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# MANAGING POST DISASTER RECOVERY OF MARKET FIRE VICTIMS IN GHANA

PRINCE GEORGE ANING-AGYEI

2018

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# MANAGING POST DISASTER RECOVERY OF MARKET FIRE VICTIMS IN GHANA

BY

PRINCE GEORGE ANING-AGYEI

Thesis submitted to the Institute for Development Studies of the Faculty of Social Sciences, College of Humanities and Legal Studies, University of Cape Coast, in partial fulfilment of the requirements for the award of Doctor of Philosophy degree in Development Studies

May 2018

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# DECLARATION

## Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature ……... Date …….

Name: ……..

## Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature …… Date ……..

Name: ……..

Co-Supervisor's Signature …… Date ……..

Name: ……..



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## ABSTRACT

Managing post-disaster recovery is a critical stage in the disaster management process to ensure successful restoration of the damage caused to victims. The study assessed the management of post fire disaster recovery among market fire victims in Ghana, using Makola, Kantamanto and Kumasi Central Markets as cases. A mixed-methods research design was adopted. A total of 400 respondents were sampled from a population of 12,945. Interview schedule and interview guides were used to gather data. The data were processed with Statistical Product and Service Solutions version 21. Descriptive statistics, Kruskal Wallis and Wilcoxon Signed Ranked tests were used to analyse the data. The study found that some of the victims collapsed upon seeing their shops engulfed in fire, while others experienced suicidal tendencies. Some businesses collapsed after the infernos, while others continue to struggle to restore pre-disaster business performance levels. High impact of the disasters on businesses was largely due to the location of both warehouses and retail shops of some victims in the markets. The disaster management institutions provided support to ensure the recovery of victims, however, none of them had a counselling unit to address the psychological needs of victims. Three years after the occurrences of the disasters, victims have not fully recovered, both psychologically and economically. It is estimated to take an average of three more years to restore business performance indicators to pre-disaster levels. The study recommends that traders should locate their warehouses outside the markets to reduce the impact of fire disasters on businesses. National Disaster Management Organisation should create a counselling unit in its operational structures to address the psychological needs of disaster victims.




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**KEY WORDS**

Disaster

Disaster management

Disaster recovery

Institutional response to disaster

Market fire disaster

Psycho-economic recovery from disaster



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## DEDICATION

To my wife and late son: Millicent Abigail Aning-Agyei and Kojo Takyi Aning-Agyei



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## LIST OF ACRONYMS

| | |
|---|---|
| AMA | Accra Metropolitan Assembly |
| APA | American Psychiatric Association |
| BBB | Building Back Better |
| DA | District Assembly |
| DACF | District Assemblies Common Fund |
| DCD | District Coordinating Director |
| DCE | District Chief Executive |
| DII | Disaster Impact Index |
| DPCU | District Planning Coordinating Unit |
| DRI | Disaster Recovery Index |
| ECG | Electricity Company of Ghana |
| FEMA | Federal Emergency Management Agency |
| GDP | Gross Domestic Product |
| GNFS | Ghana National Fire Service |
| GRDA | Ghana Railway Development Authority |
| IFRC | International Federation of Red Cross and Red Crescent Societies |
| KMA | Kumasi Metropolitan Assembly |
| KRTA | Kantamanto Railways Traders Association |
| M&E | Monitoring and Evaluation |
| MASLOC | MacroFinance and Small Loans Centre |
| MMDAs | Metropolitan, Municipal and District Assemblies |
| MTDP | Medium-Term Development Plan |
| NADMO | National Disaster Management Organisation |



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| | |
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| NDPC | National Development Planning Commission |
| NGOs | Non-Governmental Organisations |
| NSESSS | National Stressful Events Survey Short Scale |
| PMT | Protection Motivation Theory |
| PTSD | Post-Traumatic Stress Disorder |
| SBA | Small Business Administration |
| UNDP | United Nations Development Programme |
| UNISDR | United Nations International Strategy for Disaster Reduction |



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# CHAPTER ONE

# INTRODUCTION

Despite the general recognition of the importance of disaster recovery in disaster management efforts, there is conceptual confusion among researchers and practitioners over the approach to assess disaster recovery (Lloyd-Jones, 2006). Whereas researchers such as Rathfon (2010) and Smith and Wenger (2006) argue that disaster recovery should be measured in relation to the pre-disaster conditions, others, including Lyons (2009) and Hayashi (2014) contend that disaster recovery should be measured in reference to a counterfactual state, which would have existed if the disaster had not occurred. This conceptual confusion has made it difficult to develop a comprehensive theory to explain disaster recovery. It has also created methodological challenges in comparing disaster recovery efforts across institutions.

Lloyd-Jones (2006) reports that disaster recovery is the most poorly understood and least well researched among researchers and practitioners in the disaster management cycle. At the operational level, Rubin (2009) writes that broad knowledge of what to do is still lacking, and thus, the ability to act properly and effectively is deficient. Although this problem has been recognised for over 25 years, little has been done to address it. This study sought to contribute to the building of knowledge and understanding on disaster recovery using market fire disasters in Ghana between 2012 and 2013.

## Background to the Study

Disasters are exogenous shocks that destroy and erode development gains of people, businesses and economies. Carter, Little and Mogues (2007)



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and Rodríguez-Oreggia, de la Fuente and de la Torre (2008) argue that disasters have longer-term adverse consequences on economic growth and development. At the macro level, disasters affect development through physical damage to infrastructure and productive capital, which in the long term may impact on productivity and growth (Heger, Julca & Paddison, 2008). Disasters also create chaos which interrupt smooth and continuous business operations; loss of working capital, sales, assets and profitability; reduced household expenditure; unemployment; increased debt; food insecurity; reduced self-confidence; psychological disempowerment as well as difficult access to basic services at the micro level (Noy, 2009; Rodríguez-Oreggia *et al*., 2008; Toya & Skidmore, 2007).

According to Berz, Loster and Wirtz (2002), the annual average economic losses caused by disasters were estimated at US$ 75 billion in the 1960s, US$ 138 billion in the 1970s, US$ 213 billion in the 1980s, and more than US$ 659 billion in the 1990s. The United Nations International Strategy for Disaster Reduction (UNISDR) (2009) reports that disasters in 2002 affected 608 million people worldwide and killed 24,532. Guha-Sapir, Hoyois and Below (2014) indicate that an average of 388 naturally triggered disasters were registered between 2003 and 2013 resulting in the annual average death of 106,654. An average of 216 million people became victims to disaster annually within the same period. Guha-Sapir *et al*. estimated the annual average economic damage from natural disasters between 2003 and 2013 at US$ 118.6 billion.

The UNISDR (2009) indicates that disasters have significantly affected about 2.5 billion people since the commencement of the 21st Century. UNISDR



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adds that the number of people affected by disasters has doubled since the 1990s, with an average of 188 million people affected each year. Hence, the impact of disasters on people and economies has been increasing over the years. Such losses impact negatively on the development gains including Gross Domestic Product (GDP) and human development indices of affected countries (United Nations Development Programme [UNDP], 2011).

The degradation aspect of disaster corroborates the principal tenet of chaos theory that catastrophic events break the normal functioning of people's psyche and societies, and cause structural and qualitative changes in national economies, businesses and socio-economic conditions of people. According to Roulstone and Norbury's (2013), the impacts from disasters distort the patterns of growth and development of affected persons, institutions and countries. In most cases, the impact of disasters directs the operations and growth of the affected persons and businesses. Roulstone and Norbury attributed the huge impact of extreme events on societies to the fact that the occurrence and magnitude of disasters are highly volatile.

Walker and Salt (2006) contend that the impact of disaster goes far beyond physical and economic damage. The psychological toll can result in a wide range of intense, confusing, and sometimes frightening emotions. Disaster victims often have flashbacks and dreams about the event which scare them from further investments. Wisner (2004) reported that the psychological impact of disasters sometimes supresses the entrepreneurial drive of some victims. It also subdues the innovativeness of disaster victims to marshal proper strategies to recover quickly from disaster. Wisner concludes that some poverty situations associated with disaster emanate from psychological



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disempowerment of victims. Therefore, Wisner, Blaikie, Cannon and Davis (2004) recommended that it is always critical for disaster management institutions to provide psychological support to disaster victims. This is because the first phase of disaster recovery stems from psychological empowerment of victims (Prentice-Dunn, Mcmath & Cramer, 2009).

Accordingly, delays in psychological recovery of disaster victims go on to affect the physical and economic recovery following disasters. Milne, Orbell and Sheeran (2002) indicate that the indices that need to be tracked in psychological recovery include fear (of experiencing the disaster again, of further investments, of losing investment), bad feelings associated with dreams and flashbacks of disasters, and physical reactions (such as sweating, trouble breathing, nausea or a pounding heart) from remembering the event. Others are sleeping difficulties relating to the remembrance of the disaster, continuous blaming of oneself about the cause and effects of disaster, and loss of self-confidence about improving one's socio-economic conditions in the future.

Even though the occurrences and impacts of natural disasters have been massive in developing countries over the years, UNISDR (2009) projects that the occurrences and impacts of human-made disasters, such as fire, chemical and nuclear explosives, terrorism, civil strife, and armed conflicts, are more likely to increase tremendously in the near future. Fire disasters pose major environmental and socio-economic threats to both the built and unbuilt areas. This is because fire disasters occur from both natural and artificial causes which can wipe out the natural resources, economic gains and sources of livelihood of people and communities. Thus, fire disasters could occur in forested areas which destroy crops and sources of livelihoods; residential areas



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destroying properties and places of abode; and business areas including market centres leading to loss of economic gains and plunging people into huge debt and poverty (UNDP, 2011).

In spite of the devastating impact of fire disasters, it is not practically possible to protect all areas against fire outbreaks, especially in market centres where people use different forms of energy for different purposes and at different times. Consequently, there is the need for recovery activities for physical, social, economic and psychological restoration. The theory of adaptation by Darwin (1872) was used to explain the processes by which disaster victims recover from the psycho-economic impacts of extreme events. Thus, the exposure of an organism to a new environment which threatens its survival was likened to a disaster event which also poses a threat to the psychological stability and socio-economic development of victims as well as the survival and growth of businesses. After all, Smith and Wenger (2006) define disaster recovery as the longer-term activities undertaken to recover from a disaster event in an attempt to return victims to pre-disaster norms.

Victims of fire disasters adopt several conventional and unconventional strategies to manage their losses, recover from psychological, social and economic shocks and develop their conditions to be more resilient to subsequent fire disasters. The strategies are, in many instances, influenced by the opportunities available in a particular country in terms of institutions for disaster management, how resourceful such organisations are in responding to the coping and recovery needs of fire disaster victims and the technical capacities of the institutions (Lindell & Prater, 2003). Nevertheless, the level of preparedness (pre-disaster conditions) in terms of savings, extent of losses and



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proportion of losses to productive capital to fire disasters are all critical in the determination of particular strategies for recovery (Strobl, 2008).

A study by Dercon, Hoddinott and Woldehanna (2005) shows that large proportions of fire disaster victims in the industrialised countries rely on insurance companies, government support, loans from commercial banks, and support from disaster management organisations to recover from disasters. On the other hand, Joakim (2011) indicates that fire disaster victims in low-income countries rely more on friends and relatives, personal savings, and support from Non-Governmental Organisations (NGOs). Thus, while fire disaster victims in the advanced countries depend largely on institutional support, those in the developing countries rely more on individual efforts to regain economic strength. Rubin (2009) attributes the over-reliance of fire disaster victims in developing countries on individual efforts to less effective institutional structures and support systems.

In the face of ever-increasing risk and threat of fire disaster losses to developing economies, there is a good reason to be concerned about the ability and effectiveness of support systems to deal with fire disasters for quick resumption of activities of victims. Kirigia, Sambo, Aldis and Mwabu (2004) contend that effective support systems are critical for sustainable economic progress in developing countries. It helps to reduce the impact of fire disasters on people and businesses as well as provide effective support for the quick recovery of victims. According to Rubin (2009), an effective way to ensure quick and successful fire disaster recovery in developing countries is to institute permanent structures and support systems such as fire-fighting



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institutions, disaster management organisations and counselling centres both at the local and national levels to address disaster issues.

As argued by Mooney, Knox and Schacht (2002) in structural functionalist and systems perspectives, structures and support systems for fire disaster recovery should be interdependent, interconnected and interrelated and ought to be pursued holistically. In fire disaster situations, various agencies have a pre-defined role on how to respond to assist the affected people. However, such institutions should not operate in isolation. In most instances, a government agency plays the coordinating role in the disaster management system. NGOs, with specialisations in different areas, work alongside government agencies to reduce the recovery time for affected persons. Lindell, Prater and Peacock (2007) reiterate that cooperation and coordination among disaster management institutions at all levels play a significant part in fire disaster management by minimising the impact of a fire disaster and increasing the effectiveness of the response.

Similarly, Lindell, Arlikatti and Prater (2009) contend that the effective functioning of structures and institutions for fire disaster management enables individuals and businesses to be more resilient to the impacts of disasters. In countries where such institutions are well established, the pre-disaster management activities make individuals and businesses less susceptible to fire disasters, while the post disaster management activities enable them to resume operations quickly (UNDP, 2011). However, post fire disaster recovery for individuals and businesses is a major issue of concern in Africa. Disaster management organisations and support services are on many occasions unable to provide effective support for quick physical, financial, psychological,



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economic and social restorations for victims. The World Bank (2013) attributed the low support to the weak technical and financial capacities of state institutions to reduce risk and provide support systems for fire disaster victims.

As a result, there are recurring difficulties with fire disaster response in Africa (Kirigia *et al*., 2004). According to Dercon *et al*. (2005), response and recovery activities are often uncoordinated, occur concurrently and, in some occasions, overlap or conflict with one another during fire disaster situations. Often, management responsibilities for fire disaster management activities are politically assigned to people unfamiliar with them. Decisions affecting the welfare of people and their businesses are often made through political lenses (Rubin, 2009). Recurrence of such practices often makes support systems from state institutions less effective to guarantee full-term recovery from fire disasters. One major consequence is that the victims of fire disasters mostly miss opportunities to improve their infrastructure, economy, environment, or quality of life, which make them less resilient to subsequent disasters.

According to the strain theory of deviance (Merton, 1957), when people are prevented from implementing culturally, environmentally and technically endorsed recovery strategies through institutional means, they experience strain or frustration and anomie which leads to deviance. In other words, victims of market fire disasters would resort to unconventional strategies when state institutions become less responsive, insensitive, unsupportive and ineffective to their plight in the recovery process. Many of such unregulated and unapproved strategies for post fire disaster recovery are technically deficient, environmentally unfriendly, and economically unsustainable, which create hazards for subsequent disasters.



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However, the protection motivation theory (PMT) by Rogers (1983) states that the motivation of disaster victims to adopt regulated and approved strategies to protect themselves from further harm and improve their recovery processes are enhanced by four perceptions:

1. perceived severity of the threat,
2. perceived vulnerability to the threat,
3. perceived self-efficacy – victims' confidence in their ability to cope with the threat and perform threat reducing behaviours, and
4. perceived response efficacy – ability of the response to reduce threat.

In Maddux and Rogers' (1983) explanation of PMT, full-term disaster recovery is reached when victims re-attain their socio-economic status – in terms of productive assets, working capital, level of profitability, physical infrastructure, employment levels and productivity levels – and regain confidence in their ability to cope with threats, perform threat reducing behaviours, and the effectiveness of their response to reduce threats. Thus, until state institutions support victims of fire disasters to re-acquire their productive infrastructure and adopt hazard mitigation strategies to make them more resilient to subsequent fire disasters, they are not said to have recovered fully from previous situations. The length of time taken by fire disaster victims to re-attain the pre-disaster socio-economic status is therefore very critical.

Walker and Salt (2006), on the other hand, contend that restoring victims to their previous status re-exposes them to the hazards, physical and social vulnerabilities that led to the fire disasters. Walker, Abel, Anderies and Ryan (2009) attribute it to the poor control in ex-post fire disaster construction. On many occasions, the reconstruction of facilities such as market stalls, office



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complex and utilities are left on fire disaster victims without any technical supervision from State institutions. With the intention to resume business operations quickly, coupled with limited resources, victims are forced to construct sub-standard structures and facilities which expose them to more hazards and make them more vulnerable to subsequent fire disasters.

In Ghana, the Ghana National Fire Service (GNFS) is responsible for the prevention and management of undesired fires. The National Disaster Management Organisation (NADMO) is in charge of the management of areas affected by disasters and similar emergencies, for the rehabilitation of disaster victims. In addition, per the ceding of political, administrative and legislative powers to the Metropolitan, Municipal and District Assemblies (MMDAs), the MMDAs have the primary responsibility to establish regulations to prevent disasters as well as mobilise financial and technical support to enable the successful recovery of disaster victims. As part of efforts to enhance coordination and effectiveness among these institutions, Section 15 of the NADMO Act, 1996 (Act 517) entreats the disaster management institution to constitute regional and district disaster committees. The aim is to create a common platform for such institutions to interact and formulate common policies to effectively manage disasters at the local level.

Fire disasters in Ghana are quite widespread emanating from bushfires, domestic fires, industrial fires and market fires. Available statistics show that Ghana lost GH¢ 1.74 million to fire in the first quarter of 2012 as against GH¢ 1.62 million in 2011 (e.tv Ghana, 2012). In 2012, fire outbreaks recorded nationwide were 4,577 resulting in 295 deaths. The cost of damage was put at GH¢ 10.32 million (Appiah, 2013). In terms of regional distribution, the Brong



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Ahafo Region recorded the highest number of fire disasters with 378, followed by the Greater Accra Region with 330, Ashanti recorded 314, while the Volta Region recorded the least of 46 fires. While the majority of the fire disasters in the Brong Ahafo Region were bushfires, the majority of the fire outbreaks in the Greater Accra and Ashanti Regions were market and domestic fires.

Fires continue to cause considerable damage to life and property as the country recorded 2,201 fire outbreaks in the first quarter of 2013 with markets being the most affected (Appiah, 2013). From the total fire outbreaks recorded in the first quarter, it means that an average of 18 fires occurred daily, while 550 occurred monthly. Some of the major fire outbreaks recorded in 2013 occurred at the Kantamanto Market in Accra, where almost the whole place was razed down by the inferno. Other markets were the Makola Number Two and Agbogbloshie markets, and the Makola Shopping Mall all in Accra, and Kumasi Magazine and the Kumasi Central Market. Days after the fires, the affected markets became mourning grounds, as traders and shop owners mourned their losses.

The infernos at the markets led to the loss of property, sources of livelihood, businesses and working capital as well as plunged traders into huge financial debts. The GNFS is said to have conducted extensive investigations on the causes of fires in the markets. Some of the identified possible causes are faulty electrical connections, over-aged wiring of buildings as well as the use of fire by traders in the markets and their failure to put them off properly. Others are frequent power outages and illegal connections in the markets which also include overloading of metres. According to Appiah (2013), improper demarcations in the markets, hinder the entry of fire personnel to fight the fires



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effectively. Since the causes of market fires are already known, the study did not focus on the causes but rather, the recovery process of victims.

**Statement of the Problem**

Despite the general recognition of the importance of disaster recovery in disaster management efforts, Lloyd-Jones (2006) posits that there is conceptual confusion among researchers and practitioners over the conceptualisation of disaster recovery. Chang (2010) references three different ways to conceptualise recovery: returning to pre-disaster conditions, attaining what would have occurred without the disaster, or reaching a new stable state. Traditionally, post-disaster recovery consisted of restoring disaster impact areas to pre-disaster situations by repairing the physical damage that has been induced by a disaster (Smith & Wenger, 2006).

However, Kennedy, Ashmore, Babister and Kelman (2008) and Lyons (2009) point out that restoring disaster impact areas to pre-disaster standards often re-creates the same hazards and vulnerabilities that existed earlier and contribute to the recurrence of the disaster. As a result, Lyons (2009) and Hayashi (2014) recommended the use of counterfactuals, where disaster recovery is measured according to the socio-economic status of non-victims. Nonetheless, this approach is criticised that disasters have ripple effects on non-victims and, as such, the status of the counterfactuals would not be a true reflection of the situation without the disaster. In a market environment, for example, the customers and suppliers of disaster victims could shift to non-victims to boost their businesses. As such, using the socio-economic status of the non-victims to measure the recovery levels of the victims could be unfair.



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Mitchell (1999), Lewis (2003) and Kijewski-Correa and Taflanidis (2012) note that the recovery period following a disaster poses an opportunity to address vulnerability issues found in communities. As a result of witnessing the on-going impacts of disasters on communities, another concept emerged, and post-disaster recovery was taken as an opportunity to not only reconstruct what was damaged and return the community to its pre-disaster state, but also, to seize the opportunity to improve its physical, social, environmental and economic conditions to create a new state of normalcy that is more resilient and sustainable (Boano, 2009; Khasalamwa, 2009; Ozcevik, Turk, Tas, Yaman & Beygo, 2009).

In spite of the general recognition given to building more resilient and sustainable communities in post-disaster recovery, Mannakkara (2014) reports that the use of that paradigm in implementing and assessing recovery efforts has not been entirely successful. This was attributed to the poor understanding of the concept of disaster resilient communities and failure to effectively bridge the gap between theory and practice through clear strategies, indicators and methodological frameworks (Boano, 2009; Khasalamwa, 2009; Lyons, 2009). This study addressed the conceptual confusion surrounding disaster recovery by providing an alternative conceptualisation of post-disaster recovery that can be used as a methodological framework for assessing recovery efforts.

Market fire disasters are quite widespread in Ghana and have resulted in the destruction of physical infrastructure, productive assets and sources of livelihood with a massive debilitating impact on both household welfare and business performance. Micah (2009) reports that some of the traders contract loans from financial institutions to finance their businesses; and in the event of



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such disasters, most of them are pitched into huge financial debts. Some victims collapse upon seeing the damage caused by the market fires, while others sustain burns in attempts to recover some of their wares (Today Ghana, 2013a).

Akalaare (2011) emphasises that the need for insuring traders and their wares has not gained priority on the part of regulators as most of their policies are tailored towards corporate institutions and persons. Insurance providers also shy away from the markets because of the high risk in insuring them and low premium payment for fire policy. Most traders are, therefore, unable to insure their wares which make them more vulnerable to poverty during market fire disasters. A survey by the Ministry of Gender, Children and Social Protection in Ghana, showed that about 98.6 per cent of market fire victims had no form of insurance, while 34.4 per cent had no banking culture (Syme & Appiah, 2013).

In the advanced jurisdictions, these financial institutions provide financial support to ensure the long-term recovery of disaster victims. In a situation where the majority of traders do not have business relations with financial institutions, it becomes very difficult for them to get financial assistance for long-term economic recovery. They mostly resort to short-term support from informal sources and government agencies. For example, 71 out of the 684 victims of the Makola Number Two fire disaster on 18th November, 2010 received support from the MacroFinance and Small Loans Centre (MASLOC) to restart their businesses (Akalaare, 2011). The government supported GH¢7,381 market fire disaster victims with GH¢260 each in August 2013 (Syme & Appiah, 2013). Nonetheless, the traders complained that the



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amount was woefully inadequate to enable them resume their business activities. Beyond such short-term supports, how do market fire disaster victims ensure long-term recovery? How effective are state disaster-related institutions in managing the disaster recovery processes of victims? The study sought to find answers to these questions.

**Research Objectives**

The general objective of the study was to assess the management of post fire disaster recovery among market fire victims in Ghana.

Specifically, the study sought to:

1. assess the psycho-economic effects of market fire disasters on victims;
2. examine the effectiveness of institutions and support systems in managing post market fire disaster recovery;
3. assess the extent of recovery of market fire victims from disaster; and
4. recommend ways to improve post market fire disaster recovery management.

**Research Questions**

The study sought to find answers to the following questions:

1. What are the psycho-economic effects of market fire disasters on traders?
2. How effective are the institutions and support systems in managing post fire disaster recovery?
3. To what extent have market fire victims recovered from the disasters?



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**Significance of the Study**

Most studies in disaster management focus on natural disasters. Studies on human-made disasters mostly concentrate on chemical and nuclear explosions, terrorism, civil strife, and armed conflicts. Ehrenreich and McQuaide (2001) posit that few studies have been conducted into the impact of fire disasters on societies; however, most of such studies are centred on bushfires. The focus of this study on market fire disaster was, therefore, to enable both practitioners and academics to appreciate the impact of market fire disasters on people and businesses as well as the difficulties and the processes of recovery of such victims. This was very crucial to the development of disaster management discipline, both in academia and practice.

According to Lloyd-Jones (2006), of the four phases in the disaster management cycle; preparedness, response, recovery and mitigation, recovery is the most poorly understood and least well researched among researchers and practitioners. At the operational level, Rubin (2009) writes that a broad knowledge of what to do is still lacking, and thus, the ability to act properly and effectively is deficient. Although this problem has been recognised for over 25 years, little has been done to address it. This study was designed to contribute to the building of knowledge and understanding on disaster recovery.

It also brought to the attention of governments and disaster management organisations the ordeals that market fire victims go through to recover their losses and also to avert poverty situations. UNISDR (2009) proposes that disasters from artificial hazards are likely to increase



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tremendously in the near future. A study into impact and recovery process of market fire victims was, therefore, in consonance with this projection.

The study highlighted the effectiveness of disaster management organisations in addressing the psychological and economic damage of market fire victims in Ghana. This is expected to empower such institutions to know areas they can step up their efforts to support market fire disaster victims to enable them recover early from such situations. The increasing trends in the impacts of disasters on people and societies also increase their vulnerability or resilience to subsequent disasters and economic shocks. The findings of the study allowed policy makers to ascertain the difficulties market fire victims go through in efforts to recover from such situations.

This was expected to inform policies and programmes to avert the reoccurrence of market fires as well as programmes for early recovery of victims of market fire disasters. The findings of the study also served as a body of knowledge and basis for further studies on disaster management. Thus, the study drew relationships among a number of theories and concepts, and how they explain disaster recovery process of market fire victims. The study, therefore, contributed to the development of disaster management theory, which was being debated among researchers and practitioners.

**Scope of the Study**

The study focused on Makola, Kantamanto and Kumasi Central Markets in Ghana. Makola and Kantamanto Market centres are located in the Greater Accra Region, while Kumasi Central Market is located in the Ashanti Region. These market centres were selected because per statistics from



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NADMO, they had experienced most of the fires in the country. The study also focused on incidence of fire outbreaks in 2012 and 2013. These years were selected because they were the periods where occurrences of market fires were at the peak. On many occasions, the disaster recovery process begins from a few days after the incidence of market fires due to the huge negative socio-economic implications on the livelihoods of victims and their dependants. As a result, assessing the post disaster recovery of market fire victims may not require several years.

The impacts of market fire on the sales, working capital, level of profitability and number of employees of victims were analysed. Psychological recovery from disaster was assessed using the National Stressful Events Survey Short Scale (NSESSS) by the American Psychiatric Association (APA) to assess the extent of psychological recovery of the market fire victims, where economic recovery was measured using De Ruiter's (2011) 7-point scale for assessing economic recovery.

**Limitations**

The main limitation of the study was the study design. Most studies on disaster recovery adopt longitudinal study design to enable researchers clearly assess incremental recovery efforts and recovery trajectory among disaster victims. This is important because such approach enables researchers and practitioners to understand the reasons behind the various strategies, and eventually determine the appropriate time for implementing various activities in the disaster recovery process. In such studies, researchers are deployed to the disaster zone to document and study periodic progressions made by victims



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towards recovery. Nonetheless, this study was conducted two and three years after the market fire disasters, whereas the data were gathered at a single point in time.

Another limitation of the study was that the market fire disaster victims, like most informal sector business operators in Ghana, did not have records on the business performance indicators as well as items in their shops prior to the infernos. In addition, they did not keep proper records on their recovery expenses. As a result, the amounts stated as losses from the disaster, cost of business re-activation, and business performance indicators were all guessed. Any serious deviations from the actuals could, therefore, dent the validity of the findings of the study. The study employed triangulations to limit the effects of such deviations on the validity of the findings. However, the degree of control or possibility of such deviations could not be established by the researcher.

**Organisation of the Study**

The study was organised into eight chapters. The first chapter, which was the introduction, covered the background of the study, statement of the problem, objectives of the study, research questions, and scope of the study. The second chapter contained reviewed literature on the theories, concepts and empirical studies on disaster recovery. The chapter reviewed literature on conceptualising disaster, disaster recovery, measuring disaster recovery and scales of measuring disaster recovery. It further presented a conceptual framework for managing post-disaster recovery.



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Chapter Three focused on the incidences of market fire disaster and institutional framework for disaster management in Ghana. The chapter reviewed legislative instruments that established NADMO, local governance, and GNFS in relation to disaster management. Chapter Four dealt with the methodology of the study which covered descriptions of study market centres, research paradigm, research design, study design, study population, sample and sampling procedure, data collection method, research instruments, pre-test, ethics, fieldwork, fieldwork challenges, and data management. The fifth, sixth and seventh chapters focused on the results and discussion of the first, second and third research objectives, respectively. Chapter Eight also dealt with the summary, conclusions and recommendations of the study.



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# CHAPTER TWO

# REVIEW OF RELATED LITERATURE

## Introduction

This chapter reviewed theoretical, conceptual and empirical literature related to disaster recovery. It included the concept of disaster, conceptualising disaster, disaster recovery, measuring disaster recovery, scales of measuring disaster recovery, disaster impacts model, and disaster-development nexus. The chapter also reviewed literature on empirical works on disaster recovery, and presented a conceptual framework for managing post-disaster recovery.

## Theoretical Framework

The study was guided by the chaos theory, structural functionalism, systems theory, strain theory of deviance or anomie theory, theory of adaptation, and protection motivation theory.

## Chaos theory

The chaos theory was propounded by Edward Lorenz in 1961 through his work on weather prediction. The theory studies the behaviour of dynamic systems that are highly sensitive to initial conditions, an effect which is popularly referred to as the butterfly effect. Ivancevic and Tijana (2008) define chaos as the science of surprises, of the nonlinear and the unpredictable. While most traditional science deals with supposedly predictable phenomena like gravity, electricity, or chemical reactions, chaos theory deals with nonlinear things that are effectively impossible to predict or control, like turbulence, weather, stock market, brain states, potential threat of hazards, and impact of



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disasters. These phenomena are often described by fractal mathematics, which captures the infinite complexity of nature.

The study adopted the chaos theory to explain the unpredictable impact of market fire disasters on households and businesses. According to Gleick (2008), chaos is one possible result of the dynamics of nonlinear systems. Nonlinearity refers to behaviour in which the relationships between variables in a system are dynamic and disproportionate. In nonlinear systems, small changes or errors can have big effects and systems outcomes are subject to high levels of uncertainty and unpredictability (Ivancevic & Tijana, 2008). Behaviour is also erratic and filled with surprises and many unexpected events which can change patterns and flow of activities. Thus, after such events, nonlinear systems function according to the dictates of the new order.

Kyrtsou (2005) contends that the world operates in a nonlinearity system where catastrophic events break the normal functioning of businesses and societies, and cause changes in psycho-economic conditions of people as well as changes in the profitability trends, sales, productivity, productive capital and assets of business. As a result, Gleick (2008) defines chaos as the irregular, uncertain, discontinuous aspect of change within the confines of a patterned whole. In order to understand a nonlinear system, it is better to disaggregate variables and issues to linear systems and analyse the behaviour and effect of such sub-issues to appreciate the behaviour of the whole nonlinear system. The implication is that the impact of disaster should be disaggregated on different socio-economic categories of people in terms of gender, levels of education, age, etc. to clearly understand how each category of people is affected and respond to disaster.



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In addition, well-focused indicators should be used to measure different thematic areas. In other words, specific aspects of economic impacts or business performance should be separated and thoroughly investigated. Understanding the behaviour and impact on the various micro elements would eventually help to understand the overall impacts of disaster. The theory is guided by the following principles:

1. The Butterfly Effect: This effect grants the power to cause a hurricane in China to a butterfly flapping its wings in New Mexico. It may take a very long time, but the connection is real. If the butterfly had not flapped its wings at just the right point in space/time, the hurricane would not have happened. Thus, small changes in the initial conditions lead to drastic changes in the results. The impacts of disasters are on-going demonstrations of this principle as a small event may cause both direct and rippling impacts on the psychological and socio-economic conditions of the current population and future generations.
2. Unpredictability: Since one can never know all the initial conditions of a complex system, one cannot hope to predict the ultimate fate of a complex system after an event. According to Lorenz (1961), since it is impossible to measure the effects of all the butterflies in the world, accurate long-range weather prediction will always remain impossible. Kyrtsou (2005) indicates that even slight errors in measuring the state of a system will be amplified dramatically, rendering any prediction useless. The theory, therefore, suggests that it is not possible to predict or assess accurately the full and long-range impact of chaos or disasters on societies or ecosystems. This



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explains why disaster impact assessments are always focused and directed at a particular segment of the society or ecosystem.

3. Order/disorder: Chaos is not simply disorder. According to Lorenz (1961), chaos explores the transitions between order and disorder, which often occur in surprising ways. The occurrence of any disaster disrupts the normal functioning of businesses, societies and ecosystems which results in disorder at the initial stage. However, the disorder creates a new order as people and businesses begin to adopt new practices to cope and recover from the initial disorder. In other words, the impact of the chaos or disaster dictates the pace and nature of operations of people and businesses. Chaos theory, therefore, postulates that there are pockets of order which appear, suddenly and unpredictably in nonlinear dynamics or in the midst of chaos.
4. Mixing: Turbulence ensures that two adjacent points in a complex system will eventually end up in very different positions after some time has elapsed. Disaster events may have different impacts on people and businesses within the same industry or locality which may also influence their rejuvenation processes. Small businesses may be transformed into middle- or large-scale businesses through the recovery process, whereas middle or large businesses may become small or collapse through the recovery process. Disasters, therefore, cause total transformation in the organisation of societies. They halt the operations of some businesses and propel others to greater achievements. However, they all depend on the available opportunities and the effectiveness of support systems.
5. Feedback: Systems often become chaotic when there is no feedback present. In other words, rushed and uncoordinated attempts by victims to



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rejuvenate their businesses after disasters may further create hazards which could lead to the same or other forms of chaotic events in the future. The implication is that scientific processes in managing the aftermath of chaotic events or disasters are critical for ensuring effective and sustainable rejuvenation of businesses and psychological empowerment.

6. Fractals: A fractal is a never-ending pattern. Fractals are infinitely complex patterns that are self-similar across different scales. They are created by repeating a simple process over and over in an on-going feedback loop. Driven by recursion, fractals are images of dynamic systems – the pictures of chaos. In disaster management, fractals are created when series of same or similar chaotic events occur in a particular place which could be attributed to same or similar hazards. In disaster, fractals are created when hazards are not effectively controlled after catastrophic events. Thus, uncontrolled hazards subsequently create further disasters. The series of market fires in the selected market centres in Ghana could, therefore, be described as fractals. This is because careful attempts are not made to regulate and control electrical connections and sources of energy after disasters. More hazards are, therefore, created in the recovery processes which further cause infernos in the markets.

One major criticism of chaos theory is that it focuses on behaviour that is of peripheral importance in real-world situations. In other words, most scientific principles and practical life situations follow linear patterns, and as a result, the theory fails to explain reality. However, Strogatz (2003) explains that systems designed to be linear and stable may become non-linear and unstable in certain conditions. Strogatz, Abrams, McRobie, Eckhardt and Ott



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(2005) also argue that people have selectively chosen to work with linear systems wherever possible because they are easier to understand. Thus, non-linear systems become linear when humankind is able to determine the order of their behaviour and predict their outcomes.

By understanding that ecosystems, social systems, and economic systems are interconnected, it is expected that proper structures and systems will be put in place to eliminate or reduce hazards in business operations as well as manage the impact of disasters to ensure successful recovery. The level of effectiveness of the established structures and systems influences the kinds of strategies to be adopted by market fire victims and the effectiveness of the recovery processes. However, issues about instituting strong structures to effectively manage disaster situations are explained by functionalism.

**Structural functionalism**

Structural functionalism, or in many contexts functionalism, is a broad perspective in evolution, sociology and anthropology which sets out to interpret society as a structure with interrelated parts. Functionalism sees society as built upon order, interrelation, and balance among parts as a means of maintaining the smooth functioning of the whole. Hence, functionalism addresses society as a whole in terms of the function of its constituent elements; namely norms, customs, traditions and institutions (Parsons, 1951). The central idea about functionalism is that society is a complex unit, made up of interrelated parts. Functionalism views shared norms and values as the basis of society, focuses on social order based on tacit agreements between groups and organisations, and views social change as occurring in a slow and orderly fashion. Functionalists such as Merton (1968) and Parsons (1975) acknowledge



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that change is sometimes necessary to correct social dysfunctions, but that it must occur slowly so that people and institutions can adapt without rapid disorder.

Relating functionalism to disaster management implies that proper institutional structures with definite roles, functions and responsibilities should be established at all levels to provide psychological, economic, social, environmental and technical support to victims of market fire disasters. According to Urry (2000), the effective functioning of each of the institutions would help address the total needs of the victims to ensure swift and successful recovery. In Fisher's (2010) explanation on functional analysis, he argues that all social patterns work to maintain the integration and adaptation of the larger system. The implication is that the functions of disaster management organisations should aim at maintaining socio-economic patterns and equilibrium in the local and national economies.

The effectiveness of disaster management organisations could be explained in terms of the extent to which they are able to perform their functions to maintain socio-economic, psycho-cultural and technical equilibrium between disaster victims and the rest of the society. The effectiveness of the institutions could also be measured based on the importance of their functions to disaster victims. Fisher (2010), therefore, concludes that in formal functional analysis, the effects of a trait are used to explain the system rather than the trait. Functionalists such as Cancian (1968) and Holmwood (2005) argue that in order for society to function, it has to place and motivate individuals to occupy the necessary positions in the social structure. There are two main ways society does this:



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1. Society must instil in the proper individuals the desire (motivation) to fill certain positions; and
2. Once the proper individuals are in such positions, society must offer them appropriate rewards and adequate resources to deliver to maintain societal equilibrium.

The calibre and capacity of personnel of disaster management institutions as well as the adequacy of resources to execute their functions are, therefore, critical for ensuring their effectiveness, and the swift recovery of disaster victims.

Functionalism is criticised for not being able to account for social change, or for structural contradictions and conflict. It ignores inequalities including race, gender, class, which cause tension and conflict. Similarly, functionalism contains no sense of agency, and that individuals are seen as puppets, acting as their role requires. Yet Holmwood (2005) argues that the most sophisticated forms of functionalism are based on a highly developed concept of action. The functionalism's concept of systems also gives too much weight to integration and consensus, and neglecting independence and conflict which also form part of the society.

**Systems theory**

Another important theory that explains the organisation of societies is systems theory. Systems theory was proposed in the 1940s by the biologist Ludwig von Bertalanffy and furthered by Ross Ashby (Thomé, 1993). According to Rapoport (1966), systems theory is an interdisciplinary theory about the characteristics of complex systems in society and science. It provides



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a framework by which one can investigate and/or describe any group of objects that work together to produce some result. Rapoport (1968) defines a system as a set of interrelated entities connected by behaviour and history. Stichweh (2011) also defines a system as a set of social, biological, economic, technological or material partners co-operating on a common purpose. A system must satisfy the following criteria:

1. One can specify a set of identifiable elements.
2. One can specify identifiable relations among all the elements.
3. Certain relations imply others.
4. A certain complex of relations at a given time implies a certain complex (or one of several possible complexes) at a later time (Rapoport, 1966).

In the most general sense, system means a configuration of parts connected and joined together by a web of relationships. Systems theory thus serves as a bridge for interdisciplinary dialogue among independent institutions with a common goal (Stichweh, 2011). In the application of systems theory in post disaster recovery, it is expected that there should be strong collaboration among all the institutions related to disaster management such as national disaster management organisations, insurance companies, security agencies, utility companies, counselling centres and NGOs.

Thus, the strength of relationship among disaster-related organisations in managing post disaster recovery is a great determinant for ensuring that victims recover quickly, effectively and become more resilient to subsequent disasters (Dostal, 2005). A system in this frame of reference is composed of interacting or interrelating groups of activities executed by each agency towards the recovery process. The effectiveness of the disaster-related



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institutions in the disaster recovery process is, therefore, measured based on the holistic impact they make in the psycho-social and economic lives of the victims. The systems theory is, however, criticised that the social systems are less precise. In social systems, the elements and relations are vague and hard to define. As the basic unit of social systems, roles are commonly difficult to identify and classify (Stichweh, 2011).

**Strain theory of deviance or anomie theory**

With the strain theory of deviance or anomie theory, Merton (1957) posits that people use accepted and appropriate means to achieve the goals established by social institutions in a well-integrated society. Agnew (2006) recommends that the goals of the institutions and the means of the individuals should always be in a balance. Deviance is likely to occur when the goals of society and the means of individuals to achieve them are not in a balance. Andersen and Taylor (2009) argue that the ineffectiveness or lack of coordination among state institutions sometimes frustrates disaster victims who attempt to access institutional support during disaster recovery. According to Agnew (2009), not every disaster victim gets access to institutionalised means, or legitimate ways of achieving success. The principal argument in the strain theory of deviance is that when disaster victims are prevented from achieving culturally approved goals through institutional means, they experience strain or frustration that can lead to deviance (Andersen & Taylor).

Agnew (2009) posits that frustrated victims also experience anomie, or feelings of being disconnected from society, which can occur when people do not have access to the institutionalised means to recover quickly from disaster. Such feeling compels victims to adopt unconventional practices to recover



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from disaster. The proportion of victims from a particular disaster who feel frustrated by state institutions, therefore, demonstrates the level of effectiveness of such institutions in managing disaster recovery.

According to Merton (1957), strain may be either:

1. Structural: If state institutions are inherently inadequate in terms of capacity and resources or there is inadequate regulation, this may change individuals' perceptions as to the means and opportunities that could be obtained from such institutions during disaster; or
2. Individual: This refers to the frictions and pains experienced by disaster victims as they seek support from disaster management institutions.

The foregoing shows that the capacity and level of resourcefulness of disaster management institutions to support disaster victims are critical in shaping people's perceptions about conforming to conventional and unconventional practices during disaster recovery.

**Theory of adaptation**

The theory of adaptation by Darwin (1872) explains the process of change to suit a new environment or condition. The theory was used to explain an organism's ability to adapt to changes in its environment and adjust accordingly over time. According to Darwin, adaptations occur over a long period through learning and experience to make an organism better suited to new environment. This study, therefore, relates the process by which organisms adapt to new environment to disaster recovery process. Thus, the exposure of an organism to a new environment which threatens its survival is likened to disaster event which also poses threat to the physical survival and



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socio-economic development of victims as well as the survival and growth of businesses.

In disaster recovery, adaptation refers to the processes and support systems adopted by victims to adjust their activities to aid survival, rejuvenate their businesses, and recover from post-traumatic stress disorder. Socio-economic change is regarded as an adaptive response to catastrophic events, which disrupts the normal functioning of socio-economic actors and activities (Adger, Brooks, Bentham, Agnew & Eriksen, 2004). Disasters always affect some parts of an integrated social system, and create tension between the affected parts and the other parts of the system. Such tensions could only be resolved by adaptive changes in the behaviour, relationship, support and effort from both the affected and non-affected parts. Adaptive changes in disaster recovery are necessary to re-establish equilibrium among societal parts. The 'adaptive equilibrium' forms the foundation for socio-economic rejuvenation from disasters.

However, Darwin (1872) outlines the five natural selection processes which make some victims re-establish equilibrium and recover more quickly than others. Natural selection describes the way victims adapt to disaster situations making them more able to survive and recover. The five natural selection processes are explained as follows:

1. Variation is differences between individuals. In disaster recovery, differences among victims could be sex, literacy level, educational level, type of business, number of dependents, and size of social network. Such variations could explain differences in response rate among disaster victims towards recovery.



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2. Variations can increase the likelihood of a victim recovering from disaster.
3. When there are too many disaster victims they must compete for limited resources and opportunities. However, this could limit the effectiveness of institutions and support systems for quick disaster recovery.
4. Victims that successfully recover from disasters become more resilient to subsequent disasters and can share their experiences with relatives and neighbours. This suggests that victims with more fire experiences may have more skills to adapt to the situation and would be more aware of the available support systems to recover quickly from disaster than victims without any experience.
5. Over time, the many small changes accumulate. Recurrence of market fire disasters would reduce business size of victims, and deteriorate their socio-economic conditions. Losses through market fire disasters would also make it a disincentive for insurance companies and other financial institutions to transact business with traders.

Darwin (1872) proposes two issues when habitat changes: habitat tracking and genetic change or extinction. Habitat tracking and extinction refers to when a victim uses his or her own resources to restore his or her socio-economic conditions to pre-disaster era. Thus, an individual's own resources in terms of savings and insurance packages provide the immediate source of relief to disaster victims. Consequently, when a victim has little or no resource backup for immediate relief, the results become precarious including collapse of businesses, post-traumatic stress disorders, and poverty. Genetic change, on the other hand, refers to when natural selection allows a victim with



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good social network, particular gender, and educational level to have an advantage over others in terms of securing support for recovery.

**Protection motivation theory**

The protection motivation theory by Rogers (1983) indicates that the extent of damage caused to individuals and businesses as well as the degree of success of individuals and businesses to recover from disasters largely depend on pre-disaster activities. Precautionary measures are, therefore, very crucial for disaster recovery. According to Maddux and Rogers (1983), the motivation of stakeholders to protect themselves against disaster is enhanced by their perceptions on the severity of a threatening event, vulnerability to the threat or the probability of the occurrence of the threat, self-efficacy – confidence in their ability to cope with the threat and perform threat reducing behaviours, and response efficacy – the ability of the response to reduce the threat. Protection motivation is, therefore, operationalised in terms of the perceptions of the stakeholders to perform a recommended precautionary behaviour.

However, Maddux and Rogers (1983) and Milne *et al*. (2002) explain that people's perceptions on precautionary measures against disaster are influenced by the two sub-processes of threat appraisal and coping appraisal. Threat appraisal in disaster management involves an assessment of the severity of the threat and the stakeholder's vulnerability to the threat. According to Pechmann, Zhao, Goldberg and Reibling (2003), the variables used in threat appraisal are perceived vulnerability, perceived severity and fear arousal. The coping appraisal is how an individual responds to a catastrophic event. It involves an appraisal of the stakeholder's self-efficacy, response efficacy and response costs (Lwin & Saw, 2007). Efficacy is the individual's expectancy



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that carrying out recommendations can remove the threat, whereas self-efficacy is the belief in one's ability to execute the recommended courses of action successfully (Prentice-Dunn *et al*., 2009).

Milne *et al*. (2002) argue that when an individual believes that the response will be effective and is confident of performing the recommended behaviour and perceives the cost of disaster recovery exercise to be low, then he/she will be more likely to adopt the recommended coping response. The application of the protection motivation theory in disaster recovery, therefore, ensures that individuals and businesses implement disaster recovery plans as a precautionary measure for guaranteeing timely and successful recovery from disastrous events. Accordingly, disaster preparedness is essential for minimising the damaging impact of disasters to individuals and businesses as well as determining the response strategy towards disaster recovery. However, the type and scale of disaster have the potential to render one's disaster preparedness strategies and recovery plans less effective.

The foregoing explanation of the protection motivation theory assumes that every individual is rational and as a result, would always process rational information. The theory, however, does not include elements of irrationality in its threat component. It also fails to factor in the socio-cultural, economic and environmental elements that restrict people's ability to act rationally. Similarly, the theory does not consider habitual behaviours and how certain attitudes might change in the process of analysing potential threats and coping mechanisms. In other words, habitual behaviours and attitudes of individuals may influence their perceptions on impending threats, severity of the threat,



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appraisal of self-efficacy and the adoption of precautionary measures towards disaster and disaster recovery.

**Conceptualising Disaster**

According to Fritz (1961, p. 655), a disaster is 'an event concentrated in time and space, in which a society or one of its subdivisions undergoes physical harm and social disruption, such that all or some essential functions of the society or subdivision are impaired'. Kreps and Bosworth (2006) also define disaster as a situation or event which overwhelms individual or local capacity, necessitating a request to a national or international level for external assistance. Disaster is an event or series of events which give(s) rise to casualties, damage or loss of property, infrastructure, essential services or means of livelihood on a scale which is beyond the normal capacity of the affected community's ability to cope without aid (Perry, 2006). Disaster, therefore, involves the occurrence of a sudden or major misfortune which disrupts the basic fabric and normal functioning of businesses, societies, or communities. In all the definitions, the characterisation of an event as disaster is based on the comparison between the extent of damage or loss and people's ability to recover or resilience to the loss.

By definition, there cannot be a perfect system that prevents damage, otherwise it would not be a disaster. It has to suffocate people's ability to recover. Only then it can be called a disaster. Lindell and Perry (2007) explain that disasters may occur suddenly in time, or may develop over a period of time. The time element of disaster occurrence is essential as it informs the level of preparation, impact, and people's vulnerability to the event. Most disasters



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occur suddenly and unexpectedly. However, some events develop gradually, including some floods and famines related to drought. Lindell *et al*. (2007) conclude that disasters are not totally discrete events. Their possibility of occurrence, time, place and severity of the strike can be reasonably and in some cases accurately predicted by technological and scientific advances. There is a definite pattern in the occurrences of disasters and hence people can reduce the impact of damage to some extent, though they may be unable to reduce the extent of damage itself (Lindell *et al*., 2009).

Physical harm and social disruption occur because the event exceeds normal protections. A disaster's concentration in time defines three temporal periods – pre-impact, trans-impact and post-impact (Fothergill & Peek, 2004). However, Smith and Wenger (2006) argue that some disasters have multiple (e.g. earthquake aftershocks) or secondary (e.g. hazardous materials releases) impacts, so identifying the time at which impact occurs can be difficult. An alternative conception of disaster phases is defined in terms of hazard mitigation, disaster preparedness, emergency response and disaster recovery (Lindell *et al*., 2009). According to Rathfon (2010), the phases in disaster are not mutually exclusive because mitigation and preparedness generally take place concurrently in the pre-impact period. There are also overlaps in the post-impact period, with some neighbourhoods of a disaster-stricken community conducting emergency response operations, while others are initiating disaster recovery (Jordan & Javernick-Will, 2012).

At the household level, a disaster could result in a major illness, death, a substantial economic or social misfortune. At the community level, it could be flood, fire, collapse of buildings during earthquake, destruction of



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livelihoods, an epidemic or displacement through conflict. Disaster could also lead to reduction in profit, loss of customers, collapse of businesses, loss of productive assets, and loss of data when it strikes at the business level. When disaster occurs at the district or regional level, a large number of people can be affected. Most disasters result in the inability of those affected to cope without outside assistance. At the household level, this could mean dealing with the help from neighbours, financial institutions and insurance companies; at the national level, assistance from organisations such as the International Federation of Red Cross and Red Crescent Societies (IFRC), the United Nations, various NGOs and national disaster management organisations.

Alexander (2006) argues that there is no single measure of a disaster that can capture the full scope of a disaster. Individuals consider the impact of disasters on their families and livelihoods. Disaster managers assess the speed and success of disaster response. Economists measure the physical loss to buildings and loss of production. Politicians assess political damage from a poor response by state agencies. Others may focus on the nature of the hazard, the social consequences and the impact to specific elements of infrastructure. However, a common measure is the number of people killed or affected. Human beings are always at the centre of disaster. The impact of the damage, caused by an extreme event, on people is and should always be the ultimate focus in disaster evaluation and management. Arnold (2006) recommends that assessing the scope of disaster must consider all affected persons and institutions, losses and effectiveness in the response rate both in the immediate and the longer term.



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The poor organisation of societies affects the effectiveness of assessing disasters. A society's sub-divisions encompass a wide range of social units arrayed in overlapping social, economic and political sectors. Thus, individuals are included within households that are in neighbourhoods within communities. Businesses are included within industries that are in economic sectors, and local jurisdictions are contained within states/provinces that are in nations (Lindell *et al*., 2007). A major challenge to understanding disaster impacts is that social units such as communities are not homogeneous, so sub-units such as households and businesses vary in their vulnerability to disaster impacts. This has given rise to an expanding literature on differences in disaster vulnerability associated with demographic characteristics such as gender, ethnicity and poverty (Fothergill, 1996; Fothergill & Peek, 2004). Similarly, research into disaster impacts on business has examined variations by size and economic sector (Webb, Tierney & Dahlhamer, 2002; Zhang, Lindell & Prater, 2009).

Disasters are commonly categorised by their origin; natural or human-made. The list of natural disasters includes weather phenomena such as tropical storms, extreme heat or extreme cold, wildfires, winds, floods, earthquakes, landslides and volcanic eruptions. Disasters caused by humans have included fires, transportation accidents, industrial accidents, release of hazardous materials and the collapse of buildings. Disasters related to extreme weather events (floods, cyclones, tornadoes, blizzards, droughts) occur regularly, those related to the earth's geology (earthquakes, volcanic eruptions) occur less frequently, but result in major consequences (Alexander, 2006).



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Though weather and geologically related disasters are considered to have generated the greatest number of deaths and economic loss, disasters generated by humans are increasing in importance (Arnold, 2006). Barnett, Lambert and Fry (2008) also indicate that the rapid increase in the transport of people and commodities across countries and continents means that transportation disasters pose increasing threats to many people. Thus, increased technological innovations and development create new hazards which expose humankind to new forms of disasters. It is, therefore, very critical for development planners and engineers to incorporate hazard mitigation mechanisms into the development course.

**Disaster Recovery**

Due to the lack of a coherent theory to explain the disaster recovery process as well as its multi-discipline nature, disaster recovery means different things to different people in different professions in different organisations at different spatial locations, at different times and with different levels of development. For an engineer, disaster recovery may mean getting electric power generation distribution up to where it was before the disaster. For community development specialists or district, municipal or metropolitan chief executive, disaster recovery may mean repairing damaged facilities or replacing those that are destroyed. For municipal finance officers, recovery may mean re-establishing a property tax base that generates sufficient revenue to make the municipality solvent. To the ordinary citizen disaster recovery may mean removing the visual evidence of the disaster's physical effects.



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Nevertheless, Kennedy (2009) opines that long after the debris is removed and the scars on disaster impact areas are covered, individuals and businesses continue to experience psycho-economic impact of disaster events. Some firms collapse because of their inability to adapt to changes in their operational environment, whilst some individuals undergo post-traumatic stress disorders with its debilitating toll on their health, economic activities and household welfare. Thus, victims struggle to achieve viability in the newly-emerging environment within which they exist. A careful examination of the processes by which victims adapt and emerge from disaster situations are critical for the development of the disaster recovery discipline. The various conceptualisations to explain disaster recovery are, therefore, expected to lay strong foundation for the development of a logical and multidisciplinary theoretical framework for disaster recovery.

Smith and Wenger (2006) describe disaster recovery as "the differential process of restoring, rebuilding, and reshaping the physical, social, economic, and natural environment through pre-event planning and post event actions." This definition highlights the reality that disaster recovery involves more than the physical reconstruction of the built environment, as suggested by earlier researchers such as Hass, Kates and Bowden (1977). The definition also suggests that disaster recovery is not a simple linear process that is unilaterally applied to disaster victims in a particular geographical unit. It is influenced by key socio-economic and environmental dimensions, which explain the different response rates of disaster victims to recovery interventions. This explains why Anderson (2008) asserts that disaster recovery is a complex and challenging process that involves all sectors of a community as well as outside interests.



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Haddow, Bullock and Coppola (2008) contend that disaster recovery process requires balancing the more immediate need to return impact areas to normalcy with the longer-term goal of reducing future vulnerability. Disaster recovery efforts are concerned with issues and decisions that must be made after immediate needs are addressed. Accordingly, the Federal Emergency Management Agency (FEMA) in the United States uses three temporal phases to describe their response to a disaster: emergency response phase (24 hours to 2 – 3 weeks); relief phase (a week to half a year); and recovery phase (several weeks to 10 years). The aim is to ensure a balance between the short-term and long-term needs of victims to guarantee successful recovery to as many victims as possible. However, the associated timelines may differ across countries based on the type, intensity and impact of a disaster as well as resource availability.

In many cases, however, it is not even clear, if recovery has been achieved, and when, because of varying stakeholder goals for disaster impact areas (Anderson, 2008). Thus, while some researchers and organisations want disaster impact areas to return to their pre-disaster status, others want them to undergo change to realise a vision in which advances are made in risk reduction and other areas. Consequently, disaster recovery is now increasingly conceptualised as a dynamic process with no clear endpoint. According to Olshansky (2004), the use of recovery phases is thought to oversimplify the disaster recovery process and mask how in reality, the various roles overlap and interact with each other. Smith and Wenger (2006), therefore, recommend that more attention should be focused on the inequalities that are created by disasters and the recovery process.



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According to Lloyd-Jones (2006), disaster recovery involves the adoption of programmes and strategies to regain some semblance of normalcy following a disaster. In that context, disaster recovery has often implied a return to the status quo ex ante. In other words, conceptualising disaster recovery through Lloyd-Jones' definition suggests working to return to conditions as they were before the event. Increasingly, the notion of restoring or replacing that which existed before the event has been diffused by incorporating measures to reduce risks to disaster impact areas from recurrence of a similar extreme event and building 'disaster resilient' and 'sustainable' communities. The principal argument of researchers projecting issues about disaster resilient and sustainable communities in disaster recovery is that restoring disaster impact areas to pre-disaster conditions would introduce same hazards that led to the disaster and could trigger the recurrence of that disaster (Walker & Salt, 2006).

However, disaster recovery would remain an elusive concept without any reference to pre-disaster situations. This is because there would be no benchmark for assessing the adequacy of recovery efforts. An essential characteristic of sustainable communities is resistance to disasters. Nonetheless, at what point could a community be described as disaster resilient or sustainable? Is it when a community suffers a minimal or no loss from a single event or multiple events? What levels of minimal losses would constitute disaster resilience? How many events would constitute the characterisation of a community as disaster resistant or sustainable community? What scale or magnitude of disaster event should a community resist before it could be termed as disaster resistant?



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These questions could properly be answered when special reference is made to pre-disaster situations. Reference to pre-disaster situations would enable disaster management institutions and practitioners to clearly measure the impact factor of disaster as well as incremental progress towards achieving post disaster recovery. Pre-disaster situations should, therefore, remain the minimum benchmark for measuring disaster recovery efforts and programmes. An appraisal of pre-disaster situations would give clear indicators and targets by which recovery efforts should aim to achieve.

However, in order to avoid the recurrence of disaster after restoration to pre-disaster events, hazard mitigation strategies should be incorporated into the restoration process. Disaster recovery should, therefore, be concerned primarily with rebuilding the infrastructure, and restoring the social and economic life of the community with the deliberate incorporation of hazard mitigation measures as a major goal. This means that hazard appraisal and mitigation are critical elements in ensuring successful and complete post disaster recovery. This process will make disaster victims more resilient to disaster and render the main criticism levelled against this approach null and void.

Since disaster victims are the ultimate beneficiaries of post-disaster recovery efforts, their involvement in the identification and mitigation of hazards should be very paramount. This is because their ability to identify potential hazards and find mechanisms to control them is essential in avoiding the recurrence of disasters. In developing countries, social capital and community organisations with strong leadership are crucial for ensuring quick disaster recovery and providing maximum satisfaction to the community (Fujieda, Nakagawa, Shaw, Kobayashi & Kobayashi, 2004). National recovery



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programmes must, therefore, be flexible and incorporate local opinions into disaster recovery processes. It is also important that communities are provided with adequate guidance and technical support to contribute effectively in the disaster recovery process.

From the above discussion, it can be concluded that the conceptualisation of disaster recovery should start by assessing the pre-disaster situation. Analysis of the pre-disaster situation would serve as a guide on what and how post-disaster recovery should be. Appraisal of pre-disaster situation would also inform the recovery process about the hazards victims were exposed to and how to reduce or eliminate the hazards during restoration to avoid or reduce recurrence of disasters. Disaster recovery could be said to have been achieved if hazard mitigation mechanisms are deliberately incorporated into the recovery process to restore disaster impact areas and victims to pre-disaster situation. The inclusion of hazard mitigation mechanisms would help to achieve sustainable disaster recovery as has been advocated by Gardoni and Murphy (2008), that sustainable recovery process would not just recreate pre-event conditions, but would instead aim to ensure a decent quality of life for members of the disaster-stricken communities in both the short and long-term.

In other words, restoring disaster impact areas to pre-disaster situation without any deliberate effort to eliminate pre-disaster hazards could not be said to have achieved complete or sustainable disaster recovery. Accordingly, disaster recovery should aim to ensure that future generations are not undermined by the recovery efforts. The involvement of disaster victims in the identification and controlling of potential hazards is key in ensuring complete disaster recovery. Disaster recovery is, therefore, conceptualised in this study



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as the deliberate use of hazard mitigation mechanisms, through both endogenous and exogenous efforts, to restore disaster victims and impact areas to pre-disaster situation.

**Concept of Hazard Mitigation**

Khasalamwa (2009) defines hazard mitigation as any sustained action taken to reduce or eliminate the long-term vulnerability of human life and property to hazard events. According to Kijewski-Correa and Taflanidis (2012), hazard mitigation provides an approach to reduce vulnerability, and create more disaster resilient communities that are able to resist or absorb an impact, organise citizens to overcome or recover from the consequences of the impact, and adapt or learn from the experience. Hazard mitigation in disaster recovery aims to reduce the recurrence of disasters and also reduce the impact of disasters on people, businesses and infrastructure. The implication is that a careful appraisal of potential hazards is central to effective hazard mitigation and disaster control. After a disaster, hazard mitigation assessment and planning is an essential activity to prevent disaster amnesia.

Often times after disasters, repairs and reconstruction are completed in such a way as to simply restore damaged property to pre-disaster conditions. However, the replication of pre-disaster conditions in disaster recovery efforts results in a repetitive cycle of damage and reconstruction (Gardoni & Murphy, 2008). Kennedy (2009) identifies hazard mitigation planning as an effective mechanism to break the repetitive cycle by producing less vulnerable conditions through post-disaster repairs and disaster-smart reconstruction. Lyons (2009) also emphasises that the implementation of hazard mitigation



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actions leads to building stronger, safer and smarter communities that are better able to reduce future injuries and future damage.

Kennedy *et al*. (2008) recommend that hazard mitigation should focus on long-term strategies that help governments and citizens to find ways to reduce hazard risks and disaster-related costs to communities. The implication is that efforts made to reduce hazard risks should be compatible with other community goals. Mitigation would be most effective when it is a part of the larger responsibility of the government, individuals, institutions, private businesses, and non-profits. As communities plan for new development and improvements to infrastructure after disaster, mitigation can and should be an important component of the recovery efforts. According to Barnett *et al*. (2008), the essential steps of hazard mitigation are hazard identification, defining hazard mitigation strategy, implementation of hazard mitigation activities and projects.

**Hazard identification**

Kennedy (2009) reports that disaster management efforts should first discover the locations, potential extent, and expected severity of hazards. Hazard information is often presented in the form of a map or as digital data that can be used for further analysis. It is, however, important to note that hazards are not easily identified, and most often, require the efforts of both victims and disaster management experts. This is because activities experts may consider as hazards may not be regarded as such by citizens or disaster victims, and vice versa. As a result, any disagreements between State institutions and citizens regarding the constitution of hazards in a particular geographical unit may not receive the necessary mitigation efforts. The



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participation of disaster victims or citizens in hazard appraisal should, therefore, be of importance during disaster recovery.

**Defining a hazard mitigation strategy**

Once hazards have been recognised, and vulnerable people or risk areas that could be affected by a disaster are identified, there is the need to strategize about the approach to prevent a disaster from occurring or to minimise the effects if it does occur (Kijewski-Correa & Taflanidis, 2012). The end result would be a hazard mitigation plan that should identify long-term strategies that may include planning, policy changes, programmes, projects and other activities, as well as how to implement them. As part of the hazard mitigation planning, there should be a coordinated series of structural and non-structural actions and processes designed to reduce the likelihood of future damages to property, while minimising the health and safety-related impacts associated with natural hazards and disasters (Khasalamwa, 2009). Mannakkara and Wilkinson (2012) recommend that hazard mitigation plans should be done at every level including individuals, businesses, state, local, and federal governments. Hazard mitigation strategies can be categorised into three:

i. public information (e.g. hazard disclosure, mapping of hazards, education and outreach initiatives),
ii. structural property protection (e.g. building and infrastructure hardening, land use planning tools such as zoning and building codes), and
iii. hazard avoidance (e.g. limiting future development in hazard zones, relocating existing development from hazard zones).



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Selecting a hazard mitigation strategy should, however, involve both the process of identifying a coordinated set of actions or "projects" targeting buildings and infrastructure that are currently at risk as well as the application of land use techniques, policies and processes focused on pre-event hazards avoidance. Land use planning approach in all hazard mitigation efforts are, therefore, imperative because it limits the level of exposure to hazards before an event occurs in addition to tackling problematic decisions made in the past.

**Hazard mitigation activities and projects**

According to Lindell *et al*. (2009), once the hazard mitigation plans and strategies are developed, they must be followed for any change in the disaster cycle to occur. Hazard mitigation activities are meant to be permanent or long-term fixes and include a number of options such as: land-use planning, development and enforcement of building codes, removing structures from hazardous areas, retrofitting structures by changing construction materials, localisation of high hazard businesses in market areas such as welding and fish smoking, and regulation of development in hazard zones such as floodplains and wild land-urban interface areas.

The contextual definition of disaster recovery in this study, therefore, implies that the measuring of disaster recovery should include hazard appraisal, and defining and implementing hazard mitigation strategies as part of the overall effort to restore psycho-economic stability of victims, businesses and infrastructure. Accordingly, the study would assess all the three stages of the hazard mitigation process and the psycho-economic state or conditions of the market fire victims in relation to their pre-disaster situations to draw conclusions on the extent of post-disaster recovery. The confidence of the



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victims in their abilities to manage disaster based on their hazard mitigation activities would also play a key role in measuring disaster recovery.

**Measuring Disaster Recovery**

Due to the non-linear and complex nature of the impact of disasters, it would be more prudent for researchers and practitioners to clearly define their scope of recovery assessment (De Ruiter, 2011). Impacts of disaster are broad and may include social, economic, environmental, psychological, political and cultural. Similarly, there are a broad range of issues in each category. As a result, the lack of a clear niche on disaster recovery would misrepresent the entire outcome of disaster recovery studies. Furthermore, the conceptualisation of disaster recovery as a dynamic and endless process has made it difficult to identify outcomes and indicators. The consensus is that the minimum goal is to replace lost infrastructure stock and to return impact areas to pre-disaster economic function (Olshansky, 2004). According to Tyler, O'Prey and Kristiansson (2002), some disaster recovery programmes have successfully improved upon pre-disaster situations by revitalising disaster impact areas, reducing vulnerability, and preserving pre-historic buildings.

However, disaster recovery has been shown to vary over time and space due to socio-economic and political factors, and because of a multitude of decisions that are made before, during and after a disaster. Rubin (1985) emphasises that both the speed and the quality of the disaster recovery process must be monitored. Speed is imperative to rejuvenate local economic activities and to prevent further losses. However, Baker and Refsgaard (2007) caution that speed should not be generally accepted if it is at the expense of quality.



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According to Lloyd-Jones (2006), a pre-disaster plan may ensure a fast and high quality recovery. In addition, pre-disaster plans may be used to measure the success of the recovery process. The implication is that disaster preparedness and pre-disaster activities are essential for quick and successful disaster recovery. The measurement of disaster recovery is highly dependent on the scale and timeframe being analysed, as well as the perceptions of the researcher (Comerio, 2004; Quarantelli, 1999).

In terms of timeframe, Khasalamwa (2009) observes that researchers should be mindful not to hastily announce the success or failure of a disaster recovery programme as the trajectory of a recovery process may alter for a number of reasons. Firstly, the fate of the individual households or businesses may not be determined until several years after the disaster (Brown, Saito, Spence & Chenvidyakarn, 2008). For example, over half of the earthquake recovery projects in San Francisco and Santa Cruz were still under construction 15 years after the Loma Prieta Earthquake (Comerio, 2004). Secondly, the economic output and level of employment may initially rise but then drop several years later in-line with the construction market (Brown *et al*.). Thirdly, the trajectory may be complicated by random, unpredictable events. For example, Shao, Arumi and Murosaki (2004) found that lack of rain in the year following the Chi-Chi earthquake in Taiwan caused a reduction in agricultural output. Finally, many aspects of the recovery process are ultimately determined by the funding strategies and timeframes of donors and affected governments, which may in turn be defined by politics, bureaucratic rules or media pressure (Mannakkara & Wilkinson, 2012). The World Bank for example, may omit



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activities from their emergency recovery loan if they cannot be completed within three years (World Bank, 2008).

Disaster recovery may also be analysed using a range of scales, including individual, household, business, community or neighbourhood. According to Baker and Refsgaard (2007), the level of damage and the progress of recovery may be interpreted differently depending on which of these scales is used. For example, whilst business or household elements may fail, the return of the economic and labour markets may suggest a successful recovery at community level. Gardoni and Murphy (2009) indicate that ideally all of these scales should be analysed collectively. As a result, Chang (2010) recommends that a study of individual households should include information about their context within the environment and a study of the community should involve an understanding of the actions and behaviours of individual elements.

According to Quarantelli (1999), the results of disaster analysis may also vary according to the perspective of the evaluator – whether they are independent, local, a funding provider or a recipient. For example, while a local community may deem their recovery unsuccessful, the district or state departments may differ from that opinion. Brown *et al*. (2008) conclude that administrative levels have more realistic concepts about recovery, whilst individual household or businesses are more idealistic.

Chang (2010) suggests the need for a systematic framework that can be used to measure disaster recovery at the community scale. The systematic framework should be able to provide guidance for the use of statistical data. According to Alesch, Arendt and Holly (2009), the framework should be able



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to acknowledge the possibility of structural change for when post-disaster conditions of normality differ from pre-disaster conditions. Chang indicates that the framework should also recognise that aggregate trends may mask important disparities in recovery.

Gardoni and Murphy (2009) suggest a capabilities-based approach to measure recovery which also accounts for the societal impacts of disaster. In this approach, capabilities refer to what an individual is able or unable to do, such as being adequately nourished. However, indicators still need to be identified in this approach to measure the impact a disaster has on the selected capabilities, because capabilities are not directly measurable. An advantage to this approach, according to Gardoni and Murphy, is that it captures the overall impacts of a disaster, including both potential benefits and losses, whereas most approaches can only measure monetary and utilitarian amounts of loss. The capabilities-based approach can also be applied in mitigation and disaster planning (Gardoni & Murphy, 2010). Comerio (2004) also identified the need for indicators that can measure societal impacts. To the author, social vulnerability can have a large effect on the recovery process, especially in developing countries, which may not have support or basic needs such as food and shelter.

Lindell and Prater (2003) discuss the idea of an impact ratio, which compares the amount of damage caused by a disaster versus the amount of resources available to the community. Gardoni and Murphy (2008) on their part suggest that indicators should be updated over time to account for the impact of technological social changes. For Olshansky (2005), there are two main approaches for measuring recovery. In the first approach, an urban



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systems model is developed that can anticipate and explain the pace, characteristic, and success of recovery with post-disaster indicators. In the second approach, one studies the institutions, planning processes, and management approaches for guiding recovery actions by both public and private branches (Chang, 2010).

Gardoni and Murphy (2008) propose the measurement of recovery using the Disaster Impact Index (DII) and the Disaster Recovery Index (DRI) method. This method focuses on the societal aspect of community recovery. The method uses a DII to measure the change in well-being of a community after a disaster. The DII can be computed by determining the DRI, which measures the current level of individuals' capabilities. This computation is written as:

$$DII(t) = DRI(0) - DRI(t)$$

Where,

DRI(0) = the level of well-being of the community prior to the disaster

DRI(t) = the level of well-being at some time *t* after the disaster.

The DII can be computed at various time intervals after the disaster to determine the progress of the recovery from a societal perspective. This method is beneficial because the DRI can either be compared against a benchmark of ideal societal functioning, or to DRI values in other areas or from other disasters. Any measure of disaster recovery will benefit from having the ability to make these three comparisons.



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**Scales of Measuring Disaster Recovery**

Disaster recovery begins with stabilisation of an incident and ends when the community has re-established normal social, economic and political routines (Berke & Campanella, 2006). According to Alesch *et al*. (2009), disaster recovery encompasses multiple activities, some implemented sequentially and others implemented simultaneously. As a result, different households, businesses and communities engage in different sets of recovery activities at any point in time. Brown *et al*. (2008) opine that attempts to define finely differentiated phases of disaster recovery are inherently limited in their validity. Chang (2010) has suggested that researchers should pay less attention to the time phases, such as short-term recovery and long-term recovery, and focus more on the specific recovery functions that must be performed. Nevertheless, the scale of recovery assessment is critical as indicators and measures are different across different scales. The scale of recovery functions should, therefore, be clearly defined.

**Household recovery**

Kates, Colten, Laska and Leatherman (2006) identify three basic components to household disaster recovery – housing recovery, economic recovery and psychological recovery. All three components require resources and, as a result, Jha, Barenstein, Phelps, Pittet and Sena (2010) suggest that households must frequently invest significant amounts of time to obtain these resources. However, since the focus of the study is on market fire disasters, which mostly affect the psyche and economic lives of victims, the literature would concentrate on the psycho-economic analysis of disaster recovery. Some households' economic recovery takes place quickly, but others take much



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longer (Jha *et al*., 2010). For example, the percentage of households reporting complete economic recovery after the Whittier earthquake was 50 per cent at the end of the first year, but 21 per cent reported little or no recovery even at the end of four years (Bolin, 1993).

Economic recovery was positively related to household income and negatively related to structural damage, and household size (Bolin & Stanford, 1998). The relationship between economic recovery and income levels of victims was explained by the loss of permanent jobs (Yelvington, 1997). Alesch *et al*. (2009) found that household recovery is significantly determined by sources of assistance. According to Baker and Refsgaard (2007), hazard insurance is a major source of the money needed to rebuild damaged structures and replace destroyed contents. However, Lindell *et al*. (2009) contend that risk area residents in developing countries mostly forego hazard insurance because they consider premiums to be too high, deductibles too large, and insurance systems unable to protect persons, and specificity to a given hazard. Indicators for measuring economic recovery from disaster include employment rates, household income levels, government revenue received and number of businesses (Brown, 2008). According to Mannakkara and Wilkinson (2012), each of these items is compared to pre-disaster levels to assess economic recovery.

Kinship networks can also contribute to economic recovery but the significance of this source depends on the physical proximity of other nuclear families in the kin network, the closeness of the psychological ties within the network, the assets of the other families and, of course, the extent to which those families also suffered losses (Olshansky, 2005). Meyer (2013) contends



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that friends, neighbours and co-workers can also assist recovery through financial and in-kind contributions but these tend to be less important. However, in developing countries where institutional structures and capacities to support disaster victims are very weak, social support systems from friends and family members could be critical.

Institutional sources of recovery assistance include local government, national disaster management organisations, NGOs, financial institutions, and insurance companies. Because donor-victim relationship is defined by bureaucratic norms, the amount of assistance depends on whether victims meet qualification standards and proof of loss (Phillips, 2009). Institutional recovery provides assistance by means of loans at below market interest rates and grants. However, since victims sometimes take long period to recover from disaster repayment of such loans could be problematic. Common indicators used to measure institutional-aided recovery include restoration of public facilities and lifelines such as schools, water systems, electricity and housing repair or rebuilding, funds distributed through loans, enterprises aided or founded, and training programmes organised. These indicators are important because infrastructural factors influence both social and economic recovery (Miles & Chang, 2003).

Lindell (2013) posits that the majority of disaster victims recover relatively quickly from the stress of disasters without psychological interventions. Those who suffer the greatest losses to their material resources (e.g. the destruction of their homes) and their social networks (e.g. spouses and other family members) are likely to experience the most psychological distress, but not necessarily an amount that is personally unmanageable (Olshansky,



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2005). Most disaster victims benefit more from crisis counselling orientation than from mental health treatment orientation, especially if their normal social support networks of friends, relatives, neighbours and co-workers remain largely intact (Gerrity & Flynn, 1997).

However, population segments such as children, frail elderly, people with pre-existing mental illness, people with multiple disaster experiences and families of those who have died in disasters require special attention and active outreach. Counselling centres, therefore, play a key role in the psychological recovery process. Relatives, neighbours and friends may also play essential role in the psychological recovery process, especially in developing countries where there are few and poorly-resourced counselling centres. Lindell (2013) emphasises that the appropriate strategy for psychological recovery by victims and emergency responders is one of the minimal intervention to provide information about sources of material support for victims and to facilitate optional involvement in social and emotional support groups for victims and emergency responders.

**Business recovery**

Studies by Tierney (2006) and Zhang *et al*. (2009) found that older, larger (measured by the number of employees), and more financially stable businesses are more likely to adopt hazard adjustments, as are businesses in the manufacturing, professional services, finance, insurance, and real estate sectors. Small businesses, on the other hand, are more physically vulnerable because they are more likely than large businesses to be located in non-engineered buildings and are less likely to have the capacity to design and implement hazard management programmes to reduce this physical



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vulnerability. At the same time, as they face increased costs to repair structures and replace contents, these businesses also face reduced patronage if they must move far from their previous locations. Ultimately, many small businesses fail by the time the space is available for re-occupancy at their original locations (Lindell, 2013). The implication is that time scales for the various stages in the recovery process are very critical to guarantee quick and successful business recovery. There also is variation among business sectors in their patterns of recovery.

Whereas wholesale and retail businesses generally report experiencing significant sales losses, Webb *et al*. (2002) indicate that manufacturing and construction companies often show gains following a disaster. Webb *et al*. found that businesses that serve large markets tend to recover more rapidly than those that only serve local markets. Small businesses have also been found to experience more obstacles than large firms in their attempts to regain pre-disaster levels of operations (Chang, 2010). Compared to large businesses, small firms are more likely to depend primarily on neighbourhood customers, lack the financial resources needed for recovery and lack access to governmental recovery programmes (Zhang *et al*., 2009). The implication is that the type of businesses is imperative in analysing disaster impact on businesses as well as the rate of business recovery.

Pre-disaster measures such as hazard insurance, savings, and data backup would also be critical in determining the rate of business recovery from disaster. Thus, pre-disaster arrangements influence the extent to which business operations are affected by disasters, and also guarantee the speed with which businesses get resources to rejuvenate their operations. According to



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Mannakkara and Wilkinson (2012), business recovery mostly relies on the innovativeness of the entrepreneurs.

**Disaster Impacts Model**

The basic framework of disaster research indicates that the effects of a disaster are determined by three pre-impact conditions – hazard exposure, physical vulnerability and social vulnerability (Wisner *et al*., 2004). There also are three event-specific conditions – hazard event characteristics, improvised disaster responses and improvised disaster recovery. According to Lindell *et al*. (2007), two of the event-specific conditions, hazard event characteristics and improvised disaster responses, combine with pre-impact conditions to produce a disaster's physical impacts. Kendra and Wachtendorf (2006) contend that the physical impacts, in turn, combine with recovery actions to produce a disaster's social impacts. Olshansky (2005) indicates that communities can engage in three types of emergency management interventions to ameliorate disaster impacts. Physical impacts can be reduced by hazard mitigation practices and emergency preparedness practices, whereas social impacts can be reduced by recovery preparedness practices (Jha *et al*., 2010).

Of the three pre-impact conditions, hazard exposure arises from people's occupancy of geographical areas where they could be affected by specific types of events that threaten their lives or property. In African market disaster impact analysis, power relation is likely to play a major role in both pre-disaster conditions and post disaster activities. The locations of the traders are determined based on one's level of influence and resources. In most cases, the powerless operate from high hazard areas, while the influential or powerful



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operate from a low hazard area. As a result, market disaster impact is more likely to affect the powerless than the powerful in the markets. In post disaster management period, the market queens and association leaders are also engaged by disaster management institutions to identify and distribute support to victims, which also gives them additional advantage to benefit from disaster support more than the powerless.

Lindell (2013) defines disaster impacts as the physical and social disturbances that a hazard agent inflicts when it strikes an area. Physical impacts comprise casualties (deaths, injuries, and illnesses) and damage to agriculture, structures, infrastructure, and the natural environment. Social impacts comprise psychological impacts, demographic impacts, economic impacts, and political impacts. According to Lindell, a very important aspect of disaster impacts is their impact ratio – the amount of damage divided by the amount of community resources. Disasters have wide range of impacts on people and societies. However, the scope of this study limits the literature to psychological and economic impacts of disasters.

**Psychosocial impacts**

Disasters can cause a wide range of negative psychological responses (Bourque, Siegel, Kano & Wood, 2006; Gerrity & Flynn, 1997). Clive, Davis, Hansen and Mincin (2010) opine that the observed effects are mostly mild and transitory. Nonetheless, the fact that most effects are generally mild and transitory does not preclude the occurrence of some very negative long-term outcomes. Zahran, Shelley, Peek and Brody (2009) found that even though domestic crimes increased after disasters, property and violent crimes decreased. Victims can experience both positive impacts (e.g. strengthened



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family relationships) and negative ones (e.g. strained family relationships) after disaster occurrence. The type of impact may, however, depend on the extent of damage, pre-disaster preparedness mechanisms, as well as the type, quantum and time of obtaining resources from various actors in the society. Such factors affect the psyche of victims which further influence their reintegration into the society after disaster.

There are also psychological impacts with long-term adaptive consequences, such as changes in risk perception (beliefs in the likelihood of the occurrence of a disaster and its personal consequences for the individual) and increased hazard intrusiveness (frequency of thought and discussion about a hazard). In turn, these beliefs can affect risk area residents' adoption of household hazard adjustments that reduce their vulnerability to future disasters. However, the cognitive impacts of disaster experience do not appear to be large, resulting in modest effects on household hazard adjustment (Lindell & Perry, 2007).

The American Psychiatric Association (APA) (2013) developed a checklist for measuring the severity of posttraumatic stress symptoms. In the checklist, health and disaster management related institutions should monitor disaster victims on the extent of experiencing flashbacks, fear of experiencing further disaster, bad feelings associated with dreams and flashbacks on disasters, physical reactions (such as sweating, trouble breathing, nausea or a pounding heart) from remembering the event. Others are sleeping difficulties relating to the remembrance of the disaster, continuous blaming of oneself about the cause and effects of disaster, and loss of self-confidence about improving one's socio-economic conditions in the future.



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**Economic impacts**

The property damage caused by disaster impact creates losses in asset values that can be measured by the cost of repair or replacement (Committee on Assessing the Costs of Natural Disasters [CACND], 1999). Disaster losses are initially borne by the affected households, businesses and local government agencies whose property is damaged or destroyed. However, some of these losses are redistributed during disaster recovery. Unfortunately, the magnitude of these losses is difficult to determine because no organization tracks all of the relevant data and some data are not recorded at all (CACND; Charvériat, 2000).

In addition to direct economic losses, Wisner *et al*. (2004) express that there are indirect losses that arise from the interdependence of community sub-units. A business's operations can be interrupted because its workers are disaster casualties or are forced to move because they have nowhere to live within commuting distance. Alternatively, a business's operations can be interrupted by losses of its infrastructure or its normal customers (Rose & Limb, 2002; Tierney, 2006). Disasters can also have significant financial impacts on local government. Costs must be incurred for tasks such as debris removal, infrastructure restoration and re-planning stricken areas. In addition, there are decreased revenues due to loss or deferral of sales, business, property and personal income taxes.

**Sources of Recovery Assistance to Disaster Victims**

Lindell (2013) posits that there are three fundamental sources of assistance to disaster victims, which are autonomous (own resources), kinship



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(extended family resources), or institutional (governmental). However, most households rely on multiple sources of assistance to recover from devastated events. Autonomous recovery depends on the household's available human, material, and financial resources. Human resources are available to the extent to which household members can continue to generate income from employment, rental of physical assets, or interest/dividends from financial assets. Moreover, household recovery depends on the degree to which material resources are available. This includes the extent to which its possessions – land, buildings, equipment, furniture, clothes, vehicles, crops, and animals – are undamaged or can be restored at reasonable expense.

A household's recovery also depends on the degree to which its financial resources are available. This includes an ability to withdraw savings quickly from banks, to quickly liquidate stocks and bonds at a fair price, and to receive adequate compensation from its insurers. According to Adger *et al.* (2004), household recovery depends on the degree to which creditors will accept delayed payments on financial liabilities such as loans, mortgages, and credit card debt. Finally, household recovery depends on the degree to which members can reduce consumption such as purchases of shelter, food, clothing, medical care, entertainment, and other goods and services (Baker & Refsgaard, 2007). This means that the speed with which disaster victims are able to activate their human, material and financial resources to stabilise disaster impact situations are essential to hasten the household recovery process.

Lindell (2013) argues that kinship recovery depends on the physical proximity of other nuclear families in the kin network, the closeness of the psychological ties within the network, the assets of the other families and, of



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course, the extent to which those families also suffered losses. Immigrants are, therefore, more likely to take longer time to recover than natives from the impact region.

Institutional recovery depends on whether victims meet the qualification standards, usually documented residence in the impact area and proof of loss (Baker & Refsgaard, 2007). This is likely to be more problematic in developing countries where records on people's identity are poorly managed and less robust to generate reliable data to support disaster victims. Institutional recovery is categorised under private companies, state institutions and NGOs. Insurance companies play critical roles in disaster recovery processes in the advanced countries. They contribute the recovery process by insuring household and businesses on various hazards they are vulnerable to. Hazard insurance is important because it decreases government workload and expense after disasters by shifting part of the administrative burden for evaluating damage to insurance companies in the private sector.

Moreover, hazard insurance defines the terms of coverage in advance, thus reducing opportunities for politicians to increase benefits after disaster. Nevertheless, there are many difficulties in developing and maintaining an actuarially sound hazard insurance programme, so hazard insurance varies significantly in its availability and cost – flood, hurricane, and earthquake insurance being particularly problematic (Kunreuther & Roth, 1998; Lindell, 2013). Risk area occupants are particularly likely to forego certain hazard insurance policies due to high premiums and deductibles which limit the effectiveness of insurance companies in ensuring recovery of disaster victims.



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Strategies for coping with uninsured losses include obtaining government or commercial loans, obtaining government or NGO grants, withdrawing savings, and deciding not to replace damaged items (Alesch *et al*., 2009). However, loans can be problematic because they involve long-term debt that takes many years to repay. Government grants require households to meet specific standards, including proof that they are indeed residents of the disaster impact area. However, there can be problems in registering people who evacuated or were rescued without identification (Yelvington, 1997).

Relaxed standards seem humane but can allow the chronically poor and out of area occupants to obtain access to services intended only for disaster victims. In turn, resentment toward "freeloaders" can curtail services to victims. The political climate created around State loans to disaster victims could discourage high repayment which may frustrate the government's ability and willingness to support victims from subsequent disasters. NGOs also provide housing, food, clothing, medicine, and financial assistance to disaster victims. In most cases, the existing government social service agencies are supplemented by NGOs.

**Local Government Recovery Functions**

Countries across the world vary in the relative roles of local, regional (provincial), and national (federal) levels of government. In some cases, the entire burden of government assistance falls on the national government whereas, in others, responsibility is distributed across multiple levels of government (McEntire, 2006). According to Benson and Clay (2004), the main factor affecting the level of involvement of national government is the scope of



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the event. Thus, the scale and magnitude of disasters inform the level of government or state institutions responsible for ensuring quick and successful recovery of victims. A high scale disaster often requires national or sometimes international response and support in terms of funds, equipment, intelligence and technical abilities to address both the immediate and long-term needs of victims.

However, in all cases, local authorities play a crucial role in the management of the recovery process, especially in the era where governments, civil society groups and international institutions are encouraging the diffusion of fiscal, administrative and political powers to lower units of governments. Accordingly, Brody (2003) recommends that local governments should be prepared to undertake a variety of functions during a disaster recovery process, understanding that they might not receive any aid from higher levels of government for minor disasters. After a major disaster, a national disaster management organisation opens a broad range of programmes for relief and reconstruction. In such cases, the disaster management organisations play a coordinating role, working with both national and local governments. Local governments in such cases assist the process by registering victims and making sure that their immediate needs are addressed to stabilise their psycho-social and economic conditions.

Local governments are mostly responsible for ensuring the long term recovery of disaster victims (Bryson, 2004). As part of the process of ensuring quick recovery from disaster, McEntire (2006) recommends that local governments are to identify potential mitigation measures that could be incorporated into the repair of damaged facilities in order to be eligible for pre-



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and post-disaster funding. These activities should include hazard mapping, mitigation planning, development of building codes, development of training and public education programmes, establishing reconstruction information centres, and assisting communities to promote sustainable development.

Local governments also perform specific tasks during disaster recovery, some of which involve restoring services it performed before the disaster (e.g., providing functioning roads, street lights and signs, and traffic control devices). In addition, local governments rebuild any critical facilities (e.g., police and fire stations) that were damaged or destroyed. Finally, local government has a heightened need to perform its regulatory functions regarding land use and building construction (Kendra & Wachtendorf, 2006). According to Alesch *et al*. (2009), these two functions require rapid action under conditions of a greatly multiplied workload, so special provisions are required to expedite the procedures for reviewing and approving the redevelopment of private property.

**Disaster Recovery Stages and Functions**

The identification of disaster recovery as an emergency management phase has led some authors to divide it into stages, but there has been little agreement on the number and definitions of recovery stages (Alexander, 2006; Kates *et al*., 2006; Schwab, Topping, Eadie, Deyle & Smith, 1998; Sullivan, 2003). It is now generally accepted that disaster recovery encompasses multiple activities, some implemented sequentially and others implemented simultaneously. At any one time, some households and businesses might be engaged in one set of recovery activities, whereas others are engaged in other recovery activities. Indeed, some households and businesses might be fully



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recovered months or years after others and there might be others that never recover at all. According to Miles and Chang (2003), it is more useful to think of disaster recovery in terms of four functions: disaster assessment, short-term recovery, long-term reconstruction, and recovery management. Details of the four functions are presented in Table 1.

**Table 1: Disaster Recovery Functions**

| Disaster recovery stages | Recovery functions |
|---|---|
| *Disaster assessment* | |
| Rapid assessment | Victims' needs assessments |
| Preliminary damage assessment | Lessons learnt |
| Site assessment | |
| *Short-term recovery* | |
| Impact area security | Emergency demolition |
| Temporary shelter/housing | Repair permitting |
| Infrastructure restoration | Donations management |
| Debris management | Disaster assistance |
| *Long-term reconstruction* | |
| Hazard source control and area protection | Economic development |
| | Infrastructure resilience |
| Land-use practices | Historic preservation |
| Building construction practices | Environmental recovery |
| Public health/mental health recovery | Disaster memorialisation |
| *Recovery management* | |
| Agency notification and mobilisation | Recovery legal authority and financing |
| Mobilisation of recovery facilities and equipment | Administrative and logistical support |
| Internal direction and control | Documentation |
| External coordination | |
| Public information | |

Source: Lindell (2013)



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Nakabayashi and Ichiko (2004) emphasise that the disaster assessment function of the recovery phase should be integrated with the emergency assessment function of the emergency response phase in identifying the physical impacts of the disaster. Short-term recovery focuses on the immediate tasks of securing the impact area, housing victims, and establishing conditions under which households and businesses can begin the process of recovery.

Long-term reconstruction actually implements the reconstruction of the disaster impact area and manages the disaster's psychological, demographic, economic, and political impacts. Finally, recovery management monitors the performance of the disaster assessment, short-term recovery, and long-term reconstruction functions. It also ensures that they are coordinated and provides the resources needed to accomplish them. The interdependence among the disaster recovery stages and functions underscores the systems' perspective from which disaster recovery should be viewed.

**Factors Influencing Rate of Disaster Recovery**

Post-disaster recovery is a complex physical, social, economic, environmental, and political process. It involves decision making that chooses between the early return to normalcy, reduction of future vulnerability, and opportunities to improve the community. Fully understanding the disaster recovery process is difficult in part because there is no set definition of disaster recovery. Chang (2010) references three different ways to define post-disaster recovery: returning to pre-disaster conditions, attaining what would have occurred without the disaster, and reaching a new stable state. In all the conceptualisations of post-disaster recovery, Nakabayashi and Ichiko (2004)



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suggest that researchers and practitioners of disaster management should be able to identify the factors that influence the rate of disaster recovery. Careful examination of such factors could enable disaster management experts to accurately predict the rate, quality and dynamics of disaster recovery.

Miles and Chang (2003) note the potential similarities between disaster recovery and social vulnerability theories, which suggest that vulnerable groups may be more susceptible to losses and have more difficulty recovering. Tyler *et al*. (2002) emphasise that categories of people living in a disaster-stricken area are not equally affected. Vulnerability to hazards is influenced by many factors, including age or income, the strength of social networks, and neighbourhood characteristics (Comerio, 2004). Tyler *et al*. (2002) found that the poor are more vulnerable at all stages – before, during, and after – of a catastrophic event. As a result, differences in the levels of vulnerability of disaster victims influence the rate of recovery. In this case, it would always be very critical for researchers to examine vulnerability issues among disaster victims when analysing the extent of post-disaster recovery. Miles and Chang (2003) suggest that vulnerable groups may be more susceptible to losses and have more difficulties recovering from disaster.

Jordan and Javernick-Will (2012) identify limited funds mostly committed to disaster management as one of the most significant factors preventing successful disaster recovery. This may arise due to shortage of capital, lack of government support or a complex application process for funding. The method used to allocate aid and resources to the affected communities may also affect the recovery trajectory. This suggests that the level of commitment of the various stakeholders in disaster recovery, their



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levels of capacity to adequately handle the various dimensions of disaster, and fairness in the approach for providing aid and support in all the phases of disaster recovery are very critical.

Another factor that influences the recovery process is the ease with which certain groups are able to negotiate bureaucratic systems. Bureaucratic support to disaster victims is necessary because the devastating impact of disaster makes it very difficult or sometimes impossible for people to cope and recover. Funding made available through government disaster relief programmes provides the wherewithal to jump-start the recovery process. Brody (2003) reports that State support provides avenue for victims to access soft loans and important aid to guarantee sustainable recovery. However, the rules, regulations, and policies that accompany the funding can often alter priorities, limit opportunities, and curtail creative solutions (Fujieda *et al*., 2004). Fothergill (2004) found that middle and higher income disaster victims were more comfortable than low-income groups in negotiating disaster recovery bureaucracy for assistance. According to Fujieda *et al*., differential access to State support created through unfair bureaucratic systems partly explains the differences in the recovery rate of disaster victims.

Fothergill (2004) found that some low-income families were denied Small Business Administration (SBA) loans because their household incomes were too low. Similarly, Eaton and Nixon (2005) report that SBA, which runs the United States federal government's main disaster recovery programme for both businesses and homeowners, was able to process only a third of the 276,000 home loan applications it received in 2004. In addition, 82 per cent of applicants were rejected because they did not have incomes high enough or



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credit ratings good enough to qualify for government support. The implication is that criteria for accessing bureaucratic support should be clearly defined and explained. Similarly, due to the differences in the vulnerability levels of disaster victims, different support schemes should be developed for different categories to ensure successful and sustainable recovery.

Rubin (2009) accounted for disaster recovery in terms of six variables – national influences and conditions, regional or state influences and conditions, community-based needs and demands for action, personal leadership, ability to act, and knowledge about the recovery process. One important commonality among the cases Rubin studied is that the speed, efficiency and equity of disaster recovery depended significantly upon local government's ability to improvise effective recovery strategies. Olshansky, Johnson and Topping (2006) also found that communities recovered more quickly and effectively if they could identify and respond to the specific problems that arose from its unique circumstances. It is gradually being agreed among practitioners and researchers that community disaster recovery is faster and more effective if it is based on a recovery plan that has been developed prior to disaster impact (Olson, Olson & Gawronski, 1998; Schwab *et al*., 1998; Wilson, 1991; Wu & Lindell, 2004).

The recovery plan needs to establish clear goals and an implementation strategy (Smith & Wenger, 2006), preferably one that does not reproduce the community's pre-impact hazard vulnerability. After a disaster, local government needs to perform many tasks very quickly, and many of these must be performed simultaneously. It is, therefore, critical to plan for disaster recovery, as well as for disaster response (Schwab *et al*., 1998). The line



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between emergency response and disaster recovery is not clear because some sectors of the community might be in response mode whereas others are moving into recovery, and some organisations will be carrying on both types of activity at the same time.

The foregoing suggests that there will be little time to plan for disaster recovery once the emergency response has begun. By planning for recovery before disaster strikes, resources can be allocated more effectively and efficiently, increasing the probability of a rapid and full recovery. Local government agencies will frequently find during disaster recovery that some households and businesses fail to perform the tasks that are required to recover from the disaster. Whether households and businesses lack the knowledge of how to recover or the resources needed to recover, government can provide assistance. Disaster recovery plans should, therefore, be included in the overall development plans of districts and communities.

Disaster recovery is the responsibility of the local government and is most effective when outside resources are directed by local knowledge (Chang, 2010; Llyod-Jones, 2006). Staff with knowledge of the available regional, district and private resources are needed at the local level to ensure effective distribution of resources. According to Berke and Campanella (2006), it is very essential that citizens are involved in decision making throughout the recovery process. Social capital and community organisations with strong leadership are crucial to ensure a fast recovery and to provide maximum satisfaction to the community. Smith and Wenger (2006) recommend that national recovery programmes must be flexible and incorporate local opinion.



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It is also important that communities are provided with adequate guidance and technical support. However, effective citizens' participation in the recovery process may depend on structures for information flow and communication among all stakeholders in disaster recovery. Disaster victims should be made aware of where and how to get particular information about recovery. Greater participation of the citizens could enable them to acquire new sets of skills and experiences in hazard mitigation to reduce their vulnerability to hazards and increase their resilience to disasters.

According to Comerio (2004), socio-economic status plays an important role during the recovery period. In addition to income, savings, employment, access to communication channels and information as well as insurance influence whether a household will be able to recover from a natural disaster (Peacock *et al*., 1997). A study by Masozera, Bailey and Kerchner (2006) in the city planning districts of New Orleans found a significant negative correlation ($r = -0.56$; p-value$<0.05$) between income poverty and hazard insurance. This suggests that people with high levels of income poverty had low coverage of hazard insurance. This could make such people highly susceptible to the impacts of disaster and cause their recovery rate to be more sluggish. Masozera *et al*. conclude that people with lower socio-economic status have the longest and hardest recovery from disaster.

According to Dolan and Walker (2003), economic status works indirectly on recovery by affecting the availability of economic resources to mitigate and prepare for impacts, thus affecting the amount of the disaster impact. Also, economic resources assist in disaster recovery, allowing individuals to quickly return their physical surroundings to pre-event status



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(Fothergill & Peek, 2004). Age is another factor affecting individuals' rate of recovery from disaster. As people move through the life course, their resilience changes. A study by Norris, Friedman and Watson (2002) shows that children tend to be more able to recover from adversity well over time than adults. Masten and Osofsky (2010) also found that older adults show less stress symptoms than younger adults to traumatic events. On the other hand, the elderly commonly has more physical health concerns pre-disaster that affect their resilience and aging can further deteriorate physical ability to respond and recover to a disaster (Peek, 2010).

Women tend to experience and express greater psychological stress following a disaster than men (Anderson & Manuel, 1994; Norris *et al*., 2002). Norris *et al*. continue that even when controlling for impact, women subjectively experience the threat more than men. Enarson (2009) argues that beyond psychological recovery, men and women face different risks of loss in disaster, different roles in response and recovery, and different experiences with post-disaster assistance. According to Enarson, Fothergill and Peek (2007), the differences between males and females with respect to their experiences with disaster can further the gender disparity in disaster recovery. Rathfon (2010) also reports that small businesses are disproportionately affected by disasters and are relatively slow to respond to recovery efforts than medium and large-scale businesses.

Another factor influencing the rate of disaster recovery is the ability of local authorities to use appropriate tools to support the needs of the disaster victims. Making development changes in a community can be difficult and controversial for those with the authority to implement change. Not having the



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state-empowered local authority to act by adopting and enforcing proper land use measures is one thing, while failure to act is another. The inability of local authorities to enforce building codes and regulations during disaster recovery may affect complete and sustainable recovery. This is because the victims may not have the skill and knowledge to identify and find appropriate ways to mitigate certain hazards which may eventually lead to the recurrence of the disaster. The legal backing of local governance structures as well as their ability to enforce land use planning and building regulations are, therefore, imperative to guarantee sustainable recovery.

Alesch *et al*. (2009) emphasise that the extent of damage caused by disasters is a major determinant to the rate of recovery. It just seems reasonable to assume that the speed of recovery following a disaster will be determined primarily by the magnitude of the physical damage (Belasen & Polachek, 2009). This explains the importance of examining the extent and impact of disasters before assessing the rate of recovery. Since the impact of disasters disproportionately affect people, it would also be critical to consider the differences in the levels of impact of disaster on victims in the recovery process. This is because the most affected is likely to take longer period to recover than the least affected. The extent of damage could, however, be measured in terms of geographical scope of the disaster or the depth of destruction caused to productive assets and essential resources necessary to rejuvenate business operations.



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**Social Capital Formation and Disaster Recovery**

Meyer (2013) defines social capital as the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalised relationships of mutual acquaintance or recognition. Social capital is one of four forms of capital described by Bourdieu (1985) that also includes economic, cultural, and symbolic. These four capitals are unequally distributed in society and interact to determine an individual's trajectory within a specific social space (Benight, 2004). Individuals' use of social capital can result in acquisition of other forms of capital, such as economic opportunities or cultural prestige (Anheier, Gerhards & Romo, 1995). Social capital is, therefore, an interaction-based concept existing within social connections. Unlike other forms of capital, to possess social capital, a person must be related to others, and it is those others who are the actual source of a person's advantage (Portes, 1998).

Social capital has two clear components: a durable social network, and the amount and quality of resources available to be passed through the network ties (Lin, 2001). Disaster research that uses this conceptualization of social capital often focuses on how social ties affect resources and support offered to disaster survivors, or how emergency and social service organisations work together during disasters (Murphy, 2007; Nakagawa & Shaw, 2004). Varda, Forgette, Banks and Noshir (2009) identify financial (loans and gifts for property repair) and non-financial resources (search and rescue, debris removal, childcare during recovery, emotional support, sheltering, information) that can be transferred through social ties and affect recovery.



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Mouw (2006) focuses on how the characteristics of resources of friends, contacts, and groups may affect individual outcomes. Two main distinctions were identified in social capital: informal/formal and strong/weak. The informal and formal distinction relates to attributes of the person with which a tie exists. Informal social capital refers to ties with friends, family, co-workers, and acquaintances, and describes the networks of individuals who share confidences, personal information, provide social support, and discuss problems and important topics (Paxton, 1999). Formal social capital describes individuals' connections to organisations and institutions, such as churches, schools, workplaces, and non-governmental organisations. Formal ties provide access to institutional resources and information, and can lead to additional informal ties to other group members that may not exist without shared group membership (Breiger, 1974).

While disaster situations call forth images of trained professionals and formal rescue operations, throughout the sociology of disaster, Elliott, Haney and Sams-Abiodun (2010) and Hurlbert, Haines and Beggs (2000) report that informal ties, particularly neighbours, are the real "first" responders who check on the well-being of others and provide immediate life-saving assistance following a disaster. According to Heller, Alexander, Gatz, Knight and Rose (2005), social support affects recovery. Friends, neighbours, and family members communicate warnings, encourage disaster preparation, provide shelter and supplies, and offer immediate aid and initial recovery assistance (Hawkins & Maurer, 2010).

Research on informal social capital in disaster shows that the size and composition of social networks affect resilience (Hawkins & Maurer, 2010;



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Heller *et al*., 2005; Hurlbert *et al*., 2000). Individuals with larger social networks receive more tangible (e.g., debris removal), informational (e.g., directions to formal aid resources), and emotional (e.g., encouragement) assistance following disaster (Kaniasty & Norris, 1995). According to Hurlbert *et al*., individuals whose networks comprised of more men, younger people, and family members are more likely to receive informal support from their social networks.

Formal ties to churches, non-profits, and social clubs and organizations also provide resources during disaster situations. Ties to social organisations provide both connection to an organisation that can provide support through institutional channels (e.g., a church collecting money for a family in need) and potential informal ties to individuals (e.g., friendships developing between fellow church members). Beggs, Haines and Hurlbert (1996) found that members of social groups received more support following Hurricane Andrew, but organisational membership did not affect support during the preparation for the disaster. Other researchers have found similar effects of formal social ties on resource access during crises (Adger, 2006; Nakagawa & Shaw, 2004).

Another distinction in the type of social capital is strong versus weak ties. Strong ties, sometimes referred to as bonding ties, are connections with individuals that are particularly close, usually with close friends or family, and result in tight bonds to a particular group (Adler & Kwon, 2002). Strong ties are commonly characterised by homophily in demographic characteristics, attitudes, and available information and resources (McPherson, Smith-Lovin & Cook, 2001; Mouw, 2006). The strong connection makes this type of social capital good for providing social support and personal assistance during



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recovery. Well-established in the disaster literature is the importance of family ties, as strong ties, to disaster recovery because family members are commonly the first source of assistance (Drabek & Boggs, 1968; Garrison & Sasser, 2009; Hurlbert *et al*., 2000).

In contrast, weak ties describe acquaintances or individuals loosely connected to an individual that may span across social groups (Granovetter, 1983). Weak ties are more likely to include diversity in demographics and provide novel information and resources to an individual that can assist individuals in moving up in social space (Granovetter). Weak ties have been shown to provide similar benefits in disaster contexts as they do in daily life such as new opportunities and information to access novel resources that assist in long-term recovery (Hawkins & Maurer, 2010). In routine situations, a lack of weak ties among individuals in disadvantaged communities has been shown to affect their access to upward mobility opportunities (Wilson, 1989), while at the same time the available strong ties with other disadvantaged individuals is used to help make ends meet in daily life (Stack, 1974). In disasters, these inequalities in social capital resources are exacerbated, meaning those with less social capital or fewer ties with individuals who can provide the necessary resources often have reduced rate of recovery (Benight, 2004).

An example of disaster research distinguishing between types of social capital and the effects of inequality compared disaster outcomes for residents of two communities in New Orleans: the Lower Ninth Ward, a poor, majority African American community and Lakeview, an affluent, majority white community. Elliott *et al*. (2010) found that while Ninth Ward residents relied on strong ties for informal support during Hurricane Katrina, they received less



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support overall, including less sheltering assistance from social ties and less contact with neighbourhood ties in the year following the event. The authors concluded that a lack of weak social ties to people outside the affected area and ties with individuals with more resources resulted in reduced rate of recovery for disadvantaged residents from the Ninth Ward compared to residents of Lakeview.

However, Varda *et al*. (2009) posit that social capital can be studied as an outcome affected by disasters. According to Meyer (2013), social capital may deteriorate following a disaster because of dislocation of network members, loss of network ties through injury or death, or overwhelmed network resource capacity. In other words, disasters can affect both aspects of social capital: the network relationships and the resources available through those relationships. In relation to social vulnerability, Domínguez and Watkins (2003) and Stack (1974) suggest that a disaster can affect the provision of social capital resources to poor individuals need. The disruption of social capital resources can be particularly damaging to the rate of recovery of affected persons. Tobin-Gurley, Peek and Loomis (2010) showed this effect for single mothers reliant on family and friends for childcare, housing, and financial assistance. When displaced to Colorado, the women who lost these resources had slower recovery.

Networks, collaborations, and agreements are tested by disasters and new organisational actors, often from outside the community, are added to the network affecting relationships and resources available (Averch & Dluhy, 1997). As Hurlbert *et al*. (2000) argued, social networks produce 'interpretive contexts' or 'frames' that condition individuals' responses to non-routine



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situations through their effects on individuals' routine experiences. Thus, understanding the role of social capital in recovery requires in-depth knowledge about individuals' and organisations' experiences in their networks and their perspective on those network resources. Understanding social capital for recovery requires understanding not just the amount of social ties, but also the type of tie (formal/informal and strong/weak), the resource itself, and its interaction with the different phases of the disaster.

Unfortunately, most "social capital" variables identified in recovery operationalization ignore informal networks, individual-organisational links, and the "interpretive context" of resource and support mobilisation that makes social capital theoretically and methodologically distinct from other community phenomenon (Nakagawa & Shaw, 2004; Ritchie & Gill, 2007). According to Paxton (1999), what researchers often describe as social capital is really the "latent" potential of existing social capital to be actualised into disaster resources or new emergent collective behaviour to develop.

Individuals are embedded in social relationships, from family, school, work, and the community through which assistance and support during stressful events could flow. Social supports normally provided through such interrelationships to disaster victims were emotional and tangential support (Luthar, 2006; Reich, 2006). Masten and Obradovic (2008) emphasise that increased amounts of both types of support increase the rate of recovery from disaster. According to Fujieda *et al*. (2004), citizens who respond to crises are empowered when they can tap existing relationships and forge new bonds with other survivors.



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As a result, Luthar (2006) concludes that the density and strength of social networks are the most important variables – not wealth, education or culture – in determining people's rate of recovery from disaster. Reich (2006) also reports that speedy, efficient distribution of emergency shelter, food, medical care and clothing are among the essential responsibilities of government. However, at a time of scarcity, with governments and charities facing financial strain, a focus on the social infrastructure of vulnerable communities may be the best and most cost-effective survival and recovery strategy.

**Empirical Review**

This section reviews empirical works on disaster recovery. The aim was to appraise some of the approaches and methodologies used to measure disaster recovery, and related concepts and issues such as disaster impacts.

**Post-disaster community recovery linking environmental and economic recovery**

De Ruiter (2011) conducted a study on the linkages between environmental and economic post-disaster recovery for coastal communities using the effects of Hurricane Katrina on the Mississippi Gulf Coast as a case study. De Ruiter explains the dependency between environmental change and economic activity in terms of resource use, land cover, and negative feedback of economic activity on environmental pollution and degradation. She posits that changes in the natural environment can have great implications for the local economy. Despite the recognition of the dependence between a coastal economy and its natural environment, she argues that the linkages have not



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been explicitly studied for the post-disaster recovery of the fishery industry and how this compares with a non-environmentally dependent sector like tourism. De Ruiter's study was guided by the following research questions:

1. What does environmental recovery mean after a natural disaster?
2. How do coastal communities recover economically from natural disasters?
3. What is the role of environmental recovery for resource dependent sectors of coastal communities?

The study adopted an interdisciplinary research approach which combined quantitative time series analysis of economic developments from pre-to post-disaster situations and qualitative data provided by expert judgment interviews indicating their perspective on the timeframe and trajectory of the recovery. The analyses of the time series data and expert judgment interviews were based on the guidelines for measuring post-disaster community recovery by Chang (2010). Statistical data that used to track economic recovery was based on De Ruiter's (2011) indicators for measuring post-disaster recovery, which were the trajectory, the timeframe of recovery and the changes in the economy compared to pre-disaster levels.

The trajectory of the economic recovery of tourism and fisheries used time series data to create a time-path of the post-disaster recovery. The change in economic strength used a combination of the trajectory of the economic recovery and the assessments by the experts interviewed. The change in economic diversity studied the changes in number of industries in an economy, changes in number of businesses per industry and changes in business sizes per industry. The change in disaster readiness, the implementation of mitigation



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efforts during the recovery phase, was solely based on expert judgements. Economic recovery of the tourism sector was analysed using data on lodging occupancy, employment, wages and revenue. With the measure for change in economic diversity, the study considered the composition of the local economy on how the dominance of certain industries changes from the pre to the post-disaster situation.

The study found that the trajectory of recovery was steady and that full recovery had not yet been reached at the time. The economy was able to stabilise incomes for the tourism sector in 2007. The level of economic recovery for the tourism sector in 2009 was moderate recovery. The experts judged the change in economic strength of the sector on average as negative. Reasons for the negative change were low gaming revenues compared to pre-hurricane Katrina levels and a decline in number of restaurants, rental properties and tourists.

The percentage change in pre-and post-disaster economic diversity was 0.057 and the range was (0; 3.33) implying close to no change in economic diversity. The diversity change index for the economy was 0.084; the range was (0; 1.66) implying that no change in economic diversity has taken place. In the tourism related sector, accommodation and food services decreased during the post-disaster recovery period. Almost all the experts agreed that the disaster readiness of the tourism sector underwent an extensive positive change (+3) compared to the pre-Katrina situation. The experts explained that several programmes were adopted after the hurricane to help local businesses increase awareness and their disaster readiness. The city government strongly improved its practices; there were new regulations relating to building standards in place



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that have a much higher standard than their pre-disaster equivalents; and more sustainable urban planning, incorporated with smart growth practices with future impacts increasingly taken into account.

The massive damage caused by the hurricane to fishing equipment (e.g. fishing boats, docks, and harbours) and the difficult process of obtaining funding from FEMA to restore the damaged equipment impacted negatively on the recovery of the fisheries sector. A spatial issue that occurred after hurricane Katrina was that of relocation of people. Full recovery had been reached at the time of the fieldwork but that the new levels of wages, employment and production were much lower than pre-disaster levels. The quick recovery after the summer of 2010 was attributed to the economic stimulus caused by the influx of BP employees working on the clean-up after the oil spill.

From the study, hurricane Katrina caused a decline in the number of licenses issued, the number of commercial fishermen, and employees of processing plants. All environmentally related expert judgment interviewees identify the fishermen and the employees of the processing plants as the main victims of the damage done by the hurricane. The time series data analysis on the number of shrimp and crab licenses issued showed a decline for the different types of harvesting. In addition, the low prices of imported sea-products and fishing facilities lost due to hurricane Katrina, the size of the sector declined over the years. The community has tried to re-strengthen the seafood industry after Katrina by organising several seafood-related events.

The income and production of the fisheries sector had normalised by 2009 at a level lower than the pre-disaster levels until the oil spill occurred. However, operationally the recovery was not completed yet: the governmental



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projects of the city were all related to the recovery after hurricane Katrina. The main cause of decreased sales after the oil spill was also attributed to misperception. All interviewees complained that the national media portrayed the area as completely covered in oil and that seafood from the area was contaminated and unsuitable for consumption. The non-environment dependent tourism sector recovered quicker, with more ease and came closer to pre-disaster levels compared to the fisheries industry. However, the tourism industry was stronger before the hurricane than the fisheries sector as the latter was subject to both local and national decline.

Furthermore, the fisheries were almost all local businesses, while almost all casinos in Biloxi were part of larger co-operations which explain the difference in financial resilience. The resilience of the casinos also increased the resilience of the community of Biloxi as a whole because it allowed for a continuous influx of tourists which drives the local economy at many levels. There was a clear spike in the supply of rooms from 2007 on. There was also an increase in demand for hotel rooms from 2007 to 2008; this change was attributed to the pull factor that the quick recovery of the casinos seems to have been. However, many of the smaller businesses had more trouble returning to business. Many of the experts mentioned that almost none of the local grocery stores reopened after the Hurricane and many (fish) restaurants had trouble reopening.

Causes of the slow and small number of reopening of local business were threefold. First, all interviewees mentioned the slow process by which insurance companies reimburse locals and business for the damage caused by the hurricane. Many of the local grocery and restaurant owners lived in the area



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as well and needed their financial means to recovery personally first before they could recover their businesses. Secondly, the fishing industry was severely impacted by the hurricane which decreased the supply of fish, shrimp, oysters and crab for both the national and local markets. Finally, the lack of tourists not only made for a lack in push factors to recover businesses but also decreased income.

**A framework for building back better during post-disaster reconstruction and recovery**

Mannakkara (2014) perceives the concept of "Build Back Better" as the ideal process that delivers resilient, sustainable and efficient recovery solutions to disaster-affected communities. The motivation behind the Build Back Better concept is to make communities stronger and more resilient following a disaster event. The devastation and large-scale reconstruction effort following the Indian Ocean Tsunami in 2004 was the catalyst that gave rise to the phrase and concept: Build Back Better (BBB). BBB is defined as a way to utilise the reconstruction process to improve a community's physical, social, environmental and economic conditions to create a more resilient community. However, Mannakkara reports that almost all BBB efforts have not achieved the expected outcomes. Mannakkara's work, therefore, focused on understanding the concepts required to build back better, how they relate to each other and how they can be practically implemented during post-disaster recovery.

A sequential explanatory mixed methods approach was used in the research project. The concepts representing BBB were tested using two different case study environments: the 2004 Indian Ocean Tsunami disaster



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focusing on Sri Lanka and the 2009 Victorian Bushfires in Australia. Since the post-tsunami reconstruction process in Sri Lanka had long been completed, a cross-sectional study design was used to gather the data. On the other hand, as the Australian recovery process was still on-going, a longitudinal approach was taken where yearly data was collected to observe the recovery progress over time. Mannakkara employed theoretical sampling where respondents were selected according to their level of knowledge and experience on the disasters. Fifteen stakeholders from Sri Lanka and 25 from Australia were interviewed.

Mannakkara argues that Likert-type data do not reflect normal distribution and therefore cannot be analysed using parametric tests. She adopted non-parametric measures, which are distribution free, such as tabulations, frequencies, modes, medians, contingency tables and chi-squared statistics to analyse the quantitative data. Mannakkara identifies four key categories that comprehensively cover the areas required to build back better: (1) Risk Reduction, (2) Community Recovery, (3) Implementation and (4) Monitoring and Evaluation.

Risk reduction was described as improving structural designs and land-use planning. Community recovery was defined as means of support provided for psychological, social and economic aspects of disaster-affected communities. Implementation was generated to demonstrate how risk reduction and community recovery practices can be put in place in an efficient and effective way. Implementation was described as managing stakeholders and enacting legislation and regulations to control people's activities. Monitoring and evaluation was created to identify mechanisms which need to



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be put in place across the first three BBB categories and throughout short and long-term recovery to ensure compliance with BBB concepts.

The case study found a strong link between the recovery of the physical, social and economic environments of communities for overall recovery. Reconstruction of homes and important community buildings such as schools was necessary for the community to recover psychologically and feel the drive to move forward and return to their livelihoods and daily routines. Business owners were only willing to re-establish themselves in affected towns based on the extent of rebuilding taking place. In turn, economic recovery and business re-establishment needed to be visible to influence affected communities to start rebuilding instead of relocating to different locations. Psychological and social support was required to enable the community to make decisions about rebuilding and return to former livelihoods and daily routines and open/re-open businesses.

A lack in any of these elements affected the other elements showing a negative impact on overall recovery. The study concludes that risk reduction, community recovery and implementation initiatives need to be supported and implemented together in order to build back better. The biggest issues leading to the ineffectiveness of post-disaster reconstruction and the lack of achieving BBB-based recovery outcomes included the lack of consideration of the wider implications of recovery decisions made and the lack of practicability in the BBB suggestions which made implementation unfeasible.

Common flaws identified included focusing only on the immediately encountered risk during rebuilding which leads to exacerbation of vulnerability in the face of different unanticipated hazards; and focus only on risk reduction



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leading to neglected social and economic recovery. Others were poor understanding of the importance of community involvement in recovery in order to meet community needs; and lack of clarity and ad-hoc nature of recovery efforts leading to confusion and inefficiency.

**Social capital and collective efficacy for disaster resilience: Connecting individuals with communities and vulnerability with resilience in hurricane-prone communities in Florida**

Meyer (2013) posits that two components of disaster recovery and resilience that are commonly proposed, but under-theorised, are social capital and collective efficacy. These two components capture the interactive aspects of a community that imply a capacity to respond, adapt, learn, and effectively reorganise community life quickly following a disaster event. Meyer stresses that social capital and collective efficacy are not only less established in recovery and resilience researches, but they are also the key components that, from a sociological perspective, make a community "a community" and have the potential to meet the needs of vulnerable populations. These concepts represent individuals interacting and working together, and are signals that a community is more than a population and more than a simple tally of their population attributes like race, income, or housing structures.

Meyer explored the relationship between individual and community resilience and social vulnerability using social capital and collective efficacy as conceptual grounding. She defines social capital as the resources available through individual social ties with others that can be activated to affect individual life outcomes and outcomes for the entire network. Collective efficacy refers to the capacity of a group of people to work together for shared



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goals and was linked to a variety of collective outcomes such as crime rates or disaster recovery. Her study was guided by the following research objectives:

1. the relationship of individual and community levels of analysis for disaster resilience
2. the conceptual and practical relationship between social vulnerability to disaster and disaster resilience.

Case studies of two counties in Florida, Leon and Dixie were studied using a mixed-methods approach. Data were collected at both the individual and community levels for analysis. Quantitative survey data and qualitative interview data were gathered at the individual level, paired with qualitative data collected at the community level. At the individual level, mail surveys and in-person interviews were used with a sub-sample of survey participants to gather detailed information about individual social capital networks and the resources respondents believe are available through these networks. Because individual perceptions of community influence individual and group outcomes, as well as collaborative processes, Meyer gathered quantitative and qualitative data on perceptions of collective efficacy and correlates for collective efficacy used by resilience researchers. These were: social cohesion, trust, leadership and organisational response capacity, and place attachment.

A total of 600 households (300 from each county) was sampled for the study. A grounded theory approach was used to analyse the qualitative data. The data were coded and recoded in three stages, keeping the interviews from the organisational representatives and the individual residents separate. Meyer first performed open coding of basic themes in the data, then examined relationships between the themes, and performed axial coding to connect



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similar themes together under larger concepts. She identified core concepts or processes and performed selective coding of the data in relationship to these ideas. Frequencies, means and correlations were used to analyse the quantitative data.

It was found that informal disaster social capital describes the personal social networks of family, friends, neighbours, and acquaintances who individuals perceive as being able to provide assistance for disaster-related activities. Respondents' disaster-specific social networks were limited in size. Many respondents perceived a small number of individuals in their social networks as able to assist in disaster situations, and this result differed based on the resource transferring through the network. Specifically, financial networks were about half the size of non-financial networks, implying that transforming social capital into economic capital for disaster situations was perceived as difficult.

Relationships between individuals and geographic location affect the composition of disaster social networks. Specifically, family ties and geographically localised ties were prominent in these networks. Taken together, these created a complex process of network size, composition, and resource needs and availability that influence the perception of potential social ties to activate in disasters. This process has implications for potential individual resilience, based on the resources an individual has and what they can receive from their networks. For some respondents, savings and insurance would cover disaster financial needs, friends and family could assist with non-financial needs.



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Individuals who had personal economic resources did not perceive social capital as necessary for some types of disaster assistance, but for others social capital may not meet the financial needs created by a disaster. These results highlight the importance of specifying the resources available from social ties, not just the existence of ties, and also to identify how individuals determine to activate certain ties for which resources. Family was the first connection that people turned to for both financial and non-financial disaster assistance. The large amount of family in these networks results in extreme racial and, likely, economic homophily of disaster social capital. For understanding of social vulnerability's relationship to resilience, these results indicate that individuals without family may be at a disadvantage in disaster social capital, and individuals from low-income families may have more difficulty accessing financial assistance from their social ties.

Formal social capital was limited among study participants, and when it did exist, informal social capital took priority in disasters. Only half of survey respondents indicated that they had any formal social capital ties and even fewer felt that these would be useful during a disaster. At the individual level of analysis, residents perceived disaster collective efficacy from three community attributes: 1) individual friendliness, using the cultural story of small, Southern towns, 2) neighbourhood properties, and 3) organisational disaster response capacity. Organisational representatives also highlighted friendliness and organisational capacity, but they also added aspects of these individuals and organisations that promote or constrain disaster collective efficacy.



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**Conceptual Framework**

This section presents a conceptual framework for managing post-disaster recovery. Figure 1 presents a framework for managing post-disaster recovery. The framework seeks to address the conceptual confusion surrounding disaster recovery among researchers and practitioners, and also provides the basis for building theory to explain the disaster recovery process. According to Olshansky (2005), disaster impact assessment should precede every recovery effort after disaster event. It is, therefore, very imperative that every post-disaster recovery effort should be preceded by clearly focused assessment of the disaster impacts. Per the conceptualisation of disaster recovery, managing post-disaster recovery is a function of both pre-disaster and post-disaster activities.

Thus, the extent of recovery from disaster is measured against the degree to which victims are getting close to pre-disaster situation with deliberate infusion of hazard mitigation mechanisms in the process to avoid the recurrence of the disaster and vulnerability situations. As a result, disaster impact assessment should clearly examine pre-disaster conditions. This provides the benchmark for which disaster recovery could be measured against. In other words, an assessment of disaster recovery without any reference to pre-disaster situation may lack clear focus and baseline indicators or targets upon which recovery could be measured against (Mannakkara, 2014).

In explaining the protection motivation theory, Rogers (1983) emphasises that the level of disaster impact on people and businesses as well as the degree and speed towards disaster recovery largely depend on pre-disaster activities.



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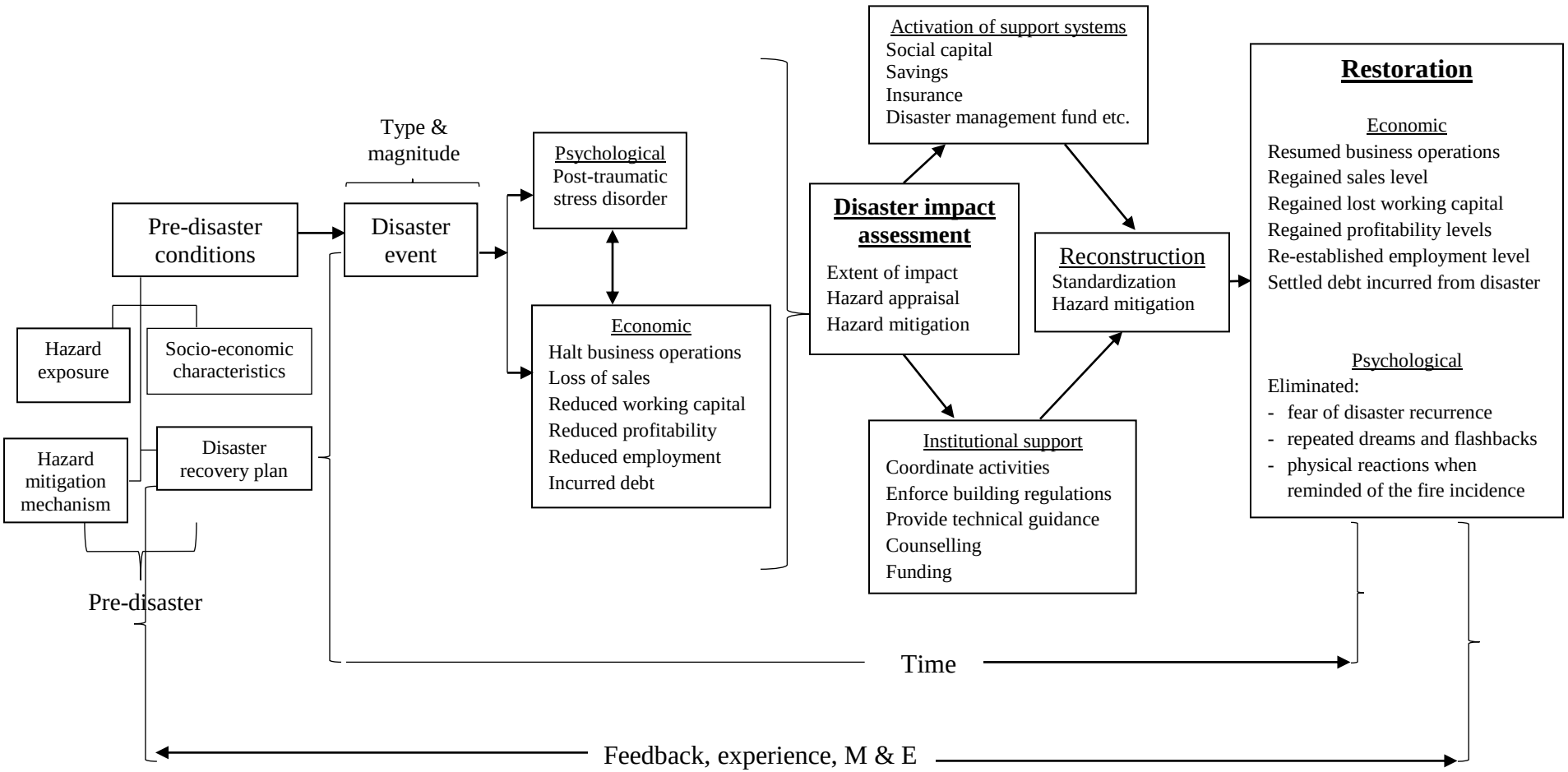


*Figure 1*: Framework for managing post-disaster recovery.

Source: Author's construct (2016)



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The basic framework of disaster by Wisner *et al*. (2004) shows that the effects of disaster are determined by pre-impact conditions – hazard exposure and hazard mitigation practices. Alesch *et al*. (2009) also report that drawing a disaster recovery plan before a catastrophic event is critical for determining the impact of disaster, trajectory and speed of recovery. Accordingly, disaster impact assessment should examine and factor into the recovery process the level of pre-disaster hazard exposure, hazard mitigation mechanisms, disaster recovery plan as well as socio-economic characteristics of the victims.

Chang (2010) posits that pre-disaster management activities inform the type and magnitude of disaster, and impact of disaster on people and businesses. Rathfon (2010) recommends that disaster impact assessment and recovery should be directed towards particular thematic issues including economic and psychological issues. This is because the level of damage and the progress of recovery are measured and interpreted differently depending on the thematic issue. Disaster causes damage to economic gains of victims which leave them with post-traumatic stress disorders. It should, however, be noted that the economic and psychological impacts from disaster are related. They both influence one another to produce the overall impact of disaster on businesses.

After the disaster impact assessment, while victims use the assessment information to activate their support systems by generating resources from social networks, savings, insurance and disaster management funds, disaster management institutions use such information to coordinate disaster recovery efforts, establish and enforce building codes and regulations, and provide technical assistance to victims and counselling to the traumatised.



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Reconstruction towards recovery continues after the establishment of clear institutional guidelines and generation of resources through support systems. The institutional guidelines and lessons from the assessment are used to establish standards for reconstruction. Hazard mitigation mechanisms are also adopted during the reconstruction to avoid the recurrence of disaster. It is expected that the adoption of standardisation and hazard mitigation mechanisms to reconstruct affected physical and economic resources through both institutional and individual efforts would enable victims to recover by achieving pre-disaster psycho-economic indicators. The incorporation of standardisation and hazard mitigation mechanisms in the reconstruction process would help to ensure sustainable disaster recovery.

However, the time taken between the disaster event and recovery is very paramount. Accordingly, the time and sequence taken to complete assessment, activate support systems, establish institutional support system, and reconstruction are critical elements to guarantee quick, successful and sustainable disaster recovery. After recovery, the disaster management institutions continue to monitor and evaluate activities in the disaster impact area to ensure that people uphold standardisation and hazard mitigation practices. The victims would also use their experience in the disaster to strengthen their conditions to make them more resilient to subsequent disaster.

**Summary of the Chapter**

The review of related literature revealed the following key issues:



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1. It was revealed in the chapter that disaster recovery is the most poorly understood and least well researched among researchers and practitioners in the disaster management cycle. This encouraged the researcher to contribute to the building of knowledge about disaster recovery.
2. The chapter showed that there is no consensus in the conceptualisation of disaster recovery. This study contributed to this gap in literature by suggesting a new conceptualisation to disaster recovery that deals clearly addresses the various criticisms and methodological gaps in the existing approaches.
3. Institutional response to disaster is essential to ensure quick and successful recovery. The study, therefore proceeded to investigate the effectiveness of the response of disaster management organisations to market fire disaster victims.
4. Disaster victims in developing countries mostly rely on informal institutions for psychological and economic support towards recovery. The study examined the support coming from the various institutions and identified the institutions that contribute most to the psycho-economic recovery of market fire victims



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# CHAPTER THREE

# INCIDENCES OF MARKET FIRE DISASTER AND INSTITUTIONAL FRAMEWORK FOR DISASTER MANAGEMENT IN GHANA

## Introduction

This chapter presents the occurrences of market fires, and reviews the Acts that established disaster management related institutions in Ghana. The aim was to demonstrate the seriousness of market fires in Ghana as well as the institutional readiness for managing disasters in the country.

## Incidences of Market Fire Disasters in Ghana

This section chronicles some of the market fire outbreaks in Ghana. It demonstrates the frequency of occurrence and the seriousness of infernos in market centres across the country. The section is organised under the dates of the fire outbreaks, extent of damage and types of institutional support received by victims to ensure quick and successful recovery. These were necessary to establish the adequacy and effectiveness of institutional support provided to market fire victims in Ghana.

On the 17th and 19th September, 2001, blazing hails of fire gutted over 150 stores at Kejetia, the hub of commercial activity in the Kumasi Metropolis (GhanaWeb, 2001). Fire swept through stalls at Makola Market in Accra on 13th August, 2002, destroying property worth thousands of Ghana cedis (GhanaWeb, 2002). Micah (2009) records that there was an unquantifiable loss of property through market fires, especially in Accra, Kumasi and Takoradi in 2008. Micah



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continues that there were six serious market fires throughout the country in 2009. Fire also gutted the Makola Number 2 Market on 18th November, 2010 which destroyed 920 shops, stalls and goods estimated at GH¢25 million. According to Akalaare (2011), a total of 684 traders were affected by this fire.

On Friday, 30th September, 2011, more than 4,000 shops were gutted by fire at the Darkuman Kokompe Spare Parts market, destroying vehicles, spare parts and other items running into thousands of Ghana cedis (Ghana Business & Finance, 2011). A four-year old girl was also burnt to death by that devastating fire (Citifmonline.com, 2011). In 2012, over five markets were razed down by fire. At least 200 traders lost their stores and stalls at the Mallam Market in Accra when fire raged through the market on the 15th of October, 2012. Fifty market sheds with items such as bags of rice, groundnut, salt, tomatoes and tins of tomatoes, corn, fish, clothes, cartons of eggs and other food stuff were all gutted by the fire (Daily Graphic, 2012). About 30 stores were also gutted by fire on the 30th of December, 2012 at the Kumasi Central Market.

In 2013, a series of devastating fires consumed at least five market centres - Makola No. 2, Kantamanto, Madina, Agbogbloshie, Dome - in Accra, and the Kumasi Central Market in the Ashanti Region in a space of six months. According to Today Ghana (2013b), large quantities of wax prints, shoes, cosmetics, clothing, leather, canned foods and other merchandise running into thousands of Ghana cedis were destroyed by the fire. One trader was reported to have lost wax prints worth GH¢50,000 through the fire three days after stocking her two shops (Today Ghana). Fire ravaged about 15 stores and offices at the



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central business district at Adum where property worth thousands of cedis was lost on the 25th April, 2013 (Myjoyonline.com, 2013a).

Fire also gutted several stores at the Kantamanto Market on Sunday, 5th May, 2013 which led to the destruction of shops and many second hand clothing (Aglanu, 2013). At about 11:30 pm on that same day, 5th May, 2013, the Dome market was gutted by fire destroying properties worth thousands of Ghana cedis (Today Ghana, 2013b). Barely 52 hours after the Kantamanto Market fire, there was another fire at the Makola Market extension at Tudu Kinbu on Tuesday, 7th May, 2013 which resulted in the destruction of 20 sheds and items worth thousands of Ghana cedis (Ghana Broadcasting Corporation [GBC], 2013).

Portions of the Agbogbloshie market were reduced to ashes in a fire incident on Wednesday, 15th May, 2013 leading to the destruction of many wares, properties and unspecified amount of money (Myjoyonline.com, 2013b). Many potters lost their life-time savings through the blaze. Naatogmah (2013) reports that large sections of Makola annex, a structure housing several shops and located opposite the Ghana Law School in Accra was destroyed by fire on Saturday, 26th May, 2013. The inferno destroyed over 40 table-top business units.

Awiah (2013) reports that two fierce fire outbreaks rocked Accra on Tuesday night, 4th June, 2013, destroying the livelihoods of 400 traders and leaving one person dead. The fire destroyed provisions, confectionery, cosmetic products, clothes, bags of sugar, large quantities of rice and other items worth thousands of Ghana cedis. A trader was reported to have lost almost all the items in her two cosmetic shops. The Makola Market fire brings to two the number of



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fire outbreaks recorded at the market in three years, and the sixth market fire in the country within two months (Myjoyonline.com, 2013c). Timely intervention from firemen prevented fire from extending to other shops at Pig Farm in Accra on Thursday evening, 6th June, 2013. Nevertheless, all items in the shop – a boutique which doubles as a cosmetics shop – got burnt (Myjoyonline.com, 2013d).

According to Alhassan (2013), an inferno occurred at the main entrance of the Kumasi Central Market, around 11:00 a.m. on Wednesday, 12th June, 2013. Goods such as clothes, plastics, and other household items were completely burnt after the fire gutted five different container stores in the market. On Sunday, 16th June, 2013, another fire outbreak razed down more than 30 shops, destroying property worth thousands of Ghana cedis at the Kumasi Central Market (Citifmonline.com, 2013). Suame Magazine, a popular industrial and manufacturing hub in the Ashanti regional capital was on Tuesday, 25th June, 2013 gutted by fire (RadioXYZonline.com, 2013). The blaze consumed four vehicles, two corn mills and eight shops worth thousands of Ghana cedis. This was the second fire disaster in the regional capital in less than two weeks. Just after some hours on that same day, a two-storey building housing a jewellery company, Letap Jewellers, erupted in flames in Accra.

About 15 shops and eight kiosks were burnt down on Wednesday evening, 24th July, 2013 at the Odawna pedestrian mall. Some shops containing women clothing were burnt completely (Darko, 2013). Nine shops and one vehicle were destroyed in another inferno at Club 600 within Suame Magazine, an industrial



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and manufacturing hub, in Kumasi on Thursday, 22nd August, 2013 (Myjoyonline.com, 2013e). The fire is believed to have caused the destruction of goods and properties running into thousands of the Ghana cedis. The fire razed a vulcanising shop, a second hand tire shop, a car battery shop and other shops located within the Club 600 vicinity. The owner of the shop that deals in second hand tires said he had taken consignment of goods worth over Gh¢100,000 a week before.

Fire also engulfed part of the Konkonba Market near the Agblobloshie market in Accra on Thursday, 24th October, 2013 and destroyed over 250 wooden shops and residential structures worth thousands of Ghana cedis (Daily Graphic, 2013). Fire gutted structures at Abossey Okai, a suburb of Accra on Sunday, 8th December, 2013, reducing car spare parts and other valuables to ashes. Part of the Agbogloshie market was gutted by fire on Thursday, 23rd January, 2014. The inferno was reported to have been caused by a gas explosion with about 2,000 wooden structures raised down and properties worth thousands of Ghana cedis destroyed (Dapatem, 2014).

More than 500 traders lost their sources of livelihood when an inferno engulfed sections of the Kumasi Central Market early Wednesday, 26th February, 2014 (Dapatem, 2014). Many of the traders wondered where they would be able to secure funds to either restart their businesses or pay the loans they had obtained from banks and other financial institutions for their trading activities. The fire razed down about 300 shops and stalls destroying food items, cosmetics, cloths, jewellery and wigs, among other items worth thousands of Ghana cedis. On



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Sunday, 11th May, 2014 about 30 shops in the Kumasi Central Market were razed down by fire (Appiah, 2014). This was the third fire outbreak in the market in 11 months. The fire destroyed shops dealing in pottery, cosmetics, clothing and accessories and food items. The loss, according to the traders, could be in tens of thousand Ghana cedis.

On Thursday, 17th July, 2014, perilous fire gutted the Kumasi Central Market destroying over 60 shops at the Dr. Mensah section of the market dedicated to selling used clothes (Appiah & Asare, 2014). This section of the market has suffered this loss twice, a year, after the market women rebuilt the area. This was the third fire incidence in the market in 2014. Fire also gutted parts of the Kumasi Central Market on Monday, 25th November, 2014 destroying properties worth thousands of Ghana cedis (Dapatem, 2014). Fire, on Tuesday, 16th December, 2014, gutted a part of the Tamale Aboabo grains market and destroyed foodstuff worth thousands of Ghana cedis. Five large stores were destroyed and several bags of cereals comprising maize, rice, guinea corn, sorghum, millet and groundnuts completely got burnt. Over 500 market women who were trading at the market were affected (Naatogmah, 2014).

Fire also razed shops at tiptoe lane of the Kwame Nkrumah Circle in Accra on Thursday, 19th December, 2014. On Wednesday, 31st December, 2014, the Dome market was ravaged by fire which destroyed property, including dressmakers' shops, hairdressing salons and about six wooden structures. The Achimota market was on Monday, 4th January, 2015 engulfed by fire. A cosmetic shop, a stationery shop, a butchery, and about 20 containers were razed down by



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the fire. At least one person was reported dead in the ravaging fire at the Kokompe market at Darkuman in Accra on Saturday, 11th January, 2015. The fire which started at about 10pm, swept through about 50 shops destroying goods worth millions of Ghana cedis (Mordy, 2015). Fire razed down portions of the Takoradi Market Circle in the Western Region on Saturday, 4th April, 2015. The fire which started around 9:00 pm destroyed various items and wares, running into several thousands of Ghana cedis (Ampofo, 2015). On Tuesday, 5th May, 2015, fire ravaged the timber market in Sunyani destroying items running into several thousands of Ghana cedis (StarrFmonline.com, 2015). Fire also destroyed shops at the Tip Toe Lane at the Kwame Nkrumah Circle in Accra on Saturday, 6th May, 2015.

It is always a scene of sorrow, anguish and pain for traders, mostly women, whose wares are completely ruined by market fires as they scream, sob or weep uncontrollably. Some victims collapse upon seeing the damage market fires have caused to them, while others sustain burns in attempts to recover some of their wares (Today Ghana, 2013a). It is quite obvious about the untold hardships market fires bring to victims and their households. Some of the traders contract loans from banks, and savings and loans companies to finance their businesses; and when fire disasters occur most of them are pitched into huge financial debts (Micah, 2009). Given the fact that many of these traders are breadwinners who take care of families, it is worrying that they continue to lose their capital, wares and livelihoods to fire.



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In most occasions, the victims appeal to the government, NGOs and financial institutions to come to their rescue by providing financial and material assistance to enable them rejuvenate their businesses to avoid being thrust into poverty. In response NADMO, local government authorities, NGOs, insurance companies and other relief agencies sometimes provide short-term financial, technical and logistical support to victims. According to Akalaare (2011), only 71 out of the 684 victims of the Makola Number Two fire disaster on 18th November, 2010 received support from the MASLOC to restart their businesses. A total of 210 spare parts dealers whose wares were destroyed by fire on 30th September, 2011 at the Darkuman Komkompe Spare Parts market were assisted with a total of one million Ghana cedis loan facility from MASLOC (Ghana Business & Finance, 2011).

Mensah (2013) reports that the Member of Parliament for Dome-Kwabenya Constituency donated an undisclosed sum of money and items including students' mattresses to about 10 of the victims who were badly affected by the inferno at the Dome market as a starter up for them to begin their businesses again on 3rd June, 2013. Stanbic Bank, in collaboration with Metropolitan Insurance wrote off about GH¢100,000 debt of 14 Kantamanto traders who lost their wares in 2013. According to Syme and Appiah (2013), the cancellation of loans was made possible because of the 0.756 per cent insurance component the bank had built into the loan product. The bank also assisted each of the 14 victims with GH¢1,000 as a token to rejuvenate their businesses (Myjoyonline.com, 2013f).



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On 12th August, 2013, the government supported 7,381 traders who had suffered losses as a result of market fires in the first half of the year with a sum total of GH¢ 2 million to enable them regain their sources of livelihood in order to improve upon their economic status. While some traders expressed appreciation to the government for the gesture, majority were of the view that the GH¢260 that each trader received was woefully inadequate and insignificant (Syme & Appiah, 2013). Some of the market fire victims also expressed their dissatisfaction about the fact that they did not have sheds to sell their wares months after their markets were engulfed in fire (Syme & Appiah). Thus, the support from the government was considered by the traders as less adequate to enable them rejuvenate their businesses within the shortest possible time.

In an interview by e.tv Ghana (2012) on fire outbreaks, Mr. Addison, Managing Director of Star Life Insurance, emphasised that the need for insuring traders and their wares had not gained priority on the part of regulators as most of their policies are tailored towards corporate institutions and persons, adding that providers also shy away from the markets because of the high risk involved in insuring them and low premium payment for fire policy. The implication is that most traders are unable to insure their wares which make them more vulnerable to poverty during market fire disasters.

In an interview by Joy fm on 25th June, 2013 on the fire outbreaks, Dr. Kwesi Aning, the Head of the Department of Research at the Kofi Annan International Peacekeeping Training Centre (KAIPTC), rated fire outbreaks as assuming an important position in the hierarchy of potential security threats



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(Appiah, 2013). In the interview, Dr. Kwesi Aning stated that the reoccurrence and the sequence of the fire incidents have increased fears of insecurity of investments by businessmen and traders in the country.

**Review of the Acts that Established Disaster Management Related Institutions in Ghana**

This section reviewed the Ghana National Fire Service Act, 1997 (Act 537), National Disaster Management Organisation Act, 1996 (Act 517), and Local Government Act, 1993 (Act 462). These institutions were selected because of the important roles they play in disaster management. All the Acts were reviewed in relation to disaster recovery.

**Ghana National Fire Service Act, 1997 (Act 537)**

The objective for the establishment of the Ghana National Fire Service (GNFS), as enshrined in Section 3 of the Act, is to prevent and manage undesired fire. For the purpose of achieving its objective, Section 4 of the Act states that the GNFS is to perform the following functions:

a. Organise public fire education programmes to:
    i. create and sustain awareness of the hazards of fire; and
    ii. heighten the role of the individual in the prevention of fire;
b. Provide technical advice for building plans in respect of machinery and structural layouts to facilitate escape from fire, rescue operations and fire management;
c. Inspect and offer technical advice on fire extinguishers;



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d. Co-ordinate and advise on the training of personnel in fire-fighting departments of institutions in the country;
e. Train and organise fire volunteer squads at community level;
f. Offer rescue and evacuation services to those trapped by fire or in other emergency situations; and
g. Undertake any other function incidental to the objective of the Service.

The objective and functions of the GNFS are directed more towards the prevention of fire disasters. The implication is that the GNFS is to carry out more education and sensitisation on fire hazard to minimise the occurrence of fire disasters in the country. The number of occurrence of fire disasters in a particular geographical unit within a definite time period can, therefore, be used as a proxy to measure the effectiveness of the GNFS in executing the fire preventive functions. Thus, the effective implementation of the fire prevention functions of the GNFS could build the capacity of individuals and communities in the prevention and management of fire disasters.

In post-disaster recovery, the role of the GNFS is to educate victims on hazard mitigation strategies to equip them with the necessary skills to adopt appropriate practices to guarantee complete and sustainable recovery as well as avoid the recurrence of the disaster. The GNFS also has a monitoring function which enables them to check the compliance of people and disaster victims during reconstruction after disaster. The aim is to ensure that people abide by proper building regulations to avert the recurrence of disasters. In other words, the monitoring function of the GNFS is to examine the extent to which people and



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disaster victims have adopted hazard mitigation practices to reduce their vulnerability to subsequent disasters. The GNFS, therefore, plays a crucial role in ensuring sustainable disaster recovery. However, to ensure the effectiveness of the role of GNFS in post-disaster recovery, its enforcement and prosecution functions should be strengthened to compel people or disaster victims to comply with building regulations.

Section 15 of the Ghana National Fire Service Act, 1997 (Act 537) states that "there shall be a District Fire Service Committee". A District Fire Service Committee shall be established in each district which shall consist of:

a. the District Chief Executive or his representative who shall be the Chairman;
b. the District Fire Officer;
c. a representative of the Ghana Water and Sewerage Corporation;
d. a representative of the Electricity Company of Ghana or the Volta River Authority where appropriate;
e. a representative of the Traditional Council; and
f. two other persons appointed by the District Assembly one of whom shall be a woman.

The District Co-ordinating Director (DCD) shall be the secretary to the District Fire Service Committee.

Section 16 of the Act stipulates the functions of a District Fire Service Committee, which include advising the Regional Fire Service Committee on any matter relating to the functions of the Service in its district, and determining



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complaints related to the issue of fire certificates under the Act and regulations made under it. The provisions made in Sections 15 and 16 aim at decentralising the operations of the GNFS to enhance responsiveness in fire hazard regulations to avert disasters. The diverse membership of the District Fire Service Committee shows the importance of the roles of various stakeholders in preventing and controlling disaster in a local area. Thus, the assignment of the Chairmanship of the Committee to the DCE and the Secretary to the DCD signifies the important role local governments play in disaster management.

In Ghana's decentralisation system, the Metropolitan, Municipal and District Assemblies have the executive and legislative powers to plan, implement, monitor and evaluate development activities at the local level. Accordingly, their involvement in the District Fire Service Committee is to ensure that disaster management issues are incorporated into their medium-term plans for quick and successful disaster recovery. In addition, the devolution of fiscal, administrative and political powers to the Local Assemblies implies that they are largely responsible for preventing and managing disaster. The deliberate inclusion of women on the Committee also shows the important roles of different gender groups in disaster management.

Sections 21 and 22 of the Act stipulate fire safety funds and expenses of the GNFS. Section 21 indicates that Parliament shall provide the GNFS with funds for its operational and administrative expenses and the Service may receive monies from other sources approved by the Minister responsible for Finance. Section 22 of the Act also states the establishment of the fire safety fund.



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1. There is hereby established a Fire Safety Fund in this Act referred to as "the Fund".
2. The Fund shall be used to finance fire safety programmes in the country.
3. The monies for the Fund shall consist of the following:
    a. such monies as Parliament may direct;
    b. gifts; and
    c. any other monies that may become available to the Service for the fund.
4. The Fund shall be managed by the Council.
5. Withdrawals from the Fund shall be subject to the approval of the Minister.

The provision for the establishment of the fire safety fund in the Act is very critical to the effective execution of the tasks and functions of the GNFS. Without a reliable source of funding to the GNFS, the Service would be unable to organise its sensitisation and education programmes as well as monitor and control the occurrence of fire disasters in the country. Nevertheless, the adequacy and reliability of the funding received by the Service from the fire safety fund are crucial elements in guaranteeing the successful implementation of its functions. In other words, the Service requires adequate and reliable funding to train and educate people on fire hazards, monitor compliance to building regulations, inspect the functionality of fire extinguishers in public buildings, and respond timely to control fire disasters. The silence of the Act on the quantum and patterns of disbursement of the fund is, therefore, likely to affect adequacy and reliability



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of the disbursement of the fund to the GNFS. Further, the assignment of the management of the fund to the Ghana National Fire Service Council would help proper accountability in the use of the fund.

**National Disaster Management Organisation Act, 1996 (Act 517)**

The National Disaster Management Organisation (NADMO) is responsible for the management of areas affected by disasters and similar emergencies, for the rehabilitation of persons affected by disasters and to provide for related matters. Section 2 of the Act states that "the object of the Organisation is to manage disasters and similar emergencies in the country." For the purposes of managing disasters and emergencies in the country, Section 2 subsection 2 of the Act stipulates that the Organisation shall:

a. prepare national disaster plans for preventing and mitigating the consequences of disasters;
b. monitor, evaluate and update national disaster plans;
c. ensure the establishment of adequate facilities technical training and the institution of educational programmes to provide public awareness, warning systems and general preparedness for its staff and the general public;
d. ensure that there are appropriate and adequate facilities for the provision of relief, rehabilitation and reconstruction after any disaster;
e. co-ordinate local and international support for disaster or emergency control relief services and reconstruction; and
f. perform any other functions that are incidental to the functions specified.



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The above provisions show that NADMO is responsible for managing both pre-disaster and post-disaster situations. The preparation of national disaster plans for preventing and mitigating the consequences of disasters are aimed at reducing the impact of disasters on the society. However, the level of commitment of all stakeholders to the implementation of the tenets of the disaster plans may be important to the minimisation of the occurrence of disasters and its impact on the society. The separation of disaster plans from development plans at the various levels of governments may also frustrate the funding of the disaster plans. Thus, development donor agencies and the government may be more committed to the implementation of development plans than disaster plans. Similarly, the separation of the two plans may create incompatibility issues in the enforcement of certain regulations that may restrict the achievement of the goals in one of the plans.

Section 12 of the Act specifies that the Organisation shall have Regional and District Co-ordinators who shall be appointed by the President in accordance with the advice of the Council given in consultation with the Public Services Commission. The Regional and District Co-ordinators shall head the offices of the Organisation at the regional and district levels and perform such functions as the Council or the National Committee shall determine. The provision in Section 12 is an indication of the decentralisation of the operations of the Organisation. The aim is to enhance the responsiveness of disaster plans to the needs and activities of people within a defined geographical unit.



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Nevertheless, the appointment of the District and Regional Co-ordinators by the President may not encourage the gradual professional progression of disaster management personnel, who have the technical capacity and experience, to assume high administrative and political responsibilities to direct affairs in the Organisation. This may reduce the level of commitment and dedication of staff of the Organisation towards disaster management. Similarly, poor professional progression through the ranks of the Organisation to assume District and Regional Co-ordinators may not attract highly qualified people in disaster management to the Organisation.

Section 15 of the Act specifies that there shall be established in each district a District Disaster Management Committee, which would consist of the District Chief Executive who shall be the Chairman, Member of Parliament of the affected constituency, District Director of Health Service, District Information Officer, representative of the Garrison Commander of the Armed Forces, District Police Commander, and District Fire Officer. The District Assembly member from the affected electoral area shall be a member for the duration of the disaster. Per the Section 16 of the Act, a District Committee shall prepare plans for the district to prevent and mitigate disasters in its area of authority, maintain a close liaison with the Regional Committee in drawing up its plans, and perform in the district such functions of the Organisation as the Council or the Co-ordinator may direct.

The constitution of the members of the District Disaster Committee shows the interdisciplinary and multi-sectoral nature of disaster management. Since the



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impact of disasters transcends beyond one sector, it requires the support and contributions from people and institutions from different sectors and disciplines to adequately prepare, control and recover from disasters. The inclusion of the District Information Officer in the District Disaster Committee is to help communicate disaster information to people and educate them on hazard mitigation measures as may be agreed by the Committee.

However, the exemption of member of the District Planning Coordinating Unit (DPCU) from the District Disaster Committee is likely to affect the integration of disaster plans into district development plans. Currently, there exist parallel roles between NADMO and the National Development Planning Commission (NDPC) which transcend down to the district levels. This would make it difficult for disaster plans to receive adequate funds for implementation. The reason being that disaster management is considered more as an emergency issue rather than development issue.

Nevertheless, for disaster management at all levels to receive the necessary financial and political attention, there should be a strong collaboration between the NADMO and NDPC in the preparation of disaster plans. This would enable the NDPC to incorporate disaster management issues into national and district development plans. Disaster management would then be considered as a developmental issue but not as emergency. Thus, the posture of disaster management in national development issues is essential for acquiring the necessary financial and political support for effective implementation of disaster plans.



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Section 22 of the Act specifies the sources of funds for the Organisation. It stipulates that the funds of the Organisation shall include money provided by Parliament for the purpose of the Organisation, and money paid to the Organisation by way of grants, donations and gifts. The meaning is that Parliament should provide reliable source of funds to enable the Organisation finance both its pre-disaster and post-disaster programmes. However, the posture of disaster management in the country as emergency is likely to frustrate the Organisation access to funds for its pre-disaster programmes.

**Local Government Act, 1993 (Act 462)**

The Local Government Act, 1993 (Act 462) gives legal impetus to the operations of decentralised government agencies in the country. Per the Act, Metropolitan, Municipal and District Assemblies (MMDAs) are the main agents for the planning and implementation of development activities. Section 10 of the Act states that the District Assembly (DA) shall exercise political and administrative authority in the District, provide guidance, give direction to and supervise all other administrative authorities in the district. The DA shall also exercise deliberative, legislative and executive functions in the district. As a result of the above functions and authority, the DA is responsible for the formulation and execution of plans, programmes and strategies for the effective mobilisation of the resources necessary for the overall development of the district.

The above provisions in the Act make the MMDAs regulatory authorities for the physical development of the districts. They are, therefore, expected to establish building codes and development controls to guide the physical



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development in their areas of jurisdiction. Effective exercising of the regulatory powers through monitoring and sanctions could help reduce the occurrence of disasters. In other words, the regulatory functions of the MMDAs define their roles in disaster prevention, whereas their development oriented posture with executive powers makes them the immediate government agents responsible for ensuring the sustainable recovery of disaster victims and impact areas. Accordingly, the role of MMDAs in disaster management is very critical to guarantee reduction in its occurrence as well as quick and successful recovery.

Section 11 of the Act specifies that a District Assembly shall be responsible for the preparation and approval of its annual budget. Similarly, section 34 gives the DA power to charge fees for any service or facility provided by the Assembly or for any license or permit issued on its behalf. These provisions give fiscal powers to the Assembly to mobilise funds for development activities in the district. Such powers could enable the DA to generate funds to support disaster victims towards recovery. However, the importance of these provisions to the total development of the districts and sustainable disaster recovery would depend on the lucrativeness of the taxable items ceded to the Assemblies. Thus, having high lucrative taxable elements for local governments could generate high and reliable access to funds to finance development strategies in the jurisdictions.

In accordance with the First Schedule to the Act, under Section 38 (1), each District Assembly shall in the discharge of its functions establish Disaster Prevention Department which would be responsible for implementing



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programmes and strategies to reduce the occurrence of disasters in the districts. This provision in the Act subsumes part of the disaster prevention responsibilities to the MMDAs. However, the Disaster Prevention Department could effectively perform its roles if adequate resources and legal support are provided to the department.

Section 40 of the Act stipulates that a DA may insure all or any of its property against risks of any kind, and insure a third party against injury or damage resulting from any act or omission by a member of staff of the Assembly in the performance of his duties. These provisions suggest that the Assembly could reduce the level of impact of disaster on its staff in the performance of their duties. Nonetheless, the non-compulsory posture of the provisions may not encourage majority of the MMDAs to insure their property and workers operating from the property.

Section 53 (1) states that "A District Planning Authority may, for the purpose of enforcing an approved development plan –

a. prohibit, abate, remove, pull down or alter so as to bring into conformity with the provisions of the approved plan, any physical development which does not conform to those provisions, or the abatement, removal, demolition or alteration of which is necessary for the implementation of an approved plan; and
b. prohibit the use of any land or building for a purpose or in a manner contrary to any provisions of an approved plan.



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The above provisions enable the DA to ensure that the physical development in a particular geographical unit conforms to plan to improve compatibility in land use patterns with human activities to avoid disasters. As a result, the DA has the power to prohibit any physical activity that does not conform to land use plan. This requires the DA to monitor physical development activities in its jurisdiction. It would also require the strong support of law enforcement agencies to maintain order in spatial development. Effective exercise of this provision could help to reduce the occurrence of disasters.

It is also indicated in Section 86 (2) of the Act that the District Assemblies Common Fund Administrator shall distribute monies from the District Assemblies Common Fund to District Assemblies in accordance with the provisions of the District Assemblies Common Fund (DACF) Act, 1993 (Act 455). This provision enables the DAs to gain some financial capabilities to execute their development projects, and implement pre-disaster and post-disaster strategies for sustainable recovery. However, the quantum of resources assigned to disaster-related activities by an MMDA may hinge on the adequacy of financial allocation made by the DACF Administrator to the district coupled with its ability to generate funds internally for its projects. Access to adequate financial resources to the MMDAs is, therefore, an essential element for local disaster management.

**Summary of the Chapter**

The review of incidences of market fire disaster and institutional framework for disaster management in Ghana has brought to the fore the following key issues:



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1. The recurrence of market fires in Ghana has had a massive debilitating impact on businesses.
2. The rampant market fires have plunged many victims into huge financial debts as the traders mostly contract loans from banks, and savings and loans companies to finance their businesses.
3. NADMO, local government authorities, insurance companies and other relief agencies sometimes provide short-term financial, technical and logistical support to victims. However, most of such supports are woefully inadequate.
4. The need for insuring traders and their wares had not gained priority on the part of regulators as most insurance policies are tailored towards corporate institutions and persons. Providers also shy away from the markets because of the high risk involved in insuring them and low premium payment for fire policy. As a result, most traders are unable to insure their wares which make them more vulnerable to poverty during market fire disasters.
5. The government of Ghana has established a number of disaster management institutions with definite roles to ensure the prevention, control and management of disasters.
6. NADMO has the mandate to coordinate all disaster activities in the country.



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# CHAPTER FOUR

# METHODOLOGY

## Introduction

This chapter elaborates the methodology adopted for the study and the approach and tools used for the data analysis to address the research questions. It depicts the systematic approach used to determine the established scientific techniques adopted to investigate the research problem. The chapter was necessary because Easterby-Smith, Thorpe and Jackson (2012) posit that it is essential to select the most suitable methods for solving a research problem in order to obtain reliable results. As a result, it provides a description of activities in the selected markets, the research paradigm and research design guiding the data gathering and analytical procedures, study population, sample and sampling procedures, and data collection instruments. It also outlines the pre-testing, ethical considerations, fieldwork, challenges encountered in the field as well as data processing and analysis.

## Description of the Selected Markets

The uniqueness of African markets and for that matter Ghanaian markets lies in the fact that one would hardly find a market that trades in one particular group of wares. Every region in Ghana has at least one major market where peculiar goods and services offered at minor markets would be readily available and at a cheaper price. Some of the major markets in the country are:

1. Kotokoraba Market in Cape Coast - Central Region



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2. Market Circle in Takoradi - Western Region
3. Kumasi Central Market - Ashanti Region
4. Kantamanto Market in Accra - Greater Accra Region
5. Makola Market in Accra - Greater Accra Region
6. Kintampo Market in Kintampo - Brong-Ahafo Region
7. Tamale Central Market in Tamale - Northern Region
8. Techiman Market - Brong-Ahafo Region
9. Mankessim Market - Central Region

Similarly, every regional capital has a major market. One common issue that Ghanaian markets face is the problem of fire disasters. These are rampant and the effect, typically, is that goods and structures are destroyed with the cost running into thousands of Ghana cedis. These fire outbreaks start from varied sources, that is, they may start as a result of an unattended iron, coal pot fire not turned-out or welders forgetting to turn off their wielding torches. The problem is always compounded because of congestion. Every major market in Ghana faces the problem of congestion. Due to this, fire hydrants have been obscured by stalls, lanes that fire trucks could use to access the market are converted into stores (Appiah & Asare, 2014). All these come together to cause the kind of destruction that occurs during the outbreak of fires. Figure 2 presents a context map of Ghana showing the locations of the three selected markets.



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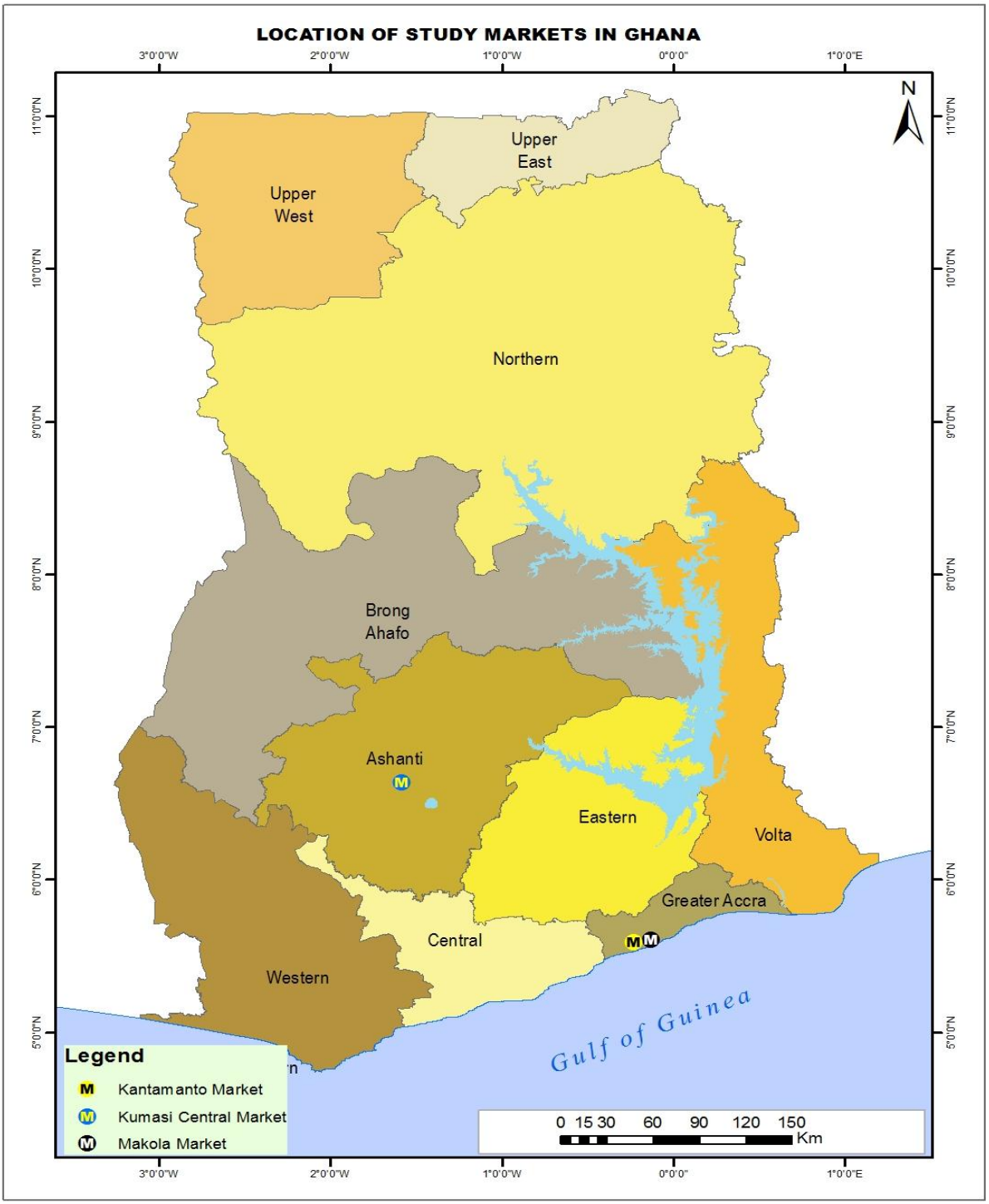


*Figure 2*: Location of the study markets in Ghana.

Source: Centre for Remote Sensing and Geographical Information System (2015)



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**Makola market**

Makola Market is a renowned market place and shopping district in the centre of the city of Accra. The Makola Market, also known as 31st December 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. The market was constructed in 1924 and stood at the heart of the urban Accra life. It served as the main wholesale and retail marketplace in Accra, the epicentre of trade in the country and one of the nation's most important social and cultural institutions.

Makola Market is currently under the management of AMA. As a result, it is the responsibility of the AMA to ensure that all the necessary facilities and systems are provided to prevent the occurrence of fire disaster in the market. The market, dominated by female traders, sells fresh produce, manufactured and imported foods, clothes, shoes, tools, medicines, and pots and pans. Most individuals use passenger mini-buses or taxis to fetch their goods to the market. The co-operatives aim to reduce transport costs, bring economic benefit, and provide a fast, reliable and secure means of transporting their goods for the female traders at Makola. The transport section of the market is currently a car park known as Rawlings Park.

**Kantamanto market**

The Kantamanto Market is a very important market in Ghana situated in Accra. It is located in the central business district of Accra (see Figure 3 for maps of Kantamanto and Makola markets).



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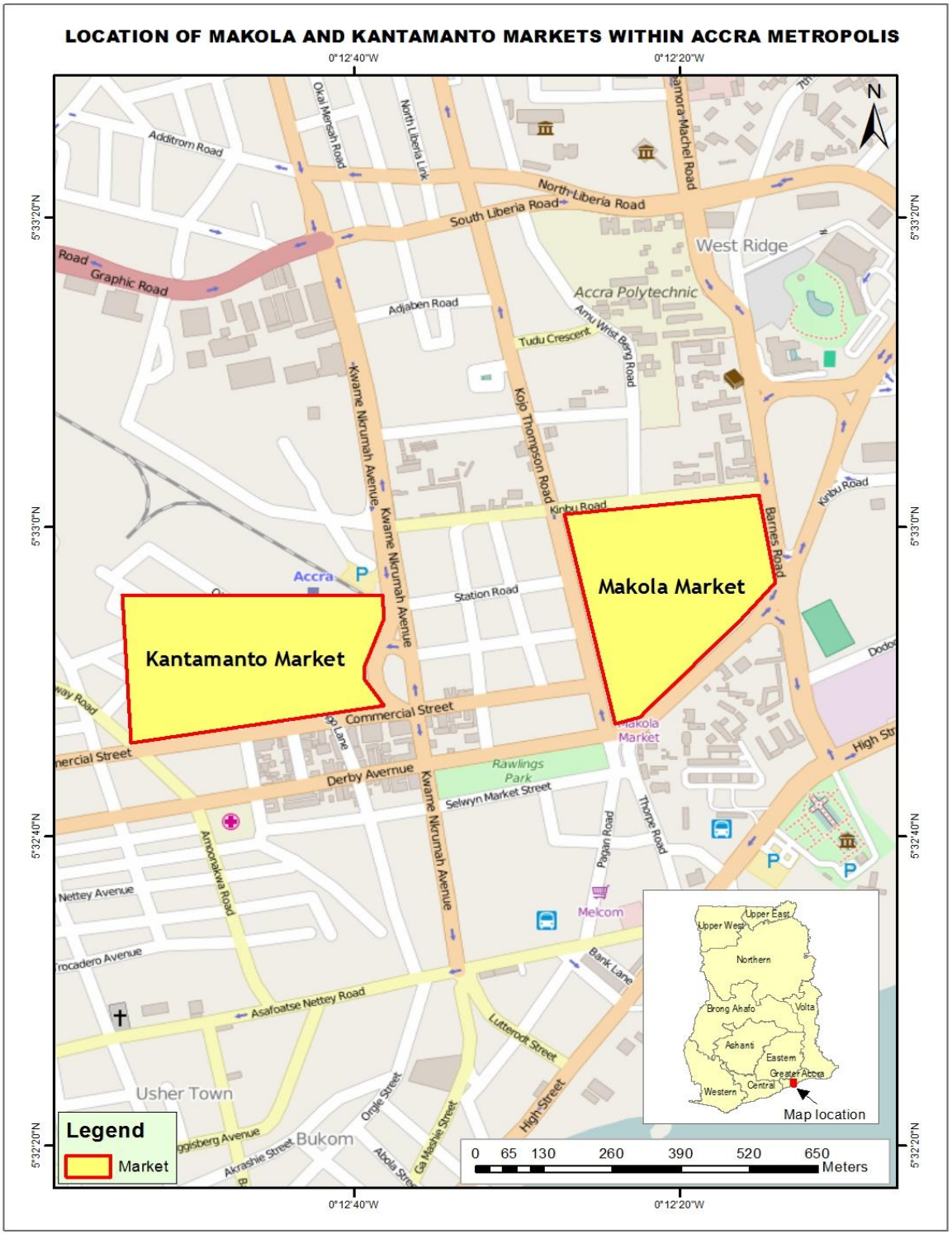


*Figure 3*: Location of Kantamanto and Makola markets in Accra Metropolis.

Source: Centre for Remote Sensing and Geographical Information System (2015)



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There are over 30,000 traders in the market selling all kinds of wares from used clothing to food and vehicle spare parts. Due to the congested nature of the market, whenever fires start in it the damage is always extensive with the destruction of goods and structures running into several thousands of Ghana cedis. There are no fire hydrants in the market making it almost impossible to refill fire tenders which run out of water during fires. This situation is similar to other markets in the country such as Kotokoraba, Market Circle and the Kejetia.

As the market gets increasingly congested, many traders have aired concerns ranging from expansion works to be done, improved fire safety to the ceiling of water hydrants to construct shops. In February 2011, the Kantamanto Railways Traders Association (KRTA) appealed to the government to suspend the ejection and expansion work being undertaken by the management of Ghana Railway Development Authority (GRDA) until an alternative place to accommodate the over 30,000 traders at the Market has been acquired.

**Kumasi Central Market**

The Kumasi Central Market is an open-air market in the city of Kumasi. The market is the largest single market in West Africa with over 10,000 stores and stalls. It has currently extended beyond its original boundaries in the Subin constituency into the Manhyia constituency. It is bordered to the North by the Kumasi Cultural Centre and to the Northwest by the Komfo Anokye Teaching Hospital. The southern part of the market forms a border with Adum, the commercial centre of the city. Figure 4 presents map of Kumasi Central Market.



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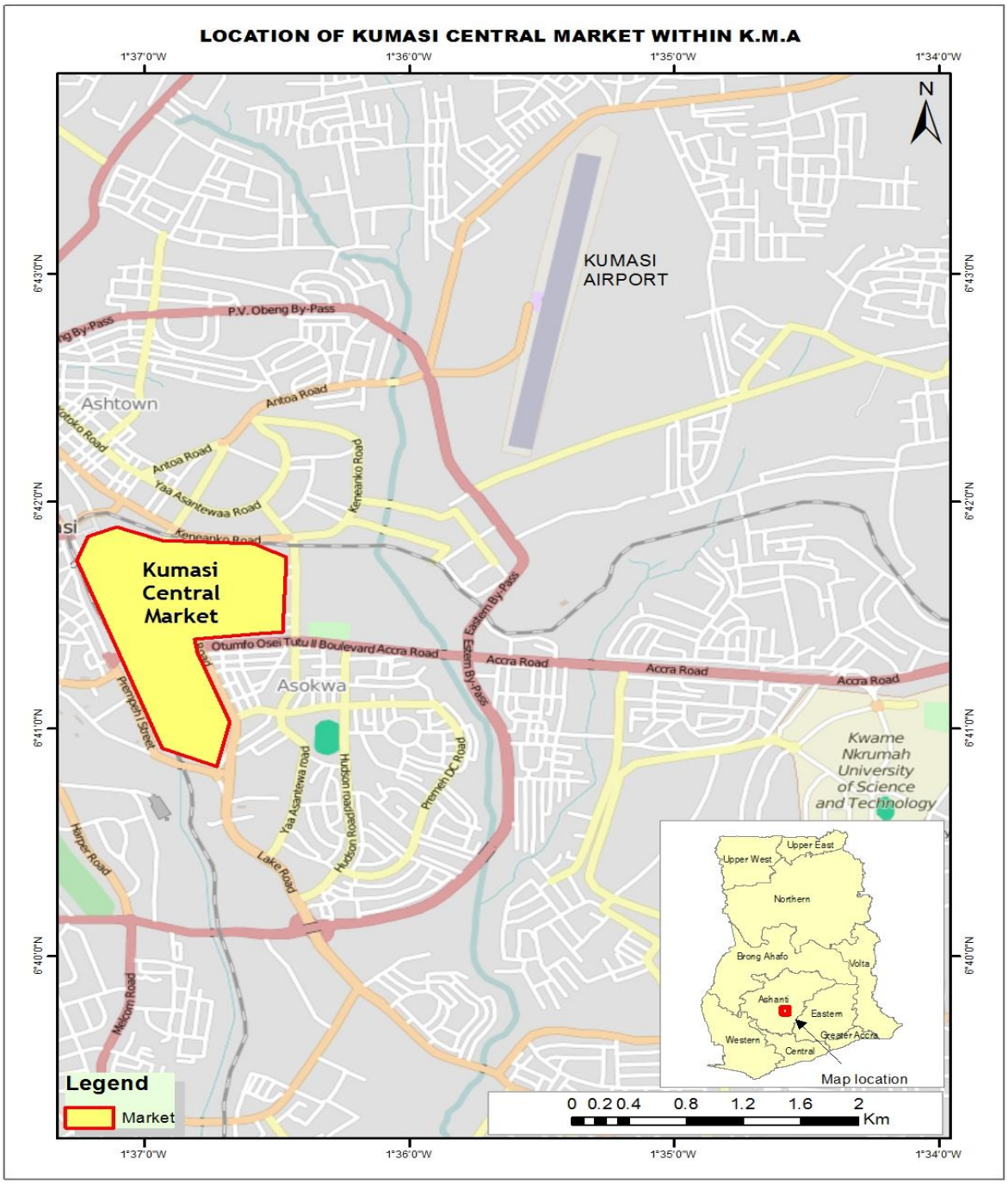


*Figure 4*: Location of Kumasi Central Market within Kumasi Metropolis.

Source: Centre for Remote Sensing and Geographical Information System (2015)



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The market also serves as an important meeting point for traders and farmers from across the country. Virtually everything that one wants to purchase from a market can be found at the Kumasi Central Market. Products range from jewellery, food, toiletries, fabrics, spices to grains. The haphazard nature of the arrangements in the market coupled with congestion make navigation in the market very difficult. Similarly, the huge human and vehicular traffic in and around the market makes its management and law enforcement very difficult. Various methods of ensuring peace and order in the market are employed, including the formation of a city guard group. Members of the group act as the market's law enforcement authority. They handle basic traffic direction duties and anti-hawking activities. However, they refer all cases that are beyond their jurisdiction to the Kejetia Police Personnel who have a station in the market.

Like all big markets in Ghana, fire outbreaks continue be the major destroyer of the Kumasi Central Market. The market has had, in the past, several outbreaks that have resulted in the destruction of stores, stalls and wares. The destruction in most cases runs into several millions of Ghana cedis. The government approved US$ 175 million on Thursday, 16th October, 2014 for the reconstruction of the first phase of the Kumasi Central Market. This was to help reduce the frequent outbreak of fire in the market.

**Research Paradigm**

Research paradigms address the philosophical dimensions of social sciences. A research paradigm is a set of fundamental assumptions and beliefs as



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to how the world is perceived which then serves as a thinking framework that guides the behaviour of the researcher (Jonker & Pennink, 2010). Although the philosophical backgrounds usually remain implicit in most research, they affect the practice of research. Some writers (e.g., Berry & Otley, 2004; Creswell, 2009; Neuman, 2011; Saunders, Lewis & Thornhill, 2009) emphasise that it is important to initially question the research paradigm to be applied in conducting research because it substantially influences how one undertakes a social study from the way of framing and understanding social phenomena. Following this suggestion, various research paradigms have been discussed to enable a justification of the theoretical assumptions and fundamental beliefs underpinning this study.

The two main philosophical dimensions to distinguish existing research paradigms are ontology and epistemology (Kalof, Dan & Dietz, 2008; Laughlin, 1995; Saunders *et al*., 2009). They relate to the nature of knowledge and the development of that knowledge, respectively. Ontology is the view of how one perceives a reality. In terms of social research, ontologically one can perceive that the existence of reality is external and independent of social actors and their interpretations of it, termed objectivist or realist (Neuman, 2011; Saunders *et al*., 2009). On the other hand, subjectivists or nominalists adopter theory beliefs that reality is dependent on social actors and assumes that individuals contribute to social phenomena.

Epistemology is the belief on the approach to generate, understand and use the knowledge that are deemed to be acceptable and valid. In addition to these two fundamental philosophies, two basic beliefs that affect the way to investigate



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reality are axiology and methodology. The former is concerned with ethics, encompassing the roles of values in the research and the researcher's stance in relation to the subject studied. The latter refers to a model for undertaking a research process in the context of a particular paradigm. These basic beliefs as they relate to research paradigms are outlined in Table 2.

Based on the attributes of the various research paradigms coupled with their associated methodological issues and the defined role of the researcher, the study adopted a pragmatist approach to gather, analyse and interpret data in relation to the research questions. Pragmatism believes that objectivist and subjectivist perspectives are not mutually exclusive. Hence, a mixture of ontology, epistemology and axiology is acceptable to approach and understand social phenomena.

The emphasis is on what works best to address the research problem at hand. The researcher shares view with Saunders *et al*. (2009) that pragmatist researchers favour working with both quantitative and qualitative data because it enables them to better understand social reality. As a result, the research problem should always be the focus of defining the methodological issues in research. Similarly, since societal issues are multi-disciplinary in nature, multiple or mixed methods should be applied to effectively analyse and address them. The researcher, therefore, adopted a pragmatist philosophical paradigm to address the central theme of the study.



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**Table 2: Fundamental Beliefs of Research Paradigms in Social Sciences**

| Fundamental beliefs | Research paradigms | | | |
|---|---|---|---|---|
| | Positivism (Naïve realism) | Post-positivism (Critical Realism) | Interpretivism (Constructivism) | Pragmatism |
| Ontology: the position on the nature of reality | External, objective and independent of social actors | Objective. Exist independently of human thoughts and beliefs or knowledge of their existence, but is interpreted through social conditioning (critical realist) | Socially constructed, subjective, may change, multiple | External, multiple, view chosen to best achieve an answer to the research question |
| Epistemology: the view on what constitutes acceptable knowledge | Only observable phenomena can provide credible data, facts. Focus on causality and law-like generalisations, reducing phenomena to simplest elements | Only observable phenomena can provide credible data, facts. Focus on explaining within a context or contexts | Subjective meanings and social phenomena. Focus upon the details of situation, the reality behind these details, subjective meanings and motivating actions | Either or both observable phenomena and subjective meanings can provide acceptable knowledge dependent upon the research question. Focus on practical applied research, integrating different perspectives to help interpret the data |
| Axiology: the role of values in research and the researcher's stance | Value-free and etic<br>Research is undertaken in a value-free way, the researcher is independent of the data and maintains an objective stance | Value-laden and etic<br>Research is value laden; the researcher is biased by world views, cultural experiences and upbringing | Value-bond and emic<br>Research is value bond, the researcher is part of what is being researched, cannot be separated and so will be subjective | Value-bond and etic-emic<br>Values play a large role in interpreting the results, the researcher adopting both objective and subjective points of view |
| Research Methodology: the model behind the research process | Quantitative | Quantitative or qualitative | Qualitative | Quantitative and qualitative (Mixed or multi-method design) |

Source: Based on Guba and Lincoln (2005), Hallebone and Priest (2009), and Saunders *et al*. (2009)



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**Research Design**

An important aspect of any research is the design. It is the basic framework outlining the interrelationships between the various research activities required to effectively address the central research question (Burns & Grove, 2001). According to Pasick *et al*. (2009), research design is the overall plan for connecting the conceptual research problems to the pertinent and achievable empirical research. Accordingly, the mode of configuring data and methods in research is of high essence in diagnosing a research problem and effectively addressing it.

Over the years, two main approaches, namely quantitative and qualitative perspectives, have informed the design of research projects (Babbie, 2005). Quantitative research involves numerical representation and manipulation of observations for the purpose of describing and explaining the phenomenon that those observations reflect. Qualitative research, on the other hand, entails non-numerical examination and interpretation of observations for the purpose of discovering underlying meanings and patterns of relationships (Babbie, 2007). While quantitative research design is explained from the positivist perspective, qualitative research draws its principles from interpretivism research paradigm.

Hallebone and Priest (2009) report that the pragmatist approach to research enables researchers to combine both quantitative and qualitative methods in research. This has led to the adoption of mixed method research design. Mixed methods research design thrives on the assumption that the weaknesses of each individual method (qualitative or quantitative) will be balanced for by the



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strengths of the other (Babbie, 2005; Sarantakos, 2005). Greene (2007) posits that the application of mixed methods design often assumes dialectical stances that bridge positivist and phenomenological perspectives.

The study adopted the mixed methods design. According to Greene (2007), mixed methods design involves the adoption of both qualitative and quantitative techniques in gathering and analysing data for a single study. It puts more emphasis on the dimensions of a research phenomenon than the method. According to Pasick *et al.* (2009), mixed methods research begins with the assumption that investigators, in understanding a social phenomenon, gather evidence based on the nature of the question and theoretical orientation. Social inquiry is targeted toward various sources and many levels that influence a given problem (e.g., policies, organisations, households, individuals). Since most social issues are complex and multi-sectoral, Saunders *et al*. (2009) assert that the adoption of multiple methods and mixed methods design are more appropriate to understand the various dimensions of a social phenomenon. Figure 5 presents the sequence with which mixed methods research design was applied in the study.

Mixed methods research, then, is more than simply collecting multiple forms of qualitative or quantitative evidences. It involves the intentional collection of both quantitative and qualitative data and the combination of the strengths of each to answer research questions (Berg, 2007; Yin, 2009). According to Pasick *et al*. (2009), the integration of quantitative and qualitative data maximises the strengths and minimises the weaknesses of each type of data.



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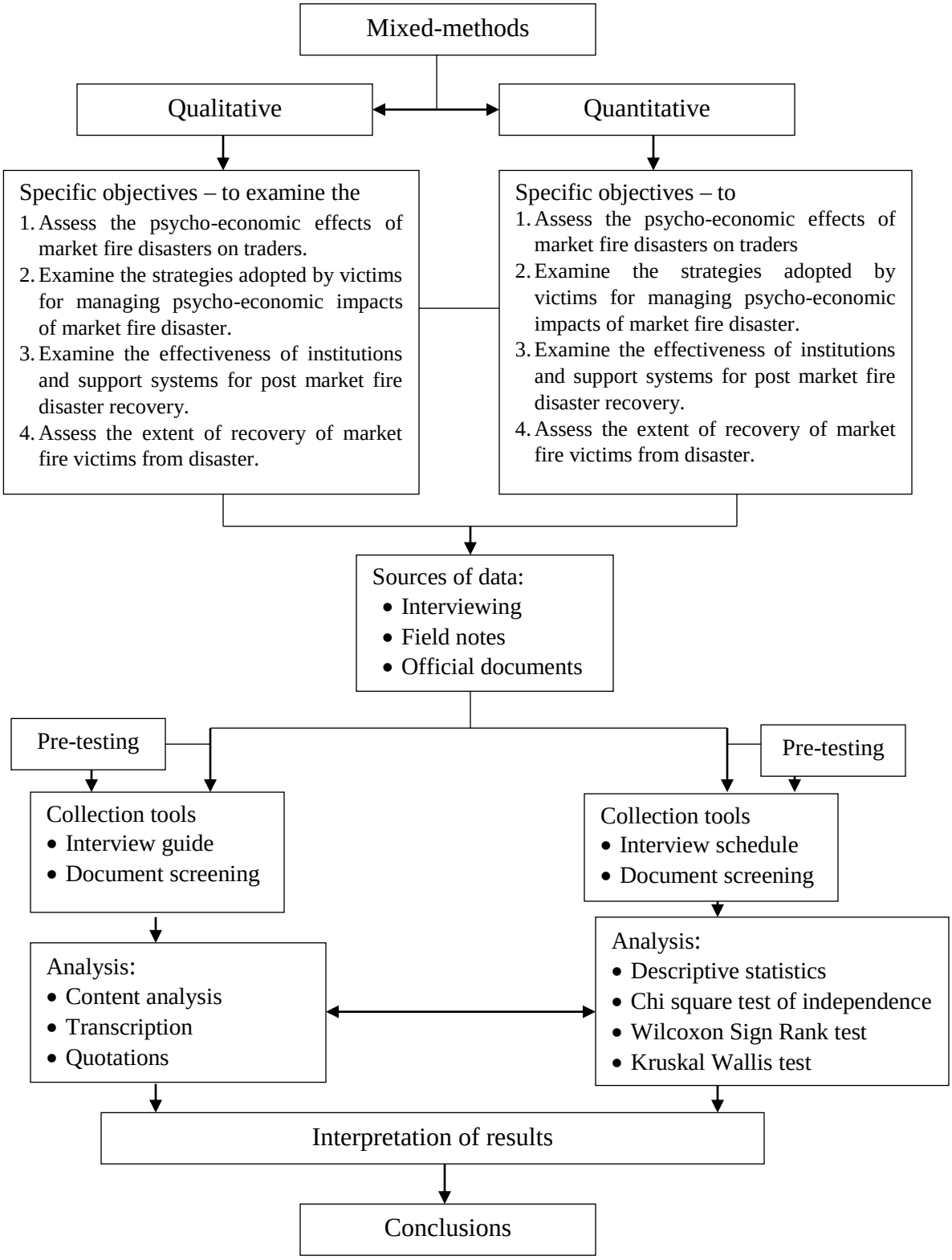


*Figure 5*: Sequence of the application of mixed methods design in the study.

Source: Adapted from Ghartey (2012)



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Over the years, studies on post-disaster recovery have been dominated by quantitative designs with the application of input-output, social accounting matrices and econometric methods to assess the extent of recovery.

The adoption of mixed methods design was informed by the research objectives. The study aimed to assess the effectiveness of disaster management institutions and support systems for post disaster recovery which requires both quantitative and qualitative methods. While issues such as the size and timeliness of support from various support systems and extent of recovery were established quantitatively, the quality of support in terms of adequacy and difficulties in accessing the support could not have been clearly understood without qualitative methods.

The study adopted cross-sectional, ex post facto and descriptive study designs. These were based on the objectives of the study as well as the data collection and analytical procedures. According to Neuman (2011), a cross-sectional study design entails observation of a subset of a population, description of the current conditions that exist, studying of the relationship among different variables at a single point in time and showing how variables affect each other. Maxwell (2005) describes cross-sectional study design as a one-shot design in which data are gathered once, during a period of days, weeks or months. Cross-sectional design was chosen because data on the impact and extent of recovery were collected at a single point in time.

Ex post facto study design was also employed for the study. According to Babbie (2011), ex post facto design is a quasi-experimental study examining how



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an independent variable, present prior to the study, affects a dependent variable. An ex post facto research design is a method in which groups with qualities that already exist are compared on some dependent variable (Neuman, 2011). The study adopted ex post facto design to explain the explain the role of pre-disaster activities in the extent of impact of the market fire disaster on victims as well as their recovery level. In other words, ex post facto design was used to explain how the extent of impact or level of recovery of the victims was largely influenced by pre-disaster elements.

The study also adopted a descriptive study design to examine the strategies adopted by victims for managing psycho-economic impacts of market fire disaster, and the effectiveness of institutions and support systems for post market fire disaster recovery. Sarantakos (2005) defines a descriptive study design as a design that involves compromise or contrast and attempts to discover relationships among existing variables. Greene (2007) reports that methods involved in a descriptive study design range from the survey which describes the status quo, the correlation study which investigates the relationship between variables, to developmental studies which seek to determine changes over time.

**Study Population**

The total study population was 12,945. It constituted 12,933 market fire victims at the Makola (3,985), Kantamanto (4,527) and Kumasi Central (4,421) Markets in 2012 and 2013; representatives of the Accra Metropolitan Assembly (AMA) and Kumasi Metropolitan Assembly (KMA) (2); and representatives of



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the leaderships of the markets (3). The others were representatives of NADMO at AMA and KMA (2), representatives of the Fire Service Departments at AMA and KMA (2), and representatives of Metropolitan Electricity Company of Ghana (ECG) (2) as well as a representative of MASLOC (1). Table 3 shows the distribution of the market fire victims among the three markets and products sold.

**Table 3: Distribution of Market Fire Victims among the Three Markets**

| Products sold | Makola | Kantamanto | Kumasi Central | Total |
|---|---|---|---|---|
| Provisions | 43 | 38 | 74 | 155 |
| Cosmetics | 417 | 475 | 376 | 1268 |
| Food/meat | 628 | 157 | 314 | 1099 |
| Textiles/clothing | 1350 | 2752 | 2209 | 6311 |
| Stationeries | 170 | 159 | 150 | 479 |
| Electrical | 317 | 159 | 158 | 634 |
| Drugs | 155 | 155 | 0 | 310 |
| Mothercare | 310 | 0 | 0 | 310 |
| Agricultural products | 50 | 0 | 105 | 155 |
| Building materials | 0 | 0 | 155 | 155 |
| Leathers | 158 | 472 | 314 | 944 |
| Utensils | 387 | 0 | 247 | 634 |
| Cassettes/CDs | 0 | 160 | 319 | 479 |
| Total | 3985 | 4527 | 4421 | 12933 |

Source: Author's construct (2015)



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**Sample and Sampling Procedure**

The total sample size for the study was 442. This constituted 430 market fire victims and 12 institutional representatives, which were two representatives of the Planning Departments, two representatives from the Metropolitan ECG, two representatives from the Metropolitan NADMO offices, two representatives from the Metropolitan GNFS, three representatives of the leaderships of the markets, and one representative of MASLOC. The sample size for the market fire victims was calculated using Magnani's (1997) sample size formula:

$$n = \frac{t^2 \times p\,(1-p)}{m^2}$$

n = required sample size

t = confidence level at 95 per cent (standard value of 1.96)

p = proportion of market fire victims to total number of traders in the markets (when the actual proportion is not known one can assume 50 per cent or 0.5 to get the highest sample size)

m = margin of error at 5 per cent (standard value of 0.05)

By using Magnani's formula, a sample size of 384 was obtained. However, Israel (2009) suggests that it is mostly necessary to add between 10 per cent and 30 per cent of the sample size in disaster-related studies to address issues of non-response resulting from death, unavailability, sickness, reluctance to participation, and emotional issues. The aim was to ensure that response rates, in relation to the actual sample sizes, were still statistically representative to the



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study populations to avoid any biased or unfair generalisations in disaster-related studies. This was imperative because of the direct and indirect debilitating impact of disasters on people and impact areas. As a result, 15 per cent (58) of the calculated sample size (384) was added given a total sample size of 442. The determination of the additional 15 per cent was based on experiences from the pre-testing of the research instruments at the Dome Market. The 442 theoretical sample size comprised 430 market victims and 12 institutional representativeness.

The cluster sampling technique was used to sample market fire victims for the study. Creswell (2012) argues that the cluster sampling method is used to select samples in situations where the population is large and scattered. It involves dividing the population into segments and selecting all or some of the segments. Elements within each chosen segment are selected randomly to constitute the final sample. In each market, the market fire victims were grouped into the types of product sold. Clustering of the market fire victims was done along the types of product sold because business activities in the markets were mostly localised or organised along the items sold. Major clusters identified in the markets were provisions, cosmetics, food/meat, textiles/clothing, stationeries, electrical, drugs, mother-care, agricultural products, building materials, leathers, utensils, and cassettes/compact discs (CDs).

Proportionate sampling was used to determine the number of respondents to be sampled from each market and cluster. The aim was to ensure representativeness in the determination of sample sizes for the three markets. Table 3 shows the number of market fire victims and the proportionate sample



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sizes for the three markets and 13 clusters. The lists of the market fire victims for 2012 and 2013 with their shop numbers and items sold were obtained from the market leaders. The list for each cluster in a market was entered into Microsoft Excel 2013 Professional Edition.

The Rand function in Excel was used to generate random numbers for the names. The random numbers were used to shuffle the names to ensure that they were not in any pre-determined order. The first names that corresponded to the sample size for a particular cluster in a market were sampled for the study. The process was repeated for other clusters and in the other markets to ensure that a total of 430 market fire victims were sampled from the three markets for the study. The aim was to avoid sampling biases and to ensure that each member in the list was given an equal chance of getting selected into the sample.

As part of the 430 market fire victims, 18 'special' victims were purposively re-selected for further interviewing. They included victims who had fully recovered, those who had partially recovered and those who had not resumed operations at all. The aim was to chronicle the experiences and strategies used by the successful victims to recover from the disaster, and the challenging stories of the non-recovered victims. In the sampling of the 'special' victims, the two most fully recovered respondents from each market were purposively selected, two partially recovered victims were randomly re-selected from each market, whereas snowballing was used to sample two victims each from the three markets who had not resumed operations yet (non-recovered). Additional instruments were administered to re-sampled fully recovered and partially



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recovered victims, while separate instrument was administered to the non-recovered victims. The Rand function in Microsoft Excel was used to generate random numbers and select the two partially recovered victims each from the markets. Table 4 presents details of the sampling distribution among the three markets.

**Table 4: Distribution of Sample Size among the Three Markets**

| Products sold | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Provisions | 2 (1.5) | 1 (0.7) | 2 (1.4) | 5 (1.2) |
| Cosmetics | 13 (9.8) | 15 (9.9) | 14 (9.5) | 42 (9.8) |
| Food/meat | 22 (16.7) | 5 (3.3) | 10 (6.8) | 37 (8.5) |
| Textiles/clothing | 41 (31.1) | 94 (62.3) | 75 (51.0) | 210 (48.8) |
| Stationeries | 6 (4.6) | 5 (3.3) | 5 (3.4) | 16 (3.7) |
| Electrical | 11 (8.3) | 5 (3.3) | 5 (3.4) | 21 (4.9) |
| Drugs | 5 (3.8) | 5 (3.3) | 0 (0.0) | 10 (2.4) |
| Mother-care | 10 (7.6) | 0 (0.0) | 0 (0.0) | 10 (2.4) |
| Agricultural products | 2 (1.5) | 0 (0.0) | 3 (2.0) | 5 (1.2) |
| Building materials | 0 (0.0) | 0 (0.0) | 5 (3.4) | 5 (1.2) |
| Leathers | 7 (5.3) | 15 (9.9) | 10 (6.8) | 32 (7.3) |
| Utensils | 13 (9.8) | 0 (0.0) | 8 (5.5) | 21 (4.9) |
| Cassettes/CDs | 0 (0.0) | 6 (4.0) | 10 (6.8) | 16 (3.7) |
| Total | 132 (100.0) | 151 (100.0) | 147 (100.0) | 430 (100.0) |

Source: Author's construct (2015)



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Purposive sampling was used to sample the representatives from the disaster management-related institutions. This sampling technique was adopted because the representatives of such institutions were perceived to be having in-depth knowledge and experience in the management of post-fire disaster recovery in the various markets. 'Representatives' were used for the institutional respondents to ensure their anonymity as enshrined in the principles of research.

**Sources of Data**

The study used data from both primary and secondary sources. Neuman (2011) defines primary data as gathering data originally for the purpose of a particular study, while secondary data is defined as the use of data originally gathered for a different purpose or study in a new study. Field survey was used to gather primary data through the administration of research instruments. The research instruments for the primary data collection were interview schedule and interview guide.

Secondary data sources included reports on number of market fire victims supported and action plans from the MMDAs, NADMO, GNFS, market leaders, and MASLOC. Maxwell (2005) reports that collecting information from a variety of sources serves as a method of triangulation and verification of findings from different sources which adds validity and reliability to the results of the study. As a result, the use of data from different sources and entities is aimed at improving the reliability and validity of the research findings.



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**Method of Data Collection**

Interviewing was used as the method for collecting data. The survey data collection method was used for the study. This data collection method was adopted because some of the respondents were perceived to be illiterate who could not read, understand and self-administer the research instruments without the assistance of the researcher. In addition, the busy working schedules of the respondents could not guarantee the administration of questionnaires since it was perceived that many of them would misplace and would never return them. The above reasons necessitated the adoption of interview guide and interview schedules as instruments tool for gathering data.

**Data Collection Instruments**

The study employed interview schedule and interview guides as instruments (see Appendices A - I) for data gathering. Interview schedule was used to gather data from the market fire victims, while interview guides were used for the representatives of disaster management-related institutions. Interview schedule was used as instrument to solicit data from the market fire victims because some were perceived not to be literate who can read, understand and self-administer the research instrument without the support of the researcher. Additionally, the study adopted the interview schedule because of the busy working schedule of traders in the markets. Sarantakos (2005) posits that interview schedule is used for quantitative research when the characteristics of the study population or sampling frame do not permit questionnaire administration.



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Quantitative analyses were made on the data gathered through the interview schedule.

Both closed-ended and open-ended research items were used in the interview schedule. The closed-ended research items were used to guide the respondents in the answering of the questions. The aim was to examine the extent to which the responses corroborate or disagree with issues in the literature. The open-ended research items, on the other hand, were used to seek explanations to open-ended items as well as generate in-depth information about the management of post-disaster recovery.

Likert-scale research items were used as part of the closed-ended questions to examine the extent to which respondents agree or disagree with statements about post-disaster recovery. According to Creswell (2003), Likert-scale is a scaling technique where a large number of items that are statements of beliefs or intentions are formulated. Scoring on the Likert scale is a reflection of the level of agreement or disagreement of the statement in question. Babbie (2011) reports that Likert-scale research items help to ensure uniformity of measurement, and guaranteeing high-levelled reliability of answers. It also helps to define the pattern of response for researchers.

The interview schedule was organised into four sections. The first section was on the background characteristics of the respondents. Some of the issues considered under the section were gender, level of education, types of business, and age. Section two was on the psycho-economic effects of market fire disasters on traders. Issues captured under the section included differences in sales, debt



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levels, working capital, profitability, and number of employees. Section three of the interview schedule was on the effectiveness of institutions and support systems for managing post market fire disaster recovery. This section considered issues such as provision of technical guidance, counselling and financial support to victims as well as the timeliness in the provision of such support.

The fourth section was on the extent of recovery from disaster. Issues considered under the section included strategies adopted by victims for managing psycho-economic impacts of market fire disaster, organisation of social capital support, and access to savings, insurance, counselling and disaster management fund. Others were the time taken to resume business operations, profitability and employment levels as well as the adoption of hazard mitigation practices. The study adopted the APA's (2013) National Stressful Events Survey Short Scale (NSESSS) for measuring the severity of PTSD and psychological recovery from the market fires. Issues considered in the psychological recovery included extent of experiencing flashbacks of the disaster, fear of disaster recurrence, and gaining self-confidence in the hazard mitigation practices.

Interview guides were also designed for the institutional representatives and 'special' victims. The interview guides were used for these categories of respondents because of their in-depth knowledge and experiences in the management of post-disaster recovery issues. Thus, the adoption of interview guide enabled the researcher to probe further into issues as well as ask follow-up questions to gain deeper knowledge and understanding about the roles and activities of the institutions in managing post market fire disaster recovery. The



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interview guides were used to generate data for qualitative analysis. The interview guides employed mainly open-ended questions. The aim was to enable the respondents to clearly explain their roles, strategies, experiences and challenges in managing post-disaster recovery. Some of the issues considered under the interview guides were time taken for assessing disaster impact, providing psychological and financial support to victims. Others were establishment of building codes and regulations for reconstruction, and sensitisation of victims on hazard mitigation mechanisms.

**Pre-testing**

The interview schedule was pre-tested in the Dome market in the Ga East Municipality, which also experienced a number of infernos within 2012 and 2013. This market was selected because it bears similar characteristics as the Makola, Kantamanto and Kumasi Central Markets in terms of the items sold and the organisation of the markets. A total of 50 interview schedules were used for the pre-testing. However, 42 representing 84 per cent were administered. This was because some of the respondents were not interested in the study, whereas others were too busy to participate in the study. The research instruments were pre-tested to assess the clarity of the questions, adequacy of the questions in addressing issues in the study, and response rate. As a result, lessons from the pre-testing were used to improve the framing of the questions, and assess the reliability and validity of the interview schedule. This was necessary because the credibility of the findings in a research project lies in the reliability and validity of the data



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collection and analytical processes undertaken (Maxwell, 2005; Maykut & Morehouse, 1994; Yin, 2009).

Yin (2009) defines reliability as the process of minimising errors and biases in research studies allowing the attainment of the same or similar result if the test was repeated. Validity, on the other hand, refers to the credibility of the results obtained. High reliability, therefore, implies that the same experiment shall give the same result at repeated attempts. Maxwell (2005) suggests validity and reliability to be assured through techniques such as long-term data collection, the collection of rich data through in-depth interviews, soliciting feedback about the data collected and results obtained from the participants as well as other expert validators and triangulation, where data is collected from multiple sources. Reliability and validity are, therefore, two concepts used to ensure that the research results have scientific value.

It is significant that parameters, measuring instruments and investigation methods are reliable and valid. If these aspects are not fulfilled, the research result will have low scientific value (Ejvegård, 2003). Reliability of research instrument states the trustworthiness of a measuring instrument and the unit of measurement. Ejvegård posits that validity of research instrument indicates the extent to which it measures the intended issues. To ensure that an instrument is valid, the procedure to develop the instrument guide also has to be proven to be valid (Yin, 2009). As a result, the research items were influenced by the scope of the various concepts and theories reviewed in the literature.



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In addition, feedback from the pre-testing exercise was used to improve the order and nature of questioning. Changes such as the subject categories used, phrasing and number of questions were revised for the actual data collection exercises based on the feedback from the pre-testing. Lessons from the feedback were also used to train research assistants to ensure common understanding of the research items for uniform interpretation to reduce biases in the data gathering. The interview guides were also pre-tested on disaster management-related institutions in the Ga East Municipality as well as on 'special' market fire victims. Lessons from the pre-testing were also used to determine the likely response rate of the actual study and adjustments to be made to ensure statistical representativeness.

**Ethical Considerations**

The study was guided by ethical standards in social science research. The researcher observed all institutional protocol before embarking on the data collection exercise. This was done through an introductory letter stipulating the identity of the researcher, the study topic and the purpose of the study. The researcher secured the consent of the respondents, in terms of their willingness to participate in the study and the appropriateness of the timing, before interviewing them. This was done through the provision of information sheet (see Appendix J), and the signing of consent form (see Appendix K) by research participants prior to the interviewing. The researcher also upheld the anonymity, confidentiality and ethical standards in social science research. As a result, data were not gathered on the names of the respondents. The aim was to instil confidence in the respondents



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about their anonymity and enable them to freely provide detailed information about the management of post market fire disaster recovery. The required ethical standards of an interviewer were also strictly followed to guarantee the gathering of high quality data for the study.

**Fieldwork**

The researcher employed the services of five research assistants to aid the data collection exercise. The fieldwork was carried out between 1st June and 27th September, 2015. The research team reported to the Administrative Heads of the selected institutions, with introductory letters, briefed them about the study, and made request to interview representatives of the institutions. Copies of the interview guides were given to the institutions for their filing, while interviewing appointments were scheduled with the representatives. The aim was to enable the representatives to gather all the necessary documents and data to aid the interviewing and improve the quality of data to be generated. It was also to uphold the ethical issue of ensuring the appropriateness of timing. The research team honoured the appointment dates and times for the interviewing.

With respect to the administration of the interview schedule, the research team used the shop numbers to locate the sampled market fire victims. The research team introduced themselves and the purpose of the study to the victims. The consents of the respondents were sought before the data collection process began. The team asked the respondents the questions based on the research items and recorded the answers on their respective research instruments. Respondents



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who did not want to remember the ordeal they went through during the market fire incident were skipped. Additionally, the mobile contacts of some of the victims who had not yet resumed operations were taken from the respondents and contacted. The first two from each market who agreed to participate in the study were located and interviewed. Some market leaders at the Kantamanto and Makola Markets showed keen interest in the study and supported the research team to identify the victims. This helped to improve the response rate of the study.

**Response rate**

Creswell (2003) emphasises that determining the response rate in social science research is essential because it justifies the difference between sample size and total frequency, and also helps to explain in nominal terms the values of percentages in inferential analysis. A total of 400 respondents were engaged in the study representing a response rate of 90.5 per cent. This comprised 388 market fire victims and 12 institutional representatives. Six out of the 388 market fire victims were 'special' victims who had not yet resumed operations. The implication is that the total frequency for the market fire victims in quantitative analysis was 382. A total of 42 market fire victims constituted the non-response.

The high response rate could partly be due to the interest showed by some market leaders at Makola and Kantamanto Markets by supporting the research team to locate the victims. There was no association among traders in the Kumasi Central Market. As a result, they did not have market leaders. Personnel from the KMA's market management office in the market were performing some leadership roles by settling disputes, sanctioning defaulters of market regulations



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and bi-laws, and registering market fire victims for government support. A representative from that office was, therefore, used as the respondent for the market leadership in the Kumasi Central Market.

In disaster studies, non-response is a response as it could give indications about the extent of impact or level of recovery. Accordingly, a critical analysis was performed on victims that constituted non-response (see Table 5).

**Table 5: Reasons for Non-response**

| Reasons | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Not resumed | 5 (38.5) | 6 (46.2) | 5 (31.2) | 16 (38.1) |
| Sold out shop to others | 1 (7.6) | 1 (7.6) | 0 (0.0) | 2 (4.8) |
| Not having time for the study | 2 (15.4) | 2 (15.4) | 3 (18.8) | 7 (16.7) |
| Could not find respondents | 2 (15.4) | 2 (15.4) | 5 (31.2) | 9 (21.4) |
| Don't want to remember issues about the disaster | 3 (23.1) | 2 (15.4) | 3 (18.8) | 8 (19.0) |
| Total | 13 (31.0) | 13 (31.0) | 16 (38.0) | 42 (100.0) |

Source: Field survey (2015)

From the table, about 38 per cent of the non-response was because the victims had not resumed operations after the fire incidence, 19 per cent did not want to remember the ordeal they went through during the disaster, while 4.8 per cent had sold the shops to others. A market leader at the Kantamanto Market stated that:

*Most of them have not resumed operations because of financial issues.*

*Some are finding it difficult to raise capital to resume operations,*



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*others are doing so to run away from their creditors, whereas others have been closed due to court order resulting from legal actions from creditors and financial institutions.*

Per the economic recovery scale by De Ruiter (2011), there is none recovery when almost no economic production or sales are taking place and more than 95 per cent of the debt incurred from the disaster is not settled. The non-resumption of the business operations of some of the victims suggests that such victims may not have economically recovered from the market fire disaster.

Per the scale used to assess the extent of psychological recovery after an extreme event by the APA (2013), people's reluctance to cope with issues that remind them about disaster situations is an indication that such people have not fully recovered, psychologically. Relating this assertion to the results in Table 5 shows that the 19 per cent respondent who did not want to remember issues about the disaster may not have fully recovered psychologically from the disaster. This agrees with the finding of Walker and Salt (2006) that people may continue to experience emotional toll from disasters years after reconstruction when physical and economic activities may seem to have normalised. Table 5 further shows that 31 per cent each of the non-responses were from the Makola and Kantamanto Markets, while 38 per cent were from the Kumasi Central Market. Similar issues were identified as reasons for the non-responses across the three markets.

From Table 6, 35.9 per cent of the respondents were from the Kantamanto Market, 34.3 per cent from Kumasi Central Market with 29.8 per cent from Makola Market. There was 89.9 per cent response rate from the Makola Market



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with 91.5 per cent and 89.3 per cent respectively from Kantamanto and Kumasi Central markets.

**Table 6: Distribution of Market Fire Respondents among the Markets**

| Markets | Frequency | Per cent | Response rate (%) |
|---|---|---|---|
| Makola | 114 | 29.8 | 89.8 |
| Kantamanto | 137 | 35.9 | 91.3 |
| Kumasi Central Market | 131 | 34.3 | 89.1 |
| Total | 382 | 100.0 | 90.1 |

Source: Field survey (2015)

**Field Challenges**

One of the major challenges encountered during the data collection exercise was the remembrance of the financial difficulties the victims went through as well as the psychological trauma attached to the disaster and the recovery process. As a result, the respondents were consoled as part of the introduction to reduce or avoid any psychological trauma during and after the interview. Another challenge was difficulties in locating the respondents due to the haphazard arrangements and busy nature of activities in the markets. One local tax personnel, who uses shop numbers for tax purposes, was engaged in each of the markets to aid the location of shops and identification of respondents.

Some of the respondents were busy transacting their businesses during the interviewing which affected the quality of time allocated to the interviewing section. In other words, interferences from buyers and business clients affected



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free flow of information. The study, however, allowed for such interferences to enable the respondents earn their living. Other challenges were difficulties in getting appointment with the institutional representatives, misplacement of interview guides, and bureaucratic process of getting the representatives. Two respondents were assigned to the institutions to ensure that data gathering from the institutions did not unduly delay the entire process.

The data collection exercise also encountered challenges such as the non-availability of sampled respondents due to collapse of business or change of location. Some of such challenges were addressed by getting the mobile contacts of the respondents or following their forwarded addresses to locate them and interview them. Another major challenge was the rains. The data collection was interrupted at the initial stages by rain. In some occasions the interviewing had to be paused for the traders to pack or display their wares during or after the rains. Some of the traders were also not coming to open their shops because of the rains. The team had to suspend the exercise for one week since it rained continuously from 2nd June to 10th June in Kumasi, where the exercise started.

**Data Processing and Analysis**

Each research instrument was given a unique identification number to avoid double entry and data loss. The data gathered was edited to check spelling, grammatical errors, and consistency of responses as well as validity of answers. The edited data from the interview schedule were coded to enhance data entry. Table 7 presents the issues discussed under each research objective, variables used to measure the issues, and the analytical tools.



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**Table 7: Variables and Analytical Tools used to Measure the Research Objectives**

| Research objectives | Issues | Variables | Analytical tool |
|---|---|---|---|
| Psycho-economic effects of market fire disasters on traders | 1. Assessment of pre-disaster<br>2. Scope of disaster<br>3. Compare pre-disaster and disaster period | Sales level, debt levels, working capital, profitability, employment, and PTSDs | 1. Descriptive statistics<br>2. Chi square test of independence<br>3. Wilcoxon signed-rank test<br>4. Kruskal Wallis H test |
| Effectiveness of institutions and support systems for managing post market fire disaster recovery | 1. Disaster assessment<br>2. Support towards recovery<br>3. Hazard awareness creation | Standards and regulations, enforcement of regulations, capacity to support disaster victims, counselling, funding | Content analysis<br>Descriptive statistics |
| Extent of recovery of market fire victims from disaster | 1. Strategies adopted by victims towards disaster recovery<br>2. Level of psychological recovery<br>3. Level of economic recovery<br>4. Hazard mitigation practices | Regained (sales, profitability, working capital, employment levels, and self-confidence), settled incurred debts, social capital, insurance, counselling, eliminated fear of disaster recurrence, reduced flashbacks, gained confidence in hazard mitigation practices | Content analysis<br>Descriptive statistics<br>Kruskal Wallis H test |

Source: Author's construct (2015)



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The data were processed with the use of Statistical Product and Service Solutions (SPSS) version 21 and Microsoft Excel 2013 Professional Edition. These software were used to create frequency tables, charts, generate descriptive statistics and inferential analyses. Descriptive statistics such as frequencies, percentages, means and standard deviations were used to conduct univariate analysis for all the research objectives. Wilcoxon Signed Rank test and Kruskal Wallis test were used to assess the psycho-economic effects of market fire disasters on traders.

An error margin of five per cent (0.05) was used for all inferential analyses. The time taken to assess the impact of the disasters, reconstruct physical infrastructure, and restore economic, psychological and physical status was also analysed. As part of the process in analysing the extent of recovery from disaster, the study examined the extent of psychological recovery and extent of economic recovery from the disaster. The hazard mitigation appraisal included hazard identification, and adoption of hazard mitigation strategies.

The study adapted the NSESSS by the APA to assess the extent of psychological recovery of the market fire victims. The NSESSS originally has a nine-item measure that assesses the severity of posttraumatic stress disorder in individuals aged 18 years and older following an extremely stressful event or experience. However, the study modified it to 13 items to adequately capture PTSD issues related to economic-related disaster. The NSESSS was designed to be completed by an individual upon receiving a diagnosis of PTSD (or clinically significant PTSD symptoms) and thereafter, prior to follow-up visits with the clinician. Each item asks the individual receiving care to rate the severity of his or her PTSD during the past 7 days.



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Each item on the measure is rated on a 5-point scale (0=Not at all; 1=A little bit; 2=Moderately; 3=Quite a bit, and 4=Extremely). The total score can range from 0 to 52 with higher scores indicating greater severity of posttraumatic stress disorder. The clinician or interviewer is asked to review the score on each item of the measure during the interview and indicate the raw score for each item in the section provided for "Clinician Use." The raw scores on the 13 items are summed to obtain a total raw score. In addition, the interviewer is asked to calculate and use the average total score. The average total score reduces the overall score to a 5-point scale, which allows the interviewer to think of the severity of the individual's posttraumatic stress disorder in terms of none (0), mild (1), moderate (2), severe (3), or extreme (4). The average total score is calculated by dividing the raw total score by number of items in the measure (i.e., 13).

According to the APA (2013), if 3 or more items are left unanswered, the total score on the measure should not be calculated. Therefore, the individual receiving care should be encouraged to complete all of the items on the measure. If 1 or 2 items are left unanswered, the interviewer is asked to calculate a prorated score. The prorated score is calculated by summing the scores of items that were answered to get a partial raw score. Multiply the partial raw score by the total number of items on the NSESSS – PTSD (i.e., 13) and divide the value by the number of items that were actually answered (i.e., 11 or 12). If the result is a fraction, round to the nearest whole number.

To track changes in the severity of the individual's PTSD over time, the measure may be completed at regular intervals as clinically indicated, depending on the stability of the individual's symptoms and treatment status.



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Consistently high scores on a particular domain may indicate significant and problematic areas for the individual that might warrant further assessment, treatment, and follow-up.

Cash flows on business performance indicators such as sales, profit and size of working capital for 2013, 2014 and 2015 were discounted to 2012 and 2013 base years when the disasters occurred. The aim was to eliminate depreciation of the actual values in the comparison between pre-disaster and post-disaster situations. The average lending interest rates from the commercial banks were used for the discounting. This was because it was at these rates that individual market fire victims were lent to by the banks. An average discount rate of 30.7 per cent was used in the discounting process over the period. This was obtained from the average lending interest rates from 2012 to 2015. An exponential discounting formula ($PV = FV*(1+i)^{-n}$) was used in the process.

A 7-point scale was used for assessing economic recovery at different points in time. De Ruiter (2011) emphasises that the different levels of such scales need to be defined clearly and the scales need to cover all possible outcomes of the measured objective. The scale for economic recovery runs from ‘none’ to ‘full’ recovery and describes the conditions of each of the different levels. The time element in post-disaster recovery was used to supplement other statistical data to measure extent of post-disaster recovery. Table 8 presents details on the 7-point scale for assessing economic recovery at different points in time.



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**Table 8: Scale for Measuring Economic Recovery**

| Scale | Level of recovery | Description of economic conditions (% relative to pre-disaster) |
|---|---|---|
| I | None | Very few aspects of business functioning, almost no economic production or sales (<5%), settled debt incurred from disaster (<5%) |
| ii | Poor | Some businesses open, little sales (5 – 25%), some people back at jobs, very low profitability level (5 – 25%), settled debt incurred from disaster (5 – 25%) |
| iii | Minimal | Many businesses open, low sales (25 – 50%), many people back at jobs, low profitability level (25 – 50%), settled debt incurred from disaster (25 – 50%). Not aware of the exposed hazards |
| iv | Moderate | Most businesses open, some sales (50 – 75%), most people back at jobs, moderate profitability level (50 – 75%), settled debt incurred from disaster (50 – 75%), aware of the exposed hazards but not adopted any mitigation practices |
| v | Good | Most businesses open, almost normal sales (75 – 95%), most people back at jobs, almost normal profitability level (75 – 95%), settled debt incurred from disaster (75 – 95%), adopted hazard mitigation mechanisms but with no confidence in their ability to prevent the recurrence of disaster. |
| vi | Almost full | For the most part: businesses open, normal sales (>95%), people back at jobs, normal profitability level (>95%), settled debt incurred from disaster (>95%), adopted hazard mitigation mechanisms but with little confidence in their effectiveness to prevent the recurrence of disaster.<br><br>But: some business sectors (e.g., construction) doing well while several others struggling; job situation has some instability (e.g., employment levels below pre-disaster levels) |
| vii | Full | Overall: businesses open, normal sales (>95%), people back at jobs, normal profitability level (>95%), settled debt incurred from disaster (>95%), people having confidence in their hazard mitigation mechanisms to avoid disaster recurrence.<br><br>Almost all business sectors doing as well as pre-disaster. Job situation stable. |

Source: Adapted from De Ruiter (2011)



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In analysing data from the interview guide, the data were transcribed and organised into thematic issues. Some of the thematic issues were programmes and services offered by disaster management institutions to market fire victims, hazard mitigation training programmes, mechanisms for ensuring compliance to hazard mitigation plan, and challenges encountered by disaster management institutions in supporting market fire victims. Content analysis was used to examine issues under the various themes.

**Summary of the Chapter**

The study adopted mixed method research approach and cross sectional study design. The cross sectional design posed a major limitation to the study as most studies on disaster recovery adopt longitudinal study design to enable researchers clearly assess incremental recovery efforts of disaster victims. However, this study was conducted two and three years after the fire disasters. The data was, therefore, gathered at a single point in time, where respondents had to recollect the associated cost and their experiences to provide answers to the study, which could not be verified independently.

A total of 400 respondents were sampled from a population of 12,945. The cluster sampling technique was used to sample market fire victims for the study. Interview schedule and interview guide were used to gather data. The data were processed with SPSS version 21. Descriptive statistics were used for univariate analysis, while Kruskal Wallis and Wilcoxon Signed Ranked tests were used for multivariate analysis. The study adapted the NSESSS by the APA to assess the extent of psychological recovery of the market fire victims. A 7-point scale was used for assessing economic recovery.



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# CHAPTER FIVE

# PSYCHO-ECONOMIC EFFECTS OF MARKET FIRE DISASTERS ON VICTIMS

## Introduction

This chapter presents the results and discussion on the psycho-economic effects of market fire disasters on victims. This was essential because the conceptual framework of the study showed that disaster impact assessment should precede every effort towards recovery. Thus, the extent of damage caused by the market fires on victims has critical effect on their rate and level of recovery. The analysis of the psycho-economic effects of the market fire disasters on victims were broadly organised under two sections: psychological effects and economic effects. This was done because clear and distinct indices or variables were used to measure each of them. However, analyses of the psychological and economic effects of the market fire disasters on the victims were preceded by the background issues of the study, comprising the demographic characteristics of respondents and pre-disaster conditions in the markets.

## Background Issues on the Market Fire Disasters

This section presents the background issues surrounding market fire disasters. It comprises the demographic characteristics of the respondents, and the pre-disaster preparations and conditions in the markets. These were necessary to appreciate the calibre of people that constituted the market fire disaster victims, and the conditions explaining the recurrence and scope of the fire disasters. The background issues were also important to understand differences in the effects of the market fire disasters on victims.



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**Demographic characteristics of respondents**

Analysing the demographic characteristics of respondents was essential because variation in individual characteristics, as expounded by Darwin's (1872) five natural selection process, explains differences in their adaptation or recovery processes following disaster. The demographic characteristics considered under the section were sex, age and level of education (Table 9).

**Table 9: Demographic Characteristics of Respondents**

| Characteristics | Categories | Frequency | Per cent |
|---|---|---|---|
| Sex | Male | 217 | 56.8 |
| | Female | 165 | 43.2 |
| | Total | 382 | 100.0 |
| Age (years) | 20 – 29 | 25 | 6.5 |
| | 30 – 39 | 141 | 36.9 |
| | 40 – 49 | 100 | 26.2 |
| | 50 – 59 | 63 | 16.5 |
| | 60 – 69 | 47 | 12.3 |
| | 70 – 79 | 6 | 1.6 |
| | Total | 382 | 100.0 |
| Level of education | None | 50 | 13.1 |
| | Basic | 135 | 35.3 |
| | SHS | 124 | 32.5 |
| | Tertiary | 73 | 19.1 |
| | Total | 382 | 100.0 |

Source: Field survey, 2015

From Table 9, the majority (56.8%) of the respondents were males. The age of the respondents ranged from 27 to 72 years with a mid-range of 49.5 years. The results showed that both the young and the aged traded in the markets. The results also showed that both traders were within the economically active ages and those within the less economically age cohorts



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were victims of market fires. The mean age of the respondents was 44.3 years with a standard deviation of 11.1. The median age was 41.8 years, while the modal age was 38 years.

The data further showed that 35.3 per cent of the respondents terminated their education at the Basic level of education. About 33 per cent had Senior High or Technical or Vocational or Commercial schools as their highest level of educational attainment, while 13.1 per cent had no formal education. The results showed that the majority (86.9%) of the market fire victims had received some levels of formal education. This is likely to help improve the recovery processes as indicated by Luthar (2006) that disaster victims with high levels of education have better access to information to secure support than those with low level or no formal education.

**Assessment of pre-disaster preparations and conditions in the markets**

This section examines the preparations and conditions in the markets prior to the fire disasters. The protection motivation theory by Rogers (1983) emphasises that the extent of damage caused to disaster victims and the degree of their success towards recovery largely depend on pre-disaster activities. According to Mannakkara (2014), assessing the pre-disaster situation should include the hazards victims were exposed to, mitigation mechanisms instituted, and recovery plans established. Such elements are important to assess the effectiveness of recovery strategies. The section is organised under hazard appraisal and mitigation strategies, and recovery plans prior to the disasters.

***Hazard appraisal and mitigation mechanisms before the market fire disasters***

The respondents were asked to indicate the hazards they were exposed to in the markets before the fire disaster incidences. As shown in Table 10, 34.8



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per cent, 33.2 per cent and 21.2 per cent of the respondents reported that the markets were exposed to illegal electrical connections, overloaded electric metres, and unstandardized use of electrical cables, respectively. The results gave indications of poor institutional regulation and enforcement over electrical connections and use of fire in the markets prior to the fire incidence. In addition, the ability of the victims to identify the above elements as hazards in the markets implies that they were all aware of the potential dangers such actions could cause.

**Table 10: Hazards Victims were Exposed to Before the Fire Incidences**

| Hazards | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Illegal electrical connections | 53 (37.1) | 41 (28.3) | 57 (39.0) | 151 (34.8) |
| Overloaded electric metres | 47 (32.8) | 48 (33.1) | 49 (33.6) | 144 (33.2) |
| Substandard use of electrical cables | 28 (19.6) | 34 (23.4) | 30 (20.5) | 92 (21.2) |
| Indiscriminate use of fire | 15 (10.5) | 22 (15.2) | 10 (6.9) | 47 (10.8) |
| Total | 143 (100.0) | 145 (100.0) | 146 (100.0) | 434 (100.0) |

Source: Field survey (2015)

n = multiple response

The common trends in the type of hazards exposed to the markets prior to the fire disasters could be due to weak institutional structures among traders in the markets and poor general control over market regulations. In other words, the rampant illegal electrical connections, overloaded electric metres



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and unstandardized use of electrical cables became part of the norms of operating in the markets. As a result, no one was able to check or reprimand the other, even though they were aware of the potential dangers such 'norms' or practices could pose to their activities.

The respondents were further requested to indicate the mechanisms they instituted to prevent the explosion or triggering of the identified hazards into disaster. This was important because once the traders were aware of the hazards in the markets they were expected to put measures in place to prevent them from causing disaster. Table 11 shows that the majority (63.1%) of the respondents from al the three markets did not put any mechanisms in place to prevent the explosion of the identified hazards into disaster.

Only 17.2 per cent of the respondents ensured formal connection to electricity in their shops; 15.5 per cent also switched off their electrical appliances before leaving the markets for their homes to prevent the triggering of the hazards into disaster. The results showed that all the adopted hazard mitigation mechanisms were in relation to electricity. In other words, none of the respondents adopted a mitigation mechanism about the indiscriminate use of fire in the markets prior to the occurrences of the fire disasters.

The results further showed that even though the respondents were aware of the hazards in the markets, the majority (63.1%) did not institute any measure to prevent their explosion into disasters. This suggests that the majority of the respondents underrated the threat posed by the hazards in the markets as described in the protection motivation theory by Rogers (1983) and Milne *et al*. (2002) that people's precautionary measures against disaster are influenced by their perceptions about threat appraisal or severity of the threat.



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**Table 11: Mechanisms Instituted by Traders to Prevent the Hazards from Causing Disaster**

| Mechanisms | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| None | 89 (70.1) | 76 (52.8) | 91 (67.4) | 256 (63.1) |
| Formal electrical connection to shop | 19 (15.0) | 32 (22.2) | 19 (14.1) | 70 (17.2) |
| Switched off electrical appliances before going home | 14 (11.0) | 28 (19.4) | 21 (15.6) | 63 (15.5) |
| Used approved electrical cables to draw power to shop | 5 (3.9) | 8 (5.6) | 4 (2.9) | 17 (4.2) |
| Total | 127 (100.0) | 144 (100.0) | 135 (100.0) | 406 (100.0) |

Source: Field survey (2015)

n = multiple response

The study also examined the reasons why some of the respondents were unable to adopt measures to prevent the hazards from causing disasters. This was necessary to understand the inhibiting factors preventing traders from adopting hazard mitigation mechanisms in the markets. As Table 12 shows, the respondents attributed their inability to adopt measures to prevent the hazards from causing disaster to poor knowledge in disaster prevention (54.4%) and bad practices with electricity connection (31.4%) in the market. Clearly, there was a gap between the traders' knowledge or awareness about hazards and their ability to implement hazard mitigation mechanisms to prevent the occurrence of disaster.



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**Table 12: Reasons Traders Failed to Adopt Mechanisms to Prevent Hazards from Causing Disaster**

| Reasons | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Poor knowledge in disaster prevention | 51 (52.6) | 47 (53.4) | 58 (56.9) | 156 (54.4) |
| Bad practices with electricity was a norm | 32 (33.0) | 30 (34.1) | 28 (27.4) | 90 (31.4) |
| Not having the money and logistics to do so | 14 (14.4) | 11 (12.5) | 16 (15.7) | 41 (14.2) |
| Total | 97 (100.0) | 88 (100.0) | 102 (100.0) | 287 (100.0) |

Source: Field survey (2015)

n = multiple response

A similar gap was observed by Maddux and Rogers (1983) who concluded that the motivation of people to protect themselves against disaster is enhanced by their perceptions on the severity of a threatening event, probability of the occurrence of the threat, self-efficacy (confidence in their ability to cope with the threat and perform threat reducing behaviours), and response efficacy (the ability of the response to reduce the threat). The results also corroborate the central themes in system and structural functionalism theories that disaster prevention demands collaborative efforts from all stakeholders with clearly defined roles and responsibilities. Thus, individuals adopt unapproved strategies when collective effort towards disaster prevention breaks down, introducing more hazards into an area.

***Assessment of recovery plans prior to the market fire disasters***

Another issue considered under the assessment of pre-disaster preparations of victims in the markets was their recovery plans. This was



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essential because Alesch *et al*. (2009) posit that having recovery plan prior to a disaster enables victims to recover quickly. As shown in Table 13, about 56 per cent of the respondents had recovery plans prior to the market fire disasters, compared to 44.5 per cent of them who did not have. The data further showed that nearly 53 per cent of those from Makola and 74 per cent from Kumasi Central markets had recovery plans before the infernos. However, approximately 60 per cent of the respondents from Kantamanto Market did not have any recovery plans.

**Table 13: Having Recovery Plan Prior to the Market Fire Disaster**

| Response | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Yes | 60 (52.6) | 55 (40.1) | 97 (74.0) | 212 (55.5) |
| No | 54 (47.4) | 82 (59.9) | 34 (26.0) | 170 (44.5) |
| Total | 114 (100.0) | 137 (100.0) | 131 (100.0) | 382 (100.0) |

Source: Field survey (2015)

One of the fully recovered market fire victims from the Kumasi Central Market remarked that:

> *The lack of a unified leadership front among the traders to regulate activities in the market and also to solicit support for us in case of any disaster, have made us to adopt measures to safeguard our businesses in times of disaster.*

The above statement shows that the lack of institutional direction and control over operations in the market heightens the fears of traders about potential disaster, which compels the majority to adopt disaster recovery plans to ensure continuous operations after any disaster. It also shows that the



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severity of threat posed by hazards increases when the norms, values, structures, and accepted practices that define a particular market as an institution are disregarded by the traders.

The traders felt the need to implement recovery plan from their perceived threats over an impending disaster in the markets. This may explain the reason why the majority of the respondents from Kantamanto Market did not adopt any recovery plan to reduce the impact of the disaster on their activities. The Kantamanto Market had strong market leadership directing and controlling activities in the market, and as a result, the individuals' perceived threats of an impending disaster were low. This agrees with the protection motivation theory that people's willingness and readiness to adopt a disaster recovery plan is influenced by their perceived threat appraisal.

The respondents were asked to indicate the recovery plans they adopted prior to the market fire disasters. Table 14 shows that the majority (65.7%) of the respondents who had recovery plans adopted personal savings to reduce the impact of the disaster on their activities, while 20.2 per cent said they opened shops in other areas.

**Table 14: Mechanisms Adopted as Recovery Plans Against Fire Disasters**

| Recovery mechanisms | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Established wholesale outside market | 5 (7.0) | 7 (10.8) | 11 (10.4) | 23 (9.5) |
| Opened shops in other areas | 16 (22.6) | 13 (20.0) | 20 (18.9) | 49 (20.2) |
| Insurance | 5 (7.0) | 4 (6.1) | 2 (1.9) | 11 (4.6) |
| Personal savings | 45 (63.4) | 41 (63.1) | 73 (68.8) | 159 (65.7) |
| Total | 71 (100.0) | 65 (100.0) | 106 (100.0) | 242 (100.0) |

Source: Field survey (2015)
n = multiple response



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The results showed that the respondents adopted both formal and informal strategies as disaster recovery plans. The adoption of personal savings as a disaster recovery plan was probably due to the fact that most of the people operated their businesses informally without a clear distinction between business account or savings and personal savings or investments. In Ghana, a business has to be registered to be formal. A registered business certificate is used to open bank account in the name of the business. However, since most the businesses in the markets are not registered, the operators are unable to open business bank accounts. As a result, most of such entrepreneurs use their personal savings and investments for business transactions. In other words, they are unable to separate their personal savings and investments from those of their businesses.

**Assessment of Psychological Effects of Market Fire Disasters on Victims**

This section assesses the psychological effects of the market fire disasters on the victims. According to Wisner *et al*. (2004), assessment of the psychological effects of disasters on victims is necessary because disasters have critical control or influence on victims' rate and level of recovery in all other sectors including their economic wellbeing. Some of the issues considered under the section were mode of reacting to the news of fire disaster, experiencing the feeling of suicidal tendencies, losing confidence after the fire disaster, and time taken to overcome the feeling to commit suicide.

The respondents were requested to indicate their mode of reaction upon hearing the news of market fire disasters. This was crucial because the mode of reacting to the first news about the disaster could affect the rate of



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psychological recovery from the disaster. As Table 15 indicates, 42.1 per cent of the respondents cried upon hearing the news or seeing their shops engulfed by the fire, 36.9 per cent were shocked, while 17.8 per cent collapsed.

**Table 15: Mode of Reaction upon Hearing News or Seeing Shop Engulfed in Fire**

| Reaction | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Collapsed | 25 (18.4) | 33 (21.7) | 19 (13.3) | 77 (17.8) |
| Cried | 62 (45.6) | 65 (42.8) | 54 (37.8) | 181 (42.1) |
| Shocked | 45 (33.1) | 49 (32.2) | 65 (45.4) | 159 (36.9) |
| Sad | 4 (2.9) | 5 (3.3) | 5 (3.5) | 14 (3.2) |
| Total | 136 (100.0) | 152 (100.0) | 143 (100.0) | 431 (100.0) |

Source: Field survey (2015)

n = Multiple response

The results showed that all the market fire victims suffered some levels of psychological toll upon hearing the news or seeing their shops engulfed in flames. The results largely confirm the observation by Prentice-Dunn *et al*. (2009) that all disaster victims suffer some degree of emotional turmoil upon seeing the destruction and counting their losses. According to Walker and Salt (2006), people's psychological reactions to disasters are critical as they have long term health consequences as well as dumb their confidence to recover. One of the representatives at Kumasi Central Market remarked:

> *Had it not been people who prevented some of the victims, they were ready to enter the fire to be bunt with their goods… This was*



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*because most of them had taken loans and did not have any hope how they were going to repay them*.

A representative of the Kantamanto Market also stated that *people helped to resuscitate many victims who collapsed other than that the situation would have been very tragic*. The two statements illustrate the extent of psychological trauma the market fire disasters had on the victims.

However, Prentice-Dunn *et al*. (2009) emphasise that the mode of reaction of victims to disaster partly depends on their level of preparation and confidence in existing institutions, structures and mechanisms to support them to recover. This means that the psychological toll of disaster on people would be low if they have high confidence in institutional structures to support them to recover and vice versa. Per this claim, the extreme psychological response to the fire disasters in these markets could mean that the victims did not have confidence in the existing institutional structures to enable them to recover.

**Emotional challenges**

The study analysed the psychological difficulties market fire victims went through following such disasters. This was necessary because emotional challenges restrict the ability and capacity of disaster victims to effectively implement strategies towards economic recovery (Tierney, 2006). The respondents were requested to indicate the emotional challenges they went through immediately after the market fire disasters, and the time taken to overcome them. The emotional challenges that emerged included suicidal tendencies, loss of confidence, personal guilt, and ashamed of appearing in public (see Table 16). From the table, nearly 57 per cent of the respondents admitted to sometimes experiencing loss of self-confidence immediately after



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the market fire disaster, whereas 10.7 per cent often had that feeling. The average time taken for experiencing the feeling of loss of self-confidence was 38.3 days.

**Table 16: Emotional Challenges Experienced After Market Fire Disasters**

| Psychological issues | Not at all (%) | Sometimes (%) | Often (%) | Always (%) |
|---|---|---|---|---|
| Suicidal tendencies | 243 (63.6) | 117 (30.6) | 22 (5.8) | - |
| Loss of self-confidence | 124 (32.5) | 217 (56.8) | 41 (10.7) | - |
| Fear | 98 (25.7) | 222 (58.1) | 20 (5.2) | 42 (11.0) |
| Personal guilt | 288 (75.4) | 94 (24.6) | - | - |
| Ashamed of appearing in public | 240 (62.8) | 120 (31.4) | 22 (5.8) | - |

Source: Field survey (2015)

n = multiple responses

According to the APA (2013), the level of confidence of disaster victims in their coping activities following disaster influences their desire and efforts towards recovery. As a result, the loss of confidence of the majority of the respondents following the market fire disaster was likely to affect the seriousness attached to their efforts towards recovery, especially within the first five weeks after the disaster. The APA (2013), therefore, recommended that regular monitoring of the level of self-confidence of disaster victims should be done to reduce their influence on recovery efforts.

About 58 per cent of the respondents sometimes experienced fear after the market fire disaster. The average time taken for experiencing the feeling of fear among the respondents was 48.2 days. The fear experienced by the majority of the respondents following the fire disaster was most likely to



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cripple their efforts towards swift economic recovery as described by Dr. Kwesi Aning in Appiah (2013) that increased fear of insecurity of investments following disasters negatively influences the quantum and quality of investments made to rejuvenate businesses.

The results in Table 16 clearly showed that fear was the psychological feeling that affected the respondents most after the disaster. It also had the longest impact on the victims with 48.2 days. This could be attributed to the fact that some of the respondents had taken loans to invest in their businesses, and as such were afraid of how their creditors would treat the issue. The data also showed that many of the market fire disaster victims were not likely to achieve any meaningful economic recovery within the first one month after the incident. This is because many of them were psychologically disturbed, and per the positive relationship between psychological impact and economic recovery as shown in the conceptual framework, they might have been emotionally disturbed to be more economically active to restore short-term economic recovery of their businesses.

**Mode of overcoming emotional challenges from market fire disasters**

The respondents were further asked to indicate how they were able to overcome those psychological challenges from the market fire disasters. The results are presented in Table 17. As the table shows, 44.2 per cent of the respondents were able to overcome their emotional challenges following the market fire disasters through counselling, 30.4 per cent overcame such feelings through financial support, whereas 13.1 per cent overcame theirs through medication.



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**Table 17: Mode of Overcoming the Emotional Challenges**

| Modes | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Medication | 28 (19.4) | 17 (10.2) | 16 (10.2) | 61 (13.1) |
| Counselling | 59 (41.0) | 71 (42.8) | 76 (48.4) | 206 (44.2) |
| Financial support | 40 (27.8) | 53 (31.9) | 49 (31.2) | 142 (30.4) |
| Credit supply | 17 (11.8) | 25 (15.1) | 16 (10.2) | 58 (12.3) |
| Total | 144 (100.0) | 166 (100.0) | 157 (100.0) | 467 (100.0) |

Source: Field survey (2015)

n = Multiple response

The results clearly showed that a substantial proportion (42.7%) of the respondents were able to overcome their emotional challenges from the market fire disasters through economic support. This suggests somewhat strongly that the emotional challenges experienced by some of the respondents were due to economic reasons and, therefore, confirms the positive relationship between psychological and economic impacts and recovery from disaster as shown in the conceptual framework.

According to Webb *et al*. (2002), early financial or economic support to disaster victims helps them to overcome their emotional challenges, which also empower them to achieve other forms of recovery including economic. In other words, economic support is necessary to achieve both psychological recovery and full economic recovery. The ensuing section analyses the economic effect of the market fire disasters on victims.



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**Assessment of Economic Effect of Market Fire Disasters on Victims**

Assessment of the economic effect of the market fire disasters on victims was important because the prime activity of the victims in the markets is economic. As a result, any disruption of business operations by fire disasters could definitely have economic implications on traders. Analysis of the economic effect of the market fire disaster on the victims was also necessary because activities in the markets are the sources of livelihood of traders. This section was structured into financial worth of goods destroyed by the fire disasters, disruption of business processes caused by the market fire disasters, comparison of business performance indicators before and after the fire disasters, and effect of market fire disasters on victims' households.

**Financial worth of goods destroyed by the fire disasters**

The respondents were asked to indicate the financial worth of goods destroyed by the infernos. This was necessary to establish a base for analysing the extent of economic impact of the infernos on business operations in the markets. It was also important because the extent of financial loss has a significant influence on the level of psycho-economic impact of the market fires on the victims as well as the mode and swiftness towards recovery. Since most of the traders did not keep records on the goods in their shops, the responses on this issue were more of memory recall. However, the respondents were pre-informed that the study was for an academic exercise, and estimates as close as possible to the actuals were acceptable.

The results are presented in Table 18. A critical look at the table shows that the means were larger than the medians, implying the distributions were positively skewed. According to Bluman (2013), the median becomes the most



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appropriate representative of central tendencies when distributions are positively skewed. As a result, the medians were used to estimate the 'average' financial loss of goods through the market fire disasters. The positively skewed distributions in the three markets implied that the financial worth of goods in the shops of a large majority of the respondents was below the mean value of GH¢24,834.80. This further gave an indication that a large majority of the market fire victims operated on a small scale. The positively skewed distributions also meant that there was a large gap between the worth of goods reported in the shops of some few victims and those of the remaining majority of the respondents.

The table further showed that the average financial worth of goods lost by the market fire victims to the infernos was GH¢17,500. For the three markets, the average financial worth of goods lost among market fire victims were: Makola Market GH¢20,000, Kantamanto; GH¢12,000; and Kumasi Central Market GH¢18,000. Clearly, victims from the Makola Market had the highest average financial worth of goods lost to the market fires, whereas those from the Kantamanto Market had the least financial worth of goods lost.

**Table 18: Financial Worth of Goods Destroyed by the Infernos**

| Markets | Freq. | Mean (GH¢) | Stdv. | Median (GH¢) | Mode (GH¢) | Mean Rank |
|---|---|---|---|---|---|---|
| Makola | 114 | 28,439.5 | 31,357.9 | 20,000 | 20,000 | 194.73 |
| Kantamanto | 137 | 26,219.0 | 29,058.0 | 12,000 | 18,000 | 176.24 |
| Kumasi Central | 131 | 20,250.4 | 11,938.4 | 18,000 | 15,000 | 204.65 |
| Total | 382 | 24,834.8 | 25,563.2 | 17,500 | 18,000 | |

Source: Field survey (2015) $\chi^2 = 4.582$ df = 2 p-value = 0.101

Skewness = 1.92 (Makola = 1.50; Kantamanto = 1.54; Kumasi Central = 2.51)

Kolmogorov-Smirnov (Makola – Statistic = 0.223; p-value = 0.001)
Kolmogorov-Smirnov (Kantamanto – Statistic = 0.285; p-value = 0.001)
Kolmogorov-Smirnov (Kumasi Central Market – Statistic = 0.279; p-value = 0.001)



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Kruskal Wallis, a non-parametric test, was used to assess statistical significance of difference among the means financial worth of goods destroyed by the infernos across the three markets. Kruskal Wallis H test was used because various tests of normality on the distributions in the three markets showed that they were all positively skewed. First, the means were higher than the medians, which showed that the distributions were positively skewed. Second, the skewness values were higher than 0.5. Third, the p-values associated with the Kolmogorov-Smirnov tests were all significant (0.001) in relation to the acceptable error margin of 0.05, indicating that they were not normally distributed. In addition, the non-existence of proper records on the goods and the use of memory recall made non-parametric test a more appropriate statistical tool for analysing any statistical inferences from such data.

From the Kruskal Wallis test, the p-value of 0.101 ($\chi^2 = 4.582$; df = 2) obtained implied that there was no statistically significant difference in the mean financial worth of loss to the infernos across the three markets. The p-value of 0.101 was higher than the accepted error margin of 0.05, implying that there were similar levels of financial losses to infernos across the three markets. The results could be attributed to the similar products sold in the three markets and similar market arrangements across the three markets.

The results further implied that across the three markets, the victims were likely to have similar levels of psycho-economic impact from the infernos. According to Wisner *et al*. (2004), disaster victims with similar socio-economic and cultural characteristics at the pre-disaster stage most often have similar experiences during post-disaster recovery. Kumasi Central Market had



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the highest financial worth of loss to the market fires with a mean rank of 204.65, followed by Makola (mean rank = 194.73) and Kantamanto (mean rank = 176.24) markets.

**Disruption of business processes caused by the market fire disasters**

The respondents were requested to indicate the length of time business activities were halted after the market fires. This was critical in post-disaster impact assessment because it shows the length of time taken by victims to re-organise themselves and resume business operations, which forms part of the initial processes towards recovery. Table 19 presents the results. The skewness values of the distributions and the p-values associated with the Kolmogorov-Smirnov statistic showed that the overall distribution and the distributions for the three markets were not normal. The median was used to represent the average because it is not influenced by extreme values. Similarly, Kruskal Wallis H test was used to assess the statistical significance of difference among the three markets with respect to the number of days that business operations were halted following the market fire disasters.

The data showed that the average number of days that business operations had to be halted in the markets after infernos was 90. In other words, businesses had to suspend operations for about three months following market fire disasters. This could negatively affect the amount of revenue generated from the markets for development activities in the country as indicated by the UNDP (2011) that the impacts of disaster transcend beyond the victims to the government in terms of loss of tax revenue and diversion of resources into disaster response.



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**Table 19: Number of Days that Business Activities were Halted**

| Markets | Freq. | Mean | Stdv. | Median | Mode | Mean Rank |
|---|---|---|---|---|---|---|
| Makola | 114 | 84.5 | 83.82 | 60 | 14 | 173.92 |
| Kantamanto | 137 | 55.8 | 60.54 | 31 | 7 | 134.53 |
| Kumasi Central | 131 | 108.6 | 22.19 | 122 | 93 | 266.38 |
| Total | 382 | 82.5 | 63.66 | 90 | 14 | |

Source: Field survey (2015) $\chi^2 = 99.96$ df = 2 p-value = 0.001

Skewness = 1.43 (Makola= 1.84; Kantamanto = 1.69; Kumasi Central = -0.10)

Kolmogorov-Smirnov (Makola – Statistic = 0.196; p-value = 0.001)

Kolmogorov-Smirnov (Kantamanto – Statistic = 0.250; p-value = 0.001)

Kolmogorov-Smirnov (Kumasi Central Market – Statistic = 0.239; p-value = 0.001)

With respect to the various markets, the table shows that business activities in the Kantamanto Market were halted for an average of 31 days, whereas that of the Kumasi Central Market was 122. A p-value of 0.001 ($\chi^2$ = 99.96; df = 2) associated with the Kruskal Wallis H test showed that there was a statistically significant difference among the three markets with regards to the number of days that business activities were halted following the infernos. This finding seems to confirm the earlier claim that the market in which one operates influences the recovery processes due to market managerial issues. For instance, the market manager at the Kumasi Central Market remarked:

> *After a series of infernos at the market, the market area was cordoned off from business activities for about two weeks awaiting disaster experts from Israel to detect the root causes of the frequent fire outbreaks in the market*.



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This may have prolonged the length of time business activities were halted, following the fire disaster at that market. One of the non-recovered victims from the Kumasi Central Market added that:

> *The cordoning off of the market area from business activities following the fire disaster aggravated my loss since the items which were not burnt were stolen by thieves and others destroyed by rains. This plunged me into huge debt that I had to sell my shop to defray some of them.*

The result corroborates one of the key tenets in the conceptual framework that the time taken to assess the impact of disaster is of great essence since any delay could further cause more harm to the disaster victims. Chang (2010) also posited that the time and sequence taken to complete assessment, activate support systems, establish institutional support system, and reconstruction are critical elements to guarantee quick, successful and sustainable disaster recovery. Indeed, the time taken to complete the various stages in the disaster recovery process could either guarantee quick recovery or frustrate disaster recovery process.

Another issue considered under the section was the effect of the break in business operations on the businesses of the market fire victims. This was necessary because a halt in business activities would affect smooth business development. As observed in Table 20, the majority (69.1%) of the respondents indicated that the break in business operations resulting from the market fire led to the loss of their customers. Some (23.6%) of the victims had their goods destroyed, whereas 7.3 per cent lost their shops. The results suggest that the break in operation of business activities, resulting from the market fire



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disasters, had negative repercussions on businesses. This agrees with the mixing principle under the chaos theory by Lorenz (1961) that disasters could transform businesses processes by creating new order to redistribute resources and opportunities.

**Table 20: Effect of Break in Business Operations on Businesses of Victims**

| Response | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Lost customers | 89 (73.6) | 111 (75.5) | 88 (59.1) | 288 (69.1) |
| Goods were destroyed | 24 (19.8) | 30 (20.4) | 44 (29.5) | 98 (23.6) |
| Lost shop | 8 (6.6) | 6 (4.1) | 17 (11.4) | 31 (7.3) |
| Total | 121 (100.0) | 147 (100.0) | 149 (100.0) | 417 (100.0) |

Source: Field survey (2015)

n = Multiple response

One of the respondents, who was in the middle of recovery from the Kumasi Central Market reported, thus:

> *Little information was given to us as to when the investigations would be over, which created a lot of tension between us and the City authorities. This almost gave me heart attack because my creditors and bankers were on me demanding their monies.*

The results also showed that the flow of information concerning disaster assessment and support efforts following disasters is imperative in instilling confidence in victims as well as calming down their emotions towards recovery. This flow of information finding agrees with the feedback principle under the chaos theory by Lorenz (1961) that systems often become chaotic



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when there is no feedback present between disaster management institutions and disaster victims.

**Comparison of business performance indicators between pre-disaster and post-disaster periods**

A disaster impact assessment is not complete until a comparison is made between pre-disaster and post disaster situations (immediately after resuming business operations). The first quarter or three months following the reactivation of business was used to define the period, 'immediately after the resumption of business activities". This period is critical in post-disaster recovery analyses as it determines future growth, size and competitiveness of businesses (Alesch *et al*., 2009). The period immediately after business resumption was selected for the impact assessment to clearly examine changes in business performance resulting from the market fire disasters.

As a result, this section compares pre-disaster business performance indicators to post-disaster indicators to clearly analyse the extent of economic damage caused by the market fire disasters to businesses in the selected markets. The business performance indicators were sales, profit, working capital and number of employees. The selection of these business performance indicators was based on De Ruiter's (2011) scale for measuring economic recovery of businesses following an extreme event.

***Comparison between average daily sales before and after the fire disasters***

Table 21 presents results on the average daily sales respondents made before and immediately after business re-activation following the market fire disaster. Since the skewness values for pre-disaster (1.87) and post-disaster



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daily (1.85) sales distributions were both above +/- 0.5, both distributions were treated as not normal. As a result, the medians were reported as the central tendencies for the distributions. Similarly, the Wilcoxon Signed Rank Test was used to assess the statistical significance of the difference between the average daily sales before and after the market fire disasters, while Kruskal Wallis H test was used to test for statistical significance of difference among the three markets.

Table 21 shows that the average daily sales before the market fire disaster was GH¢750, whereas the average daily sales immediately after the disaster was GH¢200. The results show that the average daily sales of the market fire victims reduced by 73.3 per cent. In other words, the market fire disaster caused the daily sales of the victims to drop by more than half. This shows that the businesses of victims shrunk after the disaster. The results agree with the order/disorder element of the chaos theory by Lorenz (1961) that the occurrence of disaster disrupts the normal functioning of businesses by creating a disorder in business processes and outputs at the initial stages following the disaster.

**Table 21: Average Daily Sales Before and After the Market Fire Disaster**

| Markets | Before | | | After | | |
|---|---|---|---|---|---|---|
| | Mean (GH¢) | Median (GH¢) | Mode (GH¢) | Mean (GH¢) | Median (GH¢) | Mode (GH¢) |
| Makola | 661.0 | 600 | 800 | 182.0 | 150 | 200 |
| Kantamanto | 1104.8 | 400 | 500 | 317.8 | 150 | 100 |
| Kumasi Central | 1906.1 | 1500 | 1000 | 697.3 | 650 | 500 |
| Total | 1247.1 | 750 | 500 | 528.4 | 200 | 200 |

Source: Field survey (2015) Z-value = -16.72; p-value = 0.001



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Skewness before disaster = 1.87; Skewness after disaster = 1.85

Wilcoxon Signed Rank test Makola Market – (Z-value = -9.27; p-value = 0.001)

Wilcoxon Signed Rank test Kantamanto Market – (Z-value = -10.17; p-value = 0.001)

Wilcoxon Signed Rank test Kumasi Central Market – (Z-value = -9.49; p-value = 0.001)

Kruskal-Wallis test pre-disaster – ($\chi^2$ = 87.4; df = 2; p-value = 0.001)

Kruskal-Wallis test post-disaster – ($\chi^2$ = 194.6; df = 2; p-value = 0.001)

The assessment of volume of sales was very critical because it is a significant determinant to business performance. As a result, the drop in the average daily sales following the market fire disaster may go further to affect the levels of profitability after the disaster. Representatives of market leaders from both the Kantamanto and Makola Markets added that people mostly become afraid to enter the market some months after every market fire incident. One of the partially recovered victims from the Kantamanto Market also remarked:

> *It was reported on radio stations and newspapers that the whole Kantamanto Market was bunt to the ground… As a result, people thought they could not get anything to buy from here and went to other markets… Some people also feared to come here because they thought they may be caught in another fire disaster… This greatly affected our volumes of sale at the initial stages… But by the grace of God business is gradually picking up.*

The above statement shows that the kind of information that is reported about a market fire incident is crucial as it influences people's choices and preferences over the selection of market to buy goods and services. In other words, information flow following a market fire disaster has the capacity to influence the level of business activities that occurred at the disaster impact



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area. This is in line with the feedback tenet by Gleick (2008) under the chaos theory that systems often become chaotic when there is no or poor feedback present following an extreme event. The statement above also shows that the kind of information reported about the markets following fire disasters enables people to take decisions on their safety and security in transacting business in the markets. Media houses should, therefore, be circumspect in the kind of information reported about disaster impact area.

From the Wilcoxon Signed Rank test the p-value of 0.001 (Z-value = -16.72) showed that there was a statistically significant difference between the average daily sales before and after the market fire disaster across the three markets. The result showed that the market fire disasters caused significant change in the average daily sales of the victims. This finding corroborates the assertion by Kyrtsou (2005) about the butterfly effect principle of the chaos theory that a small disruption of business processes could lead to drastic and massive changes in business performance.

Table 21 also shows that the average daily sales before the market fire disaster at the Makola Market was GH¢600 and reduced to GH¢150 after the disaster. Further, the average daily sales before the inferno at the Kumasi Central Market was GH¢1,500 and reduced to GH¢650 after the disaster. The results show that the average daily sales in all the three markets drop after the market fire disaster. Thus, the average daily sales of victims from the Makola Market reduced by 75 per cent, those from the Kantamanto Market had theirs dropped by 62.5 per cent, whereas those from the Kumasi Central Market had theirs reduced by 56.7 per cent. One of the partially recovered respondents who was purposively sampled from the Makola Market attributed the drop in



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average daily sales to reduction in the number of people who went into the market after the inferno, whereas one from the Kantamanto Market attributed it to the reluctance of creditors to supply goods to traders.

The low reduction in the average daily sales of the victims from the Kumasi Central Market compared to the other markets could be attributed to the fact that there are a number of vibrant satellite markets in the Accra metropolis that serve as alternatives for people. Thus, Kumasi metropolis has its main second-hand clothing, clothing and cassettes/CDs depots within the Central market. As a result, for price-related reasons most people might prefer to come to the Kumasi Central Market for such goods and services than procuring them from the other markets. In addition, almost all the satellite markets Tafo, Krofurom, Asafo and Race course in Kumasi are more focused on food and electricals. As a result, such markets pose little competition to the Kumasi Central Market in terms of product varieties.

In contrast, Makola, Kantamanto, Mallam Atta, Kaneshie, Dome and Agbogbloshie markets all in Accra compete strongly among themselves over customers for various goods and services. This shows that the extent of competition a market area has influences the level of disaster impact over business performance in the disaster impact area. This corroborates the third natural selection element by Darwin (1872) that opportunities for survival and growth dwindle when there is high competition over a particular geographical location.

***Comparison between average daily profit before and after the fire disasters***

The study further analysed the average daily profits across the three markets before and immediately after resuming business activities. This was



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necessary because profits measure growth in businesses. The results are presented in Table 22. Tests of normality on the nature of distributions for profitability levels before (1.34) and after (1.88) the market fire disasters showed that both distributions were skewed. As a result, non-parametric tests were used to test for statistical inferences before and after the market fire disasters as well as significance differences among the three markets with respect to the levels of profit.

Table 22 shows that the average daily profit across the three markets before the market fire disasters was GH¢290 and reduced to GH¢75 immediately after resuming business operations. Thus, the average daily profit of the victims across the three markets was reduced by 74.1 per cent immediately after resuming business operations.

**Table 22: Average Daily Profit Before and After the Market Fire Disaster**

| Markets | Before | | | After | | |
|---|---|---|---|---|---|---|
| | Mean (GH¢) | Median (GH¢) | Mode (GH¢) | Mean (GH¢) | Median (GH¢) | Mode (GH¢) |
| Makola | 244.7 | 195 | 100 | 47.4 | 45 | 50 |
| Kantamanto | 825.3 | 215 | 200 | 66.7 | 65 | 80 |
| Kumasi Central | 1039.8 | 450 | 200 | 116.5 | 150 | 100 |
| Total | 864.2 | 290 | 200 | 88.3 | 75 | 100 |

Source: Field survey (2015) Z-value = -16.03; p-value = 0.001

Skewness before disaster = 1.34; Skewness after disaster = 1.88

Kruskal-Wallis test pre-disaster – ($\chi^2$ = 52.8; df = 2; p-value = 0.001)

Kruskal-Wallis test post-disaster – ($\chi^2$ = 162.7; df = 2; p-value = 0.001)

Wilcoxon Signed Rank test Makola Market – (Z-value = -9.30; p-value = 0.001)

Wilcoxon Signed Rank test Kantamanto Market – (Z-value = -10.16; p-value = 0.001)

Wilcoxon Signed Rank test Kumasi Central Market – (Z-value = -7.79; p-value = 0.001)



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Wilcoxon Signed Rank test was used to test for the statistical significance of difference between average profit before and after the fire disaster across the three markets. A p-value of 0.001 (Z-score = -16.03) returned suggested that the reduction on the average daily profit across the three markets after the market fire disaster was statistically significant. This partially confirmed the assertion of Tierney (2006) that disruption in business operations caused by disaster always affects critical business performance indicators such as sales and profitability during post-disaster operations.

The leadership representative from Makola Market stated that "*we sometimes have to reduce the prices to gain customers, which affect our profit levels. This was not so prior to the market fire disaster because there were many buyers"*. The implication is that the market fire victims are still building relations with customers to ensure possible positive boost to business performance indicators. This corroborates the statement of Heger *et al*. (2008) that the impact of disaster continues to influence business paths and decisions even years after disaster zones have been rebuilt and businesses appear to be performing well. The results also agree with the chaos theory by Lorenz (1961) that disaster disrupts the normal functioning of businesses by eroding their gains in terms of number of customers, sale levels and profitability as well as interrupting their growth patterns.

The representative from the Makola Market further stated that:

> *The reduction in the profit levels through fire disasters also goes down to affect our quality of lives at home in terms of carrying out our responsibilities as parents… this is because it is part of our profits that we use to support our families*.



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This shows that the impact of the market fire disasters on businesses also have negative implications on household conditions, a claim which corroborates the finding by Perry (2006) that there is a strong relationship between business scale and household scale in disaster impact assessment. In other words, the level of disaster impact on the business scale often has a corresponding rippling effect on households of the victims.

Table 22 further shows that the average daily profit at the Makola Market reduced from GH¢195 to GH¢45 following the market fire disaster, while that of the Kumasi Central Market reduced from GH¢450 to GH¢150. Similarly, the daily profit for the market fire victims from the Kantamanto Market reduced from GH¢215 to GH¢65 following the disaster. The results show that the daily profit for the victims of Makola Market reduced by 76.9 per cent compared to those from the Kantamanto Market (69.8%) and Kumasi Central Market (66.7%).

The relatively small drop in profitability level among market fire victims from the Kumasi Central Market could be attributed to the small reduction in sales levels after the disaster compared to the other markets as has previously been explained in the study. Wilcoxon Signed Rank tests were used to test for statistical significance between profitability levels before and after the occurrences of the disasters. All the tests showed that there were statistically significant differences in the average daily profits before and after the market fires (Makola – Z-value = -9.30, p-value = 0.001; Kantamanto – Z-value = -10.16, p-value = 0.001; Kumasi Central – Z-value = -7.79, p-value = 0.001).



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Kruskal-Wallis H tests were also used to test for significant differences among the three markets with respect to the average daily profits. From the Kruskal-Wallis test, the p-value of 0.01 ($\chi^2$ = 52.8; df = 2) obtained implied that there was a statistically significant differences among the profitability levels of the three markets prior to the market fire disasters. Similarly, a Kruskal-Wallis H test on profits after the fire disaster returned statistically significant differences ($\chi^2$ = 162.7; df = 2; p-value = 0.001) across the three markets. The results showed that traders in some of the markets were making and are still making higher or significant profits than others in the markets. This could be due to the relative weights pulled by the various markets in their locations and the level of competition they face with other markets in terms of products and services offered to the public.

The closeness of markets (Makola, Kantamanto, Agbogbloshie, Tema station, and Okaishie) within the central business district of Accra could also contribute to the relatively low levels of sales and profitability before and after the market fire disasters compared to the Kumasi Central Market. In other words, sales and profits in a particular market would remain low in an area where consumers have options of markets to buy same products compared to sales and profit levels in markets which offer unique products and services and face no or small competition from other markets. The implication is that the level of competition a market faces could determine the levels of sales and profit of traders.

***Comparison between size of working capital before and after the fire disaster***

Another issue considered under the economic impact of the market fire disaster on businesses was the size of working capital of the victims. This was



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important because the size of working capital significantly determines the size of one's business. As a result, any negative impact on the size of working capital through the fire disaster was likely to affect the quality and quantity of products and services offered by a business entity. The results are presented in Table 23.

Since the skewness values for pre-disaster (1.84) and post-disaster daily (2.67) sales distributions were both above +/- 0.5, both distributions were treated as not normally skewed. In other words, the medians were reported as the central tendencies for the distributions. The Wilcoxon Signed Rank Test was used to assess the statistical significance of the difference between the size of working capital before and after the market fire disasters, while Kruskal Wallis H test was used to test for statistical significance of difference among the three markets.

**Table 23: Size of Working Capital Before and After the Market Fire Disaster**

| Markets | Before | | | After | | |
|---|---|---|---|---|---|---|
| | Mean (GH¢) | Median (GH¢) | Mode (GH¢) | Mean (GH¢) | Median (GH¢) | Mode (GH¢) |
| Makola | 40,138.6 | 25,000 | 10,000 | 7,730.1 | 3,100 | 7,000 |
| Kantamanto | 39,379.5 | 10,000 | 10,000 | 8,537.8 | 4,500 | 5,000 |
| Kumasi Central | 37,891.1 | 18,000 | 10,000 | 5,5333.2 | 5,000 | 8,000 |
| Total | 38,291.4 | 18,000 | 10,000 | 10,193.5 | 7,000 | 7,000 |

Source: Field survey (2015) Z-value = -15.7; p-value = 0.001

Skewness before disaster = 1.84; Skewness after disaster = 2.67

Kruskal-Wallis test pre-disaster – ($\chi^2$ = 1.55; df = 2; p-value = 0.28)

Kruskal-Wallis test post-disaster – ($\chi^2$ = 118.1; df = 2; p-value = 0.001)

Wilcoxon Signed Rank test Makola Market – (Z-value = -9.27; p-value = 0.001)

Wilcoxon Signed Rank test Kantamanto Market – (Z-value = -9.11; p-value = 0.001)

Wilcoxon Signed Rank test Kumasi Central Market – (Z-value = -8.61; p-value = 0.001)



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Table 23 shows that the average size of working capital across the three markets reduced from GH¢18,000 to GH¢7,000 following the market fire disaster. This showed a reduction of the size of working capital among the victims across the three markets by 61.1 per cent. This definitely affected the level of preparedness and resilience of the victims. As observed by Strobl (2008), the proportion of losses to productive capital and assets to disasters are critical factors in determining the effectiveness of pre-disaster strategies.

The drop in the size of working capital could also affect business sizes in terms of the quantum of goods and services to be sold or offered to the public. In other words, the current size of working capital of the victims would determine the amount of goods and services they can acquire for sale. This may have contributed to the reduction in sale and profitability levels of the affected businesses. This is in line with the order/disorder principle of the chaos theory by Lorenz (1961) that disaster creates disorder by disrupting the normal functioning of business process. The disorder establishes a new order, in the process of adopting new practices to cope with the situation, to dictate the pace and nature of business operations. As the representative from the Kantamanto Market remarked:

> *Some of our colleagues who used to supply us goods now depend on us for goods to stock their shops because all their working capital were eroded through the market fire… some of them had taken loans to buy goods to stock their wholesales in the market, and the fire destroyed everything.*

The above statement shows how market fire disasters could change business growth patterns and control patterns in the disaster zone. This corroborates the



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mixing element under Chaos theory that turbulence ensures that two adjacent points in a complex system will eventually end up in very different positions. In other words, small businesses may be transformed into middle or large-scale businesses through the recovery process, whereas middle or large businesses may become small or collapse through the recovery process. The statement also shows that the way and manner businesses are organised prior to disasters, in terms of location of wholesales and warehouses, influence the impact on business operations. This confirms one of the key issues in the conceptual framework that pre-disaster activities affect the level of impact and recovery processes following a disaster.

From the Wilcoxon Signed Rank test, a p-value of 0.01 (Z-value = -15.7) showed a statistically significant difference between the size of working capital before and after the market fire disaster across the three markets. The result suggests that the market fire disaster caused a colossal reduction to the size of working capital of the victims. This is likely to trickle down to affect other business performance indicators such as volumes of sale levels of profitability as indicated by the butterfly effect element in the chaos theory that initial disruptions caused by disasters could have rippling effects on other sectors.

Table 23 further shows that the size of working capital among victims from the Makola Market reduced from GH¢25,000 to GH¢3,100 following the fire disaster, whereas those from the Kumasi Central Market had theirs reducing from GH¢18,000 to GH¢5,000. The sizes of working capital among victims of the fire disaster, therefore, reduced by 87.6 per cent at the Makola Market, 55 per cent at the Kantamanto Market, and 72.2 per cent at the Kumasi



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Central Market. In terms of the impact on the size of working capital for victims in the markets, a representative of the Kumasi Central Market had this to say:

> *The frequent fire outbreak in the market has compelled traders to adopt various strategies to safeguard their wares and working capital from total collapse of businesses... most of them have their wholesales outside the market, whereas others have other shops at different locations.*

Clearly, past experiences of fire disasters at the Kumasi Central Market enabled them to adopt practices which are aimed at reducing the impact of such disasters on their businesses. In other words, the fractal pattern created by fire disasters in the Kumasi Central Market served as lessons to traders to adopt strategies to reduce the impact of such disasters on their working capital. This agrees with the feedback element in the conceptual framework that lessons from fire disasters would be used to improve pre-disaster conditions before any possible occurrence or recurrence of disaster.

***Comparison between number of employees before and after the fire disasters***

The respondents were further requested to indicate the number of employees they had before and after the disaster. This was necessary to assess the impact of the market fire disaster on job losses as well as the performances of the affected businesses. As shown in Table 24, the average number of employees of the victims was one across all the three markets prior to the disaster.



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**Table 24: Number of Employees Before and After the Market Fire Disasters**

| Markets | Before | | | After | | |
|---|---|---|---|---|---|---|
| | Mean | Median | Mode | Mean | Median | Mode |
| Makola | 1 | 1 | 1 | 1 | 0 | 0 |
| Kantamanto | 1 | 1 | 1 | 0 | 0 | 0 |
| Kumasi Central | 1 | 1 | 1 | 0 | 0 | 0 |
| Total | 1 | 1 | 1 | 0 | 0 | 0 |

Source: Field survey (2015)

Nevertheless, the average number of employees dropped to zero after the disaster. The study further found that the maximum number of employees employed by a business entity across the three markets prior to the inferno was six, but reduced to two after the disaster. The total number of employees engaged by the sampled victims reduced from 441 to 220 following the market fire disaster. In other words, the number of employees in the three markets dropped by 50.1 per cent after the disaster. The results show that most of the operators of the affected businesses could not maintain their number of employees after the disaster, which gives an indication of a decline in business performance.

The representative from the Kantamanto Market stated thus:

> *Businesses went so low that most of us could not hire additional labour… in fact most of us resorted to family labour at the initial stages because we could not afford to let other monies go away*.

The result shows that the market fire disaster reduced the capacity of the victims to employ additional labour, which implies a decline in business



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performance. This could be due to the reduction in business sizes in terms of quantity of goods and services to handle, sales, profit, and working capital following the disaster as described by Darwin (1872) in his fifth natural selection process that many changes accumulate overtime to give a bigger outlook about the performance of disaster victims towards recovery.

The use of family labour to support businesses after the disaster is in line with habitat tracking and extinction proposal by Darwin (1872) in the theory of adaptation and natural selection, which indicates that disaster victims first fall on their immediate resources in terms of savings, insurance and family support to soothe any damage caused. Nevertheless, victims who do not have family members around may be compelled to continue to hire additional labour, even if their businesses find it difficult to support such payments. In other words, victims with good social network system are more likely to get cheap labour support to recover quickly.

**Effect of market fire disasters on victims' households**

As part of the effort to assess the impact of the market fire disasters on the victims, the respondents were asked to indicate the effect of the market fire disasters on their households. This was necessary because many of the traders coupled as the heads of their households and as a result, any damage to their economic activities or sources of livelihood could affect the quality of life of their dependants. From Table 25, it emerged that 45.1 per cent of the respondents indicated that the reduction in business performance resulting from the market fire disaster led to reduction in their household budget. Consequently, 15.3 per cent could not afford three square meals for their households, whereas 13.3 per cent changed the schools of their children for



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reasons of affordability. Thus, while some of the respondents changed the schools of their children from private to public, others changed from one private school to the other because of cost.

**Table 25: Effect of Market Fire Disasters on Households of Victims**

| Effects | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Abandoned marriage plans | 0 (0.0) | 3 (1.9) | 3 (1.9) | 6 (1.4) |
| Changed the schools of my children | 17 (13.1) | 28 (18.2) | 14 (8.8) | 59 (13.3) |
| Children education had to delay for some time | 4 (3.1) | 6 (3.9) | 1 (0.6) | 11 (2.5) |
| Could not afford three square meals for my household | 14 (10.8) | 23 (14.9) | 31 (19.5) | 68 (15.3) |
| Lost marriage | 10 (7.7) | 8 (5.2) | 3 (1.9) | 21 (4.7) |
| Moved to a smaller apartment | 18 (13.8) | 19 (12.4) | 16 (10.1) | 53 (12.0) |
| Reduced household budget | 62 (47.6) | 57 (37.0) | 81 (50.9) | 200 (45.1) |
| Sent children to other relatives | 4 (3.1) | 6 (3.9) | 8 (5.0) | 18 (4.1) |
| Took wife's working capital | 1 (0.8) | 4 (2.6) | 2 (1.3) | 7 (1.6) |
| Total | 130 (100.0) | 154 (100.0) | 159 (100.0) | 443 (100.0) |

Source: Field survey (2015)

n = Multiple response

Further, 12 per cent of the respondents moved to a smaller apartment because they could not afford to pay for their previous apartments, while 1.6 per cent relied on their wives' working capital. Some of the males took over



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their wives' working capital because males are culturally considered as the breadwinners of their households, who should work to take care of their family. The implication is that socio-cultural factors influence the effect of market fire disasters on households. The above results also show that the market fire disaster had negative rippling effects on the households of the victims.

The results from Table 25 further show that the rippling effects from the market fire disasters on households cut across many issues, ranging from economic to social. Adger *et al*. (2004) claim that disasters always affect some parts of an integrated social system, and create tension between the affected parts and the other parts of the system. Such tensions could only be resolved by adaptive changes in the behaviour, relationship, support and effort from both the affected and non-affected parts. Adaptive changes in disaster recovery are also necessary to re-establish equilibrium among societal parts.

Access to external support is very critical in re-establishing equilibrium among societal parts. One of such sources of external support needed to re-establish disaster victims is from institutions. The next chapter examines the effectiveness of institutions and support systems for post market fire disaster recovery. This was necessary because the level of effectiveness of established structures and support systems was expected to have direct influence on the level of recovery following disasters.

**Summary of the Chapter**

All the market fire victims suffered some levels of psychological toll upon hearing the news or seeing their shops engulfed in flames. Fear was the psychological feeling that affected the respondents most after the disaster. It



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also had the longest impact on the victims with 48.2 days. A substantial proportion (42.7%) of the respondents were able to overcome their emotional challenges from the market fire disasters through economic support. The average financial worth of loss of the market fire victims in Ghana to the infernos was GH¢17,500. The average number of days that business operations had to be halted in the markets after infernos was 90. The break in operation of business activities, resulting from the market fire disasters, had negative repercussions on businesses.



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# CHAPTER SIX

# EFFECTIVENESS OF INSTITUTIONS AND SUPPORT SYSTEMS IN MANAGING POST MARKET FIRE DISASTER RECOVERY

## Introduction

This chapter assesses the effectiveness of the institutions and support systems for managing post market fire disaster recovery. The chapter aims at examining the contributions of institutional structures and systems of public, private and religious organisations towards the recovery of the market fire disaster victims. This was in line with one of the principles of the conceptual framework that there should be institutional structures and mechanisms to regulate and control the disaster recovery process to avoid the recurrence of similar disasters in the future. The chapter is organised under various sub themes.

## Mechanisms to Stem Recurrence of Market Fire Disasters

This section examines the mechanisms established by the disaster management institutions to prevent the recurrence of market fire disasters. Some of the issues considered under the section were standards and regulations instituted to avoid the recurrence of market fires in the markets, agencies establishing standards and regulations in the markets, and agencies providing education on hazard mitigation practices.

The establishment of standards and regulations to control the disaster recovery process helps to eliminate the hazards that led to the disaster and works to avoid the recurrence of similar disasters. Table 26 shows that 34.2 per cent of the respondents specified that formal connection to the electricity grid



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was the regulation instituted in the markets to avoid the recurrence of market fire disasters, 28.1 per cent indicated they had approved electrical agencies to attend to electrical needs of traders in the market, whereas 20 per cent stated that there were approved building materials for the construction of shops.

**Table 26: Standards and Regulations Instituted to Avoid Recurrence of Market Fire Disasters**

| Regulations | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Approved building materials for shops | 0 (0.0) | 32 (22.2) | 49 (35.0) | 81 (20.0) |
| Formal connection to electricity | 50 (41.0) | 41 (28.5) | 48 (34.3) | 139 (34.2) |
| Approved electrical agencies to attend to electrical needs of traders | 39 (32.0) | 32 (22.2) | 43 (30.7) | 114 (28.1) |
| Demarcated areas for cooking | 0 (0.0) | 20 (13.9) | 0 (0.0) | 20 (4.9) |
| Stop people from sleeping in the market | 16 (13.1) | 10 (6.9) | 0 (0.0) | 26 (6.4) |
| Closing the market to trading activities by 6pm | 17 (13.9) | 9 (6.3) | 0 (0.0) | 26 (6.4) |
| Total | 122 (100.0) | 144 (100.0) | 140 (100.0) | 406 (100.0) |

Source: Field survey (2015)

n = Multiple response

Kantamanto Market had the highest number of standards and regulations designed to prevent the recurrence of fire disasters, followed by Makola Market and then Kumasi Central Market. The high number of



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standards and regulations in the Kantamanto Market was attributed to the strong market leadership, while the low level of regulations in the Kumasi Central Market was due to the absence of a common leadership. The results show that the presence, strength and commitment of market leadership to prevent fire disasters inform the number and type of standards and regulations established to avoid the recurrence of fire disaster.

Results from the table further show that the main standards and regulations instituted to avoid the recurrence of market fire disasters were related to electricity. This was because most of the market fires were attributed to electrical issues. The representative from the Kumasi office of the ECG stated as follows:

> *Electrical situation in the market was horrible with cables hanging all over, overloaded metres, and improper cables for electrical connections… they also passed their cables on top of their roof to hide their electrical connections to escape paying electricity bills… as a result, we educated the traders on the need for every shop to acquire its own metre… we also made provision to provide metres to those who applied… another mechanism we have instituted in the market is that only 6mm cables should be used to draw power from the metres… we also advised them not to pass the electrical cables on top of their roofs because they get heat up by the sun and easily catch fire causing disaster....*

The results show the difficulty the ECG went through to establish controls to address electrical hazards in the recovery process at the Kumasi Central Market. The responses of the majority of the respondents from the



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Kumasi Central Market that there had not been any established regulations to prevent the recurrence of fire disasters show that most of the traders had not complied to the directives of the ECG. This could be attributed to the non-attachment of sanctions to the adoption of the above directives in the markets. The representative of the ECG from the AMA also indicated thus:

> *The Assembly has approved electrical agencies that work in the Makola and other markets in the Metropolis… this was done to ensure that only qualified electricians work in the markets to reduce the spate of fires in the markets.*

The representative from the Kantamanto Market also remarked that:

> *The market leaders have made it compulsory for each shop to have its electric metre… traders are required to use 10mm cables for the main wiring from the metre, 10mm cables for earth wire and 2.5mm cables for plugs and lights.*

The above results show the seriousness attached by the various institutions in mitigating or controlling electrical hazards from causing further fire disasters in the markets. This is very critical in the disaster recovery process as shown in the conceptual framework that disaster recovery is not complete until deliberate efforts are made by various stakeholders to identify and suppress the dangers posed by existing hazards to return a disaster zone to pre-disaster situation. The aim is to avoid the recurrence of same or similar disasters in the markets. The deliberate attempts by the various stakeholders to mitigate the electrical hazards show their commitments in controlling disasters in the markets. According to Jordan and Javernick-Will (2012), the level of commitment of the various stakeholders in disaster recovery and their levels of



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capacity to adequately handle the various dimensions of disaster are very critical to ensure quick and successful disaster recovery.

With respect to the approval of building materials for shops, the study found that some of the traders at the second hand clothing section of the Kumasi Central Market agreed to use containers instead of wood to reduce the spread of fire during such disasters. In addition, the representative from the Kantamanto Market indicated that:

> *The leaders made it compulsory for traders at the 'Cassette lane', shoes and leather section as well as the tailoring section to use cement blocks to reconstruct their shops to reduce the spread of market fires in times of their occurrences… the dimensions of the blocks and the height of the structures were strictly specified by the market leaders to ensure uniformity and avoid trespassing into other people's spaces… four inches cement blocks were recommended by the market leaders for reconstruction*.

The statements above show the strategy adopted by the market leaders and some traders to contain any fire outbreak and also reduce the spread of fire in the markets. The aim is to reduce the impact and scope of market fire outbreaks. The results further show that some traders have seen the need to devise strategies to mitigate some of the hazards identified to have contributed to the causes and spread of market fire disasters. The self-appraisal of hazards and institutionalisation of strategies by the traders ensured high levels of compliance to the strategies as almost all the areas were reconstructed as agreed and recommended. The results generally suggest that the involvement of disaster victims in hazard appraisal and mitigation practices helps to



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improve compliance to standards and regulations to control the recurrence of similar disaster.

The representative from the Kantamanto Market further indicated, *"The leaders of the market have earmarked a place for all food sellers to cook and bring the food to their allotted shops to sell... we are not allowed to cook in the market any longer"*. The market leaders identified cooking or indiscriminate use of fire as one of the hazards that led to the fire disaster in the market. Restricting the use of fire in the market is, therefore, perceived as a strategy to control fire hazard in the disaster recovery process. This supports with the assertion of Khasalamwa (2009) that hazard mitigation processes require a deliberate effort to identify all the various elements that have the potential to cause disaster and establishing mechanisms, regulations and controls to suppress their possibility of triggering disaster.

**Agencies establishing standards and regulations in the markets**

The respondents were requested to indicate the agencies that establish the standards and regulations to avoid the recurrence of market fire disaster. This was important to assess the effectiveness of the disaster related institutions in managing the disaster recovery processes. As seen in Table 27, (55%) of the respondents indicated that the standards and regulations to prevent the recurrence of market fire disasters were established by the Metropolitan Assemblies. Another 29.3 per cent attributed the establishment of those regulations to the market leaders, whereas 9.9 per cent assigned the standards to the ECG. The active involvement of these agencies, particularly ECG and the Assemblies, could be linked to their stake or interests in the markets.



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**Table 27: Agencies Responsible for Establishing Standards and Regulations to Avoid Recurrence of Market Fires**

| Institutions | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Metropolitan Assembly | 66 (56.4) | 30 (20.1) | 131 (89.1) | 227 (55.0) |
| Market leaders | 31 (26.5) | 90 (60.4) | 0 (0.0) | 121 (29.3) |
| ECG | 11 (9.4) | 19 (12.8) | 11 (7.5) | 41 (9.9) |
| GNFS | 9 (7.7) | 10 (6.7) | 5 (3.4) | 24 (5.8) |
| Total | 117 (100.0) | 149 (100.0) | 147 (100.0) | 413 (100.0) |

Source: Field survey (2015)

n = Multiple response

The Local Government Act, 1993 (Act 462) gives political, administrative and legislative authority to MMDAs to provide guidance, give direction to and supervise all other administrative authorities in the district. This provision in the Act makes the MMDAs regulatory authorities for the physical development of the districts with the responsibility of establishing building codes and development controls to guide the physical development in their areas of jurisdiction. As a result, the active involvement of the Metropolitan Assemblies in the establishment of standards and regulations to control the reconstruction processes in the markets following the fire disasters is within their legal mandate. In other words, the MMDAs have oversight responsibilities on the administrative, physical development and fiscal management of the markets.

Accordingly, such disasters reduce the quantum of taxes or revenue generated by the MMDAs from the markets. Similarly, some budgeted



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resources have to be redirected to support market fire disaster victims. The active involvement of the MMDAs in the hazard appraisal and mitigation processes, therefore, is to help maintain their revenue levels generated from the markets, avoid the diversion of resources to support disaster victims, and ensure good physical development of the markets to improve business activities. The study, however, found that the ownership structure of the markets influenced the level of activeness of the Metropolitan Assemblies in each market.

A further analysis on the involvement of the Metropolitan Assemblies in the establishment of standards and regulations in the markets shows that the majority (86.8%) of such responses came from victims at the Makola and Kumasi Central Markets, while 13.2 per cent came from respondents at the Kantamanto Market. The representative from the Kantamanto Market stated thus:

> *We the traders here have acquired a 50-year lease on this land with the Ghana Railway Development Authority… so the market belongs to us not the AMA, even though we pay taxes to them… our leaders here are, therefore, more active in controlling our activities than the AMA… but they do so with government agencies like the AMA, ECG and GNFS.*

Obviously, the market leaders play the front role in controlling activities in the Kantamanto Market through technical collaborations with other state agencies. The results further show that market leaders create a common platform for the state agencies to interact to control activities and hazards in the markets.



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On the other hand, the representatives from the Makola and Kumasi Central Markets acknowledged AMA and KMA, respectively as owners of the markets and as such, they are responsible for issuing permits to traders to operate in the markets. The ownership status of the Metropolitan Assemblies in these two markets makes them directly responsible for establishing standards and regulations to control the recurrence of fire disasters in the markets.

The leadership of the market association, as part of the agencies actively involved in the appraisal and mitigation of hazards in the markets, are also traders who have their source of livelihood at stake in case of any disaster. As a result, they have the interest in protecting their source of livelihood from disaster through hazard appraisal and mitigation mechanisms.

The ECG has electric metres and other electrical installations in the markets to protect against infernos. They are also responsible for extending electrical power into the markets. Bad electrical practices and fire disasters in the markets negatively affect the revenue generation of ECG. In case of fire disaster, the ECG has to spend part of its revenue to replace damaged electrical installations in the market. As a result, their active involvement in the appraisal and mitigation of hazards in the markets are in order.

The Ghana National Fire Service Act, 1997 (Act 537) entrusts the functions of preventing and managing undesired fires to the GNFS. It is also mandated by Act 537 to create and sustain awareness of the hazards of fire. This legal provision gives the GNFS a vested interest in the hazard appraisal and mitigation processes in the markets. Thus, the GNFS is responsible for attending to any fire outbreaks in the markets. Accordingly, the engagement of GNFS in the establishment of standards and regulations to prevent the



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recurrence of infernos in the markets is in agreement with their legal and operational mandate.

The representatives of NADMO from both Kumasi and Accra specified that they organised training programmes on hazards and mitigation practices through the Metropolitan Assemblies and market leaders. The NADMO representative from the Kumasi Metro remarked that:

> *We occasionally organise educative programmes on hazard mitigation practices for the traders at the Prempeh Assembly Hall and SSNIT Hall… in some situations too we organise radio lectures on hazard mitigation practices for traders.*

The results show that some of the activities of NADMO are accredited to the Metropolitan Assemblies. This is because the Metro offices of NADMO are under the Assemblies.

**Agencies providing education on hazard mitigation practices**

This section examined the roles of the disaster management institutions in the recovery process. It includes issues such as education, monitoring, and the types of support received from the institutions. The respondents were asked to indicate whether they received education on hazard mitigation practices from any institution after the disaster. The aim was to examine the effectiveness of the institutions in establishing strategies to avoid the recurrence of similar disasters in the markets. From the data, nearly 96 per cent of the respondents admitted to receiving education on hazard mitigation practices from some institutions after the market fire disaster, whereas 4.5 per cent denied receiving such education. Clearly, the majority of the respondents



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were made aware of the necessary hazard mitigation practices to avoid the recurrence of the disaster.

Table 28 presents results on the institutions that provided education on hazard mitigation practices to the market fire disaster victims, following the disasters. The table shows that 32.6 per cent of the respondents named GNFS as the institution that provided education on hazard mitigation practices after the market fire disasters. This was against 29.9 per cent that received such education from the Metropolitan Assemblies, and 16.4 per cent from NADMO. The results show that all the state disaster-related agencies provided education on hazard mitigation practices following the disasters.

**Table 28: Agencies Providing Education on Hazard Mitigation Practices After the Market Fire Disaster**

| Agencies | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| NADMO | 20 (16.5) | 22 (15.6) | 24 (17.3) | 66 (16.4) |
| Metropolitan Assembly | 40 (33.1) | 33 (23.4) | 47 (34.1) | 120 (29.9) |
| GNFS | 37 (30.6) | 46 (32.6) | 47 (34.1) | 130 (32.6) |
| ECG | 15 (12.4) | 21 (14.9) | 20 (14.5) | 56 (14.0) |
| Market leaders | 9 (7.4) | 19 (13.5) | 0 (0.0) | 28 (7.1) |
| Total | 121 (100.0) | 141 (100.0) | 138 (100.0) | 400 (100.0) |

Source: Field survey (2015)
n = multiple response

The multiple sources of receiving education on hazard mitigation practices would enable the fire victims to gain more understanding on the



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importance and mode of implementing such strategies to avoid the recurrence of market fire disasters. It is also likely to encourage the adoption of the hazard mitigation practices among the market fire disaster victims.

The respondents were requested to indicate the issues they were educated on. The results are presented in Table 29. The table shows that 28.7 per cent of the respondents reported that they were educated on how to avoid fire outbreak, 28.5 per cent were educated on proper electrical connections, while 23 per cent were educated on the importance of switching off main power switch before leaving the shops for home. The results show that the disaster-related agencies educated the market fire victims on various issues to avoid the recurrence of similar disasters.

**Table 29: Issues the Market Fire Disaster Victims were Educated on**

| Issues | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Proper electrical connections | 35 (28.9) | 31 (21.9) | 48 (34.8) | 114 (28.5) |
| Building materials | 0 (0.0) | 28 (19.9) | 3 (2.2) | 31 (7.8) |
| Security | 13 (10.8) | 17 (12.1) | 18 (13.0) | 48 (12.0) |
| Switching off main switch before going home | 35 (28.9) | 22 (15.6) | 35 (25.4) | 92 (23.0) |
| How to avoid fire outbreak | 38 (31.4) | 43 (30.5) | 34 (24.6) | 115 (28.7) |
| Total | 121 (100.0) | 141 (100.0) | 138 (100.0) | 400 (100.0) |

Source: Field survey (2015)

n = Multiple response



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**Level of Compliance to Established Standards and Regulations**

The study further examined the level of compliance to the established standards and regulations designed to avoid the recurrence of market fire disasters. This was to assess the effectiveness of the hazard mitigation mechanisms in preventing the recurrence of similar market disasters. The results as presented in Table 30 show that about 68 per cent of the respondents described the extent of compliance to the established standards and regulations in the markets to range from very high to high, whereas 32.4 per cent described it to be low and very low. The results show that the majority of traders in the markets attached seriousness to the adoption of the established hazard mitigation mechanisms to prevent the recurrence of fire disasters in the markets. This is likely to help stem the recurrence of market fire disasters in the markets as indicated by Kennedy (2009) that the compliance of disaster victims to hazard mitigation practices is a great determining factor for preventing subsequent similar disasters.

**Table 30: Extent to which People Comply with the Established Standards and Regulations**

| Responses | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Very low | 8 (7.0) | 0 (0.0) | 27 (20.6) | 35 (9.1) |
| Low | 17 (14.9) | 8 (5.8) | 64 (48.9) | 89 (23.3) |
| High | 63 (55.3) | 107 (78.1) | 27 (20.6) | 197 (51.6) |
| Very high | 26 (22.8) | 22 (16.1) | 13 (9.9) | 61 (16.0) |
| Total | 114 (100.0) | 137 (100.0) | 131 (100.0) | 382 (100.0) |

Source: Field survey (2015)



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The compliance of the majority of people to the standards and regulations to prevent further disasters could be attributed to the severe impact of the disasters on their businesses and livelihood. As observed by Rogers (1983) and Milne *et al*. (2002), people's precautionary measures against disaster are influenced by their perceptions about threat appraisal or severity of the threat.

Nonetheless, the assessment of about 32.4 per cent that there is low and very low compliance of the established standards and regulations in the markets is likely to pose severe threat to the disaster prevention efforts of the majority of traders. This is because those who did not comply with the standards and regulations would introduce hazards in the reconstruction and recovery processes. Further, since the occurrence, magnitude and scope of disasters cannot be accurately predicted, the triggering of the non-controlled hazards into disasters in the markets could lead to the recurrence of the market fire disasters. This corroborates the unpredictability principle of the chaos theory that the activation of the slightest hazard could be amplified dramatically, rendering all disaster prevention efforts useless.

A further analysis of the extent of people's compliance with the established standards and regulations show that the majority (73.4%) of the respondents who described the compliance rate as low and very low were from the Kumasi Central Market with 20.2 per cent from the Makola Market and 6.4 per cent from the Kantamanto Market. The results showed that there was low compliance to hazard mitigation practices at the Kumasi Central Market. This may explain the high rate of recurrence of market fire outbreaks in the Kumasi Central Market. It could also be attributed to the absence of leadership among traders at the Kumasi Central Market to supervise and enforce the adoption of



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such standards and regulations. Traders in the Kumasi Central Market had over the years relied on the KMA for supervisory functions in the market. By the time of data collection, the traders at the second hand clothing section of the Kumasi Central Market had met once (the week before) to decide on the need to have leaders to address their common concerns.

The respondents were also requested to indicate the reasons for their description about the level of compliance to the standards and regulations to avoid recurrence of market fire disasters. As shown in Table 31, about a quarter (25.6%) of the respondents attributed the high compliance to the standards and regulations to the will and commitment to avoid the recurrence of fire disasters in the markets.

**Table 31: Reasons for Level of Compliance of Standards and Regulations to Avoid Recurrence of Market Fire Disasters**

| Reasons | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Fear of suspension from the market | 18 (15.4) | 35 (23.0) | 0 (0.0) | 53 (13.0) |
| Fear of fine | 9 (7.7) | 10 (6.6) | 6 (4.3) | 25 (6.1) |
| Closure of shops | 3 (2.6) | 14 (9.2) | 3 (2.1) | 20 (4.9) |
| Seizure of license | 7 (6.0) | 13 (8.5) | 0 (0.0) | 20 (4.9) |
| Avoid future fire occurrences | 36 (20.8) | 29 (19.1) | 40 (28.6) | 105 (25.6) |
| Involvement of market leaders | 19 (16.2) | 43 (28.3) | 0 (0.0) | 62 (15.2) |
| No oversight control | 0 (0.0) | 0 (0.0) | 31 (22.1) | 31 (7.6) |
| Poor monitoring system | 4 (3.4) | 8 (5.3) | 49 (35.0) | 61 (14.9) |
| Reason for the frequent fire outbreaks in the market | 21 (17.9) | 0 (0.0) | 11 (7.9) | 32 (7.8) |
| Total | 117 (100.0) | 152 (100.0) | 140 (100.0) | 409 (100.0) |

Source: Field survey (2015)

n = multiple response



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On the other hand, 14.9 per cent of the respondents assigned poor monitoring over people's adherence to the low compliance to the standards and regulations established to avoid the recurrence of market fire disaster, whereas 7.6 per cent attributed it to no oversight control over activities in the markets. The results showed that the will and commitment of the disaster victims as well as authority over activities in the markets to enforce controls played critical role in ensuring high compliance to hazard mitigation practices in the recovery process. This agrees with the assertion of Lindell *et al*. (2009) that once hazard mitigation plans and strategies are developed, they must be enforced for any change in the disaster cycle to occur.

**Agencies monitoring activities in the markets**

The respondents were further asked to indicate the agencies which monitor activities in the markets to ensure that people comply with the set standards and regulations. As shown in Table 32, 32.7 per cent of the respondents reported that the market leaders monitor activities in the markets to ensure compliance; about 17 per cent claimed that the Metropolitan Assemblies conduct monitoring exercises in the markets. The results show that most of the disaster-related institutions monitor activities in the market to promote compliance of the set standards and regulations. This is likely to help stem the recurrence of market fire disasters as has also been posited by Kennedy (2009) that effective monitoring over reconstruction following a disaster is required to ensure the adoption of hazard mitigation mechanisms in the process to avoid the reoccurrence of same disasters in a disaster zone.



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**Table 32: Agencies Monitoring Activities in the Markets to Ensure High Compliance to the Set Regulations and Standards**

| Agencies | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| None | 0 (0.0) | 0 (0.0) | 44 (32.8) | 44 (11.3) |
| Metropolitan Assembly | 32 (26.9) | 23 (16.4) | 10 (7.5) | 65 (16.5) |
| GNFS | 10 (8.4) | 7 (5.0) | 12 (9.0) | 29 (7.3) |
| ECG | 41 (34.5) | 33 (23.6) | 52 (38.8) | 126 (32.2) |
| Market leaders | 36 (30.2) | 77 (55.0) | 16 (11.9) | 129 (32.7) |
| Total | 119 (100.0) | 140 (100.0) | 134 (100.0) | 393 (100.0) |

Source: Field survey (2015)

n = Multiple response

Table 32 further shows that 32.8 per cent of the respondents from the Kumasi Central Market reported that no organised body or agency monitor activities in the market to ensure that traders comply with the set standards and regulations. This is likely to reduce the level of compliance to the set standards and regulations in the market. The result may also explain the relative high rate of recurrence of fire disaster in the Kumasi Central Market as compared to the other two markets. The results further give an indication about the low effectiveness or capacities of the disaster management related institutions in the Kumasi Metropolis in preventing fire disasters in all areas at the Kumasi Central Market.

**Mode of handling defaulters of the set standards and regulations**

The study further examined how the disaster-related institutions handled defaulters of the set regulation and standards. This was essential because the mode of handling defaulters could either encourage or discourage



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the adoption of the set regulations and standards. From Table 33, 37.9 per cent of the respondents reported that defaulters of the regulations and standards in the markets were fined, 17.1 per cent indicated their shops were closed down, 13.2 per cent reported that such people were given advice, whereas 12.2 per cent indicated that nothing was done to defaulters.

**Table 33: Mode of Handling Defaulters of Set Regulations and Standards**

| Mode of handling | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Nothing | 2 (1.7) | 0 (0.0) | 61 (44.9) | 63 (15.7) |
| Advised | 15 (12.7) | 22 (14.8) | 16 (11.8) | 53 (13.2) |
| Cautioned | 16 (13.6) | 16 (10.7) | 14 (10.3) | 46 (11.4) |
| Close down shop | 36 (30.5) | 33 (22.2) | 0 (0.0) | 69 (17.1) |
| Fined | 41 (34.7) | 68 (45.6) | 44 (32.3) | 153 (37.9) |
| Prosecuted | 6 (5.1) | 4 (2.7) | 1 (0.7) | 11 (2.7) |
| Seizure of operating permit | 2 (1.7) | 6 (4.0) | 0 (0.0) | 8 (2.0) |
| Total | 118 (100.0) | 149 (100.0) | 136 (100.0) | 403 (100.0) |

Source: Field survey (2015)

n = Multiple response

The results show that the majority (84.3%) of the respondents knew that something was being done to the defaulters. This could explain the reason why majority of the respondents adhered to the hazard implementation strategies established by the disaster-related institutions. As observed by Kijewski-Correa and Taflanidis (2012), the attachment of some punitive measures to the non-adoption of hazard mitigation mechanisms compel people to adopt them to avoid disasters.



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Nonetheless, the view of 44.9 per cent of the respondents from the Kumasi Central Market that the disaster-relation agencies did nothing to defaulters is likely to discourage some of the traders in adopting the hazard mitigation practices thereby introducing some hazards into the reconstruction process to cause further fire disasters in the markets. This could explain the relatively low level of compliance (69.5%) to set standards and regulations in the Kumasi Central Market to prevent the recurrence of fire disasters. As reported by Gardoni and Murphy (2010), stringent measures for controlling and monitoring the reconstruction process are required to ensure strict adherence to set regulations and standards to avoid the recurrence of similar disasters in a particular disaster zone.

The results, however, disagree with the assertion of Milne *et al*. (2002) that the harsh ordeal disaster victims go through motivates or compels them to adopt practices to stem the recurrence of such disasters. Thus, even though the severity of the threat of fire disaster and the probability of its recurrence are high, many fire disaster victims at the Kumasi Central Market are not complying with the set standards and regulations. This was attributed to the general atmosphere and the culture of operations in the Kumasi Central Market. Traders in the Kumasi Central Market operate individually with little or no regard about the consequences of their actions on others or the entire market.

In addition, the lack of common leadership fronts for the traders to administer shared or mutual standard practices in the Kumasi Central Market could explain the low level of compliance and the no action taken against defaulters of the set standards and regulations. Furthermore, the size of the



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market appears to be bigger than the capacity of the KMA and the other disaster-related agencies to enforce controls and regulations in the Kumasi Central Market. As a result, whereas some of the traders see some actions taken against defaulters of the established controls, others do not see any actions against defaulters. The capacities of the disaster management agencies in enforcing the adoption of controls to prevent the occurrence market fire disasters are, therefore, very paramount.

**Roles of Public Disaster Management Agencies in the Recovery Process of Market Fire Victims**

The study further assessed the roles of the public disaster management agencies in the recovery process of the market fire victims. The aim was to examine the kind of support or contribution provided by such agencies to manage the disaster recovery process. Table 34 presents results on the types of support provided by the agencies. The results showed that only 5.2 per cent of the respondents received relief items from NADMO with 17 per cent acquiring hazard mitigation strategies from the GNFS, and 31.9 per cent and 61 per cent respectively receiving construction materials and cash from the Metropolitan Assemblies and MASLOC.

Results from the table also revealed that none of the state institutions provided psychological assistance to the market fire disaster victims. This was so because none of the disaster-related management institutions apparently had counselling units or departments in their structures. This definitely affected the quality of psychological support received by the market fire victims as they might have contacted untrained psychologists and unprofessional counsellors for emotional support.



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**Table 34: Support Received by Market Fire Disaster Victims from Public Disaster Management Agencies**

| Institutions | Support | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|---|
| NADMO | None | 114 (100.0) | 137 (100.0) | 111 (84.7) | 362 (94.8) |
| | Relief items | 0 (0.0) | 0 (0.0) | 20 (15.3) | 20 (5.2) |
| | Total | 114 (100.0) | 137 (100.0) | 131 (100.0) | 382 (100.0) |
| GNFS | None | 93 (81.6) | 114 (83.2) | 110 (84.0) | 317 (83.0) |
| | Hazard mitigation strategies | 21 (18.4) | 23 (16.8) | 21 (16.0) | 65 (17.0) |
| | Total | 114 (100.0) | 137 (100.0) | 131 (100.0) | 382 (100.0) |
| Metropolitan Assembly | None | 56 (49.1) | 88 (64.2) | 4 (3.1) | 148 (38.7) |
| | Construction materials | 0 (0.0) | 0 (0.0) | 122 (93.1) | 122 (31.9) |
| | Hazard mitigation strategies | 38 (33.3) | 31 (22.2) | 3 (2.3) | 72 (18.8) |
| | Information on sources of support | 20 (17.6) | 18 (13.2) | 2 (1.5) | 40 (10.5) |
| | Total | 114 (100.0) | 137 (100.0) | 131 (100.0) | 382 (100.0) |
| MASLOC | None | 43 (37.7) | 59 (43.1) | 131 (100.0) | 233 (61.0) |
| | Cash | 71 (62.3) | 78 (56.9) | 0 (0.0) | 149 (39.0) |
| | Total | 114 (100.0) | 137 (100.0) | 131 (100.0) | 382 (100.0) |

Source: Field survey (2015)



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The non-provision of psychological support from state institutions and trained psychologists could also prolong the emotional trauma victims suffered from the market fire disasters.

When the representative of NADMO from the Kumasi Metro was asked why the organisation did not provide psychological support to the victims of market fire disasters, the response was *"we have not even thought of that… maybe it has escaped management or it could be because we don't have counselling section in NADMO"*. The NADMO Act, 1996 (Act 517) entrust the function of managing disaster impact areas and similar emergencies, for the rehabilitation of disaster victims onto the organisation. This means that NADMO has to incorporate psychological support into its activities to ensure complete rehabilitation of disaster victims.

The results from Table 34 also showed that the majority of the market fire disaster victims did not receive any assistance from NADMO, GNFS and MASLOC. This is in agreement with the finding of Joakim (2011) that disaster victims in developing countries rely more on non-institutional support for their recovery, a situation that could likely reduce the effectiveness of the state institutions in managing the disaster recovery process of market fire victims. As Agnew (2009) has observed, the effectiveness of institutional assistance in disaster recovery process is measured by the proportion of victims who benefit from such support. The following sections describe in details the roles of the public disaster management agencies in managing post-disaster recovery among market fire victims.



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**National Disaster Management Organisation (NADMO)**

The main activity of NADMO in managing post-disaster recovery process among the market fire disasters was the distribution of relief items. The relief items distributed by NADMO to the market fire disaster victims included rice, beans, maize, buckets, bowls, plates, cups, mattresses and used clothing. The representative of NADMO from Kumasi indicated that *"some of the disaster victims were not enthused about the relief items… but these were the items we had in our stores… these are the relief items we normally receive to support disaster victims"*. The supplies of relief items of NADMO were structured more towards flood-related disaster or household recovery rather than economic recovery in a business-related environment. This may explain why some of the market fire disaster victims were not happy with the relief items from NADMO. In other words, disaster victims are more likely to be dissatisfied with support systems if they fail to address their immediate recovery needs.

The type of relief items suggest that NADMO provided short-term support to stabilise the disaster situations in the markets to enable the victims to cope with the conditions. One of the fully recovered victims from the Kumasi Central Market, however, stated that:

> *many of us did not go for the relief items from NADMO because we thought it was a waste of time… just consider losing over GH¢800,000 with your suppliers chasing you from all angles, and these people come to say they are bringing you buckets, cups and mattresses… are we refugees?*



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The results further indicate that there were huge divergences between the immediate needs of the market fire disaster victims and the relief items provided by NADMO. The results also show how dissatisfied some of the victims were with the relief items from NADMO.

It was also found from the representatives of NADMO that before the relief items were distributed to the market fire disaster victims, they first conducted an impact assessment to ascertain the type of disaster, number of people involved and estimate of the damage caused. Reports on the impact assessment were used to make request for relief items that could address the immediate needs of the disaster victims. The disaster impact assessment reports are also given to the Metropolitan Assemblies for onward actions to be taken on them. Per the conceptual framework, the time taken to assess the impact of the disaster and implement the necessary intervention is of critical essence as any delay could aggravate the damage caused to disaster victims. The recovery support stages outlined shows that the role of NADMO ended after the distribution of the relief items. This is likely to negatively affect the recovery process of the victims as Chang (20010) suggests that regular monitoring by appropriate institutions on the recovery process of disaster victims is required to assess the effectiveness of the interventions and support services provided.

The NADMO representative from the Kumasi Metropolitan office observed that:

*Sometimes the market fire disaster victims expect too much from us… they mostly expect us to provide them with financial loans and building*



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*materials… but we cannot give what we don't have… what we do is to forward such reports to the Assembly for it to work on it… the thing is that the victims do not see our contribution when such requests are acted upon by the Assembly*.

The data showed a close collaboration between NADMO and the Metropolitan Assemblies in managing post-disaster market fire disaster recovery. This collaboration could be attributed to the decentralisation of the operations of NADMO and the fusion of their activities under the Assemblies. This system makes the NADMO offices part of the structures under the Metropolitan Assemblies. Such decentralised support structures of NADMO are likely to enhance the effectiveness of the Metropolitan Assemblies in managing post-disaster recovery among market fire victims. As Lindell *et al*. (2007) posit, the effective functioning of structures and institutions for fire disaster management enable individuals and businesses to recover quickly from disasters. However, the structural problem likely to arise in the existing collaboration in disaster management is that the commitments of staff of NADMO are more likely to be inclined towards their parent organisation instead of the Metropolitan Assemblies. This is because it is the regional and national offices of NADMO that currently determine the promotion and other benefits of its workers under the Metropolitan Assemblies. The representative of NADMO from the Accra office also stated that:

*We leave the economic part of the support to the Assemblies because they are responsible for providing physical and economic*



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*infrastructure… they also take the taxes from the markets and as such should assist the victims to rejuvenate their businesses.*

The data showed that a successful psycho-economic recovery of market fire disaster victims requires the complement efforts of all disaster-related institutions. As Lindell *et al*. (2007) observed that cooperation and coordination among disaster management institutions play a significant role by minimising the impact of disaster and increasing the effectiveness of the response.

The criterion used to disburse the relief items to the market fire disaster victims by NADMO was based on time of appearance. According to the NADMO representative of the KMA, this criterion was adopted due to the challenges they faced in locating the registered victims in the market as well as the reluctance of some victims to collect the relief items. This criterion suggests that the disaster victims who had information early could benefit more from the relief items from NADMO than those who had the information late. Nonetheless, the NADMO representative from the Kumasi Metro indicated that they worked closely with the market leaders and Information Service Department to send information down to the people before going into the market with the relief items. Both representatives of NADMO from the AMA and KMA further added that the organisation receives capacity training programmes and simulation exercises from Deutsche Gesellschaft fur Internationale Zusammenarbiet (GIZ).

The main operational challenges of NADMO as indicated by the representatives from the Kumasi and Accra Metropolitan Assemblies were logistics, funds and enforcement of regulations. Both representatives specified



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that logistics and financial constraints limit their outreach programmes to educate traders on hazard mitigation practices. The representative from the Accra Metro added that:

> *Logistics and financial constraints restrain our ability to monitor the implementation of the hazard mitigation practices and give further advice to avoid market fire disasters… we mostly depend on other institutions such as the Ghana Armed Forces, GNFS and National Ambulance Service during disaster*.

These operational challenges are likely to reduce the effectiveness of NADMO in managing post-disaster recovery among the market fire victims. The results also corroborate the assertion of Lindell (2013) that disaster institutions in developing countries are mostly under-resourced to provide effective support to disaster victims. The NADMO representative from the Kumasi Metro also remarked thus:

> *Enforcement of the regulations in the markets is a major problem… it is not the duty of NADMO to enforce such regulations, rather, the Assembly through the security agencies and taskforce… we do not have the capacity to do so… we teach them what they are supposed to do and encourage them to do so… the traders become too aggressive immediately after the disaster and are mostly not ready to listen to any hazard mitigation advice… everybody wants to resume business activities quickly… if you try to enforce any regulation they will call on the 'Antoa nyamaa' deity to invoke curses on you... as a result, we*



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*submit our reports to the Assembly for them to take the necessary actions…*

The results of the study also showed the determination of market fire disaster victims to resume business operations within the shortest possible time. This could be due to the fact that their livelihood largely depends on the activities in the market. Thus, the intensification of the enforcement of hazard mitigation practices prior to such disasters would enable market fire disaster victims to automatically adopt them during reconstruction following disaster. However, the NADMO representative from the KMA stated that:

*We are supposed to monitor and enforce the regulations and safety practices in the markets as a team but it is very difficult to organise them unless there is a disaster… as a result, every organisation does what it could do… if we go there as NADMO officials they won't mind us but if we have the security agencies following us people begin to do the right thing.*

From the analysis, the Metropolitan Disaster Management Committees have not been effective, as a coordinating unit, in monitoring and enforcing disaster regulations in the markets. The poor coordination and organisation of the Metropolitan Disaster Management Committees is likely to reduce the effectiveness of the disaster management institutions as a system for managing disasters in the markets, as described by Parsons (1951) which is in keeping with view that the interrelation and balance among parts provide avenue for maintaining the effectiveness and smooth functioning of the whole. In other



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words, each disaster management agency would have enjoyed the unique capacities of others to effectively enforce controls and regulations in the market to prevent the recurrence of fire disasters.

As it stands, NADMO conducts monitoring activities in the markets without the capacity or mandate to make arrest, which does not deter defaulters from engaging in bad practices. The NADMO representative from the AMA recommended that the bill to make NADMO a security agency should be fast tracked to enhance their effectiveness in enforcing development controls in the markets. The poor organisation of the Metropolitan Disaster Management Committees also means that both Assemblies have not made disaster management a top priority in their activities. This may have contributed to the recurrence of market fire disasters in the two Metropolises.

**Ghana National Fire Service (GNFS)**

The representatives of the GNFS specified that the role of the Service in market fire disaster management is to first control the spread and put out the inferno to reduce its scope, magnitude and impact on traders. They also indicated that the Service has deployed teams into the markets who educate traders on safety and hazard mitigation practices on a daily basis. This strategy is likely to enable the majority of the traders to identify various hazards in their operational activities as well as adopt mechanisms to suppress them. However, the representative from the Accra Metro stated that "*since the markets are owned by the AMA it becomes difficult to enforce any regulation by ourselves… we only*



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*advise them"*. This shows that there is poor collaboration or coordinating effort between the AMA and the GNFS in enforcing the laid down regulations to avoid the recurrence of market fire disasters.

The representative from the AMA also complained that the GNFS had not been allocated spaces in the market to operate throughout the day. As a result, personnel from the Service hang around in the market for some time during the day and leave. Nonetheless, the strategy of the GNFS, as indicated by the Accra representative, is to have fire posts in all the markets to educate, enforce, protect and attend to any disaster quickly throughout the day. The representative of AMA, however, denied knowledge of such strategy. The above shows that the collaboration and interrelations between the GNFS and the Metropolitan Assemblies are weak. This may affect the level of enforcement of the regulations to avoid the recurrence of market fires.

The representatives of GNFS complained of poor accessibility to the markets, closure of water hydrants, logistics and financial constraints as the main operational challenges confronting the Service. The representative from the Accra Metro stated that:

> *We have complained about this poor accessibility in the markets, but nobody is minding us… this makes efforts to douse fires in the markets very hectic… this is because the full stretch of tubes from the fire tenders takes half of the water in the tender. So, in reality, we use half of the water to fight market fire disaster. The pressure will drop and makes it impossible to reach fire targets the remaining half in the tender finishes.*



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*However, you cannot effectively use the remaining in the tube… You try to locate a water hydrant in the markets and its either people have constructed shops on them or it is not working… so you have to either call for more assistance or drive over long distance in this Accra traffic to get water*.

The results affirm a weak interrelationship between the GNFS and the AMA in disaster management. This is because the AMA is responsible for directing development activities in the markets, including the creation of access routes by fire tenders for easy dousing of fire as well as making sure that people do not build on hydrants. The frustration of the GNFS in the Accra metropolis in putting out market fires could partly be due to the poor collaboration between the Service and the AMA to address their common operational challenges. This poor collaboration could also affect the effectiveness of the state institutions in the market fire disaster management system in the Accra metropolis as described in functionalism that each function is critical to the effective operations of the whole system.

The operational difficulties with respect to access routes to the markets and locating water hydrants in the markets show that the Metropolitan Fire Service Committees have not been effective. This is because the Metropolitan Fire Service Committee is supposed to create a common platform for such disaster management institutions to collaborate and address their common concerns to enhance the effectiveness of each institution in the disaster management process. The representative from AMA indicated that he could not



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remember the last time they met as such. He further stated, *"We only meet with the AMA, ECG and the Ghana Police Service when there is a disaster"*.

This submission shows that the Metropolitan Fire Service Committee is handled as an ad hoc committee in the Accra metropolis. Even so, not all the members are invited to meetings as described in Section 15 of the GNFS Act, 1997 (Act 537). This contradicts the legal provision in the Act that "there shall be a District Fire Service Committee to advise the Regional Fire Service Committee on any matter relating to the functions of the Service in the districts". In other words, such a committee has to be instituted to handle fire-related disaster and enforcement of fire hazards in the Metropolises to prevent and manage disaster effectively. The ad hoc nature of constituting such committees could explain the reason why the complaints of the GNFS about difficult access routes in the markets and non-operation of water hydrants had not been addressed.

The representative of the KMA indicated that the fire safety fund, as directed by the GNFS Act, 1997 (Act 537), was functional and that monies are generated into the fund through the issuance of fire certificates to people. The representative of the KMA admitted that they receive remittances from the fund, whilst the representative from the AMA denied the Service having benefitted or received remittances from the fund. The representative from Accra added that:

> *Sometimes I have to use my own pocket money for safety education… we don't receive enough fuel for our operations… even with the tenders we mostly have to use the filling stations through credit coupons… we*



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*finance most of our activities through our internally generated funds from our engagements with corporate organisations*.

The above statements show the difficulty within which the GNFS has to execute its functions. It also shows how the denial of the GNFS by the Government of Ghana of remittances from the fire safety fund is frustrating its effectiveness in the management of market fire disasters. Such frustrations could de-motivate or reduce the commitment of personnel from the GNFS in executing actions to effectively manage market fire disasters. Both respondents from the GNFS further indicated that the Service has strong relationship and collaboration with the police service and Metropolitan Assemblies but weak relationship with the ECG, Ghana Water Company Limited and NADMO. This confirms poor collaboration among members of the Metropolitan Fire Service Committees. It also shows the poor handling of such committees in the two Metropolises.

**Metropolitan Assemblies**

From the study, the role of the Metropolitan Assemblies in the management of the selected markets was to provide basic services such as electricity, water, sanitation and security to create a conducive environment for effective business transactions. Both representatives of the Metropolitan Assemblies further indicated that the Assemblies are responsible for allocating spaces for traders in the markets, ensuring good layouts in the markets to aid the movements of people and goods, and also collect revenue in the form of market



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tolls and rent. The above roles show that the Metropolitan Assemblies directly are responsible for the management of the markets.

Representative from the AMA stated, *"Disaster recovery constitutes reconstruction of the market following a disaster and facilitating funding arrangements for the victims"*. The representative from the KMA also specified that disaster recovery to the Assembly involves the reconstruction of the affected areas and supplying victims with construction materials. The above definitions or understanding about disaster recovery by the Metropolitan Assemblies show that they do not make the implementation of hazard mitigation mechanisms as part of the disaster recovery process. This is likely to affect the proportion of victims who could recover successfully based on the conceptual definition of disaster recovery in this study as the deliberate effort of implementing hazard mitigation practices in the reconstruction process following a disaster to forestall disaster zone to pre-disaster situation. This could explain the recurrence of fire disasters in the markets as argued by Mannakkara (2014) in the BBB approach that restoring disaster impact area to pre-disaster would introduce the same hazards that led to the previous to cause subsequent disasters.

The situation was, however, explained by the representative of KMA that:

> *the traders would not even wait for the disaster assessment report before rushing in to reconstruct their sheds… in fact they would not be prepared to listen to any advice… so mostly the education and enforcement go in when many of them have reconstructed their shops.*



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The time element in the results agrees with the conceptual framework that time is of great essence in the period between the disaster occurrence and the impact assessment. This is because any delays could aggravate the damage caused to the victims, whereas a rush could also compromise on the quality of hazard appraisal and mitigation strategies.

The results also show that the enforcement of hazard mitigation practices is not made to be part of the reconstruction processes. This is likely to make the enforcement very difficult after reconstruction because some may not have the resources to reconstruct their sheds. The speed with which the victims seek to reconstruct their sheds and resume operations could be due to the fact that their activities in the markets are their sources of livelihood and as such, any delays could deteriorate their socio-economic conditions and quality of life. The implication is that the Assemblies in consultation with the district disaster management committees and district fire service committees should establish a truce period, which should be less than a week, within which impact assessment about the cause of the disaster, hazard appraisal and mechanisms to enforce regulations should be determined.

The representative of KMA specified that the distribution of construction materials was done based on the registered victims by NADMO with the support from leaders in the disaster impact areas. The representative of the AMA, on the other hand, indicated that the Assembly uses the number of people affected, kinds of trade they are engaged in and assessment of the damage caused by the market fires to facilitate funding arrangements from MASLOC. The results show that the



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disaster impact assessments were very necessary for the state institutions to ascertain the type and quantum of support to provide for the market fire victims. This corroborates one of the main arguments in the conceptual framework that disaster impact assessments should precede every disaster recovery effort.

Some of the regulations instituted by the Metropolitan Assemblies to reduce the recurrence of market fire disasters were ensuring proper electrical connections, having certified electrical companies to operate in the markets (in the Accra metropolis), and controlling use of fire. The AMA has certified electrical companies who attend to the needs of traders in the markets. The aim is to ensure proper wiring and electrification of the markets to prevent disaster. Nonetheless, traders at the Kumasi Central Market choose their own electricians to work on their electrical faults. This is likely to introduce more electrical hazards in the market since there would be no uniformity in electrical wiring. In addition, one cannot guarantee the quality of materials used by the individual electricians in the Kumasi Central Market. This may explain the frequent recurrence of fire disasters in that market.

Other measures to prevent the recurrence of market fire disasters by the Metropolitan Assemblies were education on hazard mitigation practices, redevelopment of the markets, provision of fire extinguishers in some critical areas, and decongestion of access routes. As part of the decongestion exercise, the AMA rolled out the "Red line policy', where traders are not supposed to cross the demarcated lines to sell on pavements. Local leaders have been appointed by the AMA to enforce the policy or risk ejection from the area. This policy aims at



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ensuring free movement of people and goods as well as fire tenders in case of disasters. However, the representative from the Makola Market indicated that the policy is implemented on the main roads leading to the market and not on routes within the market.

Enforcement of the regulations by the Metropolitan Assemblies was done through periodic monitoring; unannounced visits; taskforce to arrest defaulters, arrest and prosecute recalcitrant traders; payment of penalties; sanctions; and seizure of operating permit in the markets. Both representatives indicated that the taskforces in the markets are used to conducting daily monitoring and enforcement of the regulations. The representative of KMA added that hazard awareness education is done every quarter in the Kumasi Central Market with the GNFS. All the above measures and regulations show that the Metropolitan Assemblies were aware of the various hazards leading to the recurrence of fire disasters in the markets. Nonetheless, the continuous recurrence of fire disasters in the markets cast doubts about the effectiveness of those measures and regulations in preventing market fire disasters.

With respect to the inclusion of disaster management issues in the Medium-Term Development Plans (MTDP), the representative of the KMA stated that disaster issues are normally in the yearly budgets of the Assembly. The representative of the AMA also indicated that disaster management issues are included in sectoral and departmental plans and projects, which are incorporated into the MTDP. The above statements show that both the KMA and AMA make budget allocation and provision for disaster management activities.



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However, both representatives admitted that the budgetary allocations and logistics are in many occasions not enough to adequately address major disaster issues in the metropolises. These constraints are likely to reduce the effectiveness of the Metropolitan Assemblies in managing post disaster market fire victims. As described by Benson and Clay (2004), financial allocations made by local authorities to disaster management is essential for assessing the commitment and effectiveness of such institutions in managing disasters. The representatives of the two Assemblies also reported that the Metropolitan Assemblies have the technical capacity to regulate activities in the market. However, they lack logistics and financial capacity to continuously engage people to ensure the enforcement of the regulation. This could be attributed to the fact that the markets form small proportions of the geographical scope of the Assemblies.

Both representatives also admitted to having adequate personnel for disaster management because they mostly fall on the GNFS, ECG and NADMO for such activities. This shows some level of collaboration and interrelationship between the Metropolitan Assemblies and the other disaster management committee members. Whereas the representative of KMA described their collaboration with other state institutions in disaster management as very effective, the representative of AMA described theirs as not too good.

**MacroFinance and Small Loans Centre (MASLOC)**

The role of MASLOC in market fire disaster management is to provide financial support to victims to enable them recover and rejuvenate their businesses. The representative of MASLOC specified thus:



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> *We provide soft loans to market fire victims to enable them revive their businesses and to promote business activities in the markets… we are always overwhelmed by the numbers involved but we do our best to provide something for everyone*.

The large numbers mostly involved in market fire disaster cause the amount received by each beneficiary to be low. This is likely to reduce the effectiveness of the financial support given by MASLOC to disaster victims to rejuvenate their businesses successfully within the shortest possible time.

The representative of MASLOC indicated that such supports are provided through collaboration efforts from the Metropolitan Assemblies and market leaders. The representative further remarked that:

> *The Metropolitan Assemblies furnish us with the disaster impact assessment reports and management take decisions on the amount to be allocated for the victims… the market leaders assist in disseminating information to the applicants and in the process of identifying them for the assistance and also during repayment*.

The results showed that MASLOC collaborate with the Metropolitan Assemblies and market leaders in the execution of its role in the disaster management process. The qualification criteria for financial support from MASLOC were based on time of appearance, extent of disaster impact, and guarantee from the market leaders.

From the representative, the guarantee from the market leaders was to make sure that the applicants were really part of the victims and for easy identification during repayment. Thus, the guarantee was not to make the market



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leaders liable for default payment but for easy identification or location of the beneficiaries in such cases. The representative added that the market leaders guarantee criterion was added because victims perceived such support as gifts from the government and were not honouring their repayment schedules. The statement shows that MASLOC has built into its qualification criteria measures to ensure high repayment of the loans disbursed to market fire victims. This would enable MASLOC to continuously provide financial support for market fire victims in the country.

The representative of the Kantamanto Market specified that MASLOC supported victims with small loans after the GH¢300 package for each victim by the Ministry of Gender, Children and Social Protection. He further stated, *"MASLOC has so far supported 5,700 traders in this market with a total of GH¢1,465,000, majority of which are market fire victims"*. This shows that MASLOC provides financial assistance to both market fire victims and non-disaster victims in the markets. One of the partially recovered victims at the Makola Market stated, *"We prefer the financial assistance from MASLOC to the banks because MASLOC has flexible payment terms with low interest rates"*. This shows how beneficiaries of the assistance from MASLOC appreciate their services. It is important because managing post-disaster recovery of businesses is full of challenges and uncertainties and as a result, providing financial assistance with flexible payment schemes could enable beneficiaries to organise their businesses well for total recovery.



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The above descriptions on the roles of the various state institutions in managing post-disaster recovery among market fire victims show that there were collaborations between some institutions such as Metropolitan Assemblies, NADMO, GNFS and MASLOC. Nonetheless, there were no common platforms to enable all the institutions that make up the metropolitan disaster management committee and metropolitan fire service committee to interrelate to address their mutual operational challenges. Such committees were treated as ad hoc working groups to manage the short-term effects from the market fire disasters. This affected the effectiveness of NADMO and GNFS in enforcing the regulations to avoid the recurrence of market fire disasters. It also frustrated the GNFS in getting access to various parts of the market and water hydrants to put out infernos.

This could be due to the similarities in the constitution of membership and functions of the metropolitan disaster management committee and metropolitan fire service committee. Whereas NADMO is entrusted with the role to coordinate the functions of the metropolitan management committee, the GNFS is given same responsibility over the metropolitan fire service committee. The duplication of efforts and functions by both committees with similar membership is likely to increase the workload on members. This may have led to the handling of such committees as ad hoc working groups. Further, with the central role of the Metropolitan Assemblies in development management and disaster management, the Assemblies should have been made the coordinators and conveners of such meetings. This is because the Assemblies as the parent body at the District level



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pull more weight in convening such meetings for effective collaboration than the NADMO and GNFS which become departments under the Assemblies.

The poor collaboration and interrelationships among the disaster-related institutions also resulted in the repetition of same activities and programmes in the markets. Enforcement of the adoption of hazard mitigation practices was also a challenge since some of the institutions did not have the mandate and capacity to punish defaulters. This situation may have contributed to the introduction of previous hazards into the reconstruction process by some victims leading to the frequent recurrence of fire disasters in the markets.

**Social Capital Received by the Market Fire Victims from Private Sources**

This section examines the social capital support received by the market fire disaster victims from private sources to ensure successful recovery. This was necessary because Mouw (2006) reported that social capital is one of the most critical elements towards disaster recovery. Mouw categorised social capital to formal (institutional sources) and informal (non-institutional sources). Table 35 presents results on the types of formal social capital received by the fire disaster victims. The table shows that 11.5 per cent of the respondents received cash support from banks, 1.3 per cent had cash support from insurance companies, whereas 77.5 per cent received emotional support from religious bodies. The results show that the majority of the respondents did not receive any support from the financial-related institutions.



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**Table 35: Formal Social Capital Received by Market Fire Disaster Victims**

| Institutions | Support | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|---|
| Banks | None | 98 (86.0) | 120 (87.6) | 120 (91.6) | 338 (88.5) |
| | Cash | 16 (14.0) | 17 (12.4) | 11 (8.4) | 44 (11.5) |
| | Total | 114 (100.0) | 137 (100.0) | 131 (100.0) | 382 (100.0) |
| Insurance companies | None | 109 (95.6) | 137 (100.0) | 131 (100.0) | 377 (98.7) |
| | Cash | 5 (4.4) | 0 (0.0) | 0 (0.0) | 5 (1.3) |
| | Total | 114 (100.0) | 137 (100.0) | 131 (100.0) | 382 (100.0) |
| Religious bodies | Cash | 23 (20.2) | 35 (25.5) | 28 (21.4) | 86 (22.5) |
| | Emotional support | 91 (79.8) | 102 (74.5) | 103 (78.6) | 296 (77.5) |
| | Total | 114 (100.0) | 137 (100.0) | 131 (100.0) | 382 (100.0) |

Source: Field survey (2015)

This is likely to affect the rate of recovery of the market fire victims from the disaster as such institutions have the financial capacity to bail out victims from huge debts. The results also show the important role played by religious bodies towards the successful recovery of market fire victims. The religious bodies provided the psychological support neglected by all the disaster management agencies to ensure that victims recover from the emotional toll created from the disaster.

The study further examined the informal social capital received by the market fire disaster victims (Table 36).



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**Table 36: Informal Social Capital Received by the Fire Disaster Victims**

| Categories | Support | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|---|
| Relatives | None | 10 (8.0) | 5 (3.2) | 3 (2.1) | 18 (4.4) |
| | Cash | 89 (71.2) | 119 (77.8) | 100 (68.9) | 308 (72.8) |
| | Labour | 7 (5.6) | 11 (7.2) | 14 (9.7) | 32 (7.6) |
| | Childcare | 7 (5.6) | 7 (4.6) | 11 (7.6) | 25 (5.8) |
| | Counselling | 12 (9.6) | 11 (7.2) | 17 (11.7) | 40 (9.4) |
| | Total | 125 (100.0) | 153 (100.0) | 145 (100.0) | 423 (100.0) |
| Friends | None | 16 (12.9) | 13 (8.6) | 9 (6.0) | 38 (8.9) |
| | Cash | 56 (45.2) | 81 (53.6) | 89 (59.7) | 226 (53.4) |
| | Counselling | 27 (21.8) | 30 (19.9) | 22 (14.8) | 79 (18.6) |
| | Labour | 21 (16.9) | 23 (15.2) | 25 (16.8) | 69 (16.2) |
| | Information | 4 (3.2) | 4 (2.7) | 4 (2.7) | 12 (2.9) |
| | Total | 124 (100.0) | 151 (100.0) | 149 (100.0) | 424 (100.0) |
| Market leaders | None | 8 (6.7) | 0 (0.0) | 128 (95.6) | 136 (34.2) |
| | Information | 54 (45.4) | 69 (47.9) | 3 (2.2) | 126 (31.7) |
| | Labour | 0 (0.0) | 6 (4.2) | 0 (0.0) | 6 (1.6) |
| | Hazard mitigation strategies | 57 (47.9) | 69 (47.9) | 3 (2.2) | 129 (32.5) |
| | Total | 119 (100.0) | 144 (100.0) | 134 (100.0) | 397 (100.0) |
| Business partners | None | 85 | 91 | 84 | 260 (68.0) |
| | Cash | 6 | 6 | 10 | 22 (5.8) |
| | Debt relief | 5 | 8 | 3 | 16 (4.2) |
| | Credit supply | 26 | 30 | 28 | 84 (22.0) |
| | Total | | | | 389 (100.0) |

Source: Field survey (2015)

n = multiple response



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Table 36 shows that the majority (72.8%) of the respondents received cash from their relatives, 53.4 per cent had cash from friends, whilst 32.5 per cent and 31.7 per cent obtained education on hazard mitigation practices and information on avenues for support from market leaders, respectively. Furthermore, 22 per cent received credit supply from their business partners. Three out of the six fully recovered market fire disaster victims indicated that receiving credit supplies from their suppliers was a big relief to enable them resume operations quickly. Two out of the six fully recovered victims added that the early resumption of business activities enabled them to capture the customers of their competitors. This may explain the reason for the rush with which market fire disaster victims reconstructed their sheds without waiting for the disaster impact assessment reports and recommended hazard mitigation mechanisms. The results further show that the time taken to resume business activities following disasters is critical for determining the growth of business in post-disaster recovery stage.

The analysis agrees with the mixing element of the chaos theory that the turbulence associated with disaster could transform businesses from one scale to the other. The finding is also in line with the time element in the conceptual framework that the time between disaster occurrence and resumption of businesses is essential for post-disaster recovery processes as some businesses may take advantage of the weaknesses of others to expand their scale boundaries.

Results from Table 36 further showed that the majority of the respondents received varied forms of informal social capital support. This is in line with the assertion of Varda *et al*. (2009) that both financial and non-financial resources are



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transferred through social ties to improve the recovery process of disaster victims. The results also showed that informal social capital played a critical role in the recovery process of market fire victims. The implication is that the size of one's social network could influence his or her level of recovery from market fire disasters as described by Hawkins and Maurer (2010) that the size and composition of one's social network influences his or her resilience and recovery rate following disaster. The results corroborate the assertion of the IFRC (2002) that the majority of disaster victims in developing countries receive their recovery support from informal institutions.

The representative of the Kantamanto Market stated that:

> *The market leaders organised the market fire victims at the second hand clothing section and constructed a common pavilion structure with individual shed demarcations at a fee of GH¢100 per each victim... that strategy helped to reduce the cost of reconstruction on the victims as well as enabled the market leaders to address certain hazard challenges in the market*.

The results show that the innovativeness of market leaders helped to reduce the impact of the market fire disaster on the victims. The results agree with Fujieda *et al*. (2004) that social capital and community organisations with strong leadership are crucial for ensuring quick disaster recovery.

Both representatives of the Makola and Kantamanto Markets specified that it is the market leaders that help to enforce the adoption of hazard mitigation mechanisms in the markets. They added that one can be suspended from the



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market for disobeying the directives from the market leaders. The representative of Kantamanto added that traders have high confidence and respect for the market leaders to ensure their welfare and as a result, people support the decisions from the leadership of the market. The strong leadership in the markets could, therefore, explain the high compliance of the victims to the hazard mitigation practices. This was because monitoring activities from the state institutions were not regular, whereas many of them did not have the capacity to enforce their regulations. The representative of the Makola Market stated, *"Our leaders get the ideas and regulations from the fire service, ECG and AMA and enforce them in the market"*. This shows that effective collaboration between the market leaders and state institutions could help stem the recurrence of fire disasters in the markets.

**Cash Support from Formal and Informal Sources**

The study examined the cash amounts received from both formal and informal sources. This was necessary because cash support enabled the disaster victims to reconstruct their sheds and acquire goods to resume business operations. In other words, cash support has both economic and psychological effects on disaster victims. It gives them hope about the possibility of rejuvenating their businesses, while reducing their fears about future economic hardships. Table 37 presents results on the amount of cash contributions from the various sources to support the market fire disaster victims.



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**Table 37: Average Amount of Cash Support from Various Sources to Market Fire Disaster Victims**

| Sources | Makola (GH¢) | Kantamanto (GH¢) | Kumasi Central (GH¢) | Total average (GH¢) |
|---|---|---|---|---|
| Relatives | 1,271.1 | 1,419.7 | 3,595.4 | 2,121.5 |
| Friends | 917.5 | 870.1 | 1,039.7 | 942.4 |
| Business partners | 785.1 | 1,902.9 | 593.4 | 916.8 |
| Religious bodies | 107.9 | 110.2 | 137.4 | 118.9 |
| Banks | 2,622.8 | 2,802.9 | 1,008.9 | 1,788 |
| MASLOC | 383.3 | 474.5 | 0 | 284.6 |
| Insurance companies | 657.9 | 0 | 0 | 196.3 |
| Total | 963.7 | 1,082.9 | 910.7 | 909.8 |

Source: Field survey (2015)

The table shows that the average cash support provided by relatives to market fire disaster victims was GH¢2,121.5, banks provided an average of GH¢1,788 as cash support to the victims, whereas friends provided an average of GH¢942.4 cash support to the victims. The results show that the informal social capital group (relatives, friends, business partners) of the market fire disaster victims made critical cash contribution towards disaster recovery. Thus, the average cash support from the informal sources was GH¢1,326.9, whereas GH¢597 was obtained from formal sources. This is in consonance with the assertion of Elliott *et al*. (2010) that informal ties provide immediate life and economic-saving assistance following a disaster.



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The total average cash support received by the market fire disaster victims was GH¢909.8. Comparing the total average cash support received by the market fire victims to the total average loss in working capital of GH¢11,000 shows that the cash support alone may not have guaranteed quick and successful recovery from the market fire disasters. This was because the cash support could only provide 8.3 per cent of the total amount of loss in the working capital of the market fire disaster victims. The results corroborate the assertion of Walker and Salt (2006) that different forms of support raging from psychological, financial, economic, medical to social are required to guarantee complete recovery of disaster victims.

**Time Taken by Disaster Management Actors to Provide Support to Victims**

The study further examined the period for which support from the various institutions were provided. This was necessary because the timeliness in the provision of psycho-economic support to disaster victims could reduce the impact of the damaging effects from the disaster. Table 38 presents results on the average number of days taken by the various institutions and actors to provide support to the market fire disaster victims. The table shows that relatives of the market fire disaster victims were the first to provide support in 7.4 days, followed by friends in 8.1 days and Metropolitan Assembly in 25.8 days. The results are in consonance with the finding of Elliott *et al*. (2010), Garrison and Sasser (2009) and Hurlbert *et al*. (2000) that informal ties, particularly relatives and neighbours,



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are the real "first" responders who check on the well-being of others and provide immediate life-saving assistance following a disaster.

**Table 38: Average Number of Days Taken to Support Victims**

| Actors | Makola | Kantamanto | Kumasi Central | Total average |
|---|---|---|---|---|
| Religious bodies | 29.2 | 28.5 | 28.3 | 28.7 |
| NADMO | 33.1 | 30.8 | 27.9 | 30.3 |
| GNFS | 79.8 | 83.5 | 91.4 | 88.5 |
| Relatives | 7.2 | 7.9 | 7.3 | 7.4 |
| Friends | 8.0 | 8.1 | 8.4 | 8.1 |
| Banks | 83.9 | 80.5 | 82.2 | 81.4 |
| Insurance companies | 141.6 | – | – | 141.6 |
| Business partners | 50.7 | 41.8 | 45.4 | 46.3 |
| MASLOC | 399.4 | 340.3 | – | 374.9 |
| Market leaders | 33.9 | 19.8 | 31.2 | 29.3 |
| Metropolitan Assemblies | 23.8 | 25.6 | 28.7 | 25.8 |

Source: Field survey (2015)

Hawkins and Maurer (2010) also found that friends, neighbours, and family members provide shelter and supplies, and offer immediate aid and initial recovery assistance. This could be attributed to their close association and strong bond created through family ties, friendship and neighbourliness as described by McPherson *et al*. (2001) and Mouw (2006) that the strong connection with such people makes the informal social capital good for providing social support and personal assistance during post-disaster recovery.



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MASLOC delayed most in providing assistance to the market fire victims with 374.9 days. This could be attributed to the fact that MASLOC has to wait for disaster impact assessment reports from the Assemblies to ascertain the scope and magnitude of the impact from the disaster and apportion some funds to the victims. The process could also be influenced by the swiftness with which the disaster victims would apply to MASLOC for support. The delays by many of the formal institutions in providing support to the market fire disaster victims could be due to their bureaucratic processes to assess the impact of the disaster and make recommendations to improve the situation, request for relief items, implement regulations or take decision on the quantum and type of support to be provided. Mannakkara and Wilkinson (2012) found that bureaucratic rules surrounding disaster cause delays in the deliveries of state institutions towards disaster victims.

**Effectiveness of the Support from Actors in Ensuring Successful Recovery**

The respondents were requested to describe the effectiveness of the support received from the various actors and institutions to ensure successful recovery. The aim was to ascertain the appropriateness of the support in ensuring their recovery from the market fire disasters. Table 36 shows that 40.3 per cent of the respondents described the effectiveness of the support provided by the actors and institutions towards their recovery from the market fire disaster as high, whereas 17.5 per cent described theirs as low.



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**Table 39: Effectiveness of the Support from Actors and Institutions to Market Fire Disaster Victims to Ensure Successful Recovery**

| Response | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Very high | 33 (29.0) | 32 (23.4) | 37 (28.2) | 102 (26.7) |
| High | 47 (41.2) | 59 (43.1) | 48 (36.7) | 154 (40.3) |
| Don't know | 10 (8.8) | 13 (9.5) | 8 (6.1) | 31 (8.1) |
| Low | 17 (14.9) | 25 (18.2) | 25 (19.1) | 67 (17.5) |
| Very low | 7 (6.1) | 8 (5.8) | 13 (9.9) | 28 (7.4) |
| Total | 114 (100.0) | 137 (100.0) | 131 (100.0) | 382 (100.0) |

Source: Field survey (2015)

The results show that the majority (67%) of the respondents were satisfied with the support provided by the various actors and institutions towards their recovery from the disaster. This suggests that such support may have contributed significantly towards the recovery of the respondents from the market fire disasters. The results agree with the assertion of Varda *et al*. (2009) that social capital support from both formal and informal sources to disaster victims are important avenues to restore psychological stability, establish processes and regulations for reconstruction, and ensuring the full and successful recovery.

**Summary of the Chapter**

All the state disaster-related institutions (Metropolitan Assemblies, NADMO, GNFS and ECG) played a role in assessing the causes of the disasters, providing education on hazard mitigation practices following the disasters and monitoring activities in the markets. However, there was poor collaboration



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among the disaster management institutions in monitoring activities in the markets. Market leaders were directly responsible for enforcing the adoption of hazard mitigation mechanisms in the markets. The informal social capital group (relatives, friends, business partners) of the market fire disaster victims made most critical cash contribution towards disaster recovery. The Metropolitan fire and disaster management committees were handled on ad hoc bases.



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# CHAPTER SEVEN

# EXTENT OF RECOVERY OF MARKET FIRE VICTIMS FROM DISASTER

## Introduction

This chapter analyses the extent of recovery of the market fire victims from the disasters. The aim was to ascertain the effectiveness of the strategies implemented by both the victims and the disaster-related agencies in ensuring the complete psycho-economic recovery. As a result, the chapter is broadly organised under the strategies adopted by the victims for managing the psycho-economic impacts of the market fire disaster, and the level of psycho-economic recovery of the market fire disaster victims.

## Strategies Adopted by Victims to Manage Psycho-economic Impacts

This section examines the strategies adopted by the market fire disaster victims for managing the psycho-economic impacts from the disaster. The aim was to analyse the personal or individual efforts taken by the disaster victims to reduce the negative psycho-economic impacts and reverse such negative trends to guarantee recovery. This was necessary especially when Syme and Appiah (2013) reported that the majority of the traders in markets in Ghana have no insurance policy, and UNISDR (2009) has also found that institutional support to disaster victims in Africa is very poor.



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**Psychological strategies adopted by the victims to manage the disaster**

Table 40 presents results on the strategies adopted by the victims to reduce the psychological impacts from the market fire disaster. From the table, the majority (62%) of the respondents were able to overcome the psychological impacts from the fire disaster through counselling, 29.8 per cent overcame it by avoiding talking about it, whereas 5.8 per cent used medication to overcome it.

**Table 40: Strategies Adopted to Reduce Psychological Impacts from the Fire Disaster**

| Strategies | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Counselling | 76 (64.4) | 88 (61.5) | 83 (60.6) | 247 (62.0) |
| Avoided talking about it | 30 (25.4) | 45 (31.5) | 43 (31.4) | 118 (29.8) |
| Medication | 9 (7.7) | 6 (4.2) | 8 (5.8) | 23 (5.8) |
| Self-encouragement | 3 (2.5) | 4 (2.8) | 3 (2.2) | 10 (2.4) |
| Total | 118 (100.0) | 143 (100.0) | 137 (100.0) | 398 (100.0) |

Source: Field survey (2015)

n = multiple response

Resorting to medication shows the severity of the psychological stress suffered by some of the victims. The results show that counselling played a critical role in the psychological recovery of market fire victims. It is also worth noting that the counselling came from friends, family members and religious bodies. This shows the importance of such social institutions in addressing the psychological concerns of disaster victims. This agrees with the statement from Darwin (1872) that the strength within the micro-habitat of an organism plays a



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crucial role in addressing immediate concerns following an extreme event. The results also corroborate the assertion of Murphy (2007) that social institutions and network play a critical role in addressing the psychological issues stemming from disasters.

The respondents were further asked to describe the effectiveness of the strategies adopted to manage the psychological impacts from the fire disaster. The aim was to examine how well the adopted strategies were able to reduce the emotional stress emanating from the market fire disaster. The results showed that 45.8 per cent of the respondents described their strategies as very effective in managing the psychological impact of the disaster with 19.6 per cent describing theirs as less effective (Table 41).

**Table 41: Description of the Effectiveness of the Strategy Adopted to Manage the Psychological Impact from the Fire Disaster**

| Effectiveness | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Less effective | 27 (23.7) | 24 (17.5) | 24 (18.3) | 75 (19.6) |
| Effective | 32 (28.1) | 50 (36.5) | 50 (38.2) | 132 (34.6) |
| Very effective | 55 (48.2) | 63 (46.0) | 57 (43.5) | 175 (45.8) |
| Total | 114 (100.0) | 137 (100.0) | 131 (100.0) | 382 (100.0) |

Source: Field survey (2015)

A further analysis showed that all the respondents who described their strategies as less effective in managing their emotional stress from the disaster were from those who adopted the strategy of avoiding talking about the disaster.



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The implication is that suppressing emotional stress from disaster by keeping to oneself is less effective in addressing psychological problems.

The study examined the reasons behind the descriptions given about the effectiveness of the strategies adopted for managing psychological impact of disaster. The results, as presented in Table 42, showed that the majority (87.9%) of the respondents who described their strategies in managing the psychological impact from the fire disaster as effective explained that such strategies enabled them to overcome the negative emotional toll from the disaster, whereas 4.9 per cent reported that the strategies helped to improve their self-confidence.

**Table 42: Reasons for the Level of Effectiveness of the Strategies in Managing Psychological Impact of Market Fire Disaster**

| Effectiveness | Reasons | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|---|
| Effective | Able to overcome it | 77 (88.5) | 100 (88.5) | 93 (86.9) | 270 (87.9) |
| | Improved my confidence | 4 (4.6) | 6 (5.3) | 5 (4.7) | 15 (4.9) |
| | Reduced the bad feeling | 6 (6.9) | 7 (6.2) | 9 (8.4) | 22 (7.2) |
| | Total | 87 (100.0) | 113 (100.0) | 107 (100.0) | 307 (100.0) |
| Ineffective | Battling court case | 6 (22.2) | 8 (33.3) | 3 (12.5) | 17 (22.6) |
| | Creditors harassing me | 10 (37.1) | 13 (54.2) | 6 (25.0) | 29 (38.7) |
| | Still think about the large loss | 11 (40.7) | 3 (12.5) | 15 (62.5) | 29 (38.7) |
| Total | | 27 (100.0) | 24 (100.0) | 24 (100.0) | 75 (100.0) |

Source: Field survey (2015)

On the other hand, 38.7 per cent of the respondents who described their strategies as ineffective explained that they were harassed by their creditors, while



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22.6 per cent indicated that they were still battling court cases irrespective of the adoption of strategies to managing the bad psychological feeling. Clearly, some economic situations affected the effectiveness of strategies to reduce emotional stress on the victims following the disaster. The implication is that efforts to manage psychological problems emanating from disaster should also consider or add economic strategies to enhance the process of achieving psychological recovery.

**Economic strategies adopted by victims to manage the disaster**

This section assesses the strategies adopted by the respondents to reduce the negative economic impact of the market fire disaster. This was important because the market fire disaster led to the destruction of many economic assets of the respondents. The section was organised under sources of money re-invested to resume business operations, household strategies to overcome the economic challenges from the disasters, strategies instituted to reduce the impact of any other market fire disaster, strategies to repay loans from financial institutions invested in businesses prior to the disaster, and amount of money spent to resume business operations

***Sources of money re-invested to resume business operations***

The respondents were requested to indicate the sources of the monies they re-invested in resuming their businesses following the market fire disaster. The results are presented in Table 43. The table shows that 21.9 per cent of the respondents re-invested their personal savings into their businesses to resume



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operations following the disaster, 23.5 per cent borrowed from friends/relatives to resume business operations, whereas 18.7 per cent and 9.6 per cent respectively had free financial support from friends/relatives, and sold properties to resume business activities. Some of the properties sold to resume business operations were houses, plots of land, building materials, clothes and vehicles.

**Table 43: Sources of Money Re-invested to Resume Business Activities**

| Sources | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Savings | 27 (19.3) | 40 (21.4) | 43 (24.6) | 110 (21.9) |
| Borrowed from friends/ relatives | 31 (22.1) | 44 (23.5) | 43 (24.6) | 118 (23.5) |
| Loan from financial institutions | 19 (13.6) | 17 (9.1) | 14 (8.0) | 50 (10.0) |
| Support from friends/ relatives | 22 (15.7) | 31 (16.6) | 41 (23.4) | 94 (18.7) |
| Insurance | 5 (3.6) | 0 (0.0) | 0 (0.0) | 5 (1.0) |
| Supply credit | 20 (14.3) | 34 (18.2) | 23 (13.1) | 77 (15.3) |
| Sold property | 16 (11.4) | 21 (11.2) | 11 (6.3) | 48 (9.6) |
| Total | 140 (100.0) | 187 (100.0) | 175 (100.0) | 502 (100.0) |

Source: Field survey (2015)

n = Multiple response

The results show that the majority of the respondents adopted non-institutional strategies to reduce the economic impact of the market fire disaster. This could mean that the cash support provided from the institutional sources was



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not adequate to enable the market fire victims to reactivate their businesses. The results are in agreement with the assertion of Noy (2009) that there is low institutional support for disaster victims in developing economies. The results also show that friends/relatives played crucial roles in reducing the financial or economic impact of market fire disasters on victims across all the three markets. The result corroborates the habitat tracking proposition of Darwin (1872) in his theory of adaptation and natural selection that individuals' micro-habitat in terms of savings, insurance, family and friends provides immediate source of relief to re-position them onto the path of recovery following disaster or any extreme event.

Thus, the micro-habitat provides the first source of support to stabilise the psycho-economic status of disaster victims before other forms of external support. As a result, a weak or poor micro-habitat implies that an individual victim has to depend on external assistance, which according to Benight (2004), are more expensive, very difficult and time consuming to obtain as well as come with more strict terms. The multiple response nature of the responses shows that single sources of financial support were not enough for some of the market fire victims to resume business operations.

In addition, the sale of personal properties such as plots of land, cars, houses and clothes shows how desperate and eager the victims were to recover from the economic impacts of the market fire disasters. This was because activities in the markets were their main sources of livelihood, and as a result were eager to restore their businesses to pre-disaster situation to maintain their



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socio-economic statuses. The eagerness of market fire disaster victims to resume business operations and also restore their socio-economic statuses compelled them to exchange some of their peripheral assets to secure or restore their affected sources of livelihoods. The representative from the Kumasi Central Market added that:

> *it mostly becomes like a competition who finishes setting up his or her shop first to benefit from the situation by capturing other people's customers… as a result, traders go to every length to resume operations as early as possible to safeguard the future performance of their businesses*.

This result explains the reason why some victims preferred to exchange some of their assets to reduce the economic impact of the market fire disaster by resuming business operations. The result corroborates the third and fourth natural selection criteria of Darwin (1872) that when there are too many disaster victims, they must compete for limited resources and opportunities, and those who successfully recover become more resilient to subsequent disasters.

The representative from the Kumasi Central Market further indicated that "*the ultimate goal of every market fire victim is to revive his or her business to pre-disaster levels*". Thus, having the achievement of pre-disaster business status as the ultimate goal implies that the perception and understanding of the market fire victims about disaster recovery is to bring businesses and the disaster zone back to the situation before the disaster. However, if the recovery processes are not checked through institutional mechanisms, the victims are likely to re-



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introduce the same hazards which led to the market fire disaster as described by Kennedy *et al*. (2008) and Lyons (2009) that rebuilding the disaster zone exactly as they were prior to a disaster often re-creates the same hazards and vulnerabilities that existed earlier. This may explain the recurrence of fire disasters in the markets.

***Household strategies to overcome the economic challenges from the disasters***

The study examined the household strategies adopted by the victims to overcome the economic challenges resulting from the market fire disaster. This was because Adger *et al*. (2004) reported that disasters always affect some parts of an integrated social system, and create tension between the affected parts and the other parts of the system. The results are presented in Table 44. The data showed that 42.8 per cent of the respondents reduced their household budget as a strategy to overcome the economic challenges resulting from the market fire disaster, 14.3 per cent moved to a smaller apartment, whereas 11.8 per cent changed schools of their children. The results show that both economic and social strategies were taken at the household level to overcome the economic challenges resulting from the market fire disaster. All the strategies also point to the direction at restricting household expenses to gain more resources to invest in the businesses. This corroborates the assertion of Adger *et al*. that adaptive changes in disaster recovery are necessary to re-establish equilibrium among societal parts. They further indicated that 'adaptive equilibrium' forms the foundation for socio-economic rejuvenation from disasters.



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**Table 44: Household Strategies Taken to Overcome Economic Challenges Resulting from Market Fire Disasters**

| Strategies | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Moved to a smaller apartment | 21 (17.7) | 22 (14.9) | 15 (10.8) | 58 (14.3) |
| Changed schools of children | 13 (10.9) | 18 (12.2) | 17 (12.2) | 48 (11.8) |
| Send family to the village | 3 (2.5) | 7 (4.7) | 7 (5.0) | 17 (4.2) |
| Sold house | 9 (7.6) | 10 (6.8) | 4 (2.9) | 23 (5.7) |
| Survived household on loans | 5 (4.2) | 10 (6.8) | 10 (7.2) | 25 (6.2) |
| Reduced household budget | 48 (40.3) | 60 (40.5) | 66 (47.5) | 174 (42.8) |
| Used household members as labour | 12 (10.1) | 8 (5.4) | 11 (7.9) | 31 (7.6) |
| Send children to other relatives | 8 (6.7) | 13 (8.7) | 9 (6.5) | 30 (7.4) |
| Total | 119 (100.0) | 148 (100.0) | 139 (100.0) | 406 (100.0) |

Source: Field survey (2015)

n = Multiple response

One of the partially recovered victims from the Makola Market stated thus:

*"you cannot think of family welfare in such a time... many people lost their marriages and relationships at that time… all your attention is on opportunities to revamp your business… you can easily spend your children's school fees and rent on re-establishing your business".*



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The statement showed the frustration that compels market fire disaster victims to restrict household budget to enable them overcome the economic challenges.

***Strategies instituted to reduce the impact of any other market fire disaster***

Another issue considered under the section was the strategies instituted by the respondents to reduce the impact of any other market fire disaster. This was essential to assess the extent to which they have incorporated the lessons learnt from the disaster in their recovery process to enhance their resilience in any subsequent disaster. This was in line with the conceptual framework that disaster victims would feed their experiences and lessons learnt from the disaster in their recovery process to strengthen their conditions to make them more resilient to subsequent disasters.

The data as presented in Table 45 show that 42.6 per cent of the respondents have adopted savings as a strategy to make them more resilient to any subsequent market fire disaster with 13.6 per cent establishing shops in other locations. The implication is that the majority (90.5%) of the respondents did not want to go through such economic hardship again to rejuvenate their businesses in case of any subsequent market fire disaster. This shows that the majority of the respondents acted rationally as described by Milne *et al*. (2002) in the protection motivation theory that the motivation of stakeholders to protect themselves against disaster is enhanced by their perceptions on the severity of a threatening event, vulnerability to the threat, and the ability of the response to reduce the threat.



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**Table 45: Strategies to Reduce Impact of Subsequent Market Fire Disasters**

| Strategies | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| None | 19 (13.6) | 11 (6.8) | 15 (8.9) | 45 (9.5) |
| Established shops in other locations | 18 (12.9) | 18 (11.1) | 28 (16.6) | 64 (13.6) |
| Insured goods | 8 (5.7) | 3 (1.8) | 0 (0.0) | 11 (2.3) |
| Savings | 55 (39.3) | 76 (46.6) | 70 (41.4) | 201 (42.6) |
| Changed products sold | 21 (15.0) | 24 (14.7) | 45 (26.6) | 90 (19.1) |
| Established wholesale outside the market | 9 (6.4) | 14 (8.6) | 5 (3.0) | 28 (5.9) |
| Maintained good relations with suppliers | 10 (7.1) | 17 (10.4) | 6 (3.5) | 33 (7.0) |
| Total | 140 (100.0) | 163 (100.0) | 169 (100.0) | 472 (100.0) |

Source: Field survey

n = Multiple response

One of the fully recovered respondents from the Kumasi Central Market indicated that "*with the kind of emotional trauma and economic pressure we went through, nobody would tell you to prepare yourself against any subsequent market fire disaster*". The result showed that the majority of the respondents perceived the possibility of recurrence of similar disasters as high. As Maddux and Rogers (1983) explained in the protection motivation theory that people's perceptions on precautionary measures against disaster are influenced by the threat of appraisal and vulnerability to the threat. The representative from the Kantamanto Market posited that:



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> *suppliers mostly become very sceptical in supplying traders on credit after every market fire disaster… they also fear losing their working capital… sometimes you have to go and beg them with elderly people or guarantors.*

This statement showed that some suppliers lose confidence in activities in the market after market fire disasters. The difficulties in getting product supply after market fire disasters could slow down businesses at the early stages following the disaster and slow down the processes of recovery. Such difficulties have also compelled the traders to adopt mechanisms or strategies to ensure quick resumption of business activities following any subsequent disaster.

***Strategies to repay loans from financial institutions invested in businesses prior to the disasters***

The study inquired from the respondents who had invested loans from financial institutions in their businesses prior to the market fire disaster how they were able to repay such debts. This was essential because many of them rely on loan facilities from financial institutions to clear their goods from the port and also to acquire bulk goods from the business partners, and in such cases find it very difficult to revamp their businesses. Table 46 shows that 38.9 per cent of the respondents used support from family and friends to settle loans from financial institutions invested in their businesses prior to the market fire disaster with 23.2 per cent and 15.8 per cent selling their personal property and securing loans from other financial institutions to settle such loans, respectively.



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**Table 46: Strategies to Repay Loans from Financial Institutions Invested in Businesses Prior to the Disaster**

| Strategies | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Sold personal property | 6 (18.8) | 10 (27.0) | 6 (23.1) | 22 (23.2) |
| Renegotiated payment plan | 9 (28.1) | 8 (21.6) | 4 (15.4) | 21 (22.1) |
| Support from family and friends | 12 (37.5) | 11 (29.8) | 14 (53.8) | 37 (38.9) |
| Use loan from other financial institution | 5 (15.6) | 8 (21.6) | 2 (7.7) | 15 (15.8) |
| Total | 32 (100.0) | 37 (100.0) | 26 (100.0) | 95 (100.0) |

Source: Field survey (2015)

n = Respondents who had invested loans from financial institutions in their businesses prior the disaster

Clearly, the use of loans from other financial institutions to repay loans contracted prior to the market fire disasters further pitched victims into more financial debt, which affected their recovery processes. The representative from the Kantamanto Market remarked that:

> *you would not feel comfortable until you have finished paying such loans… many shops here are still closed because the owners are being chased by their bankers… anytime they see them opened they would come after them... so people would do so many things to ensure their bankers and creditors are settled.*

This clearly explained why people sold their personal properties and secured loans from other financial institutions to settle their existed loans. The



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representative from the Kantamanto Market added that *"we do so to gain credit worthiness before our creditors to obtain more support for our businesses"*. This shows how critical access to credit is to the market fire victims to ensure quick and successful resumption of business.

***Amount of money spent to resume business operations***

The study inquired from the respondent the amount of money they spent to resume business operations. This was important to assess the scope of the economic impact of market fire disaster on the victims. From Table 47, the relationships between the means and the other central tendencies, skewness value (1.45) and the p-values associated with the Kolmogorov-Smirnov statistic show that the distributions were positively skewed. As a result, the median was used to represent the central tendency or average, whereas Kruskal Wallis was used to test for statistical significant difference among the three markets over the amount of money spent to resume business operations following the market fire disasters. Thus, the median is not influenced by extreme values, whereas the mean is highly influenced by outliers.

Table 47 shows that the victims of market fire disasters spent an average amount of GH¢5,000 to resume business operations, following the infernos. The implication is that any difficulties in raising such an amount could delay a victim's effort towards economic recovery. The data further shows that the average amount of money spent by victims of the Makola Market to resume business activities was GH¢4,000 with those from Kumasi Central Market GH¢8,000 (see Table 47).



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**Table 47: Amount of Money Spent to Resume Operations**

| Markets | Freq. | Mean (GH¢) | Stdv. | Median (GH¢) | Mode (GH¢) | Mean Rank |
|---|---|---|---|---|---|---|
| Makola | 114 | 8020.2 | 11805.8 | 4000 | 4000 | 139.1 |
| Kantamanto | 137 | 7490.5 | 8387.7 | 5000 | 5000 | 153.9 |
| Kumasi Central | 131 | 8610.9 | 5903.8 | 8000 | 2000 | 276.4 |
| Total | 382 | 10433.3 | 9613.4 | 5000 | 5000 | |

Source: Field survey (2015) $\chi^2 = 119.25$ df = 2 p-value = 0.001
Skewness = 1.45 (Makola = 2.35; Kantamanto = 1.99; Kumasi Central = 0.68)
Kolmogorov-Smirnov (Makola – Statistic = 0.257; p-value = 0.001)
Kolmogorov-Smirnov (Kantamanto – Statistic = 0.228; p-value = 0.001)
Kolmogorov-Smirnov (Kumasi Central Market – Statistic = 0.142; p-value = 0.001)

From the study, the representative from the Kantanmanto market stated that:

> *the leadership of the market organised the traders at the impact area and made them to pay GH¢100 each to construct a common roofing shed with demarcations for the cloth sellers. This helped to reduce the cost of reconstruction of the burnt shops for market fire victims here.*

Similarly, victims from the food selling (smoked fish and meat, and vegetables) and dressmaking section of the disaster impact area at the Makola Market were organised to use cooperate effort to roof their common shed. The representative of the leadership of the Makola Market added that:

> *we organised the victims and facilitated the reconstruction of the burnt area at the food section because the nature of the original construction had a common pavilion roof with demarcations for individual traders…*



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*This contributed to reduce the unit cost of reconstruction on individual traders... We could not do same at the second-hand clothing section because that area is not part of the original market… It is an extension developed by the individual traders.*

Nevertheless, all the respondents from the Kumasi Central Market admitted to bearing the full cost of reconstruction of their shops without any cooperate effort. This could explain the high cost of spending to resume business operations following the market fire disaster in the Kumasi Central Market compared to the other markets. A cursory look at the Kumasi Central Market shows that apart from the main administration block, the rest of the market (made up of wooden sheds and containers) was developed by the individual traders. Accordingly, individual disaster victims were responsible for reconstructing their sheds and shops. It could clearly be deduced from the above findings that cooperate or communal effort towards disaster recovery helps to reduce the impact of disaster on individual victims as well as enhance the rate of recovery.

It could also be deduced from the above findings that the nature of communal organisation and built up of the markets influenced the cost of reconstruction following the market fire disasters. This goes on to confirm that the type of market one finds himself or herself influences his or her rate of recovery following a disaster. From the Kruskal Wallis H test, the p-value of 0.001 ($\chi^2$ = 119.25; df = 2) shows that there was a statistically significant difference among the three markets with respect to the amount of money spent to resume business operations. This was because the asymptotic significant value associated with the



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Kruskal Wallis test was within the error margin of 0.05. The result agrees with the variation element in the natural selection process under the Darwin's (1872) theory of adaptation that differences among disaster victims in terms of location and nature of organisation could influence one's response rate towards recovery.

**Extent of Recovery of Market Fire Victims from Disaster**

This section examined the extent of recovery of the market fire victims from the disasters. The section was broadly organised under level of psychological recovery and level of economic recovery of the market fire disaster victims.

**Level of psychological recovery of the market fire disaster victims**

This section adapted the NSESSS by the APA to assess the extent of psychological recovery of the market fire victims from the disaster. The adapted scale had 13 items to assess the severity of posttraumatic stress disorder among the market fire victims following the disaster. Each item on the measure was rated on a 5-point scale (0=Not at all; 1=A little bit; 2=Moderately; 3=Quite a bit, and 4=Extremely). The total score can range from 0 to 52 with higher scores indicating greater severity of posttraumatic stress disorder and lower scores showing the extent of psychological recovery from the market fire disaster.

The raw scores on the 13 items were summed to obtain a total raw score for each respondent. Average total score was calculated to reduce the overall score to a 5-point scale, which shows the severity of the individual's PTSD in terms of none (0), mild (1), moderate (2), severe (3), or extreme (4). The average



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total score was calculated by dividing the raw total score of each respondent by number of items in the measure (i.e., 13). This was used to determine the proportions of the respondents who had none, mild, moderate, severe or extreme PTSD. The respondents were asked to indicate the extent to which they have experienced some psychological feelings and reactions relating to the market fire disaster in the past seven days.

**Table 48: Extent of Psychological Recovery of Market Fire Victims from the Disaster**

| Level | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| None | 16 (14.0) | 17 (12.4) | 7 (5.3) | 40 (10.5) |
| Mild | 98 (86.0) | 103 (75.2) | 116 (88.6) | 317 (83.0) |
| Moderate | 0 (0.0) | 17 (12.4) | 8 (6.1) | 25 (6.5) |
| Total | 114 (100.0) | 137 (100.0) | 131 (100.0) | 382 (100.0) |

Source: Field survey (2015)

Table 48 shows that the majority (83%) of the respondents experienced mild PTSDs' reactions from the market fire disaster within the past seven days, while 10.5 per cent did not experience any PTSDs. The results show that, after two or three years of the fire disasters in the selected markets, the majority of the victims have not fully recovered psychologically. Further, 86 per cent, 75.2 per cent and 88.6 per cent of the respondents respectively in Makola, Kantamanto and Kumasi Central markets experienced mild PTSDs from the market fire disaster. This is likely to affect their confidence in investing into their businesses. As described by Rodríguez-Oreggia *et al*. (2008), the extent of psychological



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recovery from disasters influences the capacity and confidence of victims to reconstruct and rejuvenate activities in a disaster impact area.

All the partially recovered respondents attributed their jumpy feelings anytime they hear unexpected noise to the frequent recurrence of fire disasters in the markets. One of such respondents from Kumasi Central Market added that:

> *Even though we have not experienced fire disaster in this section of the market since then, anytime you hear of market fire at the Central market you become scared and reminds you about the difficulties you went through… I am just praying to gather some money and travel abroad because honestly, I don't feel comfortable operating in this market anymore*.

One of the non-recovered respondents from the Kantamanto Market also indicated that "*The occasional reoccurrences of fire disasters in the market put me off from going back to the market"*.

The statements above showed that the recurrence of fire disasters in the markets is contributing to the mild and moderate PTSDs experiences of the majority of the market fire victims. In other words, most people fear of experiencing similar disasters again. The fear of experiencing similar disasters again showed that some of the respondents did not have confidence in the standards and regulations instituted to prevent the recurrence of market fire disasters. This suggests that the perceived self-efficacy of some of the market fire victims was low which indicates low recovery level among the respondents. In the protection motivation theory, Maddux and Rogers (1983) explain that full-term



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disaster recovery is reached when victims re-attain their socio-economic status and regain confidence in their ability to cope with threats, perform threat reducing behaviours, and the effectiveness of their response to reduce threats.

The representative of Kumasi Central Market attributed the recurrence of the fire disasters in the market to the non-compliance of some traders to the set standards and regulations. This means that strict adherence to the hazard mitigation practices is required to stem the recurrence of the market fire disasters and also win the confidence of the majority of traders operating in the markets.

The study further examined the level of psychological recovery from the market fire disaster between males and females. The aim was to understand the issues contributing to the recovery or otherwise of each group of people. As shown in Table 49, 13.3 per cent of the male as against 6.7 per cent of the female victims did not experience any negative psychological feeling or reaction from the market fire disasters within the past seven days. The data showed that more males than females had psychologically recovered from the market fire disasters. The differences in the levels of psychological recovery between the male and female victims of the market fire disasters corroborate the first and second natural selection principles of the theory of adaptation by Darwin (1872) that genetic variations in terms of differences in gender between people could explain differences in their response rate towards recovery.



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**Table 49: Level of Psychological Recovery from Market Fire Disaster between Male and Female Victims**

| Markets | Sex | None (%) | Mild (%) | Moderate (%) | Total (%) |
|---|---|---|---|---|---|
| Makola | Male | 12 (22.6) | 41 (77.4) | 0 (0.0) | 53 (100.0) |
| | Female | 4 (6.6) | 57 (93.4) | 0 (0.0) | 61 (100.0) |
| | Total | 16 (14.0) | 98 (86.0) | 0 (0.0) | 114 (100.0) |
| Kantamanto | Male | 12 (14.1) | 61 (71.8) | 12 (14.1) | 85 (100.0) |
| | Female | 5 (9.6) | 42 (80.8) | 5 (9.6) | 52 (100.0) |
| | Total | 17 (12.4) | 103 (75.2) | 17 (12.4) | 137 (100.0) |
| Kumasi Central | Male | 5 (6.3) | 67 (84.8) | 7 (8.9) | 79 (100.0) |
| | Female | 2 (3.9) | 49 (94.2) | 1 (1.9) | 52 (100.0) |
| | Total | 7 (5.3) | 116 (88.6) | 8 (6.1) | 131 (100.0) |
| Total | Male | 29 (13.3) | 169 (77.9) | 19 (8.8) | 217 (100.0) |
| | Female | 11 (6.7) | 148 (89.7) | 6 (3.6) | 165 (100.0) |
| | Total | 40 (10.5) | 317 (83.0) | 25 (6.5) | 382 (100.0) |

Source: Field survey (2015)

The extent of psychological recovery was also examined among various age cohorts of the respondents. The aim was to ascertain whether victims from particular age cohorts had recovered psychologically more than others. From Table 50, 80 per cent, 80.9 per cent, 85 per cent, 81 per cent and 87.2 per cent of the respondents within the ages of 20 – 29 years, 30 – 39 years, 40 – 49 years, 50 – 59 years and 60 – 69 years respectively had mild PTSDs from the market fire disaster within the past seven days. The data showed that the majority of



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respondents across all age cohorts had not fully recovered from the psychological impacts of the market fire disasters.

**Table 50: Level of Psychological Recovery from Market Fire Disaster among Victims of Different Age Cohorts**

| Age cohorts | None (%) | Mild (%) | Moderate (%) |
|---|---|---|---|
| 20 – 29 years | 5 (20.0) | 20 (80.0) | - |
| 30 – 39 years | 13 (9.2) | 114 (80.9) | 14 (9.9) |
| 40 – 49 years | 10 (10.0) | 85 (85.0) | 5 (5.0) |
| 50 – 59 years | 6 (9.5) | 51 (81.0) | 6 (9.5) |
| 60 – 69 years | 6 (12.8) | 41 (87.2) | - |
| 70 – 79 years | - | 6 (100.0) | - |

Source: Field survey (2015)

This could be attributed to the fact that the devastating impact of fire disaster has no regard to one's age. As such, the extent of damage, people's confidence in their abilities and perceived levels of resilience to subsequent disaster could influence their psychological recovery. Nonetheless, a close view of the data showed that the proportions of the respondents with mild PTSDs from the market fire disaster increased steadily from the 20 – 29 years age cohort to 70 – 79 years age cohort. This shows that there was positive relationship between the age of market fire disaster victims and level of psychological recovery. In other words, more market fire victims experienced mild PTSDs as their ages increased.

The study also examined the level of psychological recovery from the market fire disaster among victims of different levels of education. The data as



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presented in Table 51 showed that while none of the respondents with tertiary level of education had moderate PTSDs from the market fire disasters within the past seven days, some of the respondents with the other levels of education had such experience. All the respondents with tertiary level education experienced mild PTSDs, whereas some respondents with the other levels of education did not have such experiences. The analysis showed that the levels of education of the respondents did not clearly explain the levels of psychological recovery of the market fire disaster victims.

**Table 51: Level of Psychological Recovery from Market Fire Disaster among Victims of Different Levels of Education**

| Levels of education | None (%) | Mild (%) | Moderate (%) |
|---|---|---|---|
| None | 11 (22.0) | 33 (66.0) | 6 (12.0) |
| Basic | 14 (10.4) | 118 (87.4) | 3 (2.2) |
| SHS | 15 (12.1) | 93 (75.0) | 16 (12.9) |
| Tertiary | - | 73 (100.0) | - |

Source: Field survey (2015)

The results disagree with the assertion of Comerio (2004) that victims with high levels of education take advantage of their wide social network to recover faster than those with low levels of education. However, the results corroborate the finding of Luthar (2006) that the density and strength of social networks are the most important variables – not wealth, education or culture – in determining people's rate of recovery from disaster.



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**Level of Economic Recovery of the Market Fire Disaster Victims**

This section examined the level of economic recovery of the victims from the market fire disasters. This was imperative because the markets are economic centres where vigorous business activities take place daily. The section was organised under sections.

**Proportion of businesses resuming operations following the disasters**

One of the criteria used to measure the level of economic recovery of an impact area is the proportion of businesses resuming operations over time following disaster. According to De Ruiter (2011), this should be the first phase of analyses in measuring the level of economic recovery of a disaster impact area. About 97.6 per cent of the market fire victims have resumed their business activities in the markets two to three years after the disaster (see Table 52).

**Table 52: Proportion of Businesses Resumed Following the Disasters**

| Markets | Total number of victims | Number resumed | Per cent |
|---|---|---|---|
| Makola | 3,985 | 3,893 | 97.7 |
| Kantamanto | 4,527 | 4,414 | 97.5 |
| Kumasi Central | 4,421 | 4,317 | 97.6 |
| Total | 12,933 | 12,623 | 97.6 |

Source: Field survey (2015)

Some of the reasons given by the market representatives for the non-resumption of business activities by some of the victims were death, sickness,



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debt and imprisonment. Others were battling court cases, financial constraints, loss of suppliers, loss of interests in market activities, and doing other businesses outside the markets. The results show that whereas some of the non-resumed victims were operating other businesses outside the markets, others have been rendered economically inactive by the market fire disasters.

**Time taken to assess losses and resume operations**

This section examined the number of days taken by the market fire disaster victims to assess losses from the disaster and also resume business operations. The market fire victims used an average of 9.4 days to assess their business loss following the disasters with 53.3 and 82.5 days respectively to reconstruct sheds and resume business operations (see Table 53).

**Table 53: Average Number of Days to Execute Recovery Activities**

| Recovery activities | Makola | Kantamanto | Kumasi | Average |
|---|---|---|---|---|
| Assessment of losses | 9.2 | 15.0 | 1.9 | 9.4 |
| Clearing of debris | 13.3 | 21.3 | 10.9 | 15.3 |
| Reconstruction | 36.0 | 39.9 | 78.1 | 53.3 |
| Resume operations | 84.5 | 55.8 | 108.6 | 82.5 |

Source: Field survey (2015)

The data showed that, on the average, it took around two months and three weeks for market fire victims in Ghana to resume their business activities. Such a long



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halt in business activities could have negative implications on the socio-economic condition of the market fire victims and their households.

The respondents were further requested to explain the reasons behind the length of time taken to resume business operations following the market fire disasters. This was to ascertain both the propelling and deterrent factors, following market fire disasters, towards disaster recovery. The results are presented in Table 54.

**Table 54: Reasons for the Length of Time to Resume Business Operations**

| Reasons | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Demoralised | 35 (22.6) | 29 (13.5) | 27 (13.6) | 91 (16.0) |
| Sick | 11 (7.1) | 16 (7.5) | 18 (9.0) | 45 (7.9) |
| Place was cordoned | 12 (7.7) | 35 (16.4) | 9 (4.5) | 56 (9.9) |
| Financial constraints | 43 (27.7) | 40 (18.7) | 67 (33.7) | 150 (26.4) |
| Used savings | 19 (12.3) | 22 (10.3) | 26 (13.1) | 67 (11.8) |
| Secured loan | 10 (6.5) | 21 (9.8) | 8 (4.0) | 39 (6.9) |
| Insurance | 5 (3.2) | 0 (0.0) | 0 (0.0) | 5 (0.9) |
| Supply credit | 7 (4.5) | 23 (10.7) | 12 (6.0) | 42 (7.4) |
| Received support from friends/relatives | 13 (8.4) | 28 (13.1) | 32 (16.1) | 73 (12.8) |
| Total | 155 (100.0) | 214 (100.0) | 199 (100.0) | 568 (100.0) |

Source: Field survey (2015)

n = Multiple response



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The data as seen in the table showed that 16 per cent of the respondents attributed their delays in resuming business operations to being demoralised after the incident, whereas 26.4 per cent credited theirs to financial constraints. On the other hand, 12.8 per cent of the respondents who resumed business activities early ascribed it to the support they received from friends and relatives, while 11.8 per cent credited theirs to personal savings. The results showed that both psychological and financial or economic factors played critical role in the rate of recovery following market fire disasters. This suggests that psycho-economic support to market fire victims in the form of counselling and credit facilities could help to ensure quick resumption of business operations and eventual successful recovery.

Results from the fully recovered respondents show that having the trust and confidence of suppliers, financial and counselling supports from friends and relatives as well as pre-disaster preparedness enabled them to resume business operations early after the market fire disasters. On the other hand, results from the non-recovered market fire victims show that sickness, debt, lack of supplies, loss of interest in doing business in the markets, financial challenges, and court directives were the reasons for their inability to resume business operations. One of the non-recovered victims from the Kantamanto Market added that *"My shop is locked by my supplier… until I settle her fully she won't allow me to open it"*. The results show that both psychological and economic supports are critical to ensure that a market fire victim resumes business operations as early as possible.



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**Recovery trends of business performance indicators of market fire victims**

The study further examined the recovery trends of business performance indicators of the market fire victims. The aim was to analyse the extent of economic recovery among the market fire victims. The business performance indicators comprised sales, profit, working capital and employee size as described in De Ruiter's (2011) scale for measuring economic recovery. Cash flows in terms of average daily sales, profit and size of working capital following the disasters were discounted to 2012 and 2013 base years, when the disasters occur. The aim was to take away depreciation of the value of cash flows caused by inflation. An average lending interest rate of 30.7 per cent from 2012 to 2015 was used to discount the cash flows.

***Recovery trends in average daily sales of the market fire disaster victims***

This section presents results on the recovery trends in the average daily sales of the market fire disaster victims. Table 55 shows that the average daily sales across the three markets before the market fire disaster was GH¢1,247.1, reduced to GH¢561 a year after the disaster and currently GH¢719.8. The trend shows that the average daily sales across the three markets declined after the disaster and began to increase afterwards. The proportion of the current average daily sales to the pre-disaster level was 57.7 per cent. This shows the level of sales recovery following the market fire disasters. The results show that the current average daily sales in all the markets were lower than the pre-disaster levels, which means that none of the markets have fully recovered its average



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daily sales levels following the fire disasters. However, sales performance across the three markets shows upward trajectory after the disaster, indicating recovery.

**Table 55: Trends in Average Daily Sales of Market Fire Victims Before and After the Disasters**

| Time | Makola (GH¢) | Kantamanto (GH¢) | Kumasi Central (GH¢) | Total (GH¢) |
|---|---|---|---|---|
| Pre-disaster | 661.0 | 1104.8 | 1906.1 | 1247.1 |
| One year | 216.8 | 324.2 | 789.4 | 561.0 |
| Two years | 280.3 | 402.3 | 954.0 | 627.6 |
| Present | 372.0 | 617.3 | 1175.2 | 719.8 |

Source: Field survey (2015)

From the interview with the partially recovered victims, the main reasons for the low level of sales in the markets following the disasters were that few people enter the market and loss of customers. One of the partially recovered victims from the Kantamanto Market remarked that *"Many people think the market is still destroyed"*. The results show that the size or flow of customers to a market plays a critical role in ensuring sales recovery following market fire disasters. Considering the increasing trends in profits from the Makola and Kantamanto Markets after the initial drop, it is estimated that victims from the Makola Market would take additional 2.4 years to fully recover their sales level at the pre-disaster period, whereas those from the Kantamanto Market would take additional 2.1 years, all things being equal.



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***Recovery trends in average daily profit of the market fire disaster victims***

The study also analysed trends in average daily profit of the market fire victims before and after the disasters. Table 56 shows that the total average daily profit before the market fire disasters across the three markets was GH¢864.2, reduced to GH¢129 one year after the disaster, and increased to GH¢529.7. The data showed that none of the markets has recovered fully in terms of profitability levels following the fire disasters. The reasons given by some of the fully and partially recovered victims included high taxes, poor daily sales, increased cost of goods from suppliers due to high import duties and reducing prices to attract customers.

**Table 56: Trends in Average Daily Profit of Market Fire Victims Before and After the Disasters**

| Time | Makola (GH¢) | Kantamanto (GH¢) | Kumasi Central (GH¢) | Total (GH¢) |
|---|---|---|---|---|
| Pre-disaster | 244.7 | 825.3 | 1039.8 | 864.2 |
| One year | 65.8 | 88.2 | 166.3 | 129.0 |
| Two years | 106.4 | 127.9 | 283.9 | 163.8 |
| Present | 147.3 | 477.5 | 717.9 | 529.7 |

Source: Field survey (2015)

The average daily profitability trend of victims across the three markets declined at the first year following the disaster and subsequently assumed an upward trajectory. Considering the average rates of growth at the Makola and Kantamanto Markets, all things being equal, it would take victims from both



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markets additional four years and 4.3 years respectively to recover fully the profit level at the pre-disaster period.

***Recovery trends in size of working capital of the market fire disaster victims***

As part of the process of analysing the rate of economic recovery among the market fire victims, the study assessed trends in the size of their working capital before and after the disasters. Table 57 shows that the total average working capital across the three markets before the disaster was GH¢38,291.4, reduced to GH¢11,461.3 and currently at GH¢22,205.6. The average size of working capital among fire victims from the Makola Market reduced from GH¢40,138.6 to GH¢8,434.2 and currently at GH¢24,734.8.

**Table 57: Trends in Size of Working Capital of Market Fire Victims Before and After the Disasters**

| Time | Makola (GH¢) | Kantamanto (GH¢) | Kumasi Central (GH¢) | Total (GH¢) |
|---|---|---|---|---|
| Pre-disaster | 40,138.6 | 39,379.5 | 37,891.1 | 38,291.4 |
| One year | 8434.2 | 9100.0 | 6659.7 | 11461.3 |
| Two years | 18055.3 | 15207.9 | 10872.3 | 16897.6 |
| Present | 24,734.8 | 21,766.4 | 25,109.2 | 22,205.6 |

Source: Field survey (2015)

The data showed that the working capital across the three markets decreased a year after the disaster and assumed increasing trends afterwards. It is estimated that the victims from the Makola market would take additional 3.9



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years to regain their pre-disaster level of working capital. Some of the reasons given by the fully and partially recovered victims to the slow growth of working capital were paying for debt incurred during the disaster, re-establishing households, settling loans and poor sales. The results showed that the impact from the disaster is still directing the pace of growth in the size of working capital among market fire victims. This agrees with the order/disorder element of the chaos theory that the impact of chaos or disaster dictates the pace and nature of operations of people and businesses.

***Recovery trends in level of employment of the market fire disaster victims***

As part of the process of assessing the economic recovery of market fire victims the study examined trends in employment before and after the market fire disasters. The average number of employees per victims prior to the fire disaster was one across all the markets and remained so throughout the various timelines (see Table 58).

**Table 58: Average Number of Employees Before and After the Disasters**

| Time | Makola | Kantamanto | Kumasi | Total |
|---|---|---|---|---|
| Pre-disaster | 1 | 1 | 1 | 1 |
| One year | 0 | 0 | 1 | 1 |
| Two years | 0 | 0 | 2 | 1 |
| Present | 1 | 1 | 2 | 1 |

Source: Field survey (2015)



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Whereas the victims from the Kumasi Central Market maintained their number of employees a year after the disaster and increased them to two in subsequent years, those from the Kantamanto could not employ people two years after the disaster, but have currently employed an average of one. The results also show that, whereas victims from the Makola and Kantamanto Markets have regained their employment levels at the pre-disaster stage, those from the Kumasi Central Market had gone past the pre-disaster level.

One of the fully recovered victims from the Kumasi Central Market stated, *"You will definitely need someone to arrange, display, pack, do some errands, and operate the shop when you are not around"*. The statement shows that employment in the markets does not necessarily depend on the performance of businesses.

This explains why the victims have achieved employment levels at the pre-disaster period even though all the other business performance indicators are lower than the pre-disaster period. Nonetheless, one of the fully recovered victims from Kumasi Central Market indicated that most of the employees are family members who are either introduced to the business to eventually take over from the elders or to make money by themselves. This suggests that the employment system in the market is partly a successive strategy to ensure business continuity and also to protect or maintain family businesses.

**Amount of loan for business re-activation left to be paid**

The study also inquired from the respondents who borrowed or went for loans to re-invest in their business to resume operations if they had finished



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paying the amount. This was critical because the payment status also shows the impact of the disaster on the extent of recovery of market fire victims. Out of the 222 respondents who either took a loan or borrowed money to resume business operations, a little over half (52.7%) had not finished paying back their monies two and three years after the disaster. The inability of more than half of such respondents to repay their loans could affect their economic recovery from the disaster.

The respondents who had not finished paying back their loans were requested to state the amount left. This was quintessential to assess the toll of such loans on the recovery efforts of the fire disaster victims. The results are presented in Table 59. Since the skewness values for the distributions were not within +/- 0.5, they were considered to be not normally skewed. Similarly, since the p-values associated with the Kolmogorov-Smirnov tests were all significant, the distributions were treated as not normally skewed. The medians were, therefore, reported as the central tendencies for the distributions. The high mean values compared to the medians show that the distributions were positively skewed. As a result, Kruskal Wallis H test was used to test for statistical significant difference among the average amount of loan left to be paid.

The data as presented in Table 59 showed that the average amount of loan left to be paid on the amount spent to resume business operations across the three markets was GH¢8,000. With respect to the three markets, market fire disaster victims from the Kumasi Central Market, who took loan to re-activate their



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businesses, still owe an average amount of GH¢9,000, whereas those from the Makola and Kantamanto Markets respectively owe GH¢5,000 and GH¢1,900.

**Table 59: Amount of Loan for Business Re-activation Left to be Paid**

| Markets | Freq. | Mean (GH¢) | Stdv. | Median (GH¢) | Mode (GH¢) | Mean Rank |
|---|---|---|---|---|---|---|
| Makola | 27 | 7148.2 | 5493.4 | 5000 | 1500 | 54.70 |
| Kantamanto | 41 | 3919.5 | 5881.7 | 1900 | 400 | 37.54 |
| Kumasi Central | 49 | 10,023.3 | 4479.8 | 9000 | 9000 | 74.42 |
| Total | 117 | 7069.4 | 5894.9 | 8000 | 8000 | |

Source: Field survey (2015) $\chi^2 = 27.77$ df = 2 p-value = 0.001
Skewness = 0.81 (Makola = 1.09; Kantamanto = 1.06; Kumasi Central = 0.58)
Kolmogorov-Smirnov (Makola – Statistic = 0.253; p-value = 0.001)
Kolmogorov-Smirnov (Kantamanto – Statistic = 0.332; p-value = 0.001)
Kolmogorov-Smirnov (Kumasi Central Market – Statistic = 0.292; p-value = 0.001)

The high amount of debt owed by victims from the Kumasi Central Market compared to victims from the other two markets was attributed to high amounts of loan contracted to re-construct their shops and resume business operations. Thus, whereas the management of the Kantamanto and Makola Markets organised the victims to construct common pavilion shed with individual demarcations at reduced unit cost for the traders, victims from the Kumasi Central Market relied on individual efforts to reconstruct their shops.

The results showed that the nature of organisation of the markets, and type of effort (individual versus communal) adopted to re-construct the disaster impact areas influence the amount of loan taken to resume business operations. From the



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Kruskal Wallis H test the p-value of 0.001 ($\chi^2$ = 27.77; df = 2) obtained implied that there was a statistically significant difference among the three markets in terms of the amount of loan left to be paid on monies borrowed to resume business operations. This was because the p-value of 0.001 associated with the test statistic was within the accepted error margin of 0.05.

**Hazard mitigation mechanisms adopted by the market fire victims**

The study conceptualised disaster recovery as the process of deliberately incorporating hazard mitigation mechanisms into the recovery process to achieve pre-disaster performance indicators. As a result, the study examined the hazard mitigation mechanisms adopted by the market fire victims to prevent the recurrence of similar disasters. Table 60 shows that the majority (89.9%) of the market fire victims had adopted some hazard mitigation mechanisms to prevent the recurrence of similar disasters in the future. This is likely to help ensure successful recovery from the market fire disaster as described in the conceptual framework. Approximately 46 per cent of the respondents adopted proper electrical connection to their shops as the mechanism to mitigate against fire hazards in the markets with 20.2 per cent and 12.4 per cent using the approved building materials and switching off all their electrical gadgets before leaving the markets, respectively (see Table 60).

The results show that various hazard mitigation mechanisms have been adopted by the market fire victims to avoid the recurrence of fire disasters in the markets. These may help to suppress or control the fire hazards from causing disasters in the markets. Nevertheless, the inability of 10.1 per cent to implement



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hazard mitigation practices could pose serious threat to the effort to prevent the recurrence of fire disasters in the markets as their activities may introduce hazards into the markets.

**Table 60: Hazard Mitigation Mechanisms Adopted to Avoid the Recurrence of Such Disasters**

| Mechanisms | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Nothing | 4 (3.2) | 0 (0.0) | 39 (26.5) | 43 (10.1) |
| Proper electrical connection | 66 (53.2) | 91 (59.4) | 38 (25.9) | 195 (45.8) |
| Stopped cooking in the market | 9 (7.3) | 7 (4.6) | 9 (6.1) | 27 (6.3) |
| Using approved building materials | 24 (19.3) | 37 (24.2) | 25 (17.0) | 86 (20.2) |
| Acquired fire extinguisher | 8 (6.5) | 7 (4.6) | 7 (4.8) | 22 (5.2) |
| Switch off all electrical gadgets before leaving | 13 (10.5) | 11 (7.2) | 29 (19.7) | 53 (12.4) |
| Total | 124 (100.0) | 153 (100.0) | 147 (100.0) | 426 (100.0) |

Source: Field survey (2015)

n = Multiple response

Among the respondents who implemented the hazard mitigation mechanisms, the majority (88.2%) implemented them within six months after resuming business operations and 10.5 per cent implementing theirs after one year. From the interviewing with the fully and partially recovered victims the reasons for the timing of implementing the hazard mitigation mechanisms



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included not having money, little knowledge on hazard mitigation mechanisms, not feeling well, and wanting to gain much emotional stability. The results showed that economic factors played essential role in the time taken to adopt hazard mitigation mechanisms in the markets.

On the other hand, one of the partially recovered disaster victims from the Kumasi Central Market remarked that:

> *"I didn't implement any hazard mitigation mechanism because most people in this area did not do so, and besides it is very difficult and costly to acquire metre from the ECG… I use electricity to charge my phone and for security at night so I think it is not necessary to acquire a separate metre"*.

The results show that some of the market fire victims still did not understand the need to implement hazard mitigation mechanisms. From the study, all the respondents, who adopted hazard mitigation mechanisms, described those strategies as effective in preventing the recurrence of market fire disasters. This suggests that all the respondents, who adopted hazard mitigation mechanisms, had confidence in the strategies for preventing market fire disasters.

**Summary of Level of Economic Recovery of the Market Fire Disaster Victims**

Table 61 presents a summary of the level of economic recovery of the market fire victims using De Ruiter's (2011) scale for measuring economic recovery. The table shows that the current level of sales of the fire disaster victims across the three markets in relation to the pre-disaster level was at 57.7 per cent,



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profit was 61.3 per cent, whereas size of working capital was at 58 per cent. The current employment level and proportion of businesses resumed were at 100 per cent and 97.6 per cent respectively of the pre-disaster situation.

**Table 61: Summary of Level of Economic Recovery of Market Fire Victims**

| Scale | Makola (%) | Kantamanto (%) | Kumasi Central (%) | Total (%) |
|---|---|---|---|---|
| Sales | 56.3 | 55.9 | 61.7 | 57.7 |
| Profit | 60.2 | 57.9 | 69.0 | 61.3 |
| Size of working capital | 61.6 | 55.3 | 66.3 | 58.0 |
| Debt | 89.5 | 84.9 | 79.9 | 88.4 |
| Employment | 100.0 | 100.0 | 200.0 | 100.0 |
| Businesses resumed | 97.7 | 97.5 | 97.7 | 97.6 |
| Adoption of hazard mitigation mechanisms | 93.2 | 98.0 | 78.9 | 89.9 |
| Confidence in hazard mitigation mechanism | 100.0 | 100.0 | 100.0 | 100.0 |

Source: Field survey (2015)

The data showed that there have been mixed performances with respect to the business performance indicators for measuring economic recovery. In comparing the current business performance indicators of the market fire victims to De Ruiter's (2011) scale for measuring economic recovery from disaster, the overall level of recovery of the respondents could generally be described as good. This was because three of the economic recovery indicators (sales, profit and size



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of working capital) fell under moderate recovery (50 – 75%), two (debt and adoption of hazard mitigation mechanisms) fell under good recovery (75 – 95%), whereas three (employment, proportion of businesses resumed and confidence in hazard mitigation mechanisms) fell under almost full recovery (above 95%). As a result, striking an average among the current economic recovery indicators of the market fire victims places the level of economic recovery at good.

Comparing the economic recovery indicators of the various markets to De Ruiter's (2011) scale for measuring economic recovery shows that fire disaster victims from the Makola, Kantamanto and Kumasi Central Markets were all within good recovery (see Table 61). Even though the economic recovery levels of the three markets were all within good, Kumasi Central market had the best level of economic recovery, followed by Makola and Kantamanto markets. The relatively high economic recovery level of the victims from the Kumasi Central Market to those from the other markets was due to the low level of competition over customers and investments posed by the other markets in the Kumasi Metropolis to the Central market. Thus, almost all the satellite markets (such as Tafo [yam], Krofurom, Asafo [food and leather] and Race course [food]) in Kumasi are focused on food and electrical items. Such markets pose little competition to the Kumasi Central Market over many goods and services.

On the other hand, the Makola and Kantamanto Markets compete against each other over customers and investments due to their closeness. Similarly, other satellite markets within the Greater Accra region such as Agbogbloshie, Okaishie, Mallam Atta, Dome, and Kaneshie are very active in providing similar goods and



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services at competitive prices as those from the Makola and Kantamanto Markets. As a result, frequent fire disasters in the Makola and Kantamanto Markets divert customers and suppliers' attention to the other markets. This has resulted to the relatively lower levels of sales, profitability and size of working capital in Makola and Kantamanto Markets than the Kumasi Central Market.

Another peculiar reason cited by the respondents from the Kantamanto market explaining their poor economic recovery was bad media reporting. In 2013, when a portion of the market was engulfed in fire, it was reported on various media platforms that the whole market was burnt with pictures and video footages. This sent wrong signals to customers as the representative from the market reported that people do not enter the market to patronise their products as before. Thus, such wrong impressions created about the market compelled customers to divert their attention to other markets. This suggests that media reporting on disaster is imperative in influencing the rate of economic recovery.

Comparing the levels of economic recovery of the various markets to their psychological recovery levels shows that victims from the Kumasi Central Market with the lowest level of psychological recovery had the highest level of economic recovery. Victims from the Makola Market with the highest level of psychological recovery from the fire disaster were ranked second on the level of economic recovery. The results show that there is more to economic recovery from market fire disaster than psychological recovery. Social capital support and level of competition faced by a market over customers and investments also play critical roles in ensuring quick economic recovery from market fire disaster.



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# CHAPTER EIGHT

# SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

## Introduction

This chapter presents a summary of the study, including the major findings. The chapter also presents the overall conclusion of the study as well as suggests possible ways of improving the management of post-disaster recovery of market fire victims in Ghana.

## Summary

Despite the general recognition of the importance of disaster recovery in disaster management efforts, there is conceptual confusion over the appropriate paradigm to assess disaster recovery. This study partly aimed at addressing this confusion by providing an alternative conceptualisation of disaster recovery. The main objective was to assess post fire disaster recovery management among market fire victims in Ghana. It included the assessment of psycho-economic effects of market fire disasters on victims, effectiveness of institutions and support systems for managing post market fire disaster recovery, and the extent of recovery of market fire victims from disaster.

The study was guided by the chaos theory, structural functionalism, systems theory, strain theory of deviance or anomie theory, theory of adaptation, and protection motivation theory. Disaster recovery was conceptualised as the deliberate effort to appraise hazards in the disaster zone and implement hazard



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mitigation mechanisms to restore disaster victims and impact areas to pre-disaster situation.

The study adopted a pragmatist philosophical paradigm and mixed methods design to gather, analyse and interpret data in relation to the research questions. The total study population was 12,945. It constituted 12,933 market fire victims at the Makola (3,985), Kantamanto (4,527) and Kumasi Central (4,421) Markets in 2012 and 2013, representatives of the Planning Departments at the AMA and KMA (2), and representatives of the leaderships of the markets (3). The others were representatives of NADMO at AMA and KMA (2), representatives of the Fire Service Departments at AMA and KMA (2), and representatives of Metropolitan ECG (2) as well as a representative of MASLOC (1).

The total sample size for the study was 442. This constituted 430 market fire victims and 12 institutional representatives, which were two representatives of the Planning Departments, two representatives from the Metropolitan ECG, two representatives from the Metropolitan NADMO offices, two representatives from the Metropolitan GNFS, three representatives of the leaderships of the markets, and one representative of MASLOC. Cluster sampling technique was used to sample market fire victims, whereas purposive sampling was used to sample the representatives from the disaster management-related institutions. A total of 400 respondents were engaged in the study representing a response rate of 90.5 per cent. This comprised 388 market fire victims and 12 institutional representatives. Six out of the 388 market fire victims were 'special' victims who



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had not yet resumed operations. The implication is that the total frequency for the market fire victims in quantitative analysis was 382.

The study employed interview schedule and interview guide as instruments for data gathering. The data were processed with the use of Statistical Product and Service Solutions (SPSS) version 21 and Microsoft Excel 2013 Professional Edition. Descriptive statistics such as frequencies, percentages, means and standard deviations were used to conduct univariate analysis for all the research objectives. Kruskal Wallis and Wilcoxon Signed Ranked test were used to assess the psycho-economic effects of market fire disasters on traders. An error margin of five percent (0.05) was used for all inferential analyses.

The study adapted the NSESSS by the APA to assess the extent of psychological recovery of the market fire victims. A 7-point scale was used for assessing economic recovery at different points in time. Cash flows on business performance indicators such as sales, profit and size of working capital for 2013, 2014 and 2015 were discounted to 2012 and 2013 base years when the disasters occurred. The aim was to eliminate depreciation of the actual values in the comparison between pre-disaster and post-disaster situations. Content analysis was used to examine issues under the various themes.

**Major Findings**

This section presents a summary of the major findings of the study. The section is organised under the research objectives.



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**Psycho-economic effects of market fire disasters on victims**

1. All the market fire victims suffered some levels of psychological toll upon hearing the news or seeing their shops engulfed in flames. Fear was the psychological feeling that affected the respondents most after the disaster as all the respondents experienced it. It also had the longest stay on the victims with 48.2 days. This was attributed to the fact that some of the respondents had taken loans to invest in their businesses, and as such were afraid of how their creditors would treat the issue.
2. Many (42.7%) of the respondents were able to overcome their negative psychological feelings, such as fear, suicidal tendencies and loss of self-confidence, through economic support. The implication is that the negative psychological feelings of some of the respondents were due to economic reasons. It also shows that psychological and economic impacts of market fire disasters on traders are interrelated.
3. The average financial worth of loss of the market fire victims in Ghana to the infernos was GH¢17,500. Victims from the Makola Market had the highest average financial worth of loss (GH¢20,000) to the market fires, followed by victims from the Kumasi Central Market (GH¢18,000) and those from Kantamanto Market (GH¢12,000). This was attributed to the worth of goods in the shops prior to the infernos in the markets. Victims from the Makola Market had the highest worth of goods in the shops the day before the fire disaster, followed by those from the Kumasi Central Market and Kantamanto Market. The high financial worth of loss to the fire disasters was partly



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because many of the victims had their wholesales or warehouses in the markets.

4. The average number of days business operations had to be halted in the markets after infernos was 90. Business activities in the Kantamanto Market were halted for an average of 31 days, activities in the Makola Market were suspended for an average of 60 days, whereas that of the Kumasi Central Market was 122 days. The long break in businesses caused by both the cordon off of the markets by security agencies to assess the causes and extent of damage of the infernos, and delays in organising resources to resume businesses led to the loss of customers and suppliers.
5. The average daily sales of the market fire victims reduced by 73.3 per cent, average daily profit fell by 74.1 per cent, while the size of working capital reduced by 61.1 per cent immediately after resuming business operations. These show that the businesses of market fire disaster victims shrunk after the disaster. This was partly attributed to the loss of customers to other markets and bad media reporting about the disaster.

**Effectiveness of the institutions and support systems in managing post market fire disaster recovery**

1. All the state disaster-related institutions (Metropolitan Assemblies, NADMO, GNFS and ECG) appraised the causes of the disasters, provided education on hazard mitigation practices following the disasters and monitored activities in the markets. Nonetheless, such activities were not done as a coordinated unit under the District Fire Service Committee. Each institution performed its own



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programmes and activities in the markets. This affected the enforcement of controls and regulations in the markets as many of the institutions did not have the capacity and mandate to punish defaulters as well as made it difficult to address common operational challenges among the institutions.

2. The study found a divergence between the immediate needs of the market fire disaster victims and the relief items provided by NADMO. Whereas the victims needed loans, credit supplies and construction materials to ensure quick and successful recovery, NADMO provided buckets, cups and mattresses. This shows that supplies of relief items of NADMO were structured more towards flood-related disaster or household recovery rather than economic recovery in business-related environment.
3. The GNFS denied having benefitted or received funds from the fire safety fund. The lack of remittances from the fire safety fund is frustrating the effectiveness of the GNFS in the management of market fire disasters. Such frustrations could de-motivate or reduce the commitment of personnel from the GNFS in executing actions to effectively manage market fire disasters. All the other disaster management institutions cited funds and logistics as their major constraints in managing market fire disasters.
4. Market leaders were directly responsible for enforcing the adoption of hazard mitigation mechanisms in the markets. This was due to the erratic nature of the monitoring conducted by the various institutions as well as their high stake in protecting business activities in the markets. Some of the punishments meted out to defaulters were suspension from the market,



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payment of fines, and closing down shops. However, the non-existence of market leadership at the Kumasi Central Market negatively affected the enforcement of regulations and controls as individuals select their own electricians to attend to their electrical faults.

5. The total average cash support received by the market fire disaster victims from formal and informal institutions was GH¢909.8. The informal social capital group (relatives, friends, business partners) of the market fire disaster victims made most critical cash contribution towards disaster recovery. They were also the first to attend to both the psychological and economic needs of the market fire victims. These were attributed to their close association and strong bond created through family ties, friendship and neighbourliness.
6. Even though the severity of the threat of fire disaster and the probability of its recurrence were high, many (69.5%) fire disaster victims at the Kumasi Central Market were not complying with the set standards and regulations. This was attributed to the general atmosphere and the culture of operations in the Kumasi Central Market. Traders in the Kumasi Central Market operate individually with little or no regard about the consequences of their actions on others or the entire market. The size of the market also appears to be bigger than the capacity of the KMA and the other disaster-related agencies to enforce controls and regulations in the Kumasi Central Market. The lack of common leadership front of traders in the Kumasi Central Market was also contributing to the low level of compliance of regulations.



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**Extent of psycho-economic recovery of market fire victims from disaster**

1. Friends and family members played crucial role in ensuring the psycho-economic recovery of the market fire victims. None of the public disaster management agencies had counselling department or capacity to provide psychological support to the victims. As a result, the majority (62%) of the respondents depended on family members, friends and religious bodies for counselling support. Friends and family members were also the first to respond to the psychological and economic needs of the market fire victims by providing counselling, cash and labour support.
2. From the study, all the respondents restricted their household expenses to gain more resources to invest in the businesses. Some of the household strategies adopted to overcome the economic challenges from the fire disaster were moving to smaller apartments, changing schools of children, sending families to other relatives, reducing household budgets, and using household members as labour.
3. The study found that majority (83%) of the market fire victims have not fully recovered psychologically from the disasters. They were on the mild psychological recovery stage. As a result, they experienced jumpy feelings anytime they hear unexpected noise in the markets. This feeling was attributed to the frequent recurrence of fire disasters in the markets. Thus, most people fear of experiencing similar fire disasters again.
4. The overall level of economic recovery of the respondents was good. This was largely attributed to reduced sales levels resulting from competition from



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other markets over customers and supplies, increased cost of goods or supplies reducing profitability levels, and repayment of loans and losses from the disaster negatively affecting growth in the size of working capital.

5. Even though the recovery levels of victims across the three markets were within the good category, those from the Kumasi Central Market were ranked a bit higher than the others, followed by victims from the Makola market.
6. The study found that there was more to economic recovery from market fire disasters than psychological recovery. Victims from the Kumasi Central Market with the lowest level of psychological recovery had the highest level of economic recovery, whereas victims from the Makola Market with the highest level of psychological recovery from the fire disaster were ranked second on the level of economic recovery. Social capital support and level of competition faced by a market over customers and investments also played critical roles in ensuring quick economic recovery from market fire disaster.

**Conclusions**

Managing post-disaster recovery is a critical stage in the disaster management process to ensure the successful restoration of physical, psychological and economic damage caused by disasters to victims. The study conceptualised disaster recovery as the deliberate effort to appraise hazards in the disaster zone and implement hazard mitigation mechanisms to restore disaster victims and impact areas to pre-disaster situation. The study primarily focused on managing the post-disaster recovery of market fire victims in Ghana. This was



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necessitated by the recurrence of fire disasters in Ghanaian markets, especially Makola, Kantamanto and Kumasi Central Markets.

The market fire disasters caused critical psychological and economic damage to the victims. The destruction caused to goods, shops and equipment plunged victims into huge debt, ditched the performance of their businesses, and threatened the possibility of restoring businesses. This was because the traders had both their shops and wholesales in the markets which all got destroyed. The situation created fear and anxiety among the victims, which dumped the confidence in their ability to rejuvenate the businesses. Some of the victims lost their suppliers in the process, whereas others had their shops locked over unpaid loans and unsettled goods received on credit.

The market fire disaster victims resorted to counselling and medication to address their psychological challenges. Social institutions such as friends, family and religious bodies played enormous role in providing psychological support to the market fire disaster victims. This was because none of the state institutions in disaster management either had a counselling section or the capacity to provide psychological support to the market fire victims. The social institutions also contributed critically to reducing the economic impact of the market fire disasters on victims by providing financial and labour support.

The disaster-related institutions had their individual programmes and activities in managing fire disasters in the markets. Each of them performed a definite and complementary role in the management of fire disasters in the markets. However, poor collaboration and interrelationship among the disaster



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management institutions affected their effectiveness in enforcing the implementation of hazard mitigation mechanisms among the traders. The high stake of the market leaders in the markets compelled them to step in to enforce regulations and controls to avoid the re-introduction of hazards that led to previous disasters. Similarly, the poor collaboration among the institutions made it difficult to address their common operational challenges.

The extent of psychological recovery of the market fire victims was mild. This was due to the continuous harbouring of fear among the market fire victims of possible re-experiencing of similar fire disasters. The continuous harbouring of fear gives an indication that the market fire victims did not have full confidence in the established controls and regulations to prevent the recurrence of fire disasters in the markets. The overall level of economic recovery was rated as good. This was because most of the business performance indicators were below the pre-disaster levels two to three years after the disaster. The study, therefore, concludes that the impacts of the market fire disasters continue to have a debilitating toll on victims and their businesses, years after the physical damage has been restored.

**Recommendations**

Based on the findings of the study, the following recommendations were made to improve the management of post-disaster recovery of market fire victims in Ghana.

1. The study recommends that the leadership of the markets in collaboration with the Metropolitan Assemblies should establish disaster management fund



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to provide financial support to victims of market fires. Such support could help address some of the psychological and economic challenges most market fire victims go through to resume operations as well as reduce the impact of such disasters on business activities in the markets. This could be done by instituting a disaster management tax to be paid by daily by the traders. The tax amount should be decided and agreed by the traders themselves. However, this tax system should be progressive to ensure that each category of business type gets its relative share from the fund to enhance their recovery process.

A disaster management board would be constituted by the traders comprising some market leaders and representatives from the Metropolitan Assembly to administer the fund. Representatives from the Metropolitan Assembly are to instil confidence in the traders about the effective management of the fund as well as ensure efficient and cost-effective tax collection system through the Assembly's tax collection structures in the markets. The fund should be invested through the financial system to reap dividends and interests to ensure its growth. Quarterly accounts on the fund should be presented to the traders through open fora to enable them share their views about the management of the fund.

Any trader who defaults the payment of this tax over a period of time as may be agreed among them should be sanctioned. This would help to ensure the building of a solid disaster fund system to manage unforeseen catastrophic events in the market. In cases of disaster, the fund would be



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disbursed as soft loans depending on the level of damage caused to an individual as well as level of scale of the businesses as determined on the progressive tax system to enable them resume business operations as early as possible. This strategy could help reduce the hardship mostly visited on households of the market fire disaster victims. Stakeholders in the fund could decide any other line of action if the funds grow beyond supporting disaster victims.

2. The study suggests that the traders should locate their warehouses and wholesales outside the markets. This strategy would help to reduce the financial worth of loss of traders to market fire disasters. This could be done by establishing warehouses and wholesales in their homes or any convenient and safe places outside the markets. With this strategy, market fire victims would only lose goods in their shops prior to the disaster. This strategy would also enable victims of market fires to resume business activities quickly after such disasters to maintain their customers and suppliers. In other words, maintaining customers and supplies after market fire disasters would help to reduce the impact of such disasters on sales, profitability and size of working capital of victims to guarantee full economic recovery following such disasters.
3. It is also recommended that NADMO, as the coordinator for disaster management activities in the country, should create a counselling section or department in its operational structures to provide psychological support to market fire disaster victims. It is expected that having professional



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counsellors to attend to the psychological needs of the market fire victims would help to reduce the time taken to recover the negative emotional feelings experienced after fire disasters.

4. The study further suggests that traders should establish good and strong relationship with both formal (religious bodies) and informal (relatives and friends) social institutions around them prior to the occurrence of any disaster. This is because such institutions are the first to attend to the psychological and economic needs during disasters, and also make the most critical cash contribution to ensure the quick and successful recovery of market fire victims. This could be done by joining co-operative groups among friends or in religious bodies to enable them gain various forms of support during market fire disasters.
5. The study recommends that the Metropolitan Assemblies should strengthen the District Disaster Management Committee to create a common platform for the disaster management institutions to share their experiences and address their mutual operational challenges. This could be done by organising periodic meetings among members. It is expected that this mechanism would help to improve the effectiveness of the various institutions in enforcing controls and regulations to prevent the recurrence of market fire disasters in the markets.
6. NADMO should team up with the Metropolitan Assemblies to diversify its relief items to market fire disaster victims and add more construction materials. This would enable market fire disaster victims to appreciate efforts



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of NADMO in such instances and cooperate with the organisation in its activities. Thus, the relief items should be based on the disaster assessment report as conducted by NADMO.

7. The study recommends that the Central government should establish the structures and modalities to remit funds from the fire safety fund to the GNFS. This would help to improve the effectiveness of the GNFS in the management of market fire disasters in the country. Thus, remittances from the fire safety fund would enable the GNFS to acquire logistics to attend to market fire disasters and also manage post-disaster activities to prevent the recurrence of fire disasters in the markets.
8. The study recommends that the KMA should organise the traders at the Kumasi Central Market to constitute their leadership. This is necessary because market leaders played a critical role in the monitoring and enforcement of the adoption of controls and regulations to stem the recurrence of fire disasters in the markets. As a result, the constitution of leadership in the market would help to improve the enforcement of regulations among the traders to prevent the recurrence of market fire disasters.
9. The study further suggests that the disaster management institutions in collaboration with the market leaders should intensify monitoring and enforcement of regulations in the markets. The punishments meted out to defaulters should also be strengthened to deter people from introducing hazards into the market to further cause disasters. Thus, creating a hostile



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environment for defaulters would reduce fire hazards in the markets and give confidence to traders. Such confidence in disaster prevention would help eliminate the jumpy feelings of market fire victims and the fear of possible further fire disasters. This would help to ensure the full and complete psychological recovery of the market fire victims within the shortest possible time.

**Contribution to Knowledge**

The lack of consensus among researchers and practitioners about the conceptualisation of disaster recovery has been the bane for the non-existence of comprehensive theories to explain disaster recovery. Three different ways to conceptualise recovery: returning to pre-disaster conditions, attaining what would have occurred without the disaster, or reaching a new stable state were identified as the opposing forces. Whereas some researchers believe in the traditional approach that disaster recovery should be conceptualised as to the extent to which a disaster zone has been restored to pre-disaster levels, others criticised that restoring disaster impact zone to pre-disaster levels would introduce the same hazards that led to the disaster to cause similar disasters in the area. As a result, different set of goals and indicators should be established for measuring the success of disaster recovery efforts.

However, this study argued that such a strategy would imply that there could be no universal indicators for measuring disaster recovery as disaster management agencies would have the liberty to set their own goals and measure



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their own success rate. Such an approach or conceptualisation to disaster recovery would be too subjective and create avenues for institutional biases in the measurement of disaster recovery. To help eliminate such subjectivity and biases in the assessment process, this study recommends that the conceptualisation of disaster recovery should make reference to pre-disaster situation. Nonetheless, this study went further the traditional approach to suggest that there should be a deliberate effort by all stakeholders in the disaster management process to appraise the hazards that led to the disaster, and implement clear hazard mitigation strategies to eliminate or control such hazards from subsequently causing similar disasters in the disaster zone.

It is believed that this conceptualisation of disaster recovery would provide a clear reference point for assessment, in terms of comparing the after situation to the pre-disaster situation, that could objectively be verified to draw conclusions. Furthermore, the deliberate efforts to appraise and implement hazard mitigation mechanisms in the recovery process would address the criticisms levelled against the traditional approach of assessing disaster recovery. As a result, this study went a step further of the traditional approach by conceptualising disaster recovery as the deliberate effort to appraise hazards in the disaster zone and implement hazard mitigation mechanisms to restore disaster victims and impact areas to pre-disaster situation.

**Suggestions for Further Studies**

Further studies could be conducted into the impact of the market fire disasters on the psycho-economic impact of non-victims in the markets. This is



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important because the traders depend on each other for the supply of goods and services. As a result, disruption in the businesses of one's supplier due to fire disaster is likely to affect the operations of one's business. Similarly, complaints about reduction of buyers or consumers following major infernos in the markets are also going to affect the operations of non-victims of the disaster. On the other hand, market fire disasters could also help to boost the business performances of non-victims as they face less competition and would also capitalise on the business disruptions of the victims to increase sales, profitability and customer base. It is expected that a study of this nature would help ascertain the full impact of the market fire disasters on traders in Ghana.

Further studies could also be conducted into the impact of market fire disasters on revenue generation by the Assemblies. This is because halt in business activities following such disasters would negatively impact on revenue generation of the Assemblies. This study would enable both practitioners and researchers to ascertain the impact of market fire disaster on the macro level in terms of revenue generation and the quantum of resources diverted from other sectors to support disaster victims. Such a study would enable researchers to understand the impact of market fire disasters on development management.



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# APPENDICES

## Appendix A: Interview Schedule for Market Fire Victims

Dear Sir/Madam,

I am Prince George Aning-Agyei, a PhD student at the Institute for Development Studies at the University of Cape Coast. I am conducting a study into the management of post-disaster recovery of market fire victims in Ghana. The study is specifically for victims of market fire incidents in 2012 and 2013. This is an academic investigation toward the award of a doctoral degree in Development Studies at the University of Cape Coast. This interview schedule is designed to understand the psycho-economic effects of market fires on victims and how they recover. I, therefore, entreat you to spare me some time to respond to issues in the instrument.

The interview schedule is organised under the psycho-economic effects of market fire disasters on victims, strategies adopted by victims for managing psycho-economic impacts of market fire disaster, effectiveness of institutions and support systems for post market fire disaster recovery, extent of recovery of market fire victims from disaster, and background characteristics of market fire victims. Any information given would be treated with utmost confidentiality. Please note that the accuracy of your information is also very critical to the success of this study.

Thank you



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**Section A: Psycho-economic effects of market fire disasters on victims**

*Pre-disaster assessment*

1. Products sold before the market fire incidence: [1] Provisions [2] Cosmetics [3] Food/meat [4] Textiles/clothing [5] Stationeries [6] Electricals [7] Drugs [8] Mother care [9] Agricultural products [10] Building materials [11] Others (specify) …….

2. Which type of insurance did you have before the market fire incidence? [1] None [2] Theft [3] Fire [4] Others …….

3. If none, why were your goods not insured?
   [1] Do not understand their activities [2] Difficult to secure your benefit [3] High premium price [4] Companies not interested in our activities [5] Others ……

4. Which hazards were you exposed to before the market fire incidence? [1] Illegal electrical connections [2] Overloaded electric metres [3] Unstandardised used of electrical cables [4] Indiscriminate use of fire [5] Others ……

5. Did you put in place any mechanism to prevent the occurrence of the market fire incident? [1] Yes [2] No

6. If yes, what mechanisms did you put in place to prevent the occurrence of market fire disaster?

   ……

   ……

7. If no, why?



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[1] No knowledge in market fire prevention [2] Not having the resources and logistics to do it [3] Others were not doing it [4] Others (specify) ……

8. Did you put any mechanisms in place to reduce the impact of the market fire?
   [1] Yes [2] No
9. If yes, what mechanisms did you put in place to reduce the impact of market fire before the disaster?
   [1] Established wholesale outside the market [2] Opened shop in other areas [3] Insurance [4] Savings [5] Others ……..
10. If no, why? ……..
    ……..
11. How much worth of goods did you have in your shop before the market fire incidence? ……...

*Post-disaster assessment (Economic)*

12. Which of your items got destroyed by the fire? [1] Shop [2] Cash [3] Goods [4] Equipment [5] Everything [6] Others …….....
13. In your estimation, how much did you lose in the market fire incidence?
    ……
14. How long did you halt business operations after the market fire incidence?
    .....
15. Why did it take you such a time to resume operations? [1] Demoralised [2] Sick [3] Place was cord off [4] Financial constraints [5] Received



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support from friends/relatives [6] Used savings [7] Secured a loan [8] Insurance [9] Others ……...

16. How did the break in business operation affect your business? [1] Destroyed goods [2] Loss of customers [3] Loss of shop [4] Others …….
17. How much did you spend to resume operations? ……..
18. Where did you get the money to invest in your business? [1] Savings [2] Borrowed from friends/relatives [3] Loan from financial institution [4] Support from friends/relatives [5] Insurance [6] Others ……...……
19. If borrowed or loaned, have you finished repaying it? [1] Yes [2] No
20. If no, how much is left to be paid? …….
21. Please indicate the level of the following business operating performance indicators before and after the market fire incidence.

| **Economic indicators** | **Before** | **After resuming operations** |
|---|---|---|
| Average daily sales (GH¢) | | |
| Average daily profit (GH¢) | | |
| Size of working capital (GH¢) | | |
| Number of employees | | |

22. How did the loss in business performance affect your household?

……..

……..

……..



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*Post-disaster assessment (Psychological)*

23. How did you react upon hearing or seeing that your shop was engulfed by fire? [1] Collapsed [2] Cried [3] Shocked [4] Others ……..

24. Which of the following psychological feelings occurred to you immediately after the market fire incidence, and how long did it take to overcome them?

    1 = Not at all 2 = Sometimes 3 = Often [4] Always

| **Psychological issues** | **1** | **2** | **3** | **4** | **5** | **Time (months)** |
|---|---|---|---|---|---|---|
| Felt like committing suicide | | | | | | |
| Loss of self-confidence | | | | | | |
| Fear | | | | | | |
| Personal guilt | | | | | | |
| Ashamed of appearing in public | | | | | | |

25. How were you able to overcome the above psychological feelings?

    [1] Medication [2] Counselling [3] Financial support [4] Credit supply [5] Material support [6] Others ……..

26. If you have not overcome the psychological feelings, what do you think must be done to enable you overcome them?

    [1] Medication [2] Counselling [3] Financial support [4] Credit supply [5] Material support [6] Others ……..



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**Section B: Strategies adopted by victims for managing psycho-economic impacts of market fire disaster**

*Psychological strategies*

27. What strategies did you adopt to reduce the psychological impact of the market fire incidence? [1] Medication [2] Counselling [3] Avoided talking about it [4] Others (specify) …….....

28. How would you describe the effectiveness of the strategy in managing the psychological impact of the disaster? [1] Very effective [2] Effective [3] Not sure [4] Less effective [5] Least effective

29. Reason(s) for your answer:

……..

……..

*Economic strategies*

30. What business strategies did you adopt to reduce the economic impact of the market fire disaster? [1] Used personal savings [2] Loan from financial institutions [3] Borrowed money from friends/relatives [4] Sold property [5] Support from government agencies [6] Others ……

31. How would you describe the effectiveness of the strategy in managing the economic impact of the disaster? [1] Very effective [2] Effective [3] Not sure [4] Less effective [5] Least effective

32. Reason(s) for your answer:

…….

…….



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33. If you had invested a loan from a financial institution in your business prior to the market fire incidence, what strategy did you use to repay it?

    [1] Sold personal property to offset loan [2] Renegotiated payment plan [3] Jailed [4] Used insurance on the loan to repay [5] Support from friends/family [6] Others ……

34. What household strategies did you take to enable you overcome the economic challenges resulting from the market fire incident?

    ……

    ……

35. What strategies have you put in place to reduce the impact of any other market fire incidence? [1] None [2] Established shops in other locations [3] Insured goods [4] Savings [5] Changed products sold [6] Others .....

36. Products sold after disaster: [1] Provisions [2] Cosmetics [3] Food /meat [4] Textiles/clothing [5] Stationeries [6] Electricals [7] Drugs [8] Mother care [9] Agricultural products [10] Building materials [11] Others ……..

37. If products sold after the disaster are different from pre-disaster products, please provide reason(s): ……

    ……

**Section C: Effectiveness of institutions and support systems for post market fire disaster recovery**

38. What standards or regulations have been instituted to avoid the recurrence of market fires in this market?



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[1] Localisation of businesses [2] Acquisition of fire safety certificate [3] Approved building materials for shops [4] Formal connection to electricity [5] Approved electrical company to attend to electrical needs of traders [6] Others ……

39. Who established those standards or regulations?

[1] [1] NADMO [2] Metropolitan Assembly [3] GNFS [4] Market leaders [5] Market managers [6] Others …….

40. How do people comply with those standards or regulations?

[1] Very high [2] High [3] Do not know [4] Low [5] Very low

41. Reason(s) for the answer:

……

……

42. Did you receive any education on hazard mitigation practices from any state institution after the market fire incidence? [1] Yes [2] No

43. If yes, which institution(s) provided that education? [1] NADMO [2] Metropolitan Assembly [3] GNFS [4] Market managers [5] Others ……

44. What was the mode of education? [1] Public gathering [2] Media [3] Gossiping [4] Others …….

45. What were you educated on?

……

……



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46. Please indicate the type of support you obtained from the following sources, amount (if cash), time of receiving the support, and effectiveness of the support in ensuring successful recovery?

| **Sources** | **Type (i)** | **If cash, amount** | **Time (ii)** | **Effectiveness (iii)** |
|---|---|---|---|---|
| Religious bodies: [1] Church [2] Mosque [3] Others ……. | | | | |
| NADMO | | | | |
| GNFS | | | | |
| NGOs: Name of NGO …… | | | | |
| Counselling centres: Name of centre: …….. | | | | |
| Relatives | | | | |
| Friends | | | | |
| Financial institutions: Name of institution: …… | | | | |
| Insurance companies: Name of company: …… | | | | |
| Metropolitan Assembly | | | | |
| Business partners | | | | |
| MASLOC | | | | |
| Market management company | | | | |
| Market leaders | | | | |

i. Type of support [1] Cash [2] Emotional support [3] Debt relief [4] Construction materials [5] Hazard mitigation mechanisms [6] Credit supply [7] Labour [8] Clearing of debris [9] Childcare [10] Information on sources of support [11] Others……..

ii. Time = days, weeks, months or years

iii. Effectiveness = [1] Very high [2] High [3] Do not know [4] Low [5] Very low



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47. Which institution(s) come around to monitor activities in the market and ensure that people adhere to the set regulations and standards?

    [1] NADMO [2] Metropolitan Assembly [3] GNFS [4] ECG

    [5] Market managers [6] Market leaders [7] Others ……..

48. What do they do to defaulters of the set regulations and standards?

    [1] Nothing [2] Advise [3] Caution [4] Close down shop [5] Fined

    [6] Seizure of operating permit [7] Prosecuted [8] Others ……

49. How serious do people take directives from state institutions on hazard mitigation practices in this market?

    [1] Very serious [2] Serious [3] Do not know [4] Less serious [5] Least serious

50. Reason(s) for the answer:

    ……

    ……

**Section D: Extent of recovery of market fire victims from disaster**

*Psychological recovery*

51. How much have you experienced the following during the PAST SEVEN DAYS? 0 = Not at all, 1 = A little bit, 2 = Moderately, 3 = Quite a bit, 4 = Extremely. Please respond to each item by marking (√ or x) one box per row.

| **Issues** | **0** | **1** | **2** | **3** | **4** | **Item score** |
|---|---|---|---|---|---|---|
| Having "flashbacks," that is, seeing, hearing, smelling, or physically feeling parts of the disaster experience | | | | | | |
| Feeling very emotionally upset when something reminded | | | | | | |



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| | | | | | | |
|---|---|---|---|---|---|---|
| you of the market fire incidence | | | | | | |
| Trying to avoid thoughts, feelings, or physical sensations that reminded you of the market fire incidence | | | | | | |
| Thinking that the fire happened because you or someone else did something wrong or did not do everything possible to prevent it, or because of something about you | | | | | | |
| Having a very negative emotional state (for example, experiencing lots of fear, anger, guilt, shame, or horror) after the fire incidence | | | | | | |
| Losing interest in activities you used to enjoy before the market fire incidence | | | | | | |
| Being "super alert," on guard, or constantly on the lookout for danger | | | | | | |
| Feeling jumpy or easily startled when you hear an unexpected noise | | | | | | |
| Repeated, disturbing memories, thoughts, or images of the market fire incidence | | | | | | |
| Repeated, disturbing dreams of the market fire incidence | | | | | | |
| Having physical reactions (e.g., heart pounding, trouble breathing, or sweating) when something reminded you of the market fire incidence | | | | | | |
| Feeling distant or cut off from other people | | | | | | |
| Feeling as if your future will somehow be cut short | | | | | | |
| **Total/partial raw score:** | | | | | | |
| **Prorated total raw score: (if 1-2 items left unanswered)** | | | | | | |
| **Average total score** | | | | | | |



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*Economic recovery*

52. How long did it take to do the following activities after the market fire incidence and reason(s) for the time taken?

| Recovery activities | Time | Reasons |
|---|---|---|
| Assessment of losses | | |
| Clearing of debris | | |
| Reconstruction | | |
| Resume operations | | |

53. Please indicate the level of the following business operating performance indicator after the market fire incidence, and reasons for the performance.

| Economic indicators | 1 year after | 2 years after | Currently | Reasons |
|---|---|---|---|---|
| Average daily sales (GH¢) | | | | |
| Average daily profit (GH¢) | | | | |
| Size of working capital (GH¢) | | | | |
| Number of employees | | | | |

54. Have you finished paying off loans you secured to re-establish your business?

[1] Yes [2] No

55. If no, how much per month do you pay for that loan? …….



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56. What hazard mitigation mechanism(s) have you put in place to avoid the recurrence of market fire incidence?

……

……

57. When did you implement the hazard mitigation mechanism(s) after the market fire incidence? [1] Within six months [2] One year [3] Two years [4] Others ……

58. Reason(s) for the time taken to implement the hazard mitigation mechanism(s):

……

……

59. How would you describe the effectiveness of those mechanisms for preventing the recurrence of the market fire incidence? [1] Very effective [2] Effective [3] Do not know [4] Less effective [5] Least effective

60. Reason(s) for your description:

……

……

61. What strategy(s) have you put in place to ensure quick recovery in case of any market fire outbreak? [1] Savings [2] Insurance [3] Opened other shops in different areas [4] Others …….

62. What experience(s) did you gain from the market fire incidence?

……

……



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63. How have you factored such experience(s) into your operations to guarantee quick and successful recovery in case of any other market fire incidence?

……

……

64. How many people are still unable to resume operations after the disaster? …...

65. Any reason(s) for their inability to resume operations?

……

……

**Section E: Demographic characteristics of respondents**

66. Name of market: [1] Makola [2] Kantamanto [3] Kumasi Central Market

67. Sex: [1] Male [2] Female

68. Age (years): …….

69. Level of education: [1] None [2] Basic [3] SHS [4] Tertiary

70. Type of business: [1] Artisanry [2] Traders [3] Services

71. Which year and month did you experience the market fire disaster?

……..

72. Any additional information or special experience in the disaster situation or recovery process:

……..

……..

******* THANK YOU *******



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**Appendix B: Interview Guide for National Disaster Management Organisation**

Dear Sir/Madam,

This interview guide is designed to understand the management of post-disaster recovery among market fire disaster victims. The study is specifically for market fire incidents in 2012 and 2013. This is an academic investigation toward the award of a doctoral degree in Development Studies at the University of Cape Coast. I, therefore, entreat you to spare me some time to respond to issues in the instrument. Any information given would be treated with utmost confidentiality. Please note that the accuracy of your information is also very critical to the success of the study.

1. How many fire disasters did you record in the following markets?

| Markets | 2012 | 2013 |
|---|---|---|
| Makola | | |
| Kantamanto | | |
| Kumasi Central Market | | |

2. How many fire disaster victims did you register in the markets?

| Markets | 2012 | 2013 |
|---|---|---|
| Makola | | |
| Kantamanto | | |
| Kumasi Central Market | | |



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3. In your estimation, how many of the victims in 2012 and 2013 have you supported so far?
4. Reason(s) for your answer:
5. Can you please explain the stages you go through in supporting victims when there is disaster?
6. What constitutes disaster recovery to this institution?
7. What forms of support did you organise for the market fire disaster victims?
8. What criteria did you use to disburse recovery assistance to market fire victims?
9. What regulations have you instituted to reduce the recurrence of market fires?
10. How (often) do you organise hazard awareness education in the markets?
11. What forms of hazard mitigation practices have you introduced to the victims?
12. How do you enforce the adoption of the set regulations and hazard mitigation practices in the markets?
13. How often do you monitor activities in the markets to ensure that people comply with the set standard practices and regulations?
14. What do you do to people who do not comply with your regulations?
15. How do you involve the market fire victims in the recovery process?
16. How adequate is NADMO in terms of facilities in providing relief to market fire disaster victims?
17. Reason(s) for your answer:
18. How adequate is NADMO in terms of facilities and human resource capacity to rehabilitate market fire disaster victims?



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19. Reason(s) for your answer:
20. How adequate is NADMO in terms of human resource capacity to prevent market fires and support victims to ensure quick and successful recovery?
21. How adequate is NADMO in terms of logistics to prevent market fires and support victims to ensure quick and successful recovery?
22. Which other organisations did you liaise with in supporting market fire victims to recover?
23. What forms of support did you receive from other state institutions in ensuring successful recovery from market fire incidence?
24. How would you describe the effectiveness of the other disaster-related institutions in ensuring quick and successful recovery from market fires?
25. How would you describe the interdependence and coordination among state institutions in providing support to market fire victims?
26. At what point did you end your support to market fire victims in the recovery process and reasons for that?
27. What constraints limit the effective execution of your mandate with respect to the provision of support to disaster victims?
28. Any additional information:

******* THANK YOU *******



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**Appendix C: Interview Guide for Ghana National Fire Service**

Dear Sir/Madam,

This interview guide is designed to understand the management of post-disaster recovery among market fire disaster victims. The study is specifically for market fire incidents in 2012 and 2013. This is an academic investigation toward the award of a doctoral degree in Development Studies at the University of Cape Coast. I, therefore, entreat you to spare me some time to respond to issues in the instrument. Any information given would be treated with utmost confidentiality. Please note that the accuracy of your information is also very critical to the success of the study.

1. What role does the GNFS play in the management of the selected markets?
2. What hazard mitigation mechanisms have you instituted to avoid the recurrence of fires in the selected markets?
3. What structures and systems have you instituted to enforce those mechanisms?
4. How often do you sensitise traders in the markets on fire hazards and fire prevention mechanisms?
5. How do you provide technical advice for building plans in respect of activities and structural layouts to reduce the impact of market fire disasters?
6. How often do you inspect and offer technical advice on fire extinguishers in the markets?
7. How frequent do you monitor activities in the market to ensure that people adhere to safety standards and regulations?



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8. What do you do to people who do not comply with safety regulations?
9. What forms of support do you organise for market fire disaster victims?
10. How adequate is the GNFS in terms of logistics for monitoring activities in the markets to ensure strict adherence and prevention of fire outbreaks?
11. How would you describe the adequacy and reliability of the remittances from the fire safety fund in relation to the assigned functions of the GNFS?
12. What forms of support did you receive from other state institutions in ensuring successful recovery from market fire incidence?
13. How would you describe the effectiveness of the other disaster-related institutions in ensuring quick and successful recovery from market fires?
14. How would you describe the interdependence and coordination among state institutions in providing support to market fire victims?
15. What constraints limit the effective execution of your mandate with respect to the provision of support to disaster victims?
16. Any additional information:

******* THANK YOU *******



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**Appendix D: Interview Guide for Metropolitan Assemblies**

Dear Sir/Madam,

This interview guide is designed to understand the management of post-disaster recovery among market fire disaster victims. The study is specifically for market fire incidents in 2012 and 2013. This is an academic investigation toward the award of a doctoral degree in Development Studies at the University of Cape Coast. I, therefore, entreat you to spare me some time to respond to issues in the instrument. Any information given would be treated with utmost confidentiality. Please note that the accuracy of your information is also very critical to the success of the study.

1. Number of traders operating in the market
2. Role of the Assembly in the management of the selected markets
3. Constitution of disaster recovery to this institution
4. Forms of support provide for market fire disaster victims
5. Criteria used to disburse recovery assistance to market fire victims
6. Regulations instituted by the Assembly to reduce recurrence of market fires
7. Hazard mitigation strategies introduced to the victims to avoid the recurrence of market fire disasters
8. Mode of enforcing the adoption of the regulations and practices in the markets
9. How (often) do you monitor activities in the markets to ensure that people comply with the set regulations and practices?
10. Mode of handling people who do not comply with the regulations
11. How (often) do you organise hazard awareness education in the markets?



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12. Mode of inculcating disaster management issues in medium-term development plans
13. How resourceful is the Disaster Prevention Department in executing its functions?
14. Do you have district prevention and recovery plans?
15. What role does the District Disaster Management Committee play in preventing the occurrence of market fire incidence?
16. Mode of ensuring compliance to the physical planning of the market
17. How does the Assembly ensure localisation of businesses and activities to reduce the risks of market fire incidence?
18. How adequate is the Assembly in terms of funds in providing relief to market fire disaster victims?
19. Reason(s) for your answer:
20. How adequate is the Assembly in terms of human resource capacity to prevent market fires and support victims to ensure quick and successful recovery?
21. How adequate is the Assembly in terms of logistics to prevent market fires and support victims to ensure quick and successful recovery?
22. Which other organisations do you liaise with in supporting market fire victims to recover?
23. What forms of support do you receive from other state institutions in ensuring successful recovery from market fire incidence?
24. How would you describe the interdependence and coordination among state institutions in providing support to market fire victims?



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25. At what point do you end your support to market fire victims in the recovery process?
26. What constraints limit the effective execution of your mandate with respect to the provision of support to disaster victims?
27. Any additional information:

******* THANK YOU *******



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**Appendix E: Interview Guide for the Electricity Company of Ghana**

Dear Sir/Madam,

This interview guide is designed to understand the management of post-disaster recovery among market fire disaster victims. The study is specifically for market fire incidents in 2012 and 2013. This is an academic investigation toward the award of a doctoral degree in Development Studies at the University of Cape Coast. I, therefore, entreat you to spare me some time to respond to issues in the instrument. Any information given would be treated with utmost confidentiality. Please note that the accuracy of your information is also very critical to the success of the study.

1. Role of ECG in the management of the markets
2. How do you manage electrical connections in the markets?
3. Regulations instituted in the markets to avoid the recurrence of fire outbreaks
4. Mode of enforcing such regulations
5. What do you do to people who do not comply with your regulations?
6. How (often) do you monitor activities in the market?
7. What hazard mitigation practices have you introduced to the market fire victims to avoid the recurrence of market fire disaster?
8. How (often) do you sensitise the traders on standard practices in electricity?
9. What constraints limit the effective execution of your mandate with respect to monitoring activities in the markets?
10. Any additional information:

******* THANK YOU *******



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**Appendix F: Interview Guide for Market Leaders**

Dear Sir/Madam,

This interview guide is designed to understand the management of post-disaster recovery among market fire disaster victims. The study is specifically for market fire incidents in 2012 and 2013. This is an academic investigation toward the award of a doctoral degree in Development Studies at the University of Cape Coast. I, therefore, entreat you to spare me some time to respond to issues in the instrument. Any information given would be treated with utmost confidentiality. Please note that the accuracy of your information is also very critical to the success of the study.

1. Number of traders operating in the market
2. Number of people falling victim to market fire in 2012 and 2013
3. What role do you play in the management of the market?
4. What forms of support do you provide for victims of market fire?
5. Standards and regulations instituted to prevent the recurrence of market fires?
6. How (often) do you monitor to ensure that traders abide by the set standards and regulations?
7. How do you enforce the adoption of the set standards and regulations?
8. How are the victims adopting hazard mitigation practices in their recovery process to avoid the recurrence of fire outbreaks?
9. Challenges you encounter in the execution of your functions in the market
10. Any additional information:

******* THANK YOU *******



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**Appendix G: Interview Guide for MacroFinance and Small Loans Centre (MASLOC)**

Dear Sir/Madam,

This interview guide is designed to understand the management of post-disaster recovery among market fire disaster victims. The study is specifically for market fire incidents in 2012 and 2013. This is an academic investigation toward the award of a doctoral degree in Development Studies at the University of Cape Coast. I, therefore, entreat you to spare me some time to respond to issues in the instrument. Any information given would be treated with utmost confidentiality. Please note that the accuracy of your information is also very critical to the success of the study.

1. What role do you play in ensuring the successful recovery of market fire disaster victims?
2. How do you provide financial support to market fire disaster victims?
3. What criteria are used to screen the applicants?
4. What strategies have been instituted to reduce default risk in advancing financial support to market fire disaster victims?
5. What do you do to beneficiaries who default payments?
6. How many market fire disaster victims have you been able to support so far?
7. On the average, how much loan do you advance to a victim of market fire disaster?
8. How would you describe the effectiveness of the financial support given by MASLOC to market fire victims?



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9. Which other State institution do you liaise with in advancing financial support to market fire disaster victims?
10. How would you describe the effectiveness of the relationship with the other State institutions?
11. Is MASLOC adequately resourced to continue to provide financial support to market fire disaster victims? If yes, how? If no, why?
12. What challenges do you encounter in advancing financial support to market fire victims?
13. Any additional information?

******* THANK YOU *******



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**Appendix H: Interview Guide for Selected Fully and Partially Recovered Market Fire Victims**

Dear Sir/Madam,

This interview guide is designed to understand the management of post-disaster recovery among market fire disaster victims. The study is specifically for market fire incidents in 2012 and 2013. This is an academic investigation toward the award of a doctoral degree in Development Studies at the University of Cape Coast. I, therefore, entreat you to spare me some time to respond to issues in the instrument. Any information given would be treated with utmost confidentiality. Please note that the accuracy of your information is also very critical to the success of the study.

1. Estimate amount of loss through the market fire disaster
2. How did you gather yourself emotionally to resume business operations?
3. How were you able to resume business operations?
4. Overcoming psychological stress from the disaster
5. Strategies to boost business operations after resuming activities
6. Repayment of debt incurred through the market fire disaster
7. Strategies put in place to avoid the recurrence of market fire disaster
8. Strategies put in place to reduce the impact of any further disaster
9. What might have accounted for your current state of business?
10. What might be done to improve business activities in the market?
11. Any additional information:

******* THANK YOU *******



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**Appendix I: Interview Guide for Selected Non-recovered Market Fire Victims**

Dear Sir/Madam,

This interview guide is designed to understand the management of post-disaster recovery among market fire disaster victims. The study is specifically for market fire incidents in 2012 and 2013. This is an academic investigation toward the award of a doctoral degree in Development Studies at the University of Cape Coast. I, therefore, entreat you to spare me some time to respond to issues in the instrument. Any information given would be treated with utmost confidentiality. Please note that the accuracy of your information is also very critical to the success of the study.

1. Estimate the amount of loss through the market fire disaster
2. Psychological stress encountered from the market fire disaster
3. Economic difficulties encountered from the market fire disaster
4. Strategies for managing the psychological stress from the market fire disaster
5. Strategies to manage the economic impacts from the market fire disaster
6. Reasons for your non-resumption of business activities in the market
7. Time you intend to resume business activities in the market
8. Support received from people and institutions
9. What might be done to enable you resume business activities in the market?
10. Any additional information:

******* THANK YOU *******



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**Appendix J: Information Sheet for Respondents**

You are being invited to take part in a research study which is aimed at managing post-disaster recovery of market fire victims in Ghana (specifically, Makola, Kantamanto and Kumasi Central Markets). Before you decide to take part in this study, it is important for you to understand why the research is being done and what it will involve. Please take some time to read the following information carefully and discuss it with others, if you wish. Ask the researcher, if there is anything that is not clear or, if you would want more information. Take time to decide whether or not you wish to take part.

**Who is conducting the study?**

The study is being conducted by Prince George Aning-Agyei, a student, being supervised by Prof. Stephen Bugu Kendie and Dr. Brempong Osei-Tutu, both of the Faculty of Social Sciences at the University of Cape Coast.

**What is the purpose of the study?**

The study is about assessing the impact and level of psycho-economic recovery of market fire victims in Ghana. The fieldwork for this study begins in June 2015 and will continue until September 2015.

**Why have I been asked to take part?**

You have been chosen to represent the views of fire disaster victims or institutions involved in the management of disaster in the Accra and Kumasi Metropolitan Areas.



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**What would be involved?**

The interview guide or interview schedule will be administered to you at a designated place in the market where you will feel more comfortable. The questions will ask about the psycho-economic impact of the fire disasters, effectiveness of institutions in managing post-disaster recovery, and the level of psycho-economic recovery from the disasters. The interviewing should not last more than 30 minutes.

**What happens next?**

If you are interested in taking part in this study, then a consent form will be given to you to sign to affirm your willingness to take part in the study.

**Do I have to take part?**

It is up to you to decide whether or not to take part. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part, you are also still free to withdraw at any time and without giving reason.

**What are the benefits of taking part?**

There may be no direct benefits of participating in this study. However, you will be providing useful and important information, which will inform policy makers and disaster-related institutions to reform their actions to provide effective support to disaster victims to ensure quick recovery.

**Will my taking part in this study be kept confidential?**

All information which are collected about you in the course of the study will be kept strictly confidential. No names will be recorded and so, it will not be linked



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to you in any way in the report of this study. However, your participation in this study is entirely voluntary.

**What will happen to the results of the research study?**

The results of the study will be presented to the Institute for Development Studies of the University of Cape Coast and also published in academic journals. If you wish, you can obtain a copy of the published results by contacting Prince George Aning-Agyei. You will of course not be identified in the final report or publication.

**Who is organising and funding the research?**

The research is being undertaken by Prince George Aning-Agyei, a student at the University of Cape Coast, under the supervision of academic lecturers. The student is funding this research.

Thank you for reading this.



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**Appendix K: Consent Form**

For this purpose, I would like to talk to you about matters relating to the psycho-economic impact and recovery from the market fire disasters. The interview will last for approximately 30 minutes. You have the right to withdraw from the discussion at any time without reason. I would ensure that your information, opinions and experiences are kept confidential and will only be used for the purpose of the study outlined. I will not use your name or make direct reference to your personal identity. With regard to collecting information for this study, I would greatly appreciate your help and, therefore, seek your consent and cooperation. You may ask questions related to the study and I will answer these questions to your satisfaction.

**Informed consent**

I have been informed in detail about the purpose and nature of this study.

I have received satisfactory answers to all my questions relating to this study.

I have decided that I will participate willingly and can withdraw at any time for any reason.

| ……. | …….. | …….. |
|---|---|---|
| **Name of participant** | **Signature** | **Date** |
| ……. | …….. | …….. |
| **Name of witness** | **Signature** | **Date** |

As a witness of this letter, I have ensured that the above information has been accurately conveyed to the participant. I also ensured that the respondent decided to participate in this study freely and willingly.



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