Journal of Environment and Earth Science
ISSN 2224-3216 (Paper) ISSN 2225-0948 (Online)
Vol.10, No.10, 2020

Effective Communication for Disaster Management and Livelihood Vulnerability Options: A Systematic Review

Bismark Yeboah Boasu [1] Daniel Buor [2] Divine Odame Appiah[2] Gabriel Eshun[2]
Hannah Agyena-Karikari[3]
1.Department of Social Sciences, S.D.A. College of Education, Asokore-Koforidua, Ghana
2. Department of Geography and Rural Development, Kwame Nkrumah University of Science and Technology, (KNUST) Kumasi, Ghana
3.Department of Education, S.D.A. College of Education, Asokore-Koforidua, Ghana

Abstract
This paper presents a systematic review of relevant secondary materials on effective communication for disaster management. The paper undertook a copious review of secondary information on the concept of disaster risk communication and its ramifications on livelihood vulnerability, obtained from Google and other search engines data bases. Using the risk perception and planned behaviour theories, we espoused that the drivers of disasters and associated risks can be categorized into anthropogenic (human) and geogenic (natural) in nature. The discourse also revealed that individual's ability to secure sustainable livelihood, determines their affinity to devote some time and resources towards the compliance of disaster risk information communicated. Since some of the measures of protecting investments and livelihoods could be capital intensive, respondents would, usually want to be gainful in their occupations, or upgrading in their existing jobs, before they could develop the resilient capabilities for disaster management. It can therefore be deduced that people's vulnerability to risk is influenced largely by both gender and livelihood strategies. A stakeholder integration of efforts, based on the utility of the two theories espoused, should be the guiding framework in generating and disseminating risk communication among disaster risk stake-actors, in their scheme of affairs.
Keywords: effective communication, disaster, vulnerability, risk, and livelihood
DOI: 10.7176/JEES/10-10-04
Publication date: October 31st 2020

1. Introduction

Experiences with both natural and environmental factors are the foundation for people's perceptions "(Hartig, Kaiser and Bowler 2001)". The thinking and reaction of every individual is normally based on conditions within his or her environment. That is, the environment has influence on people's lifestyles. Therefore, in almost all disciplines, perceptions have become an essential part of examining relevant attitudes and behaviours and the complex environments "(Kusakari et al. 2014)". Since people's perception of risk determines their coping strategies "(Aboagye, Dari and Koomson. 2013)", improving an understanding of the linkage between risk perception and decision making, through effective communication, is therefore of significant importance to both the vulnerable and the authorities for effective and efficient development "(Trumbo et al. 2011)". The perception of the public on commercial fire disasters will help to examine the effective management mechanisms.

Public perception is achieved through Effective Risk Communication (ERC) and the meanings that people make out of the communication "(Peters, Covello and McCallum 1997)". In their research on risk perceptions towards flooding and environment in low-income urban communities in Indore in India, "Stephens et al. (1994)" postulate that poor communities ranked flooding low in comparison to other risks and problems; they perceive it to be a part of life and therefore expect it (cited in "Parkinson, 2003"). This implies that the poor trader might underrate the incidence of commercial fire and pays less attention to its impact and/or is unconcerned to its management.

There is an attitudinal change in people. However, the perception of well-being is of high regard "(Charumitra, Kumar and Anupama 2014)" and relative to the disasters and risk management. According to "Slovic and Peters (2006)", humans perceive and act on risk in two fundamental ways:- risk as feelings which refers to individuals' instinctive and intuitive reactions to danger; and risk as analysis which brings logic, reason, and scientific deliberation to bear on risk management. What this means is that risk, by nature, is relative because people have different feelings altogether. That is, although by nature feelings are common to everybody, it varies from one person to another and that is why emotions are not the same. This, at least, indicates that there is a dimension in disaster risk and its management.

"Trumbo et al. (2014)", therefore, argue that the concerns people have about disasters can diminish over time given the absence of an obvious or recent manifestation of such events. That is, with time people forget about the pains and difficulties they experience from disasters. It is also found that being older, having lived in disaster-prone area longer, and being more optimistic in general were all positively associated with optimistic bias to disaster risks "(Trumbo et al. 2014)". Additionally, it is observed that newer residents in disaster-prone areas tend

to be more likely to evacuate from disaster events "(Cross 1990 cited in Trumbo et al. 2014)". That is, because of their inexperience and lack of knowledge, such people are always afraid of witnessing such events. On the other hand, people gain experience or get much knowledge and find antidote/measures to disaster risks after a long practice of livelihood strategies. Such people are not afraid of the risks associated with their strategies. They will therefore perceive less risk from livelihood hazards or disasters.

This implies that dwellers who have lived in disaster-prone communities for a short period of time will perceive high risk from general disasters compared to their counterparts who have lived in same areas for longer period of time. The concern over the threat of HIV/AIDS, for example, has decreased over the years as improved use of preventative measures and more effective treatments have become more common "(Valdiserri 2004)". This means that time has the capacity of killing the intensity of risks perception among people. Thus, with time people gain experience and also have antidote to disaster risks and therefore do not fear much even should such events occur frequently. This suggests that traders who have operated in the central market for longer period may have optimistic bias to fire disaster risks, hence Effective Fire Risk Communication (EFRC) is appropriate.

Moreover, many other studies show that men tend to perceive less risk than do women "(Flynn et al. 1994 cited in Trumbo et al. 2014)". This is because women are the most directly affected by environmental risk in cities including inadequate access to safety measures "(Brundtland 2003 cited in Owoeye and Omole 2012)". It is therefore not surprising for "Songsore and McGranahan (1998)" to state that environmental hazards impose greater burdens on women more than men "(cited in Aboagye 2012)". Can we therefore conclude that female are more vulnerable to commercial fire risks and hence embrace fire risk communication better than their male counterparts in the central market of Kumasi?

Awareness leads to effective precaution. Thus, it is observed that if awareness is created, local communities are able to adapt latent local knowledge and experience to help cope with hazards "(Adger, 2006 cited in Jankowska, Weeks and Engstrom 2011)". Again, in their study on risk perceptions in savannah region of Ghana, "Aboagye, Dari and Koomson (2013)" posit that people's perception of flood risk determines their coping strategies. That is, proper attention is always paid to events that are disastrous to human health provided one is made aware of those events. This implies that if every trader in the central market of Kumasi is made aware of the negative impact of commercial fires, carefulness will be seriously taken into consideration which could result to effective management of the frequent fire outbreaks or lead to Disaster Risk Reduction (DRR) in general.

Meanwhile, it is not the information per se that determines whether people take actions to manage their risks, but the social characteristics of the people that reflect how they interpret and collate information to make it meaningful for mitigation actions "(Samaddar et al, 2012)". It is also found that whereas risk and benefit tend to be positively correlated across hazardous activities in the world, they are negatively correlated in people's minds "(Slovic and Peters, 2006)". Thus, in reality, high risk leads to high benefit in all risk ventures, however people think otherwise. This means that people perceive risk to be low on activity or venture when they realize that the benefit associated to that activity or venture is high and vice versa.

This inverse relationship between perceived risk and perceived benefit of an activity is therefore linked to the strength of positive or negative effect associated with that activity "(Finucane et al. 2000 cited in Slovic and Peters, 2006)". This could also mean that fire risk is relative in nature because what one may consider as risky venture, other(s) would see it as normal depending upon the rate of benefit each of them attaches to that particular venture. It is against this background that this systematic review was conducted to examine how livelihood and perceived vulnerability impact on disaster management.

2. Method and Procedures

This paper presents a systematic review of relevant secondary materials on the topic. The intention of this effort is to situate in the literature, the global, regional to sub-regional and national perspectives on effective disaster risk communication. The information was sourced from the internet, particularly through google scholar search using keywords and phrases. The keywords and phrases used included; "disaster" "fire risk" "vulnerability" "risk perception theories" "communication" "disaster management" and "livelihood". The search from the database resulted in 4,059 papers out of which 95 were selected and reviewed. The review was structured into themes and sub-themes that reflected on the topic under discussion.

Table 1: List of top 20 references used and their scope

Number	Author/Year	Area	Spatial Scope
1	Aboagye, D., Dari, T. and Koomson, J. (2013)	Risk Perception and Disaster Management in the Savannah Region of Ghana	International
2	Ajzen, I., and Fishbein, M. (2005).	The influence of attitudes on behavior.	International
3	Conner, M., and Sparks, P. (2005)	Theory of planned behaviour and health behaviour.	International
4	Covello, V. and Sandman P. M. (2008)	Risk communication: Evolution and Revolution Solutions to an Environment in Peril Anthony Wolbarst (ed.)	International
5	Fusheini, H. (2014)	Livelihood Strategies in Ghanaian Slums: The Case of Effiakuma in the Sekondi-Takoradi Metropolis	International
6	Höppner C., Bründl M. and Buchecker, M. (2010)	Risk Communication and Natural Hazards.	
7	Janoske, M., Brooke, L. and Sheppard, B. (2012).	Understanding Risk Communication Best Practices	International
8	Judy, C. B. and Jelagat, B. E. (2015).	Factors that Influence Effective Communication of Youth Enterprise Development Fund to the Youth in Kabianga Division, Kericho Country, Kenya	International
9	Ma, X., Tu, R., Zeng, Y., and Fang, T. (2019).	An analysis of low ambient pressure on fire risks associated with rigid polyurethane building facade insulation under various width constructions.	International
10	Myers, B., Allan, G. L. Williams, R. Duff, G., Jacklyn, P., Landsberg, J., Russell-Smith, J. Bradstock, R., Dias, and Morrison, J. (2004)	Fire Management in the Rangelands	International
11	Niekert V. D. (2005)	Comprehensive Framework for Multi-sphere Disaster Risk Reduction in South Africa.	International
12	Okada, N. (2005).	Urban Diagnosis and Integrated Disaster Risk Management	International
13	Oteng-Ababio, M. and Sarpong, A. O. (2012).	Fire Risk Reduction through Community-Based Risk Assessment Initiative	National
14	Pang, C. L. and Chow, W.K. (2011)	Fire safety concerns on existing super tall buildings and proposed upgrading in Hong Kong.	International
15	Sommer, L. (2011)	The theory of planned behaviour and the impact of past behaviour	International
16	Tall A., Mason S. J., Aalst M. V., Suarez P., Ait-Chellouche Y., Diallo A. A., and Braman L. (2012).	Using Seasonal Climate Forecasts to Guide Disaster Management	International
17	Twumasi, P., Nkansah, A.N., FeiBaffoe, B., Yeboah, K.Y., Addo, E.O.K. and Adom-Appau, I. (2013)	Managing Fire Outbreaks in Ghana.	National
18	vanWesten, C. and Kingma, N. (2009)	Disaster Risk Management.	International
19	Wisner B., Rose J., O'Keefe P. and O'Brien G. (2006)	Climate change and disaster management,	International
20	Yodmani S. (2000)	Disaster Risk Management and Vulnerability Reduction: Protecting the poor.	National

2.1. Theoretical support of the paper

The reviewed paper is predicated on two theories that support disaster risk communication and disaster management. These are the risk perception and planned behaviour theories.

2.1.1.Risk Perception Theory (RPT)

This theory holds that there are a variety of factors that influence the way people perceive risk. One of these factors, according to "McInnes (2005)", is the source of the risk (i.e. natural or human-made). That is, individuals normally pay particular attention to the nature and the cause(s) of a particular risk before decision on how to manage it is made. Usually, more attention is paid to naturally caused disasters compared to man-made caused disasters perhaps due to the perceptions people have for those disasters. That is people might pay more attention to risk information on natural disasters and easily accept or react quickly and positively to the message and vice versa. "McInnes (2005)" refers to this as a factor of agency because it shapes people's perceptions of risks. Thus, if individuals realize that something can be done to control their exposure to commercial fire events, they might seek for fire information to reduce the risk and vice versa based on the kind of trust they have for the source of the information.

Trust is the foundation of risk communication "(Infanti et al. 2013)". Therefore, any EFRC depends on the trust that both the public and the disaster managers/authorities have in either the information source(s) or among themselves. That is, if people get to know that the source(s) of fire risk information is credible, reliable and valid, they might react positively to the message to ensure EFRC and vice versa. The proponents of trust determination theory, for instance, hold the belief that when individuals are faced with difficulties or fed up, they commonly lose trust "(Covello et al. 2001)". This means that to ensure EFRC in commercial fire disaster management, both the authorities and the public need to establish trust and confidence between and among themselves in advance or prior to the occurrence of commercial fire outbreak so as to reduce the impact or cope with the situation.

2.1.2. The Theory of Planned Behaviour (TPB)

The theory has gained popularity as one of the top-supported social psychological theories and extensively applied with respect to predicting the behavior of mankind (Ajzen, 2005; Chatzisarantis et al., 2007) or basically to explaining substantial magnitudes of intention and behavior (Sommer, 2011). The ideology of the proponent of this theory is actually in line with Fishbein's theory of reasoned action which emphasizes that people usually do what they intend to do and fail to do what they do not intend (Trafimow et al., 2002). In modeling the TPB in the study of attitudes, personality and behavior, for instance, Ajzen (2005) established a relationship between background factors (including personality, social and information variables) and intention formation and/or behavior. Although Wegner and Wheatley (1999) argue against the idea that intentions cause behavior, Ajzen and Fishbein (2005) believe strongly that intention is the sole determinant of behavior. Following the existence of its common predictive power (Ajzen & Fishbein, 1980; Conner & Sparks, 2005), the theory of planned behaviour was adopted for the study to ascertain the action of the public when fire risk information is communicated to them.

3.Results and Discussions

3.1.Causes and ramifications of commercial fire disasters

In the known history, the intensification of fire disasters is linked to numerous factors including both natural and anthropogenic "(Arthur and Yeboah 2011; Ma, Tu, Zeng & Fang, 2019; Stern, O'Hern, Morse, Bishop & Kytömaa, 2017; Yan, Jiang, Zhou & Sun, 2017)". Naturally, fire is known to ignite only when the three combustion elements *inter alia* heat, oxygen and fuel come together and in right quantities "(Amoako 2014)". These three elements form a triangular shape usually referred to as the fire triangle. "Twumasi et al. (2013)" therefore opines that if any of these elements is taken out from the triangle, fire outbreak could be avoided. However, sometimes, it is difficult to do that in the Ghanaian central markets, especially when risk communication becomes ineffective. Thus, the open air nature of Ghanaian central markets, including the Kumasi Central Market, coupled with the congestions and the presence of inflammable goods as well as excessive heat from the weather normally pave way for these three elements to come together with ease to facilitate fire ignition.

Although many a time people do not aim to create disaster events, the situation normally calls for this. That is, naturally, disaster events are bound to occur. "Yeeles (2015)" therefore attributes the cause of disasters to the climate variability. To him, climatic conditions do not only determine economic productivity, especially in the African continent, but they also have a great influence on technological hazards. That is, climatic conditions such as hot temperature produce physiological discomfort that usually escalates aggression and anger. This actually is in line with the notion of "Niekerk (2005)" that naturally, climate induces disasters after realizing that rainfall triggers landslides. Likewise, high temperature brings hot and dry conditions that might also facilitate fire outbreaks in the central markets of Ghana in general and the central market of Kumasi to be specific. "Myers et al. (2004)" assert that physical gradient also has a great influence on the spread of fire, especially during its outbreak.

Contrary, "Yodmani (2000)" opines that disasters, including fire outbreaks, are not seen as extreme phenomena created solely by natural forces but also as manifestations of unresolved problems of development. This means that the escalation in disasters is related to an increase of people's vulnerability which is mainly influenced by development and inadequate management "(CRED 2015)". That is, the incapability of humankind

to have solution for the numerous problems or hazard conditions in their environment results in disaster. Thus, rapid urbanization, low infrastructure, income disparity, lack of effective management and low local incentives for improvement usually cause disasters "(Bai and Imura 2000)" including commercial fire outbreaks.

Additionally, the actions and inactions of public could also be a contributing factor to fire outbreaks at market centres. Thus, the impacts of disasters are exacerbated by the rapid growth and unsustainable development practices around the world "(Alcántara-Ayala et al. 2015)". That is, the developmental activities in most instances trigger environmental hazards "(Niekerk 2005)" which could end up with fire disasters. At least the effects of overcrowding on fire impacts is known; however, how this overcrowding influences fire outbreaks has not been ascertained "(Oteng-Ababio and Osman 2012; Oteng-Ababio and Sarpong 2012)". All the same, the careless behaviour of some of the urban dwellers, especially smokers and drunkards, leads to fire outbreaks (Oteng-Ababio and Sarpong, 2012). Thus, whiles many people continue to be careless in the way they handle naked fires during and after smoking or cooking, others indulge in illegal electrification in the market centres which eventually ignite fires "(Abubakar 2012; Giwa 2012; Pang and Chow 2011)". This suggests that the actions and inactions of such people have direct or indirect influence on commercial fire disasters in diverse ways. That is, People's bad behaviours or attitudes and the strong beliefs they hold for their activities in the market centres also have influence on fire outbreaks in those areas.

"Sakijege, Lupala and Sheuya (2012)" also attribute the cause of disasters, including commercial fires, to the dwellers themselves. This means that the entire livelihoods of the dwellers can be considered as the contributing factor to both artificial and natural disasters. That is, human livelihoods generally contribute to the overwhelming hazards which could eventually turn to various disasters in the universe. This implies that the lifestyles of traders operating in the central markets of Ghana could be a contributing factor to the outbreaks of commercial fires in these geographical areas.

Although heating and cooking have actually been noticed as the leading cause of fire outbreaks in the market centres "(Seattle Fire Department 2006; Tyler 2006)", the inadequacy of public knowledge in dealing with fire emergencies also contribute to the spread of fire outbreaks "(Kachenje, Kahila and Nguluma 2010)". The educational level of individuals, therefore, has effect on fire disasters. That is, people with low educational background are less likely to grasp the full import of public fire education messages "(Fahy and Norton 1989 cited in Sarpong 2013)". This indicates that, in ensuring disaster management, including commercial fires, there is always a correlation between educational levels of individuals and EFRC from both the authorities and the public.

During his acceptance speech for the Nobel Peace Prize in 2009, President Obama supported this notion by saying that "there is little scientific dispute that if we do nothing, we will face more drought, more famine, more mass displacement – all of which will fuel more conflict for decades" (cited in "Gleditsch 2012: 3"). This implies that humankind is indeed a major contributing factor to the global hazards which bring about numerous disaster events of which commercial fire is one. Additionally, both "Aboagye, Dari and Koomson (2013)" and "Dari, Aboagye and Koomson (2013)" postulate that natural events are not sufficient to explain human vulnerability to disasters; rather, social processes cause human vulnerability to disaster events such as commercial fire outbreaks. To them, these social processes include the culture, religion and the entire demographic background of dwellers living in a geographical area. That is, the attitude and behaviour of people in any geographical area is influenced by their traditional values and/or religious doctrines which sometimes bring about catastrophic phenomena such as commercial fire outbreaks.

"Wisner et al. (2006)", on the other hand, are of the view that governments rather need to be blamed for the occurrence of disaster events following their poorly planned development interventions for some communities, especially in cities in general and the commercial areas in particular. That is, the lack of infrastructure and limited opportunities for planning normally increase the vulnerability of the major population and economic centres "(Asian Disaster Preparedness Cente [ADPC], 2004)". That is, following their reluctance to have a development plan in the informal settlements in cities, governments can be identified as the major cause of flood and fire hazards in such areas "(Wisner et al. 2006)".

In Ghana, the inefficiency of governments' institutions to implement policies has given many people opportunities to have almost free access to the environment and eventually their activities end up with disasters such as commercial fire outbreak. That is, people's reluctance to abide by the fire regulations code (LI 1724) and the incapability of the Ghana National Fire Service (GNFS) to enforce such laws also contribute to fire outbreaks "(Amoako 2014)". "Jenninngs (1996)" posits that areas with illegal electricity connections normally experience more fire outbreaks compared to areas with proper or legal connections; also buildings made up with planks are usually more prone to fire outbreaks than those made of blocks or metals. This lack of professionalism and the kind of materials people use to put up structures in the central market could be a contributing factor to the rampant fire outbreaks.

In Mumbai, for instance, it was observed that pavement dwellers occupy about 70% of flood prone areas and yet received limited attention from the government both prior to and after a disaster "(Samaddar et al. 2012)". They further opine that it becomes understandably clear that the local government had no idea about the

community's evacuation intention, preferred shelters, risk perception, response orientation and other existing stumbling blocks sought to be annihilated to instigate the evacuation strategy in a flood prone micro- hotspot in Mumbai. Thus, information on disaster risk and their management are not well communicated. This indicates how governments, over the years, have relaxed in their efforts to deal with disaster risk in some areas, including market centres.

3.2.Drivers of effective fire risk communication

Communication usually occurs in written (i.e. printed materials), verbal (i.e. face-to-face approach) and non-verbal/visual (i.e. electronic materials) modes. "Fekete (2012)", however, asserts that there are two main ways of risk communication – top-down and bottom-up. This means that the information on commercial fire risk could be disseminated to the public from the disaster managers or authorities and vice versa. "Hoppner (2010)", therefore, postulates that the channel of risk communication could either be a direct (face-to-face) or an indirect (mediated).

The choice of communication channel is thus guided by the purposes and functions of that communication as well as the direction mode – one-way or two-way "(Hoppner 2010)". Two-way communication, which Guanquan & Jinhua (2008) advocate and is being applied in this study, normally takes either a dialogical or non-dialogical form depending on actors' motive. The former is realised if actors indulge in interactive exchange of information while the latter is achieved if one actor consults the other for information "(Hoppner 2010)".

It is also believed that people's awareness with and accessibility to early warning information in their daily life and a community's preparedness prior to the occurrence of a disaster is known to be more effective in dealing with disaster risks "(Okada 2005)". However.it cannot be achieved without an effective means of communication. That is, with good channel of communication, the local people are made aware of the hazards that could lead to disasters. They can also access early warning information that will help to prevent or reduce the impact of the disasters, such as commercial fires, even if they occur unexpectedly.

In response to the 2008 seasonal forecast on disaster impact free in Ghana, for instance, a communication system was established to enable the circulation of information from the national Red Cross Society's (RCS) headquarters, to contact focal points in the regions, districts, and communities at risk. By this, the impact of disasters minimized to some extent "(Daly 2009)". This, at least, is an indication that an ERC does not only raise the awareness but it also ensures effective management of disasters for it helps to bring about low or no loss of life after their occurrences. This implies that the medium and the method of communicating commercial fire risk are essential for EFRC at the central market of Kumasi.

There are different ways through which information on risk is communicated to the local people before, during and after the occurrence of a disaster. "VanWesten and Kingma (2009)" identified massmedia (e.g. television, radio, newspapers, etc.), social media (e.g. facebook, tweeter, WhatsApp, etc.) and people (e.g. leaders, volunteers, and heads of group) as effective channel of communicating early warnings of disaster risks. In awareness creation, however, they recommend stand-alone print (including poster, billboard, warning signs, etc.), distribute print (e.g. leaflet, pamphlet, brochure, booklet, newsletter, etc.), postal or direct mailing, face-to-face (e.g. meeting, seminar, workshop, demonstration, training, etc.) and folk media (e.g. story, drama, music etc.) as the effective means of communication.

On the African continent, different channels are utilized for risk communication. In the community of Atiegou-Zogbeji located North of Lome, Togo, for example, "Braman (2009)" established that a community leader with a loudspeaker went through the flood-prone community to advise people to evacuate when riverbed water levels were realized to have reached dangerous levels. And after one and a half hours, the population of almost 2000 was able to evacuate to avoid death casualty, though physical damage occurred when the floodwaters arrived. Besides, disaster managers also reach the communities with transport buses to disseminate risk information and preventive measures directly to the vulnerable. This means of communication actually yielded a remarkable achievement in disaster management in Togo "(Tall et al., 2012)".

However, in Burkina Faso, it is found that although cellular phone text messages are utilized in disseminating early warning information to the public to ensure disaster management, its effectiveness has not been felt much since many people are incapable of accessing the information "(Tall et al. 2012)". That is, those, especially the marginalized, who do not own cellular phones would not be able to benefit from this channel of communication hence denied from adhering to the directives of the information. In the same way, those who do not own or have access to other electronic means of communication such as television, internets, radio, among others are also denied of risk information. This implies that risk information on commercial fire disasters need to be communicated through different and/or many channels and media so that many people operating in the central market of Kumasi could get access to the message to ensure DRR or effective management of commercial fire outbreaks.

In many instances, word of mouth and mass media have been useful. However, based on the assumption that information is uniformly received by all kinds of people, the dominant deficit-model which is a top-down approach of communication is applied mostly by many governments "(Judy and Jalagat 2015)". Meanwhile, this is not

always the case because it is not easy getting everybody to accept the facts from the message and respond accordingly "(Fischhoff, Brewer and Downs 2011)". In their agenda-setting assumption, "McCombs and Shaw (1972)" also opine that sometimes the media are unsuccessful at informing the public what to think, but they are more successful at informing the public what to think about "(cited in Gakpe and Mahama 2014)". That is, it is sometimes difficult for the media to solicit ideas on the cause(s) of a particular problem from the public but very easy to give out ideas on how to solve such problem. One may ask: 'if you do not know the cause of a problem, how do you solve it?' This is the question that needs to be answered. It is therefore prudent for the media to give the public more opportunity to publicly air their views on the cause(s) of a particular problem, such as commercial fire disaster which is being under study.

Even-though social media programmes involve momentous resources, including human resources, it has proven to be an effective instrument for risk communication "(Kelly 2014)". During the firestorm in San Diego, California in 2007, and the aftermath of the earthquake and tsunami in Japan in March, 2011, for instance, social media attested really cherished in circulating official and credible information "(Skarda, 2011; Poulsen, 2007)". "White (2012)" assigns numerous benefits to the use of social media including its easy way for information distribution and its ability to reach many people within a short period of time. This implies that with the use of social media as a medium of communicating commercial fire risks, information can be circulated all the time in a multiplicity of ways in order to get swift response. That is, unlimited means of communication can be generated with it. Thus, by sharing images, text messages and among others, it makes a reflective impression on the public's ability to cope during disaster and recover in its aftershock "(Capriles, 2014; Merchant, Elmer and Lurie 2011)".

However, social media is a bottom-up form of communication and therefore lack formal command and control of the authority "(Coombs, 2012)". At times, it provides erroneous or false information "(Kusakari et al. 2014)". It is evident that the Cable News Network (CNN) report posted on social media on some facts about the 2013 Boston Marathon bombing incident turned out to be false "(Carr 2013)". Thus, with social media, timely information is regularly given primacy over precise information "(Petrecca 2012)". Information from the traditional communication methods including mass media are therefore regarded as more credible "(Schultz and Goritz, 2011)".

Contrary, following its sensitivity to fires, smoke alarm is considered the most effective medium of communicating fire risks "(United States Fire Administration [USFA], 1990)". "DiGuiseppi et al. (2002)", however, is of the view that a mere installation of smoke alarms is a waste of resources. Thus, it provides only a little benefit because many lack the skills to comprehend the instruction of this medium "(Gilk, 2007)". It is therefore imperative to identify the best method and medium which many people can access to ensure EFRC in the central of Kumasi.

3.3.Livelihoods vulnerability and disaster management

The issues of livelihoods, vulnerability and disaster management have been dealt with by many scholars. In his study of livelihood diversification, for instance, "Simtowe (2010)" posits that women and men particularly in Africa have different roles in the making of livelihoods. He further opines that livelihoods diversification is important because it can lead to some form of specialization and also increase the people's ability to cope with risk. That is, once individuals gain new jobs or an upgrading in the existing jobs, they usually have both the resistant and resilience flexibilities and capabilities for disaster management. It can therefore be deduced that people's vulnerability to risk is influenced largely by both gender and livelihood strategies. This could also mean that the impact of fire disaster in the central market of Kumasi differs from one group of people to another. That is, the livelihoods of traders are affected differently by commercial fires hence their response to fire risk information and commercial fire disaster management could also differ.

Livelihood, according to "Chamber and Conway (1992)", comprises people, their capabilities and their means of living including food, income and assets. Livelihood is, thus, a means of gaining a meaningful living. Majority of people, especially the marginalized, living in cities are found in the informal sector and engage in private ventures for their economic livelihoods "(Fusheini 2014)". That is, despite the fact that majority of urban dwellers earn their living from both informal sector activities and informal sector entrepreneurs, employment alone cannot provide a livelihood to urban poor. This implies that people's vulnerability to disaster risks cannot be solely attributed to the kind of job they do for living but also how they behave. That is, the actions and inactions of people operating in the commercial areas in general and the central market in particular could have direct or indirect influence on the incidence of fire outbreak.

Conditions in a geographical area also make people vulnerable to disaster risks. "Javed (2014)" asserts that people living in the informal settlements in cities experience the most deplorable living and environmental conditions which are characterized by hazardous location, insecurity of tenure and vulnerability to serious health risks. These features indicate that risk is both inevitable and unabated in such communities in cities including where the central market is located. Thus, each of the above stated characteristics can endanger the lives of people, making them vulnerable to disaster risk. This shows that the congestions, illegal connections among others together

with the kinds of items sold at the central market of Kumasi could also facilitate the occurrence of fire disasters.

Additionally, there is a relationship between lifestyles of individuals and disaster risk in every geographical area. Characteristics of group of people sometimes make them vulnerable to disaster. "Chatterjee (2010)", for instance, postulates that factors like religion, employment type and economic sector, language group, gender, demographic composition of households among others play a significant role in determining the level of vulnerability each household suffers from disaster occurrences. Sources of their income, which are normally inadequate for formally regulated markets "(Adarkwa and Post 2001)", therefore, depend on the ability of their performance in these ventures which are both legal and illegal. This means that some localities mainly provide informal labour market characterized by low wage, insecurity and uncertainty of working hour "(UN- Habitat, 2003)". These situations usually make them incapable to deal with disaster events whenever they occur. Thus, the loss of working days required to repair structural damage or the trauma cause victims to redirect assets towards treatment "(Parkinson, 2003)". Meanwhile, such assets are sometimes inadequate or lacking when they are requested from the traders operating in the central market.

In the case of Nigeria, for instance, "Rich and Wallace-Hadrill (1991)" identified that livelihoods of marginalized in cities are earned through different forms of economic activities including: employment as shop assistants, casual labourers, small business owners, and other income-generating activities such as carriers of goods. It therefore means that the moment one becomes handicapped, say from commercial fire disaster, his/her income reduces if not ceased unlike those in the formal sector. This situation could make many traders, especially those in the central market of Kumasi, vulnerable to the predicament of disaster risk. This could also explain why most of the traders in the central market are vulnerable to commercial fire outbreaks.

3.4.Factors facilitating effective fire risk communication

The heart of all communications is relationship "(Chatsworth Consulting Group [CCG], 2014)". EFRC would thus be achieved whenever good relationships exist among and between the authorities and the public "(Janoske, Brooke and Sheppard 2012)". Disaster managers therefore need to develop good rapport with the public in order to ensure the acceptability and utilization of the educative message communicated to them about the risks of commercial fires.

Declaration of intentions is vital in issues such as risk communication and disaster management. That is, until the public become aware of the disaster managers' intentions, they usually pay less attention or adamant to the educative messages in fire risks communicated to them. This means that there should be a transparency on what the public is expected to know and do with pre-risk information "(CCG, 2014)". ERC thus depends on self-awareness "(CCG, 2014)". That is, at any point in time, information is received differently by different people based on certain factors including socio-cultural background of the individuals "(Judy and Jalagate, 2015)". Both the disaster managers and the public therefore need to know each other's background information in order to ensure meaningful and successful fire risk communication.

The background information, according to 'Lionheart (2006)", includes socio-cultural and socio-economic factors. Thus, these factors directly or indirectly influence risk communication and disaster management. Male, aged and high income individuals have high optimistic bias to risk "(Trumbo et al. 2014)". This group of individuals, according to "Trumbo et al. (2014)", believe themselves to be less likely harmed by disaster events compared to others. This means that gender and level of income have influence on the decision-making process at the various phases of disaster "(Lionheart 2006)". Gender and income of individuals are thus important for ensuring EFRC. It is, therefore, important that the background information of both the disaster managers and the public should be made known to each other in order to ensure EFRC at various phases of disaster management.

Besides, level of education also influences EFRC for it plays a crucial role in diverse ways. Thus, literacy normally facilitates accessibility and understanding of risk information "(Lionheart, 2006)". "Duncanson, Woodward and Reid (2000)" therefore opines that low level of education significantly reduces individuals' understanding capacity. It impedes the abilities of individuals to do effective reading or understanding of risk information from instruction manuals and warning labels and eventually increases their risks of disaster "(Fahy and Norton, 1989 cited in Sarpong, 2013)". Besides, the kind of language to be used and the background of the audience or public are also vital since information is received differently by different people based on these factors among others "(Judy and Jalagat 2015)".

EFRC is again influenced by the perceptions of the public. "Peters, Covello and McCallum (1997)" opine that perceptions depend on: knowledge and expertise; openness and honesty, as well as concern and care. This implies that the reasons attached to disaster management policies and the credibility of the disaster managers are usually very necessary for ensuring ERC and disaster management "(Janoske, Brooke and Sheppard 2012)". The perceptions that the public hold for risks, management policies, institutions and disaster managers themselves have influence on ERC. Thus, people are most likely to accept decisions when they acknowledge both the moral basis of the judgment and the legitimacy of the decision-making body "(Tyler, 2006)" and vice versa.

Time and ethnicity are also considered as facilitating factors for risk communication. Some people have a

belief that anything told them officially is the truth and therefore bound to occur "(Lionheart 2006)", hence they pay particular attention to all sorts of information coming from the authorities. However, the timing for the dissemination of information is also essential. For instance, "Lionheart (2006)" postulates that tired people are less patient and therefore frown to communications or reject ideas with ease, especially when they are not favourable to them. The traders' mood and situation therefore need to be considered at any point in time when communicating fire risk information to ensure fire disaster management at the central market of Kumasi.

Also, the confidence that people have in the disaster managers or authorities as well as the source of risk information are also critical when ERC comes to play. Whiles confidence involves the beliefs of people based on their past experience, trust involves the judgment of people's intention. Confidence, therefore, enhances the public's acceptability of the risk message from the managers or authorities "(Earle 2004)". Thus, the confidence that individuals have in the disaster mangers or the authorities directly or indirectly has influence on their actions and inactions towards the acceptability of any risk information "(Siegrist and Rödel, 2006)". In addition, if the authorities and the disaster managers have confidence and trust among themselves, their cooperation will be high to ensure ERC "(Siegrist, 2006)". Both confidence and trust are therefore essential in the decision making process towards commercial fire disaster management.

When analyzing the validity of risk information in all the phases of disaster, trust and credibility are vital factors which the public pondered. "Peters, Covello and McCallum (1997)" assert that the public usually conform with the direction of disaster managers if they believe that the messengers are accurate and competent. Trust is, therefore, considered as the fundamental element of risk communication "(Janoske, Brooke and Sheppard 2012)" or key social factor that has a significant influence on risk communication "(Earle 2004)". It involves the judgment of people's intention. Thus, the willingness of audience to the acceptance of the risk messages depends mainly on the level of trust that they have for the source of the information "(Earle 2004; Löfstedt 2005)".

There is therefore a direct relationship between trust and EFRC in all phases of fire disaster management. Trust between the disaster managers and the public is, thus, essential for an ERC "(Covello, 2010)". "Glik (2007)" therefore puts what it takes to ensure ERC into five components—consistency of messages; accuracy of messages; specific instructions on messages; messages and approaches to be customized for the various audiences; and messages need to be tested extensively. Establishment of trust thus requires the commitment of communicating agencies to policies of openness and transparency in their functions "(Infanti et al. 2013)".

Many people, however, lose trust and confidence in the fire authorities especially when they frequently call to answer questions on the failure of their operations. "Vennet (2006)" therefore opines that the authorities or disaster managers need to be honest in all their endeavours in building their trust and confidence with the public. Thus, the ability of disaster managers to build trust and confidence with the public through their response to disaster events and information delivery can help escalate the public perceptions on risk "(Palenchar, 2008)". That is, once the public has developed the trust in the authorities, they rely on them for all sorts of information regarding fire risk thereby ensuring effective commercial fire risk communication.

Meanwhile, according to "Covello and Sandman (2008)", with the application of its seven (7) cardinal rules of risk communication, the EPA has been successful in disseminating risk information to the public. These rules among others include: accepting and involving the public as a legitimate partner; listening to the audience; being honest, frank, and open; coordinating and collaborating with other credible sources; meeting the needs of the media; speaking clearly and with compassion; and planning carefully and evaluating performance "(Covello and Sandman, 2008)".

4. Conclusion

Hinged on the perspectives of the risk perception and planned behaviour theories which espouse that there are a variety of factors that influence the way people perceive risk and the acceptability of an information communicated, depends on the trust that both the public and the disaster managers/authorities have and exhibit respectively, the paper has analysed the causes and ramifications of commercial fire disasters, as having tendencies to be lined with both anthropogenic and natural drivers. Human livelihoods security is also identified to be a function of the vulnerability levels of the individual, exposed to a certain degree of risk.

Thus said, it is imperative to juxtapose the relative cost of a disaster occurrence on the survival and livelihood sustainability of the individual. These efforts, bring our commitment to the compliance of early warning communication, and/or prevention of the occurrence. This is because the emphasis on the psychological effect of disaster risk communication and the manner the information is transmitted by the audience as well as the rhetorical skills of the communicators in receiving decoded feedback is highly not mutually exclusive. A stakeholder integration of efforts, based on the utility of the two theories espoused, should be the guiding framework in generating and disseminating risk communication among disaster risk stake-actors, in their scheme of affairs.

REFERENCES

Aboagye, D. (2012). The Political Ecology of Environmental Hazards in Accra, Ghana. Journal of Environment

and Earth Science, Vol 2, No.10, pp. 157 – 172.
Aboagye, D., Dari, T. and Koomson, J. (2013). Risk Perception and Disaster Management in the Savannah Region of Ghana. International Journal of Humanities and Social Science, Vol. 3, No.3, pp 1 – 20
Abubakar, J. (2012). Causes and Preventions against fire outbreaks.
Adarkwa, K. and Post, J. (2001). The Fate of the tree; Planning and managing the Development of Kumasi, Woeli publishing services, Accra.
Ajzen, I. (2005): *Attitudes, Personality and Behaviour*; Open University Press – Second Edition, McGraw-Hill Education, ISBN 0335217036
Ajzen, I. and Fishbein, M. (1980). Understanding attitudes and predicting social behaviour, Eaglewood Cliffs, NJ: Prentice Hall
Ajzen, I., & Fishbein, M. (2005). The influence of attitudes on behavior. *The handbook of attitudes*, *173*(221), 31.
Alcántara-Ayala, I., Altan, O., Baker, D., Briceño, S., Cutter, S., Gupta, H., Holloway, A., Ismail- Zadeh, A., Díaz V. J., Johnston, D., McBean, G., Ogawa, Y., Paton, D., Porio, E., Silbereisen, R., Takeuchi, K., Valsecchi, G., Vogel, C., Wu, G. and Zhai, P. (2015). Disaster Risks Research and Assessment to Promote Risk Reduction and Management.Journal of Disaster Risks Research and Assessment, Vol. 47.
Amoako, C. (2014). Emerging Issues in Urban Flooding in African cities – The Case of Accra, Ghana. 35th AFSAAP Annual Conference Proceeding. Accessed on 07 August, 2015 from www.afsaap.org.au
Arthur J. L. and Yeboah I. A. (2011). Movement Under Environmental Disasters: The Case of Flooding and Bushfires for Selected Periods in Ghana, Bielefeld: COMCAD. Working Papers No. 97, pp 1 – 20.
Asian Disaster Preparedness Cente (ADPC), (2004).Reducing Fire Threat to Homes: Piloting Community-Based Fire Risk Assessment in Ban Hatsady Village.
Bai, X. and Imura, H. (2010). A comparative Study of Urban Environment in East Asia: Stage Model of Urban Environment Evolution, Journal of International Review for Environmental Strategies, 1(1). pp. 135 – 158.
Braman L. (2009). "Early warning, early action: An Evaluation of IFRC West and Central Africa Zone Flood Preparedness and Response," International Federation of the Red Cross and Red Crescent Societies (IFRC) 56th Report.
Capriles, C. (2014). Social media use for public safety agencies [Personal interview].
Carr, D. (2013). The pressure to be the TV news leader tarnishes a big brand. Retrieved from http://www.nytimes.com/2013/04/22/business/media/in-boston-cnn-stumbles-in-rush-to-break-news.html?pagewanted=all
Chamber, R. and Conway, G. (1992).Sustainable rural livelihoods; practical concepts for the 21st Century, IDS Discussion Paper 296, Brighton, IDS.
Charumitra B., Kumar, D. K. and Anupama, S. (2014). Slum Redevelopment Strategy: A Way forward to Urban Environment Management through Inclusive Approach. Research Journal of Engineering Sciences, Vol. 3(7), pp 28-37.
Chatsworth Consulting Group (2014). How Well Do You Communicate? Accessed from www.chatsworthconsulting.com on 15/02/16.
Chatterjee, M. (2010).Slum Dwellers Response to Flooding Events in the Megacities of India. Mitigation Adaptation Strategies Global Change, Vol. 15, pp. 337–353.
Chatzusarantis, N., Hagger, M. and Smith, B. (2007): Influences of perceived autonomy support on physical activity within the theory of planned behaviour; in: *European Journal of Social Psychology*, Vol. 37, pp. 934-954
Conner, M., & Sparks, P. (2005). Theory of planned behaviour and health behaviour. *Predicting health behaviour*, *2*(1), 121-162.
Coombs, W. T. (2012). Ongoing crisis communication: Planning, managing, and responding. [S.l.]: Sage Publications.
Covello, V.T., Peters, R., Wojtecki, J., and Hyde, R. (2001). Risk communication, the West Nile virus epidemic, and bioterrorism: responding to the communication challenges posed by the intentional or unintentional releaseof a pathogen in an urban setting. Journal of Urban Health, vol. 78(2), pp 382-91.
Covello, V. and Sandman P. M. (2008). "Risk communication: Evolution and Revolution" Solutions to an Environment in Peril Anthony Wolbarst (ed.) John Hopkins University Press, pp 164-178
CRED (2015). "Disaster Data: A Balanced Perspective" Issue No. 39
Daly M. (2009). "Translating climate information into action: considering next steps for early warning, early action in West and Central Africa," in Proceedings of the 3rd World Climate Conference, World Meteorological Organization, Geneva, Switzerland.
Dari T., Aboagye D. and Koomson J. (2013).Coping with Floods in the Savannah Region of Ghana. Arts and Social Sciences Journal, Vol.61, pp. 1 – 13
De Guzman, E. M. (2005).Towards Total Disaster Risk Management Approach. Asian Disaster Reduction Center and United Nations Office for the coordination of Humanitarian Affairs – Asian Disaster Response Unit.

DiGuiseppi, C.,Roberts, I., Wade, A., Sculpher, M., Edwards, P., Godward, C., Pan, H., et al.. (2002). Incidence of fires and related injuries after giving out free smoke alarms: cluster randomised controlled trial. *Bmj*, *325*(7371), 995. British Medical Journal Publishing Group.

Duncanson, M., Woodwrad, A. and Reid, P. (2000).Social and Economic Deprivation and Fatal Unintentional domestic fire incidents in New Zealand 1988-1998.University of Otago Research Team; Research Report Number 5 ISBN 0-908-920-47-4.

Earle, T. C. (2004). Thinking aloud about trust: A protocol analysis of trust in risk management. *Journal of Risk Analysis*, vol*24*(1), pp 169–183.

Fekete, A. (2012). Safety and Security Target Levels: Opportunities and Challenges for Risk Management and Risk Communication. International Journal of Disaster Risk Reduction (Elsevier), vol 2, pp 67 – 76

Fischhoff, B., Brewer, N. T. and Downs, S. J. (2011).Communicating Risk and Benefits: An Evidence-Base User's Guide. Accessed on 15th June, 2015 fromwww.fda.gov

Fusheini, H. (2014). Livelihood Strategies in Ghanaian Slums: The Case of Effiakuma in the Sekondi-Takoradi Metropolis. International Journal of Innovative Research and Development, Vol. 3 (11).

Gakpe, B. K. and Mahama, P.Y. (2014). Reportage of Stories on Fire Outbreaks in Ghana: An Analysis of the Daily Graphic and the Chronicle. Journal of New Media and Mass Communication, vol. 24(1), pp 1 – 11.

Giwa, A. (2012). The National Emergency Management Agency Seminar on fire prevention and outbreak.

Gleditsch, N. P. (2012). Whither the weather? Climate change and conflict Journal of Peace Research 49(1), pp 3–9

Glik, D. C. (2007).Risk communication for public health emergencies.Annu Rev Public Health. Vol. 28(1), pp 33-54.

Hartig, T., Kaiser, F.G. and Bowler, P.A., 2001.Psychological restoration in nature as a positive motivation for ecological behavior. *Environment and Behavior*, *33*(4), pp.590-607.

Höppner C., Bründl M. and Buchecker, M. (2010). Risk Communication and Natural Hazards. CapHaz-Net WP5 Report, Version 2.1 (D 5.1) Birmensdorf, Switzerland.Swiss Federal Research Institute WSL. (Available at: http://caphaznet.org/outcomes-results/CapHaz-Net_WP5_Risk-Communication.pdf).

Infanti J., Sixsmith J., Barry M.M., Núñez-Córdoba J., Oroviogoicoechea-Ortega C., Guillén-Grima F. (2013). A literature review on ERC for the prevention and control of communicable diseases in Europe. Stockholm; ECDC, pp 1 – 24

Jankowska M. M., Weeks J. R. and Engstrom R. (2011). Do the Most Vulnerable People Live in the Worst Slums? A Spatial Analysis of Accra, Ghana. NHIS Public Access, Ann GIS, Author manuscript; deposited in PMC, pp 1 – 14.

Janoske, M., Brooke, L. and Sheppard, B. (2012). "Understanding Risk Communication Best Practices: A Guide for Emergency Managers and Communicators," Report to Human Factors/Behavioral Sciences Division, Science and Technology Directorate, U.S. Department of Homeland Security. College Park, MD: START.

Javed, S. S. (2014). Integrating Slums: a 21st Century Challenge.Sai Om Journal of Commerce and Management, Volume 1, Issue 3, pp. 1 – 5

Jennings, C. R. (1996). Urban Residential Fires: An Empirical Analysis of Building Stock and Socio-Economic Characteristics for Memphis, Tennessee. Unpublished Doctoral Dissertation, pp 105-107.

Judy, C. B. and Jelagat, B. E. (2015).Factors that Influence Effective Communication of Youth Enterprise Development Fund to the Youth in Kabianga Division, Kericho Country, Kenya.*International Journal of Humanities and Social Science*, vol. 5 (4) pp 172 – 178.

Kachenji, Y., Kahila, J. and Nguluma, H. (2010).Assessing Urban Risk in the Central Business District of Dar esSalam.*Jamba journal of Disaster Risk Studies*.Vol 3 (1).

Kelly, W. (2014). "Social Media: An Effective Tool for Risk and Crisis Communication?" Master's Projects. http://scholarworks.sjsu.edu/etd_projects/344

Kusakari, Y., Asubonteng, K. O., Jasaw, G. S., Dayour, F., Dzivenu, T., Lolig, V., Donkoh, S. A,

Leonard, H.B., and Howitt, A. M. (2014). Boston Marathon bombing response. Crisis Response, 8(4), 18-21.

Lionheart, P. (2006). The DUN Factor: How Completes the Patient Safety and Quality Healthcare. Accessed from www.lionhrtpub.com on 14/05/2016.

Löfstedt, R. E. (2005). *Risk management in post-trust societies.* London: Palgrave Macmillan.

Ma, X., Tu, R., Zeng, Y., & Fang, T. (2019). An analysis of low ambient pressure on fire risks associated with rigid polyurethane building facade insulation under various width constructions. *Indoor and Built Environment*, *28*(7), 905-913.

McInnes, C. (2005). Health, security and the risk society. London: The Nuffield Trust and the UK Global Health Programme.

Merchant, R. M., Elmer, S., and Lurie, N. (2011).Integrating Social Media into Emergency-Preparedness Efforts. New England Journal of Medicine, 365(4), 289-291. doi: 10.1056/NEJMp1103591.

Myers, B., Allan, G. L. Williams, R. Duff, G., Jacklyn, P., Landsberg, J., Russell-Smith, J.Bradstock, R., Dias,

and Morrison, J. (2004).Fire Management in the Rangelands, Tropical savannas CRC, Darwin.

Niekert V. D. (2005). A Comprehensive Framework for Multi-sphere Disaster Risk Reduction in South Africa. A thesis submitted for Ph.D degree in public management and development in the school of Social and Government Studies at the Northwest University, Potchefsteroom Campus.

Okada, N. (2005). Urban Diagnosis and Integrated Disaster Risk Management. *Journal of Natural Disaster Science*, Vol. 26(2), pp 49-54

Oteng-Ababio, M. and Osman, A. (2012).Hulking Hazards: Exploring Fire Risk Vulnerabilities in Ghanaian Markets. For African Urban Risk Analysis Network (AURAN).(Forthcoming).

Oteng-Ababio, M. and Sarpong, A. O. (2012). Fire Risk Reduction through Community-Based Risk Assessment Initiative -Reflections from the Makola Market, Accra, Ghana.

Owoeye J.O and Omole F.K (2012). Built Environment Decay and Health Situation of Slum Dwellers in Residential Cores of Akure, Nigeria. American Journal of Human Ecology, Vol. 1(2), pp 33-39.

Palenchar, M. J. (2008). Risk communication and community right to know: A public relations obligation to inform. *Journal of Public Relations, vol. 2*(1), pp 1-26.

Pang, C. L. and Chow, W.K. (2011). Fire safety concerns on existing super tall buildings and proposed upgrading in Hong Kong. *International journal on Engineering Performance-Based Fire Codes*, vol 10 (2), pp 24-35.

Parkinson J. (2003). Drainage and stormwater management strategies for low-income urban communities, *Journal of Environment and Urbanization*, vol 15(2), pp 115 – 127

Peters, R. G., Covello, V. T., and McCallum, D. B. (1997). The determinants of trust and credibility in environmental risk communication: An empirical study (Rep.). Retrieved from: http://centerforrisk communication .org /publications/Environmental_Risk_Trust_Credibility_Factors_Study.pdf

Petrecca, L. (2012). After bombings, social media informs (and misinforms). USA Today.Retrieved from http://www.usatoday.com/story/news/2013/04/23/social-media-boston-marathon-bombings/2106701 on October 4, 2016.

Poulsen, K. (2007). Firsthand reports from California wildfires pour through Twitter. Wired.com. Retrieved from http://www.wired.com/threatlevel/2007/10/firsthand-repor/on September 24, 2016.

Rich, J., and Wallace-Hadrill, A. (Eds.).(2003). *City and country in the ancient world*.Routledge.

Sakijege, T., Lupala, J., and Sheuya, S. (2012).Flood, flood risks and coping strategies in urban informal residential areas: The case of KekoMachungwa, Dar es Salaam, Tanzania. Jamba: Journal of Disaster Risk Studies, vol. 4(1), Art No. 46

Samaddar S., Bijay A., Misra B. A., Chatterjee R. and Tatano, H. (2012).Understanding Community's Evacuation Intention Development Process in a Flood Prone Micro-hotspot, Mumbai.Journal of Integrated Disaster Risk Management Vol 2 (2).pp 89 –107

Sarpong, A.O. (2013). Fire Risk Vulnerability in Informal Settlements .The Case of Ashaiman. A thesis submitted to the University Of Ghana, Legon, in partial fulfillment of the Requirement for the award of Mphil Geography and Resource Development degree (Unpublished). Pp 19-20.

Schultz, F., and Goritz, A. (2011).Is the medium the message?Perceptions of and reactions to crisis communication via twitter, blogs and traditional media. Public Relations Review, 37(1), 20-27.

Seattle Fire Department, (2006).Fire Prevention Division Public Education Section. Retrieved from www.seattle.gov/fire on 15- 09- 2015.

Siegrist, J. and Rödel, A. (2006). Work stress and health risk behavior. *Scandinavian journal of work, environment & health*, pp.473-481.

Simtowe, F. P. (2010). Livelihoods diversification and gender in Malawi. African Journal of Agricultural Research, Vol. 5(3), pp. 204-216.

Slovic P. and Peters E. (2006). Risk Perception and Affect. Journal of Association of Psychological Sciences, Vol 15, No 6.

Skarda, E. (2011). Facebook to the rescue: How social media is changing disaster response. Retrieved from http://content.time.com/time /printout/0,8816,2076195,00.html

Sommer, L. (2011). The theory of planned behaviour and the impact of past behaviour. *International Business & Economics Research Journal (IBER)*, *10*(1).

Stern, M. C., O'Hern, S. C., Morse, T. L., Bishop, J., & Kytömaa, H. (2017). Fire risks due to unintentionally energized metal structures. *Journal of fire sciences*, *35*(5), 415-426.

Tall A., Mason S. J., Aalst M. V., Suarez P., Ait-Chellouche Y., Diallo A. A., and Braman L. (2012). Using Seasonal Climate Forecasts to Guide Disaster Management: The Red Cross Experience during the 2008 West Africa Floods.Hindawi Publishing Corporation, International Journal of Geophysics, vol. 2 (12),pp 1 – 20.

Trafimow, D., Sheeran, P., Conner, M., & Finlay, K. A. (2002). Evidence that perceived behavioural control is a multidimensional construct: Perceived control and perceived difficulty. *British journal of social psychology*, *41*(1), 101-121.

Trumbo C., Lueck M., Marlatt H., and Peek L. (2011). The Effect of Proximity to Hurricanes Katrina and Rita on

Subsequent Hurricane Outlook and Optimistic Bias.Society for Risk Analysis Journal.Vol. 10.

Twumasi, P., Nkansah, A.N., Fei-Baffoe, B., Yeboah, K.Y., Addo, E.O.K. and Adom-Appau, I. (2013).Managing Fire Outbreaks in Ghana.Onesal Multimedia, Accra.[ISBN 978-9988-1-8531-2].

Tyler, D. (2006). Department of Public Safety.Division of Fire and life Safety.

UNDP (2014).2013 Annual report on disaster risk management for International Federation of Red Crescent Societies (IFRCS).

UN-Habitat (2003). Slums of the World: the face of urban poverty in the new millennium. Nairobi. Accessed from http://www.unhabitat.org/publication/slumreport.pdfon 24th September, 2016.

U.S. Fire Administration (1990).Fire in the United States 1983-1987. 7th ed. Emmitsburg, MD:USFA

Valdiserri R.O. (2004). Mapping the roots of HIV/AIDS complacency: Implications for program and policy development. AIDS Education and Prevention, vol. 16(5), pp 426 – 439.

vanWesten, C. and Kingma, N. (2009). Disaster Risk Management. In C. van Westen (Ed.), Multi-hazard risk assessment: Distance education course/Guide book: United Nations University–ITC School on Disaster Geoinformation Management.

Wegner, D. M. and Wheatley, T. (1999): Apparent Mental Causation: Sources of the Experience of Will; in: *American Psychologist*, Vol. 54, No. 7, pp. 480-492

White, C. M. (2012).Social media, crisis communication, and emergency management: Leveraging Web 2.0 technologies. Boca Raton, FL: CRC Press.

Wisner B., Rose J., O'Keefe P. and O'Brien G. (2006). Climate change and disaster management, 30(1), pp 64−80 Published by Blackwell Publishing, 9600 Garsington Road, Oxford, OX4 2DQ, UK and 350 Main Street, Malden, MA 02148, USA.

Yan, W., Jiang, L., An, W., Zhou, Y., & Sun, J. (2017). Large scale experimental study on the fire hazard of buildings' U-shape façade wall geometry. *Journal of Civil Engineering and Management*, *23*(4), 455-463.

Yeeles, A. (2015). Weathering unrest: The ecology of urban social disturbances in Africa and Asia. Journal of Peace Research, Vol. 52(2) pp 158–170

Yodmani S. (2000). Disaster Risk Management and Vulnerability Reduction: Protecting the poor. A paper presented at the Asia and Pacific Forum on poverty organized by the Asian Development Bank.