and Katamanto market include: Poor market structure, inadequate firefighting equipment, inadequate firefighting personnel, lack of funds to intensify as well as executive some important fire management approach and further increases in illegal electrical connections.

4.7.5 Poor Market Structures

In the study, it was revealed that poor market structure was the main hindrance to fire management in the market. According to both Mrs. Helen Duku (GNFS) and Mr. Yaw Twumasi (legal and security officer of AMA), noted that poor market structures at Makola and Katamanto are as a result of overpopulation coupled with overcrowding has resulted to lack of access routes which have been a hindrance to the movement of fire vehicles as well as fire engines during fire

incidence. This problem was confirmed by responses from traders during survey, which indicated a lack of market access by 93.3% of respondents (This can be found in table 4.6.3 above).

4.7.6 Inadequate Fire Fighting Equipment

Another problem with regards to fire management was the inadequacy of firefighting equipment available in the market. According to Mr. Boye (personnel officer AMA), noted that fire extinguishers and fire hydrants were the only firefighting equipment available in the market which in quantity were 5 and 1 respectively.

4.7.7 Inadequate Fire Fighting Personnel

Another challenge was the number of firefighting personnel available at the market. From an in depth with Mr. Boye (personnel officer, AMA), he noted that security personnel were the only personnel available in the market. The table below shows the number of fight fighting personnel in the market. From the table it was evident that the AMA do not have personnel such as fire wardens (in charge of quenching fire in the market), market patron teams (in charge of monitoring activities of traders that are capable of creating fire hazards) as well as qualified electrical inspectors (to check the activities of illegal electrical connections).However, the authority have two (2) security personnel employed in the market.

In conjunction with this problem, was also the inadequacy as well as lack of multi-purpose fire service personnel. With reference to an in-depth with Mr. Adjei (Station Officer of GNFS,

Makola), noted that due to inadequate personnel coupled with lack of multi-purpose fire service personnel, the institution is faced with higher response difficulties during fire incidences in the market. Below is a table showing the number of personnel available by the GNFS at Makola and Katamanto.

4.7.8 Lack of Funds

Another challenge to fire management in the market was the lack of funds to ensure the effective implementation of proper fire management practices. According to Mrs. Duku, the institution (GNFS) does not have funds allocated for the education of traders on safe fire management practices as well as how to operate fire extinguishers. Furthermore, as a result of this, through personal observation in the market, it was hardly for you to see fire hazard / warning signs in the market.

4.7.9 Increasing Practice of Illegal Electrical Connection

Results from a key informant interview with an official from ECG (Accra Central) revealed that another challenge of fire management in the market was the increasing incidence of the activities of illegal electrical connection by the market operators. According to the official, he noted that in 2013 the company's inspection team disconnected all illegal wiring in the market; however, during their inspection in 2014 after a fire incidence at the market, they noted an increase in

illegal electrical wiring more than the former.

Figure 4: Scenes of suspected Illegal electrical connection

Source: Field survey 2016

4.8 Issues of Risk Communication by GNFS

4.8.1 Medium used by GNFS for Risk Communication

The research revealed very interesting observations as regards evaluating the medium used to convey risk messages. Mrs. Helen Doku said, the main medium used to convey risk messages in Ghana were the radio, television, the newspapers and to some extent personal interaction between the staff of GNFS and affected traders. She however noted that radio is being used to a great extent in conveying risk messages.

4.8.2 Education of traders on the risk of Domestic fire out-break

Interview with Mrs. Helen Doku an official from the GNFS, confirmed that the GNFS had a hazard education program which involved their staff going to traders and residents to educate them. The interview further revealed that GNFS has Technical Committees and Public Relations outfits dedicated to educating people on the risk of fire outbreak.

Mrs Helen Doku further stated the Risk Communication Approach used by GNFS. The interview indicated that information is collected from experts and then disseminated to the traders and residents in the risk prone areas in Makola and Katamanto, basically revealing the "Top down" approach.

4.8.3 GNFS Preparedness

Reacting to the question as to whether GNFS were more prepared against the risks of fire outbreak than the other stakeholders, Mrs. Helen Doku said the GNFS are more prepared for the risks of fire outbreak since the institution is the first point of call during fire outbreak.

4.8.4 Effects of Risk Messages on Residents and Traders Awareness to Fire Risk

When asked if risk messages have increased residents and trader's awareness to fire risk, she noted that traders' awareness was increased to a very large extent. She said during the 2013/2014 fire outbreaks at the various markets across the country, GNFS in conjunction with NADMO educated traders on fire risks which has considerably reduced fire outbreaks at the markets.

4.8.5 Regulations

During the interview, Mrs. Helen Doku indicated that the congestion and slum building with the markets areas as well as tapping of electricity illegally has been a major risk of fire outbreaks. She went on to explain that there were regulations to control these anti-social activities. However the implementation of these regulations has not been carried out over the years and continues to be inadequate. As a result people flout the regulations with impunity. This lack of enforcement of regulations has adversely affected the Risk Communication process in the city of Accra.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Key Findings

This chapter gives the summary of the major findings with literature, conclusion and recommendations which are meant to promote better fire management practice in Makola and Katamanto market.

The first major objective of this study was to ascertain the perception and attitude of traders towards fire prevention. Data analysis and interpretation revealed that majority of the respondents identified illegal electrical wiring/ connection as the main cause of fire in the market. In addition it was also revealed that apart from water and sand, majority of the traders cannot use foam cylinders, fire blankets, fire extinguishers as well as wet chemicals to quench fire outbreak, since in the study it was revealed that 54 out of the 60 respondents did not have any firefighting equipment. Moreover the traders were not fully satisfied with the number of firefighting equipment in the market. Finally, with regards to whose responsibility to manage market fires, majority of the respondent indicated it was the responsibility of the GNFS at the expense of the collaboration among all key stakeholders in the market.

The second objective of the study was to ascertain the fire management approach used by the authority. Data analysis and interpretation showed that the AMA as an authority in charge of the market does not have any fire management approach to prevent, mitigate as well as cope with fire incidence and its impacts.

The objective of the study which was to ascertain the challenges faced with fire management in the study area. Data analysis and interpretation indicated that the poor structure of the market posed a major challenge to the accessibility of fire tenders during fire incidence in the market. For instance, in the study it was revealed that 93.3% of the respondent indicated a lack of market accessibility to fire tenders. Moreover, Apart from fire extinguishers and fire hydrants, the study revealed that AMA does not have any other firefighting gadgets such as fire blankets, foam cylinders, fire alarms, hose reels and wet chemical in the market. Nevertheless the available Firefighting equipment are inadequate. Furthermore, the market lack firefighting personnel such as fire wardens, market patrol team as well as qualified electrical inspectors in the market who can help prevent as well as mitigate the impact of fire in the market. Finally, increasing activities of illegal electrical connection in market was also indicated as one of the challenges of fire management in the market.

5.1.1 Education of Traders on Risk of Fire

The researcher result demonstrates that in spite of the fire risk education program of GNFS, traders perceive their efforts to be in vain and not educative enough.

Public hazard education programmes are vital precursor to changing risk perception. From the interviews, it was clear that GNFS had a hazard education programme which involves the staff of GNFS going to the affected areas to educate traders. The interviews further revealed that GNFS has Technical Committee and Public Relations outfits dedicated to educating people on the risk of fire. Various media are used to do the education, namely through Radio, Television and Print, including occasional workshops.

Literature on the above stipulates that communities should be provided with hazard scenarios that describe the possible challenges, opportunities and threats faced by a community from hazard activity, and promotion of strategies to manage or control them (Sandman, 1994). These scenarios can be used to extract their hazard perceptions and the information and resource requirements necessary for the formulation and adoption of mitigation strategies, consistent with the beliefs, needs and goals. These are clearly lacking currently in GNFS's educational drive.

5.1.2 Risk Communication Approach

Interviews on the above indicated that information is collected from experts and then disseminated to the traders in risk prone areas at the markets; the interviews also revealed that some efforts were being made in involving the affected people in the risk communication approach. An in-depth analysis of the above illustration however reveals that risk communication approach used by GNFS is basically a 'top down' approach.

Otway and Wynne (1989), and Stern (1991) have indicated that by adopting this risk communication approach, the communicator devalues the perspectives and knowledge of the risk bearers as well as masks the political aspects to many of the risk conflicts in the society. The Inter-Departmental Liaison Group on Risk Assessment (ILGRA) recommends that instead of seeking risk communication as provision of information, it should be seen as two way process which engages people in discussion and debate.

As indicated by Sandman (1994), to assume that risk communication fundamentally as one way endeavor with a recognized audience to be warned or reassured and a source to do the warning of warning or reassuring is a crucial and very contentious assumption.

The only way to make this assumption less contentious is to relate it to other assumptions such as;

i. That the source knows more about the risk than the audience

ii. That the source has the audience's welfare at heart

iii. That the sources recommendations are high and dry in real information, and not just in values or preferences

The risk communication process in Accra to a large extent does not fulfill the above stipulations. The strategy for effective risk communication ought to reflect the sincerity of the process to all views points and to what degree values are sieved from scientific claims.

5.1.3 Medium Used for Risk Communication

Very interesting observations as regards evaluating the medium used to convey risk messages were made from the research. The interviews conducted indicated that the main medium used to convey risk messages in Ghana were the radio, television, the newspapers and to some extent personal interaction between the staff of GNFS and affected traders.

From the results of the research, it is quite obvious that more people in the areas of the survey listen to radio, followed by the television, lastly the print media.

One of the main deductions from the above observation is that the literacy rate for most of the traders is low, in other words they are more likely to react to risk messages on radio rather from any print medium. In the urban context such as is found in the city of Accra, the task of creating effective communication strategies that is consistent with the recipients beliefs and calculated to meet their requirements and motivate appropriate action is rendered more intricate by the diversity and distribution of vulnerable groups throughout the city of Accra.

Palenchar & Heath (2002) argue that the objective of risk communication is an attempt to take into consideration the diverse perception of risk to basically minimize conflict. They further indicate that the essential feature of risk communication is not to create some all – encompassing solution but to enhance dialog and expectations. Finding the appropriate form of communication between different groups with different perceptions contribute to a better mutual comprehension of a given risk, thus there is an interface between risk perception and risk communication.

As a result of the diversity, the present approach to the formulation and the dissemination of risk messages is made less successful, because it assumes a level of community homogeneity

with factors like demographics, beliefs, resources etc. to evolve effective messages context. GNFS would need to take into consideration, individual and community vulnerability factors, define relationships between them and hazard effects and then adapt information for each group.

5.1.4 Self-Preparedness

Findings from the research confirms the literature which says that by attributing improved preparedness to self, relative to community as a whole, individuals may accept the need for greater preparedness, but perceive this as applying to others but not to themselves, thus the likelihood of their attending to information or acting on warnings will be minimized (Johnson, 1999). This is the case in Ghana.

5.1.5 Risk Communication Training

The research showed that staffs responsible for formulation of risk messages in GNFS do not have adequate professional training in the risk communication. This is found to be contrary to what the literature says. Risk Communication is a professional discipline, whose application requires knowledge, planning, preparation, skills and practice. Knowledge of the factors affecting people's willingness to prepare themselves is important in the design to risk communication and information to the public. (Covello, McCallum & Pavlova, 1989).

5.1.6 Regulations

The findings from the research revealed that the fire outbreaks are caused by human activity. In the interview with Mrs. Helen Doku of GNFS indicated that the congestion and slum building within the markets as well as tapping of electricity illegally has been a major risk of fire outbreaks. She went on to explain that there were regulations to control these anti-social activities. However the implementation of these regulations has not been carried out over the years and continues to be inadequate. This state of affairs has affected adversely the Risk communication process in Ghana because of the fact that the risk messages are not backed by effective regulations.

Literature indicates that the first overarching rule of good risk communication is integrating risk communication and risk regulation. Engagement and discussion with those interested in and affected by risk issues is imperative. It should be an integral part of every process for the management and regulation of risks (Inter- Departmental Liaison Group on Risk Assessment (ILGRA), Risk Communication: A Guide to Regulatory Practice, 1998).

5.2 Conclusion

The literature review and fieldwork have been synthesized to help identify the key issues to be managed by GNFS to manage fire outbreaks and improve the risk communication process in Ghana. The following were the conclusions from the research.

The basic fundamental tool for economic development in every country is protection for the sectors which serve as the engine that pull all the financial resources and harness together them for development for the benefit of all. Traders are important because they bridge the gap between the producers and the final consumers and also break the bulk into smaller units that can suit the demands of consumers. Without them, the workers in the other sectors of the economy will have to stop whatever thing they are doing and spend time to meet the producers of the commodities they want which can bring the economy to a halt.

The findings of the study have indicated that market operators are indeed vulnerable to fire at the market as a result of poor fire management practices. The lack of access route due to overpopulation coupled with inadequacies of the AMA as well as other key stakeholders which makes them prone to fire, has contributed to their vulnerability.

For instance, the AMA does not have any fire management approach as well as lack important firefighting gadgets as well as personnel in the market thereby heightening the risk of fire in the market. Furthermore, the limited educational campaign by the Fire Service on fire prevention and safety measures together with AMA's deficiency on the regular assessment of the vulnerability of market have all contributed to the ignition fires in the market.

5.2.1 Importance of Risk Communications

From the research it was very clear that the Ghana National Fire Service (GNFS), the state institution responsible for the management of the risk of domestic fire perceived Risk

Communication as a very important part of Risk Management practice and as Means of Fire Prevention tool.

5.2.2 Risk Communication Medium

It was evidenced from the research that the main media used to communicate risk in Ghana was the Radio, Television and the Print media and to lesser extent workshops. The researcher revealed that the use of radio as a medium to convey risk messages was most effective because of the universal availability and wider reach in Ghana.

5.2.3 Risk Communication Training

The researcher indicated that GNFS staffs responsible for the formulation and dissemination of risk messages do not have adequate professional training in risk communication. This lack of professional training has adversely affected the risk communication process in Ghana.

5.2.4 Risk Communication Approach

It was also evident from the findings of the research that the risk communication approach used by GNFS is largely the "top –down approach".

5.2.5 Risk Regulation

The researcher indicated that effective regulation as a means of backing the risk communication process in Accra is lacking to a very great extent.

5.3 Recommendations

Below are recommendations proposed by the researcher for an effective risk communication process in the management of fire outbreak in the market areas. In the light of the findings of the study, the following recommendations are made in order to curb the high rampant of fire outbreak in Ghanaian markets.

First of all, the researcher recommends that the Assembly must co-ordinate and collaborates with other key stakeholders such as AMA, GNFS, ECG and the market operators in order to development a holistic or an integrated fire management approach for the market. In this regard, there must be interaction between the market users and the appropriate agencies providing services to address the hazards and constraints within the markets.

Secondly, all the electrical installation must be inspected by qualified personnel from Architectural Engineering Services Limited (AESL) every quarter of the year so that all the safety violations could be addressed. In addition, the Electricity Company of Ghana should assess the electrical wiring and gadgets at the market place on yearly basis in order to issue certificate for validity as well as disconnect all illegal electrical wiring in the market.

Thirdly, government must allocate adequate funds to Ghana National Fire Service so that they can organize regular educational seminars on the causes and prevention of fire outbreak in the market so that the traders can be more careful about their actions and consequences in the markets.

Fourthly, the Authority must ensure the establishment of fire wardens at the market places. That is, special security force that has knowledge in fire combating techniques should be assigned to protect the markets at nights since most of the fire outbreaks happen at the night. The AMA must properly reconstruct the market in order to ensure adequate accessibility through the market as well as to reduce congestion.

Finally, the GNFS as the main institution responsible for fire prevention must consider the following risk communication factors;

1) The GNFS must increasingly use the radio as the main medium for conveying risk messages.
2) The staff responsible for the formulation of risk messages and its dissemination should be given adequate professional training in risk communication before embarking on any risk communication mission.
3) There is the need for GNFS to change their "top down" risk communication approach into interactive approach this will enable GNFS to better articulate the needs, beliefs and perceptions of the recipients of the risk message.

4) The Central Government of Ghana must, as a matter of urgency, see the GNFS as a priority agency and endeavor to provide adequate resources to enable them adequately implement their risk communication programmes.
5) The government of Ghana must grave importance implement measures to enforce their risk regulations. It also recommend that the regulatory bodies must identify and engage with all those concerned and affected by each risk issue and endeavor to understand their attitudes to risks and risk control measures.

5.4 Limitations of Research

The main limitation of this research was the relatively low literacy levels of subjects questioned in the fire risk prone areas of Makola and Katamanto markets. Comprehension of the questionnaires by some subjects was lacking.

5.5 Areas for Further Research

Limited research on Risk Communication has been conducted in Africa and particularly, in Ghana for that matter. It will be interesting to conduct a research to replicate this study on Risk Communication in other hazards in Ghana.

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APPENDICES

APPENDIX 1: Traders and Household Questionnaires

TRADERS QUESTIONNAIRE

PROJECT TITLE:

ACHIEVING EFFECTIVE RISK COMMUNICATION FOR DISASTER PREVENTION IN GHANA

I am Prince Billy Anaglate student of Masters' Program at Ghana Institute of Journalism and I am conducting a research into the above named topic. I would be very grateful if you could spare me some few minutes of your busy scheduled to answer the questions below. The confidentiality of your responses is assured.

Questionnaire No .....Date of Interview..... Locality/Suburb ..... Name of Enumerator .....Tel. No. of Respondent .....

SECTION A: DEMOGRAPHIC AND SOCIOECONOMIC FEATURES

1. Gender:

a. Male [ ] b. Female [ ]

2. Age: .....

3. Educational background:

a. No formal education [ ] b. Elementary/primary education [ ] c. Junior Secondary School [ ]

d. Senior Secondary School [ ] e. Others: .....

4. Religious conviction

a. Christian [ ] b. Islam [ ] c. Traditionalist [ ] d. No religion [ ] e. Other, please specify.....

5. Ethnic Groupings

a. Akan [ ] b. Ewe [ ] c. Ga-Adangme [ ] d. Northerner [ ] e. Other, please specify.....

SECTION B: ATTITUDES AND PERCEPTIONS OF TRADERS

6. Have you ever experienced a fire outbreak in this market?

a. Yes [ ] b. No [ ]

7. If yes, what is the main cause of the fire?

a. Electrical equipment/wiring [ ] b. Arson (Intentional fires) [ ] c. Smoking [ ] d. Don't know [ ]

e. Other, please specify.....

8. Whose responsibility is it to manage market fire?

a. The individuals [ ] b. The AMA [ ] c. The GNFS [ ] d. All stakeholders [ ]

9. Could you explain your answer?

.....

.....

10. Do you often take the chance to educate other market operators/ traders on the need to reduce market fire?

a. Yes [ ] b. No [ ] c. Do not know [ ]

11. If yes, what are some of the lessons you teach them?

.....

.....

12. Do you have fire fighting equipments?

a. Yes [ ] b. No [ ]

13. If yes, what fire fighting equipments do you have?

.....

.....

14. Can a fire fighting vehicle access the market?

a. Yes [ ] b. No [ ]

15. If the answer to question 14 is yes, what control measures are you aware of?

i=the use of Portable Fire Extinguishers [ ]

ii=the use of Fire Blankets [ ]

iii=the use of Fire buckets [ ]

iv= the use of Hose reels [ ]

v=the use of Sprinkler systems [ ]

vi=seeking assistance from the Ghana National Fire Service [ ]

vii=others (specify).....

16. What would be your immediate reaction in an event of fire outbreak in your premises?

a=I would look for the escape route and ran away [ ]

b=I would look for the direction of the fire and identified a safe place for escape [ ]

c=I would look for firefighting equipment to control the fire [ ]

d=I would wait for an assistance from neighbours or fire management institutions for evacuation[]

e=others, specify .....

17. Awareness of contacts of fire management institutions

Name of institution/awareness of contact of institutions	YES	NO
Fire Service		
Electricity		
NADMO		
Ambulance		

A.M.A		

Knowledge on the use of Fire Safety Measures

Name of safety measure	YES	NO
18. Physical accessibility to building		
19. Means of escape		
20. Signs and notices		
21. Smoke detectors		
22. Emergency lightning system		
23. Portable Fire Extinguishers		
24. Fire Blankets		
25. Fire buckets		
26. Others (specify)		

Compliance with Fire Safety Measures

Name of safety measure	YES	NO
27. Physical accessibility to building		
28. Means of escape		
29. Signs and notices		
30. Smoke detectors		
31. Emergency lightning system		

32. Portable Fire Extinguishers		
33. Fire Blankets		
34. Fire buckets		
35. Others (specify)		

APPENDIX 2: QUESTIONNAIRE TO THE GHANA NATIONAL FIRE SERVICE

QUESTIONNAIRE TO THE GHANA NATIONAL FIRE SERVICE

1. What are the major causes of domestic fire outbreaks in the Accra Metropolis?

.....

2. Could you provide me with the statistics of domestic fires from 2003 to 2014?

3. What measures has GNFS put in place to manage domestic fires in Accra Metropolis?

.....

.....

4. What are some of the problems faced by the service in its attempt to manage domestic fires?

.....

.....

SECTION B: RISK COMMUNICATION APPROACH

5. Are there education for traders of Risk of Fire?

.....

.....

6. What are the Risk Communication Approach used by GNFS?

.....

.....

7. What medium is often used for Risk Messages?

.....

.....

8. Is GNFS prepared above other stakeholders in the prevention of fire outbreak?

.....

.....

9. Are there Professional training for GNFS staff on Risk Communication?

.....

.....

10. What are some of the Regulation GNFS has in place to enforce in prone areas?

.....

.....

APPENDIX 3: QUESTIONNAIRE TO THE ACCRA METROPOLITAN ASSEMBLY

QUESTIONNAIRE TO ACCRA METROPOLITAN ASSEMBLY

1. What role is AMA playing in domestic fire management in Accra metropolis? (prevention, detection and control)

.....

2. What has the assembly achieved in its quest to manage domestic fire?

.....

3. What measures has the service put in place to ensure effective domestic fire management in the Accra Metropolis.

.....

4. What problem(s) is the Assembly facing in its efforts to complement the efforts of GNFS to manage domestic fires in Accra Metropolis?

.....

5. What is channel of communication between the AMA and GNFS

.....

.....

6. What are some of the challenges in the communication between your institution and the GNFS

.....

.....

SECTION B: APPROACH AND CHALLENGES OF MANAGING MARKET FIRES

7. How does the department deal with market fire?

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8. How often do you use each of these methods?

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9. What are some of the problems resulting from these methods?

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10. What are some of the greatest difficulties you encounter working in Makola?

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.....

11. What do you intend doing about these difficulties?

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Thank you for your time and assistance.

APPENDIX 4: Questionnaire to the Electricity Company of Ghana

QUESTIONNAIRE TO ECG

1. What is your main responsibility as an organization?

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2. How would you assess the discharge of your responsibility?

1. Very good [ ] 2. Good [ ] 3. Weak [ ] 4. Very weak [ ]

Explain.....

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3. What are the salient attributed causes of fire outbreaks at Makola and Katamanto market?

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4. What measures have your institution put in place to manage fire outbreaks in the market?

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5. What are the main challenges faced with reference to fire management in market?

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7. Do you think your personnel have requisite skills to execute their functions?

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10. Is there any specific strategy your organization has developed and wants to implement to reduce the present market fires?

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11. How often are there fires in this market?

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12. How severe are fires in this market?

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13. Which areas in the market that are mostly affected?

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14. How many fires have occurred as far as you can remember?

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THANK YOU