**UNIVERSITY OF GHANA**

**DEPARTMENT OF GEOGRAPHY AND RESOURCE DEVELOPMENT**

# EVALUATING POST-FLOOD DISASTER RESPONSE STRATEGIES IN ASHAIMAN AND AGONA SWEDRU

**BY**

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**THIS THESIS IS PRESENTED TO THE DEPARTMENT OF GEOGRAPHY AND RESOURCE DEVELOPMENT, UNIVERSITY OF GHANA, LEGON, IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF MPHIL, GEOGRAPHY AND RESOURCE DEVELOPMENT.**

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## DECLARATION

I hereby declare that this work is the result of my own research and has not been presented by anyone for any academic award in this or any other university. All references used in the work have duly been acknowledged. I bear responsibility for any shortcomings.

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## CERTIFICATION

We hereby certify that this thesis was supervised in accordance with procedures laid down by the university.

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## DEDICATION

This work is dedicated to my parents, Mr. and Mrs. Osei, my brother Joshuah Addy, and my entire siblings as well as my friend, Evelyn Ampadu. God richly bless you for the financial and spiritual support given me throughout my long years of education.

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## ABSTRACT

Highly concentrated urban areas have experienced many floods over the last decades. There has been significant increase in the trend of extreme rainfall events, in the face of a lack of effective flood management systems. Though rainfall in Ghana has been decreasing since the 1970's, and the government has initiated many disaster reduction interventions, incidences of flooding have ironically continued to increase. The study explores the post-flood disaster response mechanisms, effectiveness and dynamics in Ghana using the June 2010 flood incidences in Ashaiman and Agona Swedru as case study. This is undertaken through both qualitative and quantitative research methods. The study reveals that the interest and commitment of the institutions as well the public in undertaking flood risk reduction activities have waned with time. This is explained in an Activity Level Decline Model. Response operations should emphasise highly on preventive measures that would appreciably mitigate flood risk factors and make the communities safe from floods. This would, however, need the total commitment of all actors concerned with disaster risk management. In the long term, interest should be focused on activities such as local community outreach using the community, the churches and other religious organisations as the platform for the campaigns. More significantly, inter-organisational platforms and forums should be annually organised through which information and ideas on effective disaster prevention, preparedness, response and recovery activities could be exchanged, and orientations of concerned stakeholders properly shaped to reflect more of prevention and mitigation initiatives.

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| | |
|---|---|
| ALDM | Activity Level Decay Model |
| CRED | Centre for Research on the Epidemiology of Disasters |
| CDERA | Caribbean Disaster Emergency Management Agency |
| DMC | Drought Monitoring Centre |
| DACF | District Assembly Common Fund |
| EEA | The European Economic Area |
| ERA | Emergency Response Agencies |
| EM-DAT | Emergency Disasters Database |
| FEMA | The Federal Emergency Management Agency |
| FIG | International Federation of Surveyors |
| GRCCS | Red Cross and Crescent Society of Ghana |
| GSS | Ghana Statistical Service |
| HFA | Hyogo Framework for Action |
| ICS | Incident Command System |
| IDNDR | International Decade for Natural Disaster Reduction |
| IIED | The International Institute for Environment and Development |
| IFRC | The International Federation of Red Cross and Red Crescent |
| MTDP | Medium Term Development Plan |
| NADMO | National Disaster Management Organization |
| NGO | Non-Governmental Organizations |
| NDMP | National Disaster Management Plan of Ghana |
| NSOPER | National Standard Operation Procedure for Emergency Response |

| | |
|---|---|
| UN | The United Nations |
| UNCHS(Habitat) | The United Nations Centre for Human Settlements (Habitat) |
| UNDHA | United Nations Department of Humanitarian Affairs |
| UNDP | United Nations Development Programme |
| UN/ISDR | United Nations International Strategy for Disaster Reduction |
| WDR | The World Development Report |

# CHAPTER ONE

# GENERAL BACKGROUND

## 1.0 Introduction

Improving the quality of life of the world's population has been the core concern of countries across the globe (Fuduka-Parr and Ponzio, 2002), and projects and programmes are being undertaken each passing day to realize this end. Often times, most of the development trajectories followed tend to have adverse impacts on the environment though in varying scale across space (WDR, 2003). Some developments usually trigger disasters of varying sorts including flood, fire, drought etc (Anderson, 1991). This is usually phenomenal in the developing world, where the quest for development, in many cases, have triggered haphazard urban spatial outlook posing serious challenges to the environment, thereby leading to a reinforcement of the quagmire of problems already persisting in these countries (IIED, 2007; World Bank, 2010).

Admittedly, disasters have been one of the numerous phenomena that have posed substantial challenges on many economies, particularly the developing ones which have limited managerial capacities (World Bank, 2010; Actionaid International, 2006). According to UNDHA (2001), 'a disaster is a serious disruption of the functioning of society, causing widespread human, material or environmental losses which exceed the ability of affected society to cope on its own resources'. Disaster may occur in different forms and include those that result from fire, flood, drought and earthquake. Suffice stating that one of the most common and destructive hydro-meteorological events that have thwarted human development globally have been incidence of flooding (IFRC, 2001). Between 1971 and 1996, 163 major floods occurred in Europe (EEA, 2001). ReliefWeb (2002) also showcases the November, 2001 natural disasters

(mainly floods and typhoons) which killed about 576 Vietnamese and cost about 200 million US dollars of material losses. Mpofu (2000) observed that countries in Southern Africa experienced devastating floods in 1999 and 2000 which affected more than 150, 000 families. These flood events have hit developed and developing nations alike but are often observed to have a disproportionate impact on the poor and socially disadvantaged who are least able to help themselves (ActionAid, 2006).

In Ghana, flooding has become a seasonal worry to most communities as well as the government. Across the country, some communities experience periodic flood disasters of varying scale and intensity whenever there is a downpour. In Northern Ghana, for example, climate change impacts result in severe droughts in the dry season and severe floods in the rainy season causing huge losses both in monetary and human resources. Most people are recurrently rendered homeless due to flooding. In recent times, flood disasters have caused major disruptions in the socio-economic development. In many instances, floods have washed away highly invested projects such as roads making the expenditure on such projects recurrent on the government.

Recollecting few, in 1999 rainfall induced storm caused coastal floods that resulted in many deaths across the coastal parts of Ghana, with Accra being very much affected (Karley, 2009). In June 2001, torrential rain caused widespread flooding in Ghana and particularly Accra, leaving 11 people dead and over 100,000 without homes (Karley, 2009). Report in the Daily Graphic (2005) indicates that in 2005, the country was one of the worst hit of the countries in Western Africa that experienced severe flooding leaving 20 people across the Upper East, Upper West and Northern regions dead. The National Disaster Management Organization (NADMO) estimates that about 350,000 people were severely affected during these flooding incidents and several hundred hectares of crops of farmland were completely washed away. In 2008, it was estimated

that the summer flooding in July and August caused more than US$1 million worth of damage in the country (Vanguard Assurance, 2008 as cited in Karley, 2009).

With the recent high rate of urbanization, worse environmental situations are inevitable (Yankson and Gough, 1999). While the rates of urbanization have been lower than in neighbouring countries in West Africa, Ghana is following similar trends in which by 2030, 58 percent of the people will be located in urban areas, with the average annual growth rate being 3.1 percent from 2000-2010, reaching 2.2 percent from 2020-2030 respectively (UN, 2005). Uncontrolled urban growth has led to the springing up of conspicuous features of informal settlements and many inner city slums (FIG, 2010). These settlements are usually sited in flood plains and other environmentally sensitive areas in most cities globally (FIG, 2010). Ghana has not been an exception in the phenomenon of growth of informal settlements in the cities (World Bank, 2008).

Ashaiman, a predominantly migrant and highly heterogeneous population with population hovering around 150,312 (GSS, 2005), has been one of the municipalities characterized by slums and growth of informal settlements with poor environmental and household conditions. Similarly, Swedru, one of the highly populated municipalities in the central region with a population of 45,614 by the 2000 population census, has got some informal structures and settlements growing within it (GSS, 2005). The developments, create vulnerable conditions to flooding making the outbreak of both natural and human induced flood disasters inevitable (UNDP, 2004). The June 2010 Ashaiman flooding that took away lives as well as the June 2010 devastating floods in Swedru that swept away properties worth millions of Ghana cedis are sufficient to buttress this development.

These few instances of floods outlined above unveil some of the challenges floodwater present, hence warranting immediate support for the affected communities as well as repositioning such communities at flood resilient levels (FEMA, 2011; World Bank, 2010). The effectiveness of these response mechanisms is prominent in reducing the impacts associated with such inhumane phenomena, or better still prevent their recurrence. Thus stakeholders could seize the window of opportunity provided by the flood disaster to rebuild a more sustainable and flood resilient community (Comfort, 2005; Anderson, 1991; Cuny, 1983). However, interplay of factors which include political, socio-cultural and institutional capacities make it rare to adequately reduce, if not totally avoid, the recurrence of such devastating floods in our human settlements (Oxfam, 2005; Cuny, 1983). Although the causes and dynamics of flooding in Ghana have been extensively studied, little is known about what happens following their containments and the restoration of normalcy or stability. This study, therefore, explores the effectiveness of the post-flood disaster response efforts in Ashaiman and Agona Swedru.

### 1.1 Problem Statement

In recent years, incidence of flooding has become a major problem throughout the world. Many lives have been taken, and costs due to damages typically run into hundreds of millions of dollars. Many of the major flood events have occurred in highly concentrated urban areas (World Bank, 2011). There have been enough events in every region of the world to identify flooding as a global problem, and to warrant urgent and concerted international action towards risk reduction (World Bank, 2011). World Bank report revealed that Asia-Pacific region has assumed that notoriety of being the worst affected in terms of economic impact and size of population involved, followed by Africa. There has been a significant increase in the trend of large

magnitude floods, in the face of a lack of effective flood management systems (UNDP, 2006).

Recent studies have revealed that Ghana is an exception to the global dynamics in the face of verifiable climatic variations (Karley, 2009; Nyarko, 2000). For example, the rainfall pattern in the country was particularly high in the 1960s, but decreased to particularly low levels in the late 1970s and early 1980s (World Bank, 2011). Available data show that, between 1960 and 2006, rainfall witnessed an overall decreasing trend of 2.3mm per month or 2.4% per decade (World Bank, 2011). These decreasing rainfall trend notwithstanding, the incidence of flooding have ironically increased over the 1986-1995 period, and have continued to increase in the last decade (World Bank, 2011). This worrying trend is happening in spite of government's continuous efforts towards strengthening institutional capacity in disaster risk management as well as building social and ecosystem resilience to any future extreme climatic events including floods (World Bank, 2011).

In most cases, communities previously hit by floods frequently witness the recurrence of similar events or harsher scenarios in no time. This suggests that, the state of the affected community might not have been fully put in flood resilient conditions during the preceding response and recovery operation before its re-occupation. Thus, the underlying flood risk factors in the affected community might not have been comprehensively mitigated. This brings about the recurrence of even harsher scenarios. But World Bank (2011) has indicated that the harsher the disaster events such as floods, the higher the incidence of poverty. Therefore, there is a need to properly plan and carefully adopt disaster response and recovery pathways that ensure building flood

resilience community, and integrate mitigation measures into all facets of planning towards disaster risk reduction and disaster management.

The frequent recurrence of flood events particularly in the urban centers have augmented response operations performed by stakeholders involved especially the National Disaster Management Organization (NADMO). Responding to, and managing more flood disasters presents operational challenges to national and regional disaster response capacity. Moreover, not all governments or organizations have sufficient infrastructure or capacity to cope with increased flood disasters. Therefore, several dynamics surface to derail effective execution of the response operations. This includes: delays or flaws in the execution of the response strategies (Ingram et al., 2006); and unfair distribution of relief items or curtailed response process perhaps due to politics infiltrating the response system (Oxfam, 2005). Hence, the condition of the affected population is far worsened before the assistance is offered them, and the scale of the required rehabilitation is usually made tremendous. These developments raise issues about the dynamics of post-flood disaster response operations, thereby, making this research worthwhile.

Literature is replete with studies addressing efficiency issues in post-disaster response and reconstruction in several parts of the world (Vale and Campanella, 2005; Burby and Deyle, 2000; Berke et al., 1993). However, the current literature search in the Ghanaian context revealed that, the subject has received very little academic or scholarly attention. Indeed, to the best of the researcher's knowledge, little or not much has been done in terms of analyzing the post-flood disaster response mechanisms, effectiveness, and its dynamics in the Ghanaian context. This information dearth also coincides with the growing concern about the increasing frequency and severity of disaster events at a time when early warning systems are inadequate and disaster

management is apparently weak (DMC, 2000). This research thus, contributes in bridging the dearth in literature by exploring the efficacy of post-flood disaster responses in Ghanaian context.

## 1.2 Research Questions

Bordered by issues concerning efficiency in post- flood disaster responses, the researcher muses on a number of key questions regarding the flooding and the responses in Ashaiman and Agona Swedru, which experienced flood incidence concurrently in the month of June 2010. The questions asked are stated thus:

a. Why is the occurrence of flood disasters increasing in the face of dwindling rainfall patterns?

b. How did the state/conditions of the study communities improve following the execution of disaster response?

c. What has been the character of disaster response operations in the study areas?

d. How did the response operation consider the needs of the most vulnerable in the communities?

## 1.3 Objective

The main objective of the study is to assess the efficacy of post-flood disaster response strategies and mechanisms in the study areas.

### *1.3.1 Specific Objectives*

a. Identify the disaster response strategies through which flood response and recovery exercises are executed in Ghana.

b. Investigate the effectiveness of the post-flood disaster response and recovery strategies in the study areas.

c. Examine the challenges that thwart successful execution of the post-flood response and recovery strategies in the study areas.

d. Provide policy recommendations on disaster response strategies.

### 1.4 Proposition

Effective response strategies reduce the susceptibility of the affected communities to future flood recurrence.

### 1.5 Organisation of the Study

The study has been organised into five chapters. The first chapter discusses the general background of the study. This entails the statement of the problem which further defines the questions that guide the study, the objectives of the study, and the proposition. The second chapter reviews literature relevant for the study. It is under this chapter that the conceptual framework is discussed. The third chapter discusses the study areas, research design and methods. It presents the physical, social and economic characteristics of the research locations. These provide enough background information of the two research locations which facilitate smooth transition to the data collection methods and techniques. The discussion and analysis of the results of the survey, with the intent of achieving the objectives of the study, is presented in the fourth chapter. The final chapter presents the summary of the findings, conclusions and the recommendation towards improving post-disaster response operations.

# CHAPTER TWO

# LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

## 2.0 Introduction

This chapter reviews the literature under specific themes and topics: development and disaster risk; urbanization and disaster risk; floods - types, causes and effects**;** disaster management and flood vulnerability reduction; disaster management in Ghana; and historical and global experiences of post-disaster response and recovery approaches. It also presents the conceptual framework for the study.

## 2.1 Literature Review

### *2.1.1 The Nexus between Development and Disaster Risk*

Development encompasses continuous 'change' in a variety of aspects of the human condition (Chambers, 2004). The dimensions of development are extremely diverse, including economic, social, political, legal and institutional structures, technology in various forms, the environment, religion, the arts and culture (Corbridge, 1995). Though, the brain behind these strategic changes in varying aspects of human society has been to adequately enhance the quality of life of the people (Fuduka-Parr and Ponzio, 2002), many unanticipated dire effects have coupled the expected changes (IFRC, 2010; UNDP, 2004).

Thus, some development initiatives have failed in many parts of the world, and it is the failures of development that have led to an accumulation of disaster risks making the outbreak of disasters frequent (White et al., 2005). According to the Centre for Research on the Epidemiology of Disasters (CRED) (2009), in 2008, disasters killed more than 235,000 people, affected about 2.14 million people, and cost over 190 billion US dollars. Over recent years, there has been an increase in the number of small

and medium scale disasters, especially storms, floods and epidemics (IFRC, 2010), most of which have been triggered by the effects of development.

Thus, the nexus between disasters and development cannot be overlooked (Anderson, 1991; UNDP, 1994). Viewing disasters in the context of development, the growing literature on the relationship between disasters and development reveals four basic themes: disasters setting back development; disasters providing development opportunities; development programmes increasing an area's susceptibility to disasters; and development programmes decreasing an area's susceptibility to disasters and their negative consequences (UNDP, 1994).

Disaster events are capable of destroying years of development initiatives, wiping out major assets, and global human resources (World Bank, 2010; CDERA, 1996). Most national and global infrastructures such as transport and utility services have been damaged by disasters, forcing the diversion of scarce resources into repairs or replacement of such assets rather than the creation of new wealth (CDERA, 1996; UNDP, 1994).

However, disasters often provide opportunities for development (UNDP, 2004). Thus, disasters create a platform through which sustainable development programmes such as land reforms and redevelopment could be effected (World Bank, 2010; UNDP, 1994). This, however, can be achieved only under circumstances where there exists a well-established disaster management system. The United Nations Development Programme (2004), therefore, emphasizes the need to consider emergency responses and disaster management in the context of development, and the integration of development considerations into emergency response planning and operations. But most response operations fail to successfully progress to levels where disaster risk and vulnerability reduction initiatives could be undertaken. Thus, the dynamics of most

post-disaster response operations have not allowed an adequate seizure of the 'window of opportunity' created by the disaster events. Hence, disaster risks have accumulated and persisted in most human settlements especially urban centers despite the frequent recurrence of disaster events such as floods at these places.

### *2.1.2 Urbanization and Disaster Risk*

One conspicuous feature in the history of human pursuit for development has been urbanization. According to UN-HABITAT's report (2010), no country has ever achieved sustained economic growth and rapid social development without urbanization. Urbanization is fast occurring in developing countries especially those in Africa and Asia (United Nations, 2004; Ziegler et al., 2003). The United Nations (2006) observed that half of the world's population of around 6.4 billion people, as at the year 2005, lived in urban centres, compared to less than 15 per cent in 1900 (Graumann, 1977). According to the World Bank (2008), the share of population growth in Ghana is shifting considerably from rural to urban areas.

It has been argued that strong urban economies are the backbone and engine of a national wealth (Parr, 1998). It is assumed that cities, with their accumulated capital resources could become the growth centers through which innovation and progress are nourished and diffused to the peripheral centers (Angotti, 1998; Parr, 1998; Penouli, 1972; Friedmann, 1966). Therefore, most cities in the developing countries have been the beneficiaries of major infrastructural and economic investments. But very minimal trickle down effects have been realized, widening rural-urban inequalities. This has triggered influx of people into the cities (Gilbert, 1974; Conroy, 1973).

Urbanization may be a necessary condition to generate growth and development but not a sufficient condition to guarantee a sustained economic growth and social

progress (Parr, 1999; Henderson, 2000; Kessides, 2005; Bloom and Khana, 2007). But most African cities lack the sufficient prerequisite such as higher income earning opportunity, and better infrastructure and services for economic growth. This has influenced risks accumulation in most cities in Africa. Hamza and Zetta (1998) have argued that urban areas are not disaster prone by nature but that the structural process that speeds up rapid urbanization, population movement and population concentrations greatly increase vulnerability of low-income urban dwellers to disasters.

In Ghana, the effects of the Structural Adjustment Programme in the 1980's on urbanization cannot be overlooked. Though it had positive impacts on the economy, it led to the polarization of the country between regions, between cities and rural areas, between people in different sectors, between the elite and politically weak (Songsore, 2003; 2003b; Jonah, 1989). This led to migration of labour into the south mainly the cities and towns, bringing about risk accumulations and creating sanitation nightmares within the urban areas (Grant and Yankson, 2003; Konadu-Agyemang, 2001; Yankson, 2000). Songsore (2004) also observed that rapid urban change has outpaced the capacity of most governments in developing countries to appropriately address urban environmental health challenges.

Urbanization has lead to high proliferation of inner city slums and informal settlements within most cities of Ghana (FIG, 2010; World Bank, 2008; UNDP, 2004). In 2001, it was estimated that more than half of Ghana's urban population lived in slum settlements characterized by high density, poor infrastructure, low housing quality, and irregular development without any planning (The UN-Habitat, 2006). These settlements are often located along flood plains leading to the growth of unstable environment, and generating disaster conditions such as floods (FIG, 2010; World Bank, 2008; UNDP, 2004).

Flooding has been more frequent and intense in Ghana, and often occurring in locations previously not at risk (ActionAid, 2006). Since 1995, the cities of Accra and Kumasi have been predominantly affected by floods (ActionAid, 2006). These suggest that the processes that have shaped urbanization in Ghana have tended to create or exacerbate flood risks and vulnerabilities (UN-Habitat, 2006; World Bank, 2008). Therefore, post-flood disaster response operations become mechanisms through which well-planned restoration and reconstruction could be undertaken, and risks significantly reduced. Thus, the accumulated risks in the cities of Ghana facilitate flood disasters, but the disasters serve as the platform and fundamental 'tool' towards risk reduction in the cities. The success of this, however, requires intense and sustained commitment as well as sacrifice by all stakeholders including the affected community.

### *2.1.3 Floods: Types, Causes and Effects*

Severe earthquakes, cyclones, and floods cause widespread devastation and generate sensational images for months or even years after their occurrence (WMO, 2007). In the 1990s, more than 90 per cent of those killed in disasters lost their lives in hydro meteorological events such as droughts, windstorms and floods, but floods accounted for more than two-thirds (IFRC, 2001). Floods are the most frequently occurring events, affecting both rural and urban settlements (Jha et al., 2012). According to the EM-DAT global disaster database (OFDA/CRED, 2011) between 1985 and 2009, floods were the most common natural disaster, accounting for 40 percent of all natural disasters.

Flood is a temporary covering by water of land normally not covered by water. Floods are caused by many factors: Heavy rainfall, highly accelerated snowmelt, severe winds over water, unusual high tide, tsunamis, or failure of dams, levees, retention ponds, or

other structures that retained the water. Flooding can be exacerbated by increased amounts of impervious surface especially in urban settlements or by other natural hazards such as wildfires, which reduce the supply of vegetation that can absorb rainfall (Thompson, 1964; Welch *et al*., 1977; USEPA, 2002; Powell, 2009).

*2.1.3.1 Types of Flooding*

Descriptions and categorizations of floods vary and are based on a combination of the sources, nature, causes and impacts associated with them. From such combinations, floods can be generally classified, among others, as river or fluvial floods, tidal or coastal floods, flash floods and urban floods (Jha et al., 2012). Coastal or tidal floods arise from incursion by the ocean or by sea water. They result from an unexpected relative increase in sea level caused by storms surge or a tsunami. Thus, storms with high wind speeds cause tall and powerful waves, but low pressure fronts cause sea levels to rise above normal levels, creating dome of water which may be forced towards the land, inundating the coastal zones (Bariweni et al., 2012). This is often sudden and presents a significant danger to life. It is often possible to forecast, with reasonable accuracy, this type of flooding due to the predictability of the tide and track ability of low pressure systems (Dance and Hynes, 1980).

Some floods occur in the floodplains of rivers when the capacity of water course is exceeded as a result of rainfall or snow and ice melts within catchment areas further upstream. Blockages of water courses and flood channels by settlements may also lead to rising water levels. The excess water overflows the banks of the watercourse and spills out into adjacent, low-lying floodplain areas (Jha et al., 2012). This form of flood is the fluvial or river floods. Examples can be mentioned of the June 2010 floods in Agona Swedru and Ashaiman. Preventing this form of floods demands channel modification to increase channel capacity, and more sustainably, keeping human

infrastructure away from stream banks and out of floodplains. The latter is the most cost effective means of managing flooding events.

Another type of flood is the flash flooding. According to the U.S. National Weather Service (2006), flash flood is a rapid and extreme flow of high water into a normally dry area. World Meteorological Organization (2007) defines it as a flood of short duration with a relatively high peak discharge. Flash floods are typically caused by torrential rainfall, but can also occur from a dam break. Urban flash flooding is a serious and increasingly common problem as cities grow and sprawl. Impervious surfaces like concrete or compacted soils create instant high energy runoff from heavy rainfall that can inundate roads and buildings (Jha et al., 2012). These have been common in urban areas. These types of floods are much devastating and common in many cities poor management systems, and most cities in the developing countries are worst affected by this type of floods.

*2.1.3.2 Effects of Floods*

Floods, irrespective of the type, impact on people, infrastructure, and family assets alike. In 2010, reported flood disasters killed over 8,000 people directly worldwide (Jha et al., 2012). Two-thirds of direct deaths from flood events are caused by drowning and one-third by physical trauma, heart attack, electrocution, carbon monoxide poisoning or fire (Jonkman and Kelman, 2005 as cited in Jha et al., 2012). Release of contaminants poses serious public health risks for survivors of floods. Flood waters can mix with raw sewage and thus dramatically increase the incidence of water-borne diseases. Such contaminated flood waters eventually contaminate the affected community's drinking water, bringing about death from water related diseases such as diarrhea and cholera (Kunii et. al., 2002).

Fast flowing floodwaters are also capable of washing away entire buildings and communities. In January 2011, floods in South-Eastern Brazil rendered about 100,000 people homeless and destroyed key infrastructures (Jha et al., 2012). The economic losses associated with floods cannot be overlooked. The estimated costs and losses in the 2010 flood in Lomé were about $15.5 million in the social sector and $19 million on infrastructure (Amankwah-Ayaeh and Caputo, 2011 as cited in Jha et. al., 2012). The damages and impacts floods exert on human settlements are devastating; therefore, incorporating risk mitigation activities in all phases of disaster management including the response phase cannot be underestimated.

### *2.1.4 Disaster Management and Flood Vulnerability Reduction*

Emphasis on the reactive traditional methods of disaster management has made urban inhabitants in developing countries more vulnerable to disasters such as floods (CRED, 2004). Vulnerability has been defined by UN/ISDR (2005) as conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards. Traditional methods of disaster management have continued to focus on reactive responses such as relief and rescue (CRED, 2004). With approach to disaster management, life threatening event such as flood is only given attention "as and when they occur". The implication is that efforts to reducing underlying flood risk factors and human vulnerability to flood disasters are less a priority. This is a development which permits the recurrence of disasters. Moreover, the enormity of current global disasters makes reactive response to disasters woefully inappropriate (Munslow and Brown, 1999).

There is the need, therefore, to promote strategic and systematic approaches to reducing vulnerabilities and risks to hazards. This has been underscored by the ''Hyogo Framework for Action (HFA) 2005–2015'' (United Nations, 2005). The HFA

aims to make the world safer from natural hazards by reducing, to a very minimum level, the number of occurrence of disaster events and the economic losses associated with such events (United Nations, 2005).

The HFA outlines five priority areas for action which include: ensuring that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; identifying, assessing and monitoring disaster risks and enhance early warning; using knowledge, innovation and education to build a culture of safety and resilience at all levels; reducing the underlying risk factors; and strengthening disaster preparedness for effective response at all levels (UN\ISDR, 2011). It is noted from the HFA, that local capacity building in terms of knowledge of flood disasters and their mitigation measures is highly uncompromising in achieving and ensuring the existence of a flood resilient community. It prescribes incorporation of risk reduction into all facets of disaster management including the response phase.

Despite these major developments in disaster management culture, emergency aid still tops the funding list of most donor agencies and national governments (CRED, 2004). This is perhaps due to the fact that emergencies are media friendly, funds are less flexible to obtain because it is seen as morally justified and humanitarian to help those incapacitated by such disasters (CRED, 2004). For instance, millions of US dollars were spent by donor agencies on famine relief in Niger during a drought situation in 2005, but there was limited interest among donors on Senegal's proposal to build a "green wall" against the encroaching desert which could also lead to a drought situation (O' Brien et al., 2006). This suggests that, in countries where majority of the stakeholders have their orientations towards rescue and relief services, vulnerability and risk reduction initiatives would be less financed. Thus, vulnerability and risk reduction initiatives would not be sustained. Though, the reactive management practice

has its positive elements such as helping people in their immediate unfortunate situation, it does little at reducing the underlying risk factors, and thus expose the population to similar disaster events in the near future.

Moreover, reactive approaches to disaster management are less vital and virtually unsustainable, especially in the face of numerous and frequent disasters that are being recorded worldwide. Moreover, it is impossible for any governmental and non-governmental organization to, single handedly or even in joint forces, adequately and satisfactorily meet the pressing needs and demands disaster victims. No amount of relief could compensate for the economic losses the victims incur as well as the emotional and psychosocial stresses and tremor endured by the victims.

Flood losses could potentially be reduced quite dramatically through reduction of exposure and vulnerability of populations to flood risks. It has been identified that, hazards only become disasters when people's lives and livelihoods are swept away (Annan, 2003). This suggests that, vulnerability and risk reduction must be the underlying principles of disaster management systems. These are disaster preventive measure acknowledged within the sustainability standards, and this is quite essential over efforts directed at giving hands to disaster victims.

Though, the proactive approach to disaster management aims to reduce outbreaks and recurrence of disasters, preparedness for effective response as prescribed by the HFA cannot be underestimated. Thus, in an unfortunate event of disasters, effective handling of the rescue and relief services sets the favorable platform through which the mitigation and sustainable initiatives could be undertaken uninterruptedly. The response structure based on the Incident Command System (ICS) - 'a systematic tool used for the command, control, and coordinate emergency response'- is a standard

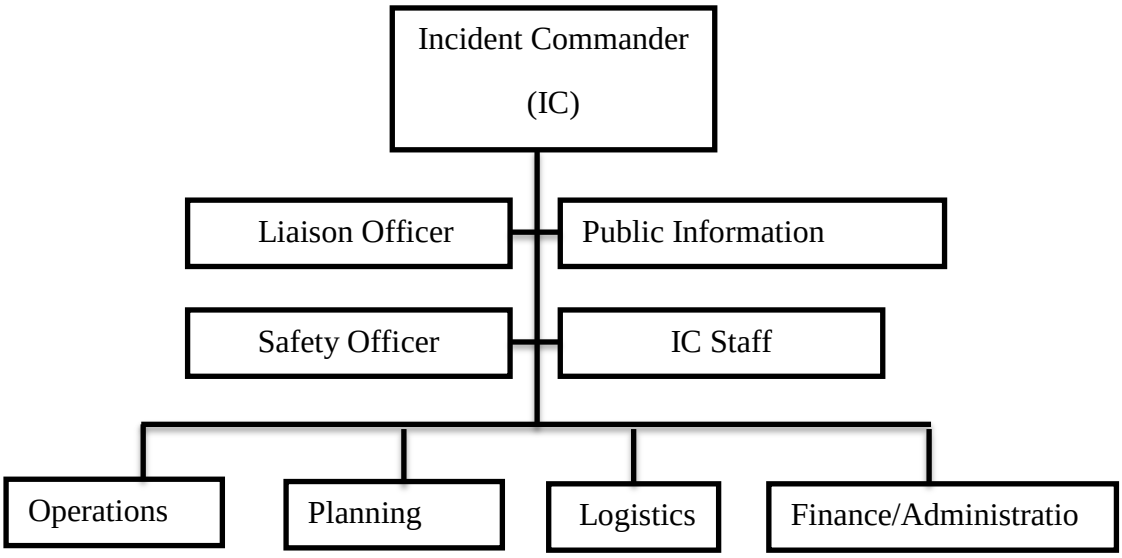
framework for managing such events (FEMA, 2010). Regardless of the size of the incident or the number of agencies involved in the response, all incidents require a coordinated effort to ensure an effective response, and efficient and safe use of resources (Herrmann, 2007).

To coordinate the effective use of all of the available resources towards proving relief and successively undertaking risk and vulnerability reduction initiatives, agencies need a formalized management structure that lends consistency, fosters efficiency, and provides direction during a response (Herrmann, 2007). ICS is the model tool for command, control, and coordination of a response, and it provides a means to coordinate the efforts of individual agencies as they work toward the common goal of stabilizing the incident and protecting life, property, and the environment (Herrmann, 2007). The Incident Command System is a practical system for restoring normalcy and building sustainability. It defines the structure of the incident response as well as the coordination of the responding agencies (Herrmann, 2007). Fig. 2.1 is the structure and hierarchy of the Incident Command System.

As shown in Fig. 2.1, the ICS is built around five critical components with someone identified as the lead for each component (Herrmann, 2007), whilst highlighting liaison between and among the components. Thus, the field response level is normally structured to facilitate activities in five major functional areas: Command, Operations, Planning, Logistics, and Finance & Administration (FEMA, 2011). The command function is directed by the Incident Commander in charge at the incident. When expansion is required, the Incident Commander establishes other Command Staff positions: Information Officer, who coordinates the release of information to the media; the Safety Officer, who monitors safety conditions and develops measures for ensuring the safety of all assigned personnel; and the Liaison Officer who is the on-

scene contact for other agencies assigned to the incident. The Incident Commander activates additional General Staff sections as necessary. This includes the Planning, Operations, Logistics, and Finance & Administration sections. The creation of these sections ensures resource utilization, effective provision of facilities, services, and materials; and tracking incident costs (FEMA, 2008).

**Fig. 2.1: Incident Command Structure and Hierarchy**




*Source: FEMA, 2011.*

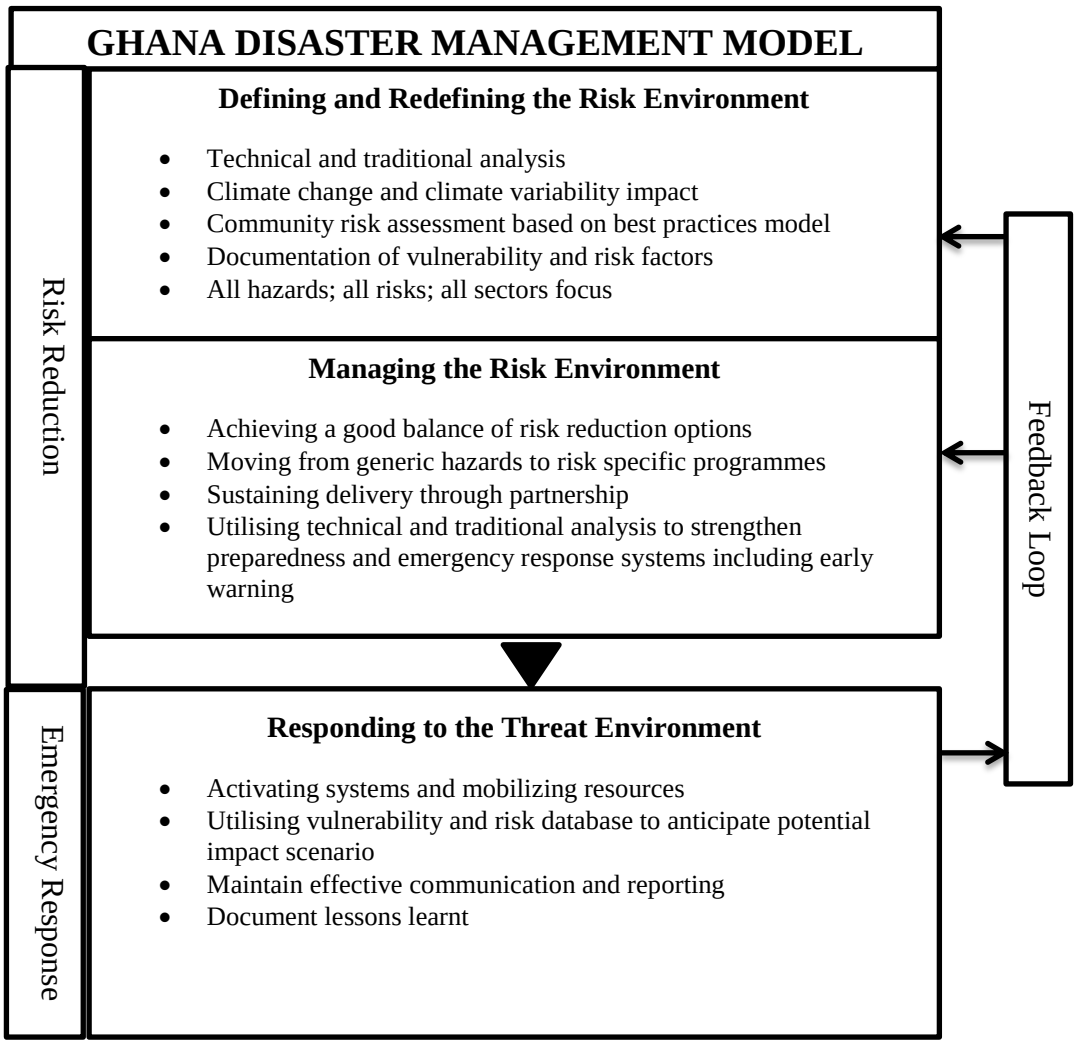
The ICS, therefore, is an important system through which a well-coordinated response is executed. This system has been incorporated in the Recovery Continuum Framework. It operates particularly in the immediate phase of the response and recovery process. It facilitates the progression of the response and recovery efforts through the intermediate phase to the long term phase where vulnerability and risk reduction initiatives are undertaken. Thus, the Incident Command System guarantees the consideration of the interest of all stakeholders, thereby neutralising the differences, as well as other variables that could impede the successful execution of the response operation.

### *2.1.5 Disaster Management in Ghana*

Societies with high poverty levels have been the most vulnerable to disasters. Reckoning this, Ghana formed the National Disaster Management Organization in 1996, backed by an Act of Parliament (Act 517) to manage disasters and emergencies. This constitutional provision, which establishes NADMO, provides it with the legal basis to execute disaster response and recovery assistance/operations in the country. Formation of NADMO came about after Ghana had responded to the United Nation Declaration GAD 44/236 of 1989 declaring 1990 to 1999 as the International Decade for Natural Disaster Reduction (IDNDR). The IDNDR was brought into force to increase the awareness of the general public on the need for disaster prevention and encourage member states to establish agencies to manage disasters.

Prior to the formation of NADMO, the National Mobilization Programme, set up after the 1982-1983 crises of drought, bushfires, famine, and the deportation of about 1.2 million Ghanaians from Nigeria served as the implementing agency of the Disaster Relief Committee until 1994. This programme metamorphosed into NADMO in the 1996 through the Act of Parliament. NADMO's mandate includes the drawing of plans to prevent disasters or mitigate their effects on residents in Ghana, to coordinate activities before and during emergencies such as registration of victims; relief efforts; operations, ensuring post - disaster rehabilitation, reconstruction as well as resettlement including mobilization and provision of resources (NADMO, 2005). It uses a decentralized system in the discharge of its duties. Structurally, there is the National, Regional, Metropolitan, Municipal and District disaster response and risk reduction platforms (NADMO, 2005). NADMOs operation is couched within the Disaster Management Model of Ghana shown in Fig. 2.2.

**Fig. 2.2: Ghana Disaster Management Model**




*Source: NADMO, 2005.*

The Disaster Management Model for Ghana is based upon risk reduction and emergency response. Identifying and reducing the disaster risks in Ghana as well as responding to the threat posed by disasters fall under risk reduction whilst the emergency response element of the model entails responding to the consequences of disasters of whatever sort and form. The element of the model 'defining and redefining the risk environment' generates knowledge of interaction of the hazards and the element at risk using a more scientific and systematic analytical procedures. This might include establishing the likely threats; understanding the possibility and

consequences of the risks; understanding the social, political and community environment etc. through structured and analytical measures.

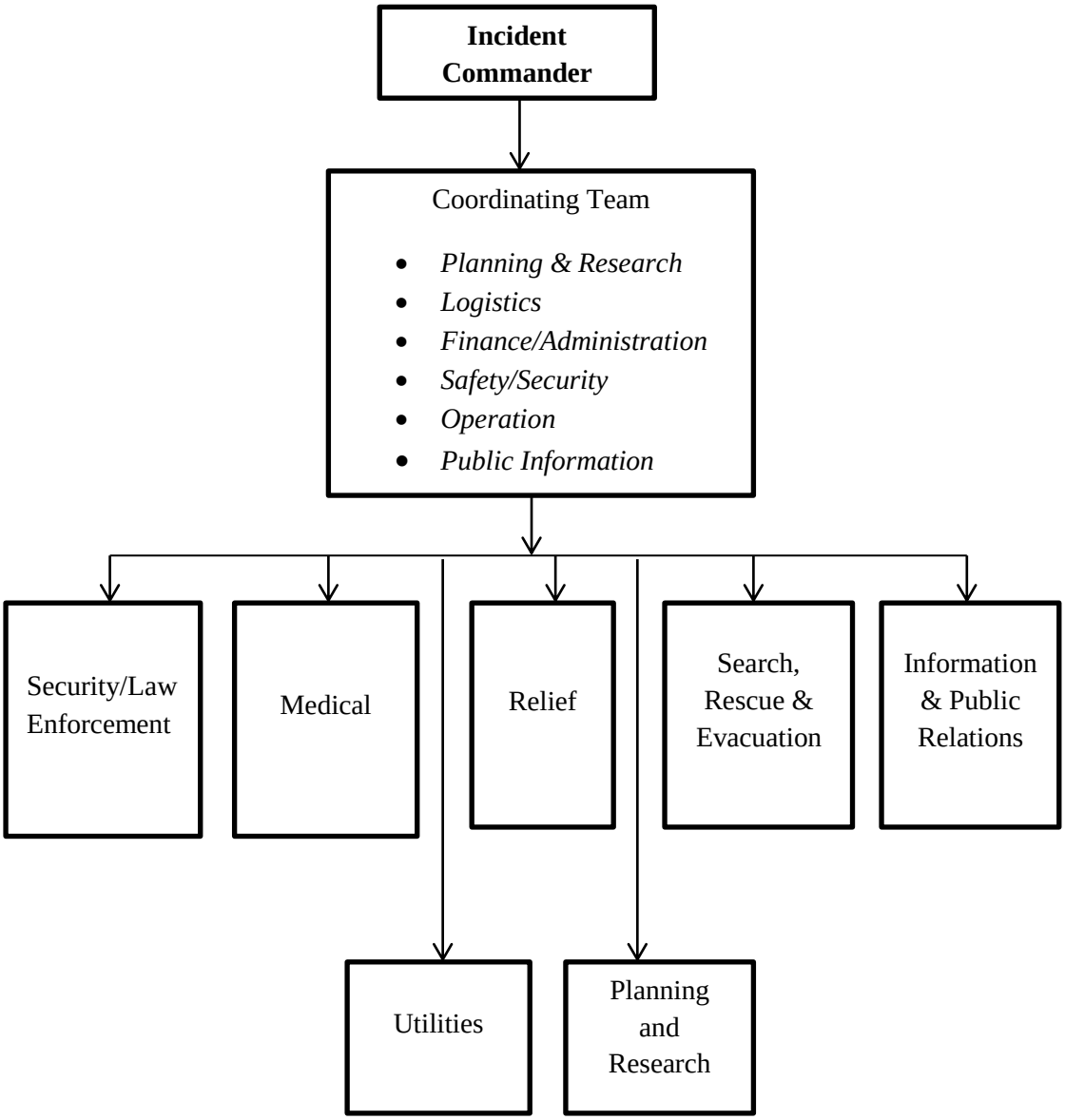
The next element is the management of the risk environment. This element on the model involves activities which seek to ensure that prevention, preparedness, response and recovery programmes are multi-hazard oriented, and that management of risk environment is tilted from hazard generic towards risk specific. The prime purpose of the element is to effectively empower the communities to better understand their continuous changing risk environment and thus become more resilient through proactive risk reduction efforts.

The model acknowledges that, impacts of disasters could be reduced to the very minimum if proper mitigation measures are undertaken. But not all disasters can be prevented, eliminated or minimised. Therefore, the element 'responding to disaster environment' in the model comes in to deal with the actual threat situation. The response may include: warning period which involves alert and activation of emergency response services; disaster onset which constitutes the response operation; and post disaster period which encompasses relief, recovery and rehabilitation.

The National Standard Operating Procedures for Emergency Response serves as the emergency operating component to the National Disaster Management Plan of Ghana (NADMO, 2010). This National Standard Operating Procedure for emergency response in Ghana states clearly, the agencies and stakeholders in emergency response operations, defines the task/roles/responsibilities of such agencies, establishes the operational procedure for disaster response operations, and defines the command systems both within and/or between disaster response teams. Shown in Fig. 2.3 is the Incident Command Structure under the National Standard Operating Procedures for

Emergency Response in Ghana, which diagrammatically demonstrates the on-scene response operation by the various response teams.

**Fig. 2.3: Emergency Response Operations Structure Used in Ghana**.




*Source: NADMO, 2010.*

As shown in Fig. 2.3, the hierarchy of command in an on-site/scene disaster situation has been defined having components such as the Incident Commander (established according to the type of emergency), who directs and co-ordinates the activities of Task Force Teams involving personnel from the planning and research section; the

logistics section; finance/ administration section; safety/ security section; operation section and the public information section.

The Task Force Teams are the Emergency Response Agencies (ERA) that participate in the field response effort. From the structure, there are seven Task Force Teams which engage in emergency response operation in Ghana. These are the Security/Law Enforcement Team in charge of maintenance of law and order at the disaster site; Medical Team which provides medical care; Relief Team which provides quick assessment of relief requirements; registers victims; supply basic needs: food, water, shelter, clothing, medicine, counselling; Search Team, Rescue & Evacuation Team which performs quick damage assessment and demarcation of damaged areas, and rescue of people marooned by flood; Information & Public Relations Team which disseminate information and gives public education on the disaster; Utilities Team shuts down unsafe electrical circuits, fuel supplies; and Planning and Research Team collects data on damages/losses for evaluation and future.

Careful examination of NSOPER, as shown in Fig. 2.3, reveals some harmonies of the Ghanaian Emergency Response Strategy with the internationally recognised standard of emergency response given by FEMA in the Recovery Continuum Framework as shown in Fig. 2.5. NSOPER functioning within the Ghana Disaster Management Model commensurate the guiding principles given in the Incident Command System which forms an integral part of the Recovery Continuum Framework as shown in Fig. 2.5 (FEMA, 2011). Therefore, with liaison highlighted between and among the components and leaders of each agency in the emergency response service, a well-coordinated response and recovery process is possible. Highlighted by Oxfam (2005), key concerns that stimulate most post-disaster agitations and obstructions tend to hover around services concerning relief and rescue. Indeed, with such careful and well-

planned disaster response system spelt out in the NSOPER, and which does not function in isolation but functions within the Ghana Disaster Management Model, there is a potential to curtail some of these inconsistencies and obstructions in the overall response operation as well as reduce reliance on unrehearsed approaches as highlighted by Herrmann (2007). Hence it has the capability to establish the enabling environment through which the community could be resituated in a state where recurrence of similar disaster incidence becomes highly impossible.

The ICS has proven to be very useful in managing post disaster situations in settings comparatively endowed with technological, material and human resources necessary for the implementation of the principles as spelt out in the ICS. In an environment relatively limited with such necessary implementing requirements, would the NSOPER effectively function as the ICS does in the advanced countries? Categorically, this would require decisive sacrifice, absolute commitment of all stakeholders, and uncompromising willingness to apply the underlying principles of NSOPER. Observations of development trends indicate, however, that most developmental agendas in Ghana tend to suffer from Downs' (1972) concept of Issue Attention Cycle. The cycle has five stages: pre problem; alarmed discovery and enthusiasm; realising cost of significant progress; gradual decline of public interest; and post-problem stage. It explains that the interest in addressing most developmental problems tend to leap into prominence problem but gradually fade from the centre of public attention with time. If disaster management in Ghana follows similar trend, then NSOPER would exist only as idealistic or unrealistic disaster response operation procedure.

### *2.1.6 Approaches and Models of Post-Disaster Response and Recovery*

Being pre-emptive towards recurrence of disasters, stakeholders in disaster management are adopting more comprehensive response strategies that adequately reduce, if not totally eliminate, similar experiences in future. Critical in such disaster response operations are control and coordination between, and/or among multi-stakeholders, as well as pursuit of long term disaster risk mitigation initiatives. However, the response and recovery systems are directly or indirectly influenced by a variety of socio-political elements within the setting of human settlements. Several models exist in the literature providing schematic expression of the complex interactions between these socio-political elements and the disaster response system in many parts of the world.

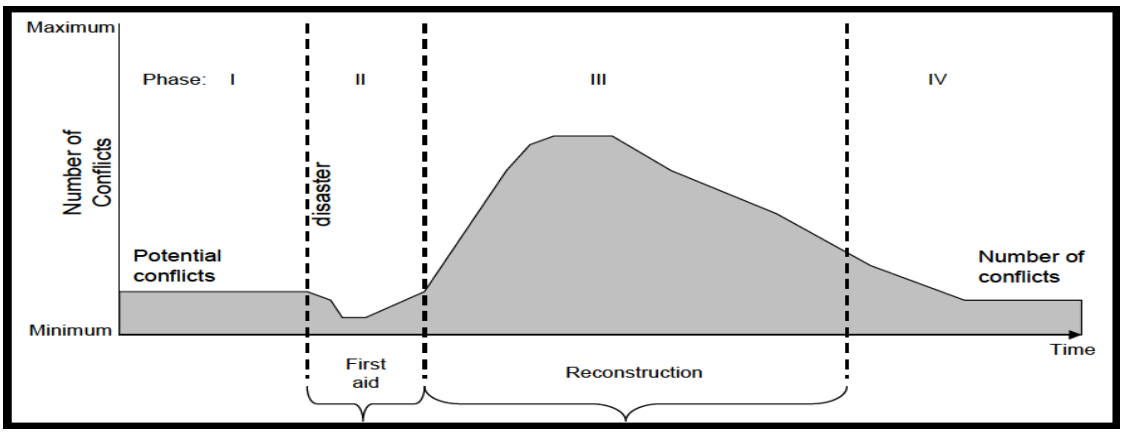
Haas et al. (1977) developed a disaster recovery model that divided the recovery process into four distinct, but overlapping periods: Emergency Period which is the initial period following the disaster; Restoration Period where major services, transportation and communications are restored; Replacement Reconstruction Period during which social and economic activities return to pre-disaster levels or higher; and Memorials, Commemorations, Major Reconstruction Period during which future growth and development activities are undertaken.

This framework argues that "disaster recovery is ordered, knowable and predictable" (Haas et al., 1977). The model prescribes progression of the response operation from immediate life-saving activities to long-term development initiatives aimed at reducing the community's vulnerability to similar disasters. This pattern described by the model suggests an orientation towards risk and vulnerability reduction in the future. However, it has been too linear, emphasizing highly on value-addition, but lacking explicit

recognition of the politics and several other dynamics involved in disaster response and recovery (Berke et al., 1993).

Geipel (1982), therefore, developed the Conflict Model of Recovery which examined the role of culture and politics on post-disaster response and recovery processes. Geipel's work focuses on the conflicts experienced during the response and recovery period as planners and developers establish complex rebuilding plans that compete with local citizen's ideologies. This has been illustrated in Fig. 2.4 below. The model states that there are pre-existing potential conflicts in many communities, and this is shown in Phase I.

**Fig. 2.4: Conflict Model of Recovery**




*Source: Geipel (1982)*

But the disaster event acts as a catalyst for solidarity, sacrifice and mutual helping. This is shown in Phase II of the model. During this period inter-group and individual differences virtually submerges. However, conflicts begin to arise as external interventions begin and relief aid is distributed, and during the reconstruction planning phase, conflicts reach a maximum as shown in Phase III. When reconstruction comes to an end, the number of conflicts decreases as individuals and families become accustomed to the new circumstances and living arrangements (Geipel, 1982). This model argues that issues of class and culture create differing perceptions on needs,

rebuilding plans as well as the role of government and external interventions in the process. These divergent perceptions have the potential to derail the execution of the response operations, and undermine rebuilding as well as reconstruction efforts. The model therefore suggests culture and class as variables that can influence disaster response operations. However, it did not place emphasis on the role of leadership in managing these community dynamics during the response operation process.

Recognizing this dearth in the literature, Rubin et al. (1985) came out with a framework that focused on the roles of leadership and organizational knowledge in reducing the length and increasing the efficiency of disaster recovery. Their framework examined principally the influences of political leadership on disaster response and recovery processes. This element is very crucial in response and recovery process (Oxfam, 2005; IEG, 2006). Post-disaster governmental manipulations of response processes exacerbate existing inequalities within the affected community, and this provokes angry protest and demonstration against the institutions in charge (Pelling and Dill, 2006; World Bank, 2010). Political leaders often use the aftermath of disaster to regain or even enhance their popular legitimacy. This is exemplified in the response to the 1966 hurricane in the city of New Orleans where an incumbent mayor used disaster relief to bolster his public image to facilitate his re-election into office a month later (Abney and Hill, 1966). This happened despite being publicly hated for reallocating city funds originally intended for shoring up the levee. Thus, influences of political leaderships on disaster response operations cannot be underestimated. However, political decision in disaster situation affects particular group of people in the affected community who react in different ways to issues affecting them. Therefore, their cooperation and interaction with the leadership in achieving success in the response operation cannot be ignored either. This has been acknowledged by

Alesch (2004) that, "whether a community system survives and becomes viable in the post-event setting depends in part on the individual choices of a critical mass of people and institutions in the community". This argument throws weight behind Berke et al. (1993) Horizontal and Vertical Integration Model of Recovery.

The Horizontal and Vertical Integration Model of Recovery focused on inter- and intra-community relationships in influencing post-disaster reconstruction and recovery processes. The horizontal relationships refer to the level of formal and informal integration of people and organizations in an equalitarian manner, whereas vertical integration refers to the level of relations between various social units in the community to external social, economic and political institutions (Berke et al., 1993). The model argues that, the level of vertical and horizontal relationships impact disaster recovery as they reflect the capacity to influence and organize effective recovery programs that meet the needs of the community and impacted households. The Horizontal and Vertical Integration Model offers important insight into community characteristics that can influence the success of disaster recovery. It reflects access to power and links to important social networks. This model also indicates the types of social capital that increase community coping capacity, and provides direction for community improvement. But it is a bit silent on the processes that create the 'strong' and 'weak' communities, as well as how this can be achieved through the recovery process itself and sustained after the event has relapsed.

Recent models have sought to embrace the sustainable development paradigm. The Sustainable Hazards Mitigation Approach by Mileti (1999), which acknowledges that hazards and disasters are not experienced in isolation rather they are linked to broader systems and processes, is one these recent models. This approach is a hazard-oriented

approach which connects disasters to everyday activities that have a bearing on disasters. It also views disaster reduction and recovery as a process. This approach relates disasters to development activities and explores the complex relationship between the two (Mileti, 1999).

The approach has been critiqued for emphasizing on hazards and lacking the element of reducing vulnerability (Lewis, 1999). According to McEntire (1999; 2000; 2001) and Wisner et al. (2004), the Sustainable Hazards Mitigation Approach does not directly contend with the root causes of disaster (i.e. vulnerability). Recent manifestations seem to vindicate this argument as scholars and current development literatures are now shifting attention onto reducing exposure and vulnerability as against dealing with the hazards. Studies by (Pielke, 2000; 2006; Barthel and Neumayer, 2010; Crompton and McAneney, 2008; Swiss Re, 2010) demonstrate that the attribution of increased losses across exposure, vulnerability and hazard is currently weighted towards exposure and vulnerability rather than hazard. Vulnerability reduction is, therefore, an uncompromising element in all aspects of disaster management. Hence, models that fail to recommend directions towards reducing vulnerability leaves a gap in its functioning.

Lloyd-Jones (2007) Kennedy et al. (2008) have, therefore popularized the concept of 'Building Back Better'. This approach builds on vulnerability research and the theory that a "window of opportunity" for disaster risk reduction and improved re-development is created during the post-disaster recovery period. During this period, local citizens tend to have increased awareness of disasters risks and place pressure on government and organizations to direct reconstruction efforts towards remedying the weaknesses in developmental policies, infrastructure and institutional arrangements

(Christopolos, 2006; Clinton, 2006; UNISDR, 2005). It is an opportunity that could be used to facilitate building a resilient community.

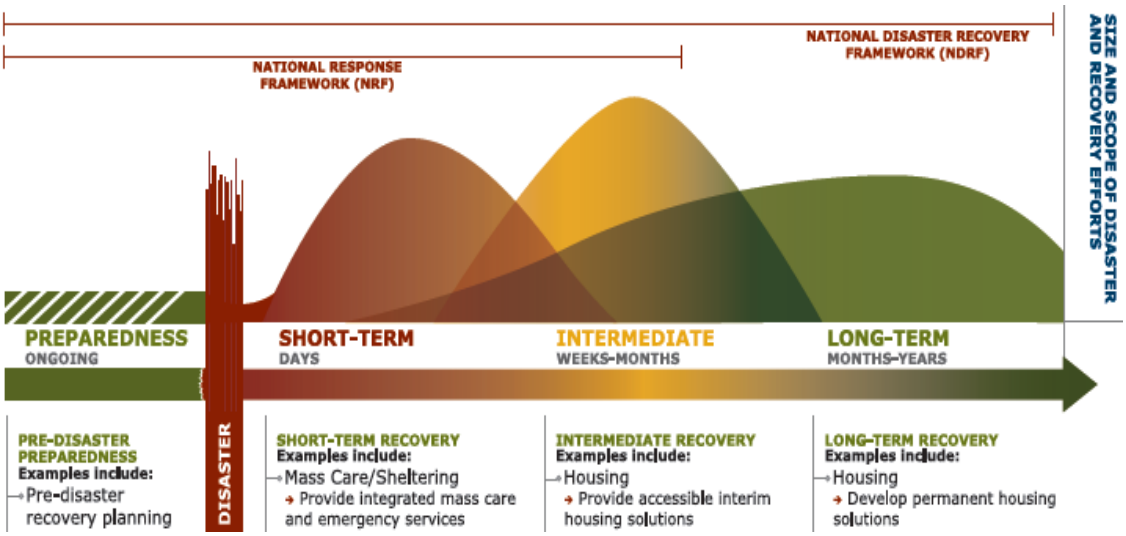
It is, however, acknowledged that a variety of factors influence the perceptions local people and response organizations have of "better", and trade-offs exist between the many potential forms of betterment (Kennedy et al., 2008). This makes it difficult defining the concept 'better'. For instance, during the recovery effort after Hurricane Katrina, funding originally intended for low-income residents affected by the hurricane was re-directed towards large-scale economic development projects, such as expansion of port facilities, indicating a focus on economic activities as opposed to vulnerable populations (Steps Coalition, 2009; Klein, 2007). Thus, although governments and aid organizations may claim to be building back better, there is some haziness in clarity as to what "better" entails, and it lacks a conceptual framework to drive response and recovery efforts (Regnier et al., 2008).

However, "Building Back Better" could incorporate some of the ideas given by (Clinton, 2006) such as addressing some of the underlying vulnerabilities and inequalities as well as linking recovery efforts to longer-term development and sustainable initiatives (Kennedy et al., 2008). Thus, post disaster response initiatives should aim at repositioning the affected community on levels less susceptible to outbreaks or recurrences of similar events.

With experiences of recent disaster response and recovery efforts, FEMA (2011) provided a Recovery Continuum Framework, showed in Fig. 2.5, which allows flexible structure, guide and promote effective response and recovery efforts, and enables a unified and collaborative disaster response and recovery operation. The Recovery Continuum Framework focuses on restoring, redeveloping, and revitalizing the health,

social, economic, natural and environmental fabric of the disaster affected community and building a more resilient community.

**Fig. 2.5: The Recovery Continuum Framework**




*Source: FEMA, 2011.*

The Recovery Continuum Framework shown in 2.5 demonstrates that disaster response and recovery goes beyond returning the communities to pre-disaster circumstances. Rather it involves repositioning the community on a height less vulnerable to similar disasters in the near future. This is achieved through a thorough, integrated and systematic progression of distinctive but overlapping activities from the short-term, through the medium-term, to the long-term sustainability initiatives, that minimizes the community's disaster risks and strengthens its ability to withstand and recover from future disasters. Integrated in this framework is the Incident Command System which allows for unity of effort and coordinates support of common response and recovery objective from all stakeholders, both community and institutions alike, especially in the emergency phase of the disaster as shown in Fig. 2.1. This serves as a standard and it is being advocated by the United Nations Development Programme.

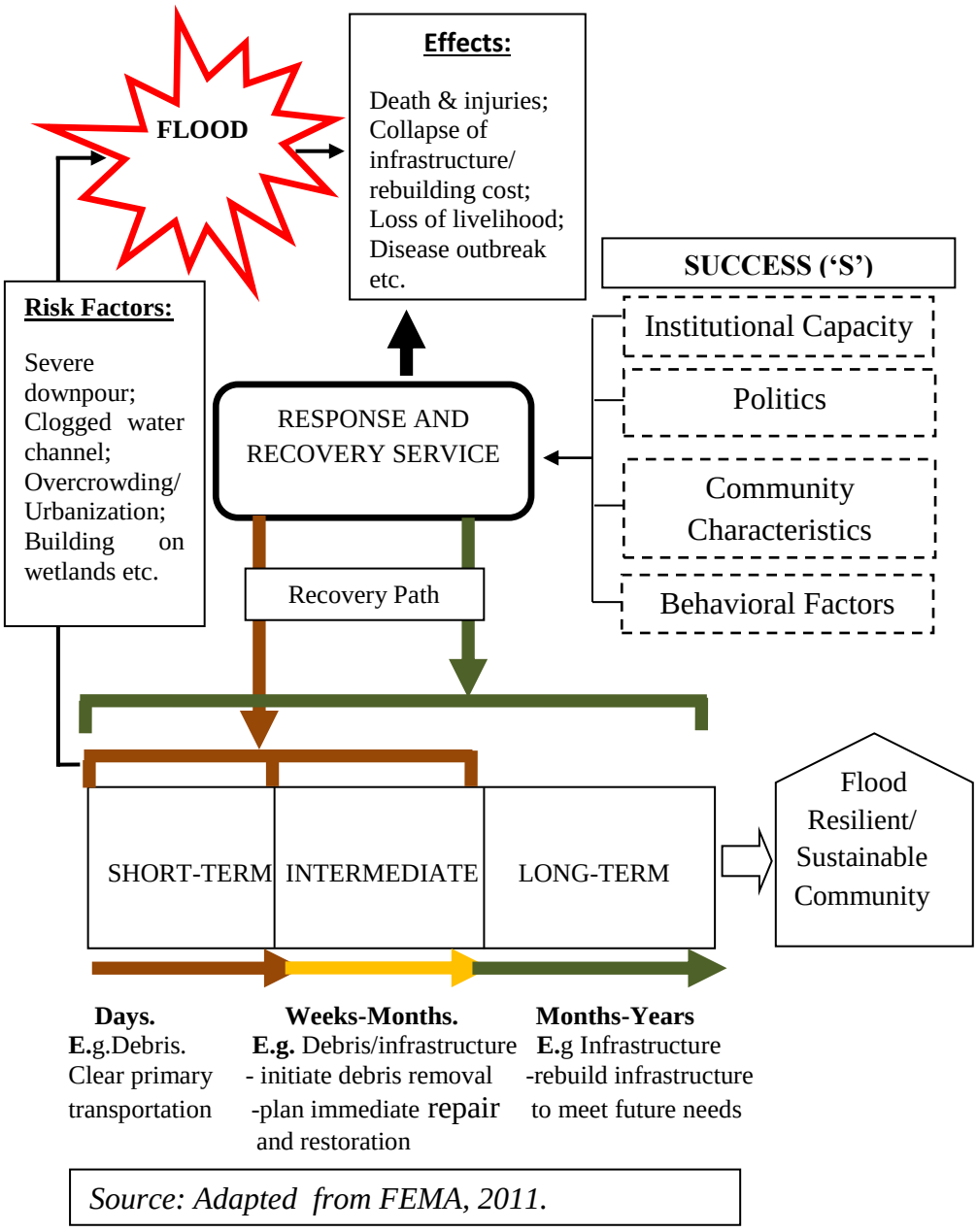
However, most of these models have sought to explain the dynamics of disaster response operations, identifying major influencing variables on the response, in geospatial settings quite different from the geographical and socio-cultural space of Ghana. It, therefore, becomes difficult and vague to suggest that similar patterns and dynamics of disaster response operations are witnessed in Ghana. This dearth in literature thus, underlies and drives this study in Ghana exploring the dynamics and effectiveness of post-flood disaster response mechanisms in Ghanaian context.

## 2.2 Conceptual Framework

As illustrated in Fig. 2.6, there might be some prevailing structural, hydrological and the anthropogenic conditions that might serve as flood risk factors. These flood risk factors might include excessive rainfall, clogged water channels, insufficient drainage systems, overcrowding, building in waterways or water logged areas etc. In many regions of the world, people moving from rural areas to cities often settle in urban areas that are highly exposed to flooding. Land use changes can also increase the risk of flooding: urbanization that reduces permeability of soils increases surface runoff, thereby overloading drainage systems that were not designed to cope with such augmented flows.

In cities, areas of open soil that can be used for water storage are very limited. Therefore, all the precipitation and other flows have to be carried away as surface water or through drainage systems which are usually constrained by the competing demands on urban land. High intensity rainfall can cause flooding when the city drainage systems do not have the necessary capacity. The existence of these flood risk factors, if not properly mitigated, serves to contribute to the occurrence of flood disasters as indicated in Fig. 2.6.

**Fig. 2.6: FLOOD RESPONSE AND SUSTAINABILITY BUILDING**




*Source: Adapted from FEMA, 2011.*

Floods affect both rural and urban settlements but they are increasingly problematic in urban areas due to increasing growth and inflow of population, increased paving and other hard surfaces, unplanned development in flood plains, and the changing climate (World Bank, 2011). Floods have catastrophic effects on the environment through the release of toxic materials such as pesticide into water bodies leading to contamination

of drinking water. Rebuilding cost is one of the economic losses caused by floods. Again, floods lead to death, injuries, and spread of infectious diseases such as cholera.

These enumerated effects illustrate the hostility of floods to human, hence warranting urgent response in times of break (Jha et al., 2012; Kunii et. al., 2002). According to the World Bank (2010), the immediate challenge in times of flood is to respond urgently to reconstruction needs but in ways that improve on past practices and reduce the chance of a recurrence of problem in the future. Thus when response and recovery activities are systematically executed and advance progressively from relief and rescue activities to long term activities aimed at rebuilding to meet future community needs, enforcing local adherence to urban land use demarcations, then building a flood resilient & sustainable community becomes real

But the response and recovery process in many instances end up in the intermediate phase neglecting the long term activities aimed at ensuring that vulnerability of the community to flood hazard is reduced to the very minimum level. Therefore, as the fundamental causes of the previous flood are not adequately mitigated, flood recurrence in the future becomes more predictable and inevitable, initiating a new cycle of flood outbreak and response as indicated in Fig. 2.6.

However, the path followed by the response operation depends on some success 'S' factors. These include institutional capacity, politics, community characteristics, and behaviour of the population or individuals as indicated in Fig. 2.6. Thus, the human and material resources of the institution coupled with the legal framework that defines its room of operation; political manipulations; communities and individuals' cooperation with the response agencies affect the successful progression of the response operation.

This conceptual framework is built through triangulation of response and recovery models. Thus, the framework incorporates many of the ideas and variables from the post-disaster response and recovery models that have developed over time. Though most of these models dealt principally with particular variables that influence recovery efforts, none of the variables surface in isolation. Therefore, ideas from these numerous models, as reviewed in the literature, are integrated in this conceptual framework for a more comprehensive study, capturing the various variables likely to influence the success of the response operation.

### 2.3 Summary

The relationship between disasters and development cannot be underestimated. Well planned development programmes serve to decrease the vulnerability of communities to disasters. However, it is the failures of development that have led to the accumulation of disaster risks in many parts of the world. On the other hand, disasters destroy economic investments such as infrastructure, interrupt the natural and human environment, and force the diversion of scarce resources into replacement and repairs of assets. It, however, creates the atmosphere in favour of change or re-planning. Thus, it creates the platform through which sustainable development initiatives could be undertaken.

Disaster management has, therefore, been viewed in the context of development. Thus, there has been a shift from traditional methods of disaster management, which focuses on reactive responses, to proactive measures, which aim at incorporating risk and vulnerability reductions in all phases of disaster management. This has been underscored by the Hyogo Framework for Action 2005-2015. Ghana has embraced this new thinking in disaster management by making risk and vulnerability reduction a key

priority in all aspects of disaster management in the country, especially utilizing the response phase of disaster management to ensure resilient building.

However, several response and recovery models have sought to identify major elements that influence successful incorporation and implementation of risk and vulnerability reduction initiatives during the response phase of disaster management. These include the conflict model of recovery, horizontal and vertical model of recovery, sustainable hazard mitigation approach, the recovery continuum framework as well as those that emphasize on the role of leadership and organizational knowledge in influencing the efficiency of disaster response and recovery. The models reveal that disaster response paths may either fail to progress beyond medium term activities or successively progress to the Long-Term Phase, where disaster risk and vulnerability reduction initiatives or resilient building activities could be undertaken.

Thus, in our understanding of the paths followed by disaster response operations in many parts of the world, several factors influence the execution of the response operation. These include, among others, the characteristics of the affected community, political, behavioural, as well as institutional factors. However, most of these dynamics in disaster response operations have been identified and explained in geospatial settings quite different from the geographical and socio-cultural space of Ghana. It, therefore, becomes challenging and vague to suggest that similar patterns and dynamics of disaster response operations are witnessed in Ghana. This dearth in literature thus, underlies and drives this study which explores the dynamics and effectiveness of post-flood disaster response mechanisms in Ghanaian context using the June 2010 flood incidences in Agona Swedru and Ashaiman as case studies.

# CHAPTER THREE

# STUDY AREAS, RESEARCH DESIGN AND METHODS

## 3.0 Introduction

This chapter presents the physical characteristics including location, relief and drainage, climate and vegetation, the population dynamics, the economic features, dynamics of the 2010 floods as well as governance systems in Ashaiman and Agona Swedru. It also presents the approach, procedures and techniques through which data were collected, and objectives investigated. These provide enough background information of the two research locations to facilitate smooth transition to the analysis of the results of the survey, with the intent of achieving the objectives of the study.

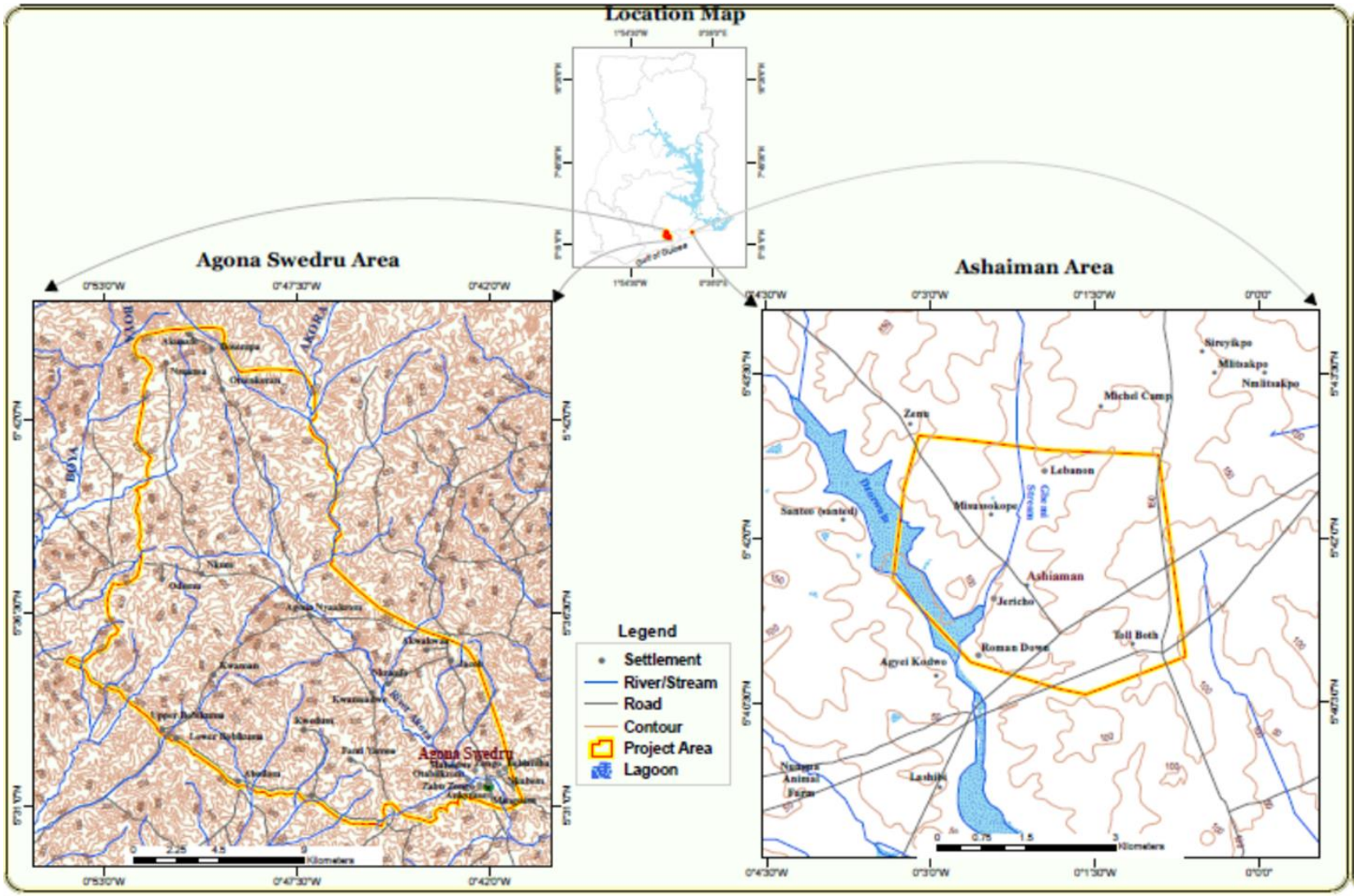
## 3.1 Physical Characteristics

### *3.1.1 Location of the Study Areas*

Agona Swedru is the capital of the Agona West Municipal Assembly the Central Region. The town is located in the south eastern corner of the Agona West Municipality and it is one of the six Urban/Area Council Centres according to the Legislative Instrument that establishes the Agona West Municipality. It is the administrative, political and commercial capital of the municipality (Korli, 2010).

Ashaiman conversely, is located in the Greater Accra Region, and it is the capital of the newly created Ashaiman Municipal Assembly which is located about four kilometres to the north of Tema and about 30km from Accra. The town shares boundaries on the North and East with Katamanso Traditional Area, on the South with the Tema Township, and on the West with Adjei Kojo. Fig. 3.1 and Fig. 3.2 below show the major drainage, relief and some of the localities that were affected by the floods.

**Fig. 3.1: Map of the Study Areas**




*Source: CERGIS, 2013.*

### *3.1.2 Relief and Drainage*

Agona Swedru has a diversified relief with altitudes varying between 75-150 meters above sea level with the highest point being 350 meters; and has undulating and sloppy topography from north to south with isolated hillocks in the north-east, most of which are made up of granite rocks (Korli, 2010). The main river which primarily drains through the town is Akora River.

The relief of Ashaiman is generally flat and forms part of the Accra-Togo plains, however, there are isolated hills in the general area but even these barely reach 65m high (www.ghanadistricts.com). One of the main streams in the community is the Gbemi Stream, and it flows through localities such as Lebanon, Jericho, Roman Down. The town has well engineered drains along major roads in the township. Drainage within the residential units is however very poor as there are no well-engineered drainage system. Surroundings within these units have, therefore, been marred with liquid waste compounding the already existing problem of sanitation. Most of these drains along the major routes are also choked.

### *3.1.3 Climate and Vegetation*

Agona Swedru is in the wet semi-equatorial climate zone and has a bi-modal system of rainfall, with maxima occurring in May/June and September/October. Annual rainfall of the area ranges between 1000mm - 1400mm. This puts the area in the forest zone, which Allows for two main growing/wet seasons. The dry-season lasts from December to March with the highest mean monthly temperature of 33.8C being recorded between March/April. The lowest mean monthly temperature of 29.4C is, however, recorded in August (Korli, 2010).

The town is largely a forest urban settlement with almost 10% of its land area covered with water (Korli, 2010). The community falls within the moist semi-deciduous forest zone and has a lot of valuable trees suitable for timber processing. Due to human activities such as farming and logging most of the original forest is being reduced to secondary forest (www.mofep.gov.gh or www.ghanadistricts.com).

Ashaiman, on the other hand, lies within the Accra-Togo plains, and therefore, experiences a climatic condition that extends from the east coast of Ghana into Togo. Rainfall in this area ranges from 730mm-790mm. The major raining season starts from April to July and September to November forms the minor season. Temperatures are high throughout the year. March–April is usually the hottest period with temperatures reaching 32ºc during the day and 27ºc at night. Cooler temperatures occur from May-September with a high of 27-29°c during the day and 22-24°c in the night. Humidity varies with the seasons with a height of 60-80% in the wet season and less than 30% in the dry periods. The vegetation consists of savannah grasses and shrubs due to the low rainfall regime. However, due to human activity, the natural vegetation no longer exists.

### 3.2 Population Dynamics of the Study Areas

Agona Swedru has areas subjected to urban planning control, with their development guided by planning schemes of the assembly. However, there are other settlements where developments have illegally defied the existing planning schemes bringing about a long pattern of uncontrolled informal and shanty settlements. Thus, there are squatters and informal settlements such as the Zongo, Nkubem and the other indigenous areas which have developed outside existing development regulations.

The indigenous and older settlements are among the densely populated areas, and they grew before formal planning schemes were instituted. These settlements are principally along the Akora River (GSS, 2005). The town is one of the fastest growing settlements in southern Ghana (GSS, 2005). Being the capital of Agona West Municipal Assembly, Agona Swedru is the most densely populated town of the Municipality with a population of about 45,614 (GSS, 2005). The population of the town has changed over time. It increased from 21,522 in 1970 through 31,226 in 1984 to about 45,614 in the year 2000 (GSS, 2005). It can be inferred that in 14 years (between 1970 and 1984) Agona Swedru has recorded a population increase of about 9,704, and within 30 years (from 1970 to 2000), the town recorded about 24,092 population increase, which is about 112% of the 1970 recorded population figure (GSS, 2005). Thus, the town has been growing in terms of its population size. The trend is increasing due to its strategic location coupled with its huge commercial potentials as well as its current political role.

In terms of its gender dynamics during both the 1984 and 2000 population censuses, females formed 53% of the population whilst the males constituted 43% (GSS, 2005). The indigenous peoples of the town are the 'Agonas'. Over the years they have co-existed with other prominent minority migrants such as Obutus, Gomoas, Ewes, Effutus, Fantis, Kwahus, Atakpames, Kontokoris and several ethnic groupings of Northern Ghana origin (GSS, 2005). The town has a waste disposal site. Nevertheless, it suffers from poor waste disposal practices due to inefficient and inadequate infrastructure facilities, especially drainage and toilet facilities.

Ashaiman, however, is a heterogeneous and slum community in the Greater Accra Region located near a port-city Tema. The 2000 census of Ghana indicates that Ashaiman is dominated by migrants with majority (31%) being Ewes, followed by

Akan (30.2%). The indigenous group, Ga-Dangme, constitute 21.1% (GSS, 2005). There is also a large population of minority migrants from other West African countries, such as Nigeria, Togo, Burkina Faso and Mali resident in the locality (IBIS, 2003).

The population of Ashaiman has increased from 22,549 in 1970 through 50, 918 in 1984 to 150,312 in the year 2000 (GSS, 2005), indicating that within 30 years, Ashaiman recorded a population change of 127,763. The increase in the population of the community has not matched with infrastructure provision such as housing. These circumstances have led to the growth of slums within the community, usually in areas demarcated as flood prone zones.

The community is said to be one of the poorest in the Greater Accra Region as it is unplanned and under-resourced. It, therefore, fits the description of a sprawl (Ibis, 2003). Ashaiman is largely underdeveloped compared to its surrounding settlements, such as Tema and Accra. The town has serious social and economic problems, as well as infrastructure and social amenities are lacking. Most households in Ashaiman do not have domestic toilet facilities in their houses, and are highly exposed to events like fire outbreaks, floods, disease outbreaks due to the characteristics of their housing conditions and locations (IJSA, 2012).

### 3.3 Economic Activities of the Study Areas

Commerce is the largest occupation engaging most of the self-employed. Those engaged in this sector are however largely in petty trading in foodstuff and provisions. Other activities such as crop farming, livestock and construction engage a sector of the population. There is also a growing sector in spare parts for both construction equipment and vehicles (IJSA, 2012).

Agriculture is the major economic activity in Agona Swedru and it engages vast proportion of the population. Cultivation includes tree/cash crops, food crops, vegetables and sugarcane (www.mofep.gov.gh or www.ghanadistricts.com). Trade and commerce is the second most important economic activity in the community. It has one of the biggest market centres in Central Region. Commercial Livestock production is on a limited scale. Fishing is done along the Akora River but this activity is economically insignificant (www.mofep.gov.gh or www.ghanadistricts.com). Some of the population are working in the formal sector namely banking and insurance, the government institutions among others.

### 3.4 Dynamics of the 'June 2010 Floods' in the Study Areas

The Planning Officer in Agona Swedru stated in an interview, that yearly the level of water in the Akora river rises particularly during the raining season, but it does not usually flood the community. Thus, there have been frequent and periodic rise of the water level in the Akora river most especially during raining seasons. Though floods seldom occur in the town, in June 2010, a heavy downpour caused the Akora river to overflow its banks, affecting the settlements located near its course principally the older settlements of Agona Swedru community.

In Ashaiman, one of the challenges they face has been flooding. This was revealed in an interview with the Planning officer in Ashaiman Municipality. One of these major devastating flood events that have hit the community recently has been that which was witnessed in June 2010, induced by a twelve-hour lasting downpour. Therefore, as the settlements along the Akora river battled with the 2010 floods, settlements along the main gutter in Ashaiman witnessed similar devastating floods concurrently.

In Ashaiman, the flood occurred as a result of a heavy twelve-hour downpour which caused the Gbemi stream to runoff its banks affecting settlements such as Lebanon, Roman Down and Jericho. The flood resulted in the collapse of three bridges i.e. the Valco Flat, the Lebanon and the Roman Down bridges; it led to the death of 17 residents (including women and children); rendered about 547 people injured; and displaced over 9,314 people (http://www.modernghana.com/news/331264/1/ashaiman-flooding-a-year-after.html). Some homes along the stream's banks were almost completely submerged with waters rising as high as the roof. Also business and livelihood were either seriously disrupted or permanently destroyed.

In Agona Swedru, the settlements affected were along the banks of the Akora river, and included Nkubem, Mahondwe, Zabu Zongo, as well as the Sawmill areas. Plate 3.1 shows residents in the Sawmill area of Agona Swedru displaced by the floods.

**Plate 3.1: Residents in Sawmill Area Rendered Homeless by the Flood**

*Source: Acquired From an Informant in Agona Swedru (Jan, 2013).*

According to the NADMO Municipal Coordinator in Agona Swedru, the flood caused the death of ten people, rendered thousands of people homeless and washed away several properties running into thousands of Ghana cedis. It further destroyed the Texaco bridge, flooded shops near the central market depriving many of their

livelihood, and principally halted economic activities within the community. Plate 3.2 shows some flooded settlements in Agona Swedru.

**Plate 3.2: Flooded Houses in Nkubem**

*Source: Acquired From an Informant in Agona Swedru, Jan, 2013.*

Following the June 2010 floods, institutions such as NADMO, the Ghana Red Cross and Crescent, Catholic Relief Agency, the Adventist Development and Relief Agency, Ahmadiya Muslim Mission, some media organisations as well as individual philanthropist and politicians offered assistances of varying sort such as the provision of shelter, relief and medical services to the affected population. Some of the victims, predominantly the women, were given other form of support. The Catholic Relief Agency for example provided a GH¢ 70 worth shopping coupon to the affected women. Additionally, items such as cements, roofing sheets, cooking oil, tin tomatoes, toilet rolls, used clothing, and 200 bags of rice were presented to the victims by the same organisation. In Ashaiman, the Municipal Assembly compensated the families of the deceased with GH¢ 500.00 each to cover for the funeral and burial rites expenses. Additionally, a total of GH¢ 40,000 resolving Fund was put together to procure relief items or resources for the victims (http://www.modernghana.com/news/331264/1).

### 3.5 Governance Systems in the Study Areas

Agona Swedru is the capital of the Agona West Municipal Assembly. It is one of the six Urban/Area Council Center in the Central Region. It is the administrative, political and commercial capital of the municipality. The assembly is assisted in the discharge of its functions by the Executive Committee chaired by the Municipal Chief Executive and its subsidiary committees consisting of Finance and Administration; Justice and Security; Social Services; Economic Development; Technical Infrastructure; Education; and Public Relations and Complaints.

The Assembly is made of eleven departments, and included Social Welfare and Community Development Department; Disaster Prevention Department; Physical Planning Department etc. The department for disaster prevention performs among other things education of the inhabitants on the prevention and management of disasters such as floods, and the municipal coordinator of NADMO functions principally in this area within the municipality. There are assembly members and other sub-municipal structures in the form of Town/Area Councils as well as Unit Committees through which participation in governance gets better down to the people.

The primary source of revenue for running and executing the administrative functions of the Assembly such as accomplishing disaster prevention initiatives and goals within the municipality is transfers from the Central government through the District Assembly Common Fund (DACF). This is complemented by locally generated revenue which includes fees, licenses, market tolls, property rate. It is through these sources of revenue that development is ensured within the municipality. The Assembly encounters lots of developmental problems which range from health care, sanitation as well as governance. For instance, the Assembly suffers from falling standard of

education, poor sanitary conditions, and insufficient refuse disposal sites. Governance within the municipality has also not been free of challenges. Coordination between the Core Assembly Staff and the decentralized departments have been inadequate; poor enforcement of Assembly by-laws; revenue mobilization by the Assembly has been poor, limiting their ability to provide adequate and basic municipal services; as well as non-functioning of the lower sub structures. These challenges in diverse ways limit the Assembly's capacity to ensure a systematically and properly developed municipality.

Ashaiman is the capital of the Ashaiman Municipal Assembly which has eight Town and Zonal Councils and 20 Unit Committee. Ashaiman Municipal Assembly has eleven decentralized departments and included are Physical Planning Department, Disaster Prevention Department, and Department for Social Welfare/Community Development among others. The Assembly had a Medium Term Development Plan (MTDP) (2010-2013) prepared by the established Plan Preparation Task Force in collaboration with stakeholders from decentralized departments including the Disaster Prevention Department, Community Based Organization, NGOs, traditional authorities and communities. The MTDP captured the views and perception of all segments of the municipality including the vulnerable (women and children) and the physically challenged.

There exist within the organizational structure of the Assembly, an arrangement which establishes a strong community interface through which the views of the communities are tapped and government policies, programmes and plans communicated to them. One of these arrangements is through periodic organized community durbars in the communities with participants ranging from assembly members, unit committee members, assembly technical staff, residents of the various electoral. This arrangement according to the Assembly has increased the residents' confidence in the Assembly,

and it is a precedence adequate enough to win the cooperation of the local people in the implementation of development projects such as disaster risk reduction initiatives. The assembly involves the beneficiaries of development projects and all stakeholders in the monitoring and evaluation of projects. This is a strategy aimed to build self-reliant attitude among the residents of the assembly.

Resources mobilizing for the development of the municipality are either by internal or external means. The internal sources include rates and receipts, lands (share of stool lands, sale of building permits), fees and fines, licenses (local breweries, kiosks), and rents of market stalls, whilst the external sources of revenue include those mainly from grants (ceded revenue, DACF).

### 3.6 Research Design

The study employed a case study research design, and involved qualitative and quantitative data. Thus, it employed an in-depth study of the disaster response strategies and operations in Ashaiman and Agona Swedru communities. This method of study was empirically useful as it allowed for measuring the behaviour of the disaster response operation in the study communities against recognized or standard disaster response and recovery frameworks or models.

### 3.7 Data Collection Methods

#### *3.7.1 Sampling Size and Techniques for Questionnaire Administration*

In undertaking the study, 200 respondents were proportionately sampled in Ashaiman and Agona Swedru using the 2000 Census figures as illustrated in Table 3.1. Random sampling was first used to sample housing units located along the banks of the Akora River and the Gbemi Stream in Agona Swedru and Ashaiman respectively, areas where the floods affected. The researcher took transect walks along the Akora River

and the Gbemi Stream, listing the housing units that were affected by the floods. From the listed housing units, 46 and 154 were randomly selected from Agona Swedru and Ashaiman respectively as illustrated in Table 3.1.

**Table 3.1: Distribution of Respondents between Ashaiman and Agona Swedru**

| COMMUNITY | POPULATION | % OF THE 200 RESPONDENTS | SAMPLING SIZE |
|---|---|---|---|
| ASHAIMAN | 150,312 | 77% | 154 |
| AGONA SWEDRU | 45,614 | 23% | 46 |
| **TOTAL** | **195,926** | **100%** | **200** |

*Source: Ghana Statistical Service, 2005.*

Within each selected housing unit, purposive sampling was used to select the individual respondents for the study. The strategy through which the purposive sampling was executed was through the criterion purposive sampling. The individuals or residents in the sampled housing units who met a certain criterion were considered for the study (Given, 2008). The defined criterion for the sampling was therefore "victims of the June 2010 floods in Ashaiman and Agona Swedru".

The victims of the floods served as clients to the disaster response service, dealt directly with the disaster response organisations, and benefited from the response and relief services. Hence they were the suitable persons who could have shown uncompromising interest in monitoring the response operations. They were, therefore, the appropriate persons to provide useful information on the kind of response activities they witnessed the disaster response organizations undertake, as well as the quality and satisfaction of the disaster response service delivery.

The resultant sampling data from the respective communities were further distributed based on gender. This was determined by the population figures in the 2000 population census. This has been illustrated in the Table 3.2.

**Table 3.2: Distribution of Obtained Sampling Size Based on Gender**

| GENDER | ASHAIMAN | | | AGONA SWEDRU | | |
|---|---|---|---|---|---|---|
| | POPULATION | SAMPLED SIZE | | POPULATION | SAMPLED SIZE | |
| | | No. | % | | No. | % |
| **MALE** | 75,183 | 77 | 50 | 21,536 | 22 | 47 |
| **FEMALE** | 75,129 | 77 | 50 | 24,078 | 24 | 53 |
| **TOTAL** | **150,312** | **154** | **100** | **45,614** | **46** | **100** |

*Source: Ghana Statistical Service, 2005.*

The questionnaires were administered within the months of January 2013 and February 2013. Four graduate students from the University of Ghana served as field assistants in administering the questionnaire. Literate respondents answered the questionnaire with little or no assistance from the field assistants, whilst the respondents who could not read and write were aided by the field assistants in answering the questionnaire. The aid did not go beyond reading and interpreting the questions to the respondents as well as writing their exact responses against each respective question asked. This process lengthened the time spent on completing each questionnaire, hence prolonged the duration under which the questionnaires were administered.

Additionally, key-informant interviews were held with the NADMO coordinators as well as the Municipal Planning Officers in the respective communities. Formal letters were sent to these respective stakeholders for the interview appointment dates. With the exception of the NADMO coordinator in Ashaiman, who for three consecutive

times rescheduled the appointment date, all the other interviews were conducted on the scheduled dates. Each interview lasted for not less than an hour.

Varied information was sought from these key stakeholders. This included the major environmental challenges faced by the respective communities, the dynamics of the 2010 floods, the dynamics of the disaster response operations, major lessons learnt from the flood disaster, key recommendations made toward preventing future occurrence of floods in the communities, successes achieved, as well as the challenges confronted in the execution of the response operations as well as implementation of the recommendations. The data gathered from the interviews were incorporated into describing and explaining, among others, the disaster response strategies employed in disaster situations; informing the time-series analysis, which according to Yin (1994), is an analytic technique ideal for explaining how and why questions about the changes in behaviour of an event i.e. the response operation; and explaining the factors that shaped the behaviour of the response operation. This implies that responses of key stakeholders and that of the sampled respondents from Ashaiman and Agona Swedru were combined in the study. Therefore, effectiveness of the disaster response operation was comprehensively measured by simultaneously studying institutional accomplishments with regards to key recommendations made following the flood disaster on the one hand, and the perception of the disaster response agencies' clients i.e. the flood disaster victims on the other hand. This enabled a wide-ranging presentation of findings (Kirschenbaum, 2004).

To generate less political or interest-laden findings on the effectiveness of service delivery, 'neutral' third party observers were also interviewed (Kirschenbaum, 2004). Therefore, 4 resident-non-victims (2 each from the respective study communities) who observed the floods and the post-flood response developments were also interviewed to

seek additional insights on the response operation. These residents were purposively sampled for the interview. These interviews helped validate most of the information provided by the affected population.

### *3.7.2 Focus Group Discussion*

Focus Group Discussions (FGDs) were held within each of the study communities. FGD is an informal discussion among a group of selected individuals about a particular topic (Wilkinson, 2004). Any successful focus group discussion relies heavily on 'the development of a permissive, non-threatening environment within the group' where the participants can feel comfortable to discuss their opinions and experiences without fear that they will be judged or ridiculed by others in the group (Hennink 2007). In light of this, two FGDs each were conducted in Ashaiman and Agona Swedru, with separate groups for males and females because of the cultural setting that predominantly support male domination over women, hence harbouring the potential to prevent the women from being as involving, interactive and expressive as possible if mixed with men in a single group, even though they might be the highly affected with rich experiences to share in the discussion. For the purposes of information control, eight (8) people formed a group.

The primary aim of a focus group discussion, according to Liamputtong (2009) is to describe and understand meanings and interpretations of a selected group of people to gain an understanding of a specific issue from the perspective of the participants of the group. The purpose of the FGDs was, therefore, to interact within groups and identify joint construction of meaning in the issues raised by the individual flood victims (respondents) in the questionnaire administration. The issues that were discussed included their expectations from the response agencies; response activities observed; quality of the relief service delivery; cooperation with the response agencies;

challenges faced; impressions on the organizations; as well as recommendations towards making future response operations effective.

Thus, the FGDs served as a backup to the information gathered through the questionnaire administration by helping to generate a 'collective conversation' in order to validate some of the information provided and more importantly to give more insight on the magnitude of the concerns raised (regarding their experiences, observations etc.). Because according to Stewart et al. (2009) FDGs provide rich and detailed information about feelings, thoughts, understandings, perceptions and impressions of people in their own words. This method permitted the researcher to uncover aspects of perceptions that remained hidden in the more conventional questionnaire administration method (Liamputtong, 2009). The information were incorporated in explaining the perceptions as well as impressions of the people on the disaster response agencies, the character of the response operations, as well as recommendations towards improving future disaster responses operations.

The FGDs did not go without challenges. In Agona Swedru most of the participants could not understand English. But virtually all of them could speak and understand Twi. Therefore, Twi was agreed and used for the discussions. However, in Ashaiman Twi could not be used since most of the participants could not even understand it. Though not all the participants could express themselves fluently in English, most of them could express themselves in 'broken English'. Therefore the medium of discussion in Ashaiman was English whilst that in Agona Swedru was Twi. In both communities, a major difficulty faced initially was getting a convenient day and time that could favour all the participants. But some of the participants eventually made compromises to enable the discussions to be held.

### *3.7.3 Field Observation and Photography*

In the field study observations of the areas in Ashaiman community and the Agona Swedru community where the June 2010 flood incidence occurred were made. In the former, the flood occurred in settlements along the Gbemi stream whilst the latter had settlements located along the Akora River flooded. In Ashaiman, the state of the Gbemi stream was observed, identifying some of the characteristics (clogged or otherwise etc.). This was done because clogged drains have diminished capacity to channel flood water away from residential areas. Similarly, in Agona Swedru, the state of the channel of the river, its banks, and situation of houses around the river were observed. Photographs were taken in both Ashaiman and Agona Swedru. The field observation and photographs provided information that helped in analyzing, for instance, issues such as the susceptibility of the study areas to flood recurrence, physical changes along the banks of the Gbemi Stream as well as the Akora River.

### 3.7.4 *Text and Documentary Analysis*

Text, documentary as well as analysis of internet information were conducted as secondary sources of data to supplement the primary data gathered through questionnaire administration, the Focus Group Discussions, interviews and field observations. This was particularly helpful in reviewing the literature etc. These secondary sources of data helped in explaining the disaster response strategies employed in emergency situations in Ghana, the socio economic characteristics, relief and drainage of the study areas.

## 3.8 Data Analysis

The strategy for analyzing the study was through developing a case description. Thus the analysis of the data was organized on the basis of description of the general

characteristics of response operation. The technique used for developing the case description included pattern matching i.e. empirically based patterns or standards were compared with the evidence from the studied cases. This was complemented with time-series analysis technique – a technique which, according to Yin (1994) is very ideal for 'how' and 'why' questions about relationships and changes of the behavior of an event over time – was used. Thus, the character of the flood disaster response and recovery processes in the study areas were described and compared with the trend of empirical models of disaster response management. The behaviour of the response operation over time was modeled. Thus, the study employed scheme modeling.

Also, aided by an appropriate statistical tools and computer software (Statistical Package for Social Sciences-SPSS) frequencies were tabulated. As one of the means of analyzing data on the effectiveness of the response strategies in the study areas, Likert scale was used to evaluate the local people perceptions on the performance of the response organizations during the flooding disaster.

**Table 3.3: Selected Disaster Response Activities**

| Response Activities |
|---|
| Swiftness of response |
| Relief item distribution |
| Direction and control |
| Local involvement |
| Communications |
| Health service |
| Property protection |
| Building social cohesion |
| Repairs |
| Reconstruction |
| Shift from relief to reconstruction |
| Community outreach |

*Source: FEMA, 2011.*

Likert scales are a psychometric response scales which provide a range of responses to a given statement and primarily used to measure respondents attitude or preferences (Cohen et al., 2000). The respondents were asked to rate the performance of the response organizations on response activities which were executed as given Table 3.3.

The ratings ranged from 'very good' through 'fair' to 'very poor' popularly known as the Likert scale. Each rating was scored as illustrated in Table 3.4.

**Table 3.4: Scores Assigned to the Likert Scare Ratings**

| Scale | Score |
|---|---|
| Very Poor | 5 |
| Poor | 4 |
| Fair | 3 |
| Good | 2 |
| Very Good | 1 |

*Source: Brown, 2001.*

The scores of each activity were then amassed and the average coded to determine the performance rating given to the organizations on the selected disaster response activities by the respondents at large and within each community. The rule for interpreting the average scores is shown in the Table 3.5.

**Table 3.5: Rules for Interpreting Average Scores on the Likert Scale**

| **Interpretation** | **Mean Range** |
|---|---|
| Very Poor | 4.3-5.0 |
| Poor | 3.5-4.2 |
| Fair | 2.7-3.4 |
| Good | 1.9-2.6 |
| Very Good | 1.0-1.8 |

*Source: Brown, 2001.*

### 3.9 Summary

The study was conducted in Agona Swedru and Ashaiman. These communities have different locational, relief, drainage, climatic, and vegetation characteristics. But they share virtually similar socio-economic conditions such as population dynamics and

occupational or economic activities. The main occupations in the communities have been either agriculture or trade and commerce. These sectors engage majority of the population. The populations of these communities have been characteristically heterogeneous, and have shown significant growth over time. Agona Swedru has indigenous and older settlements where illegal and long pattern of uncontrolled, informal and shanty settlements which have sprang up along the banks of the Akora River, the major drainage system. Ashaiman, on the other hand, is a slum community with many infrastructural and social problems. Some of these slum settlements have grown along the banks of the Gbemi Stream, the main drainage of the community.

The settlement patterns in both areas expose the most of the people to floods especially during the raining season. Thus, the water levels in the Akora River and the Gbemi Stream seasonally rise to higher levels due to rainfall, and often overflow their banks bringing about floods. The June 2010 floods happened concurrently in the study communities following heavy downpours in the respective communities. The floods resulted in significant loss of lives, destruction of properties and infrastructure, spread of diseases, and have also deprived most of the people their source of livelihoods. The settlements that were significantly affected by the floods in Agona Swedru and Ashaiman were those along the banks of the Akora river and the Gbemi stream respectively.

There exist within each community arrangements for managing socio-economic issues including disasters. Agona Swedru and Ashaiman, being the capitals of the Agona West Municipal Assembly and the Ashaiman Municipal Assembly respectively, share similar governance and administrative systems. The municipalities are, however, of different regional locations. Whilst Agona West Municipal Assembly is located in the Central Region, Ashaiman Municipal Assembly is in the Greater Accra Region. But

they virtually share parallel systems of governance in many aspects of their municipal administrations including disaster management.

In exploring the post-flood disaster response mechanisms and effectiveness in both areas, multiple methodologies were adopted. Random sampling was first used to sample housing units located along the banks of the Akora River and the Gbemi stream in Agona Swedru and Ashaiman respectively. These housing units were sampled because they comprise localities along these major streams in the study communities that were affected by the floods. Criterion purposive sampling was used to select the respondents from each sampled housing unit. The defined criterion through which the respondents were sampled was "victims of the June 2010 flood". Questionnaires were administered to these sampled respondents for their responses on issues concerning the execution of the flood response operation. To obtain more insights on issues such as quality of relief service delivery, response activities observed, and demands on the response agencies, two Focus Group Discussions were held in each of the study communities. Eight people formed a group, and there were separate groups for males and females.

Additional information was sought from some key stakeholders including the NADMO coordinators as well as the Planning Officers in the respective study communities through interviews. To generate less interest-laden findings, two informants in in each of the study communities were purposively sampled and interviewed. Field observations were then conducted identifying the state and developments along the banks of the Gbemi stream and the Akora river respectively. Additionally, photographic records were taken, and reports, text and documentarily analysis were conducted as secondary sources of data to complement the primary data. From these data, case description were developed, and patterns matched against the

Recovery Continuum Framework, a standard which prescribes intensification of mitigation measures in the Long Term Phase of disaster response operations.

# CHAPTER FOUR

# DISCUSSION AND ANALYSIS OF DATA

## 4.0 Introduction

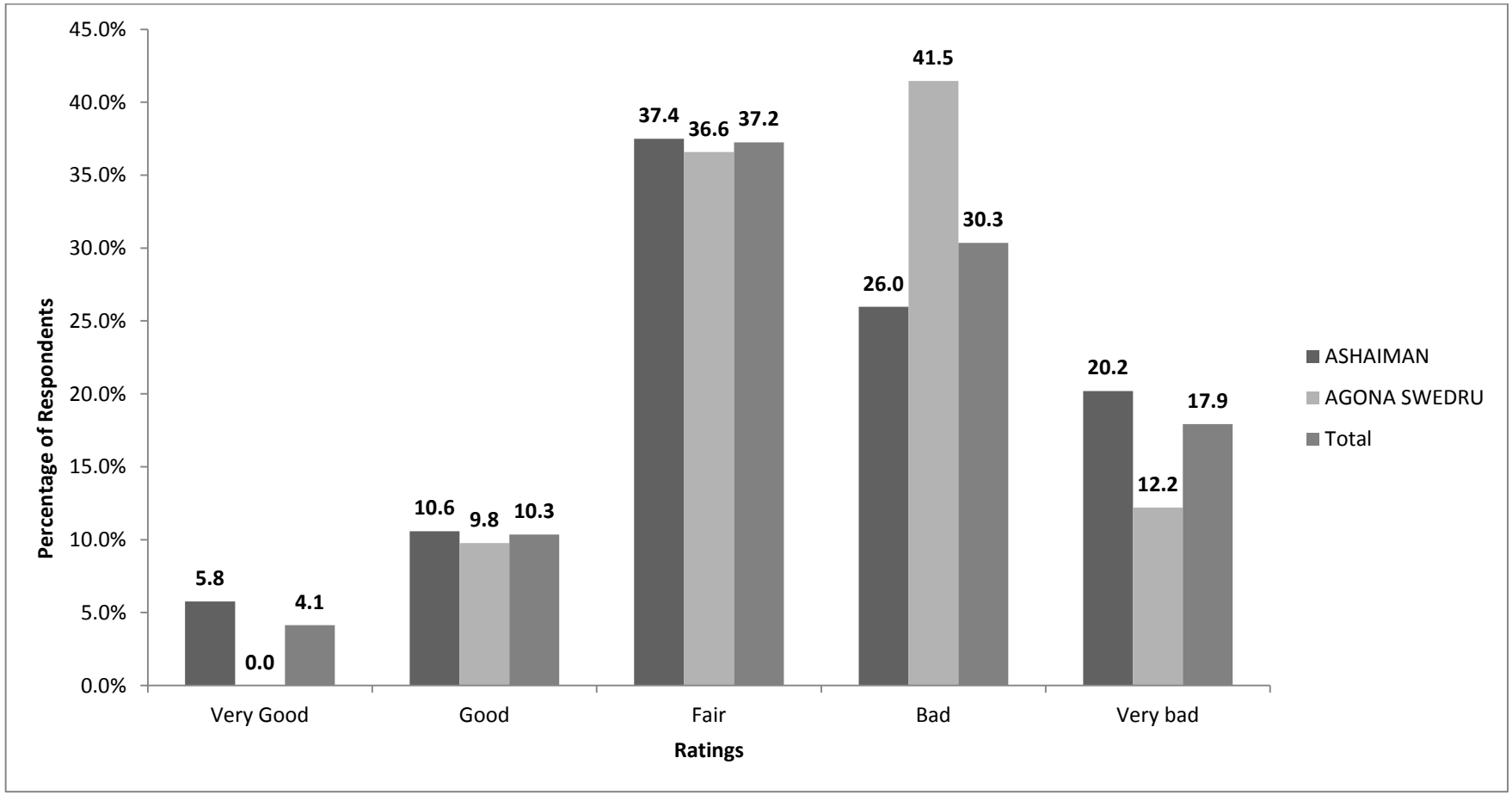
This chapter presents the discussion and analysis of the data collected. The discussion is presented under the various themes. First the effectiveness of the disaster response strategies in the study communities is discussed. Under this theme, local people's perceptions of the disaster response operation as well as the character of the disaster response in the study areas are presented. The latter seeks to present the progress of the disaster response operation from the short-term activities, through the intermediate activities, to the long- term activities aimed at reducing flood risk and vulnerability within the flood affected communities. The chapter finally discusses the challenges that thwart the successful execution of disaster response operations in the study areas.

## 4.1 Effectiveness of Disaster Response Strategies

### *4.1.1 Local People Perception of the Assistance Received*

The perception the respondents have of the assistance they received shed light on the disaster relief process as well as on social service provision more generally from recipients' perspective. Largely, there were mixed perceptions of the assistance and social service provision by the disaster response organisations. Asked to assess the assistance received following the disaster with regards to its timeliness, quality and quantity, on the whole, only 4.1% of the respondents rated it as very good. About 37.2% of the respondents said that it was fair whilst a significant proportion of the respondents (about 30.3%) said it was bad.

**Fig. 4.1: Perception of Relief Support/Assistance Received**




*Source: Field Data, Jan 2013.*

Seen from the details illustrated in Fig. 4.1, largely, a considerable proportion of the respondents rated the assistance received as ordinary or below average. These perceptions the respondents have, especially where about 48.2% of the entire respondents perceive the assistance to be below average, is perhaps influenced by their literacy standards, the expectations they held during and after the disaster period, the promises from government, as well as the low community outreach on disasters.

Most of the respondents had and continue to have negative perceptions of the response agencies they worked with and the assistance they received greatly because of the above mentioned factors. Because in Ashaiman, though majority of the respondents (about 53.8%) perceived the assistance to average and above average, a considerable proportion of them (26.0% and 20.2%) said the assistance was bad or very bad respectively.

Manifestations in the focus group discussions in Ashaiman unveiled some of the underlying reasons behind these perceptions. The male group for instance mentioned that they expected some form of financial assistance to help re-establish themselves and their families, but only those who lost their relatives got some 'token'. The female group also pointed out that many of the promises from the Municipal Chief Executive and some other authorities were never fulfilled more especially the promised medical aid. The male group also expressed their disappointment in promised medical care which was never delivered.

With the hopes of the flood victims, raised, their levels of expectations could be anticipated. Therefore, in an event of failure to make provisions to adequately match the victims elevated expectations, such negative images are likely to be conceived of the organisation responsible. These expectations the respondents had bring to bear

questions about the frequency and adequacy of disaster management organisations' community outreach programmes. If there had been enough outreach programmes on flood disasters, their causes and effects, and the residents had been made conscious of the essence of flood disaster relief, the victims would have appreciated the little that were made available to them. Because they would have seen them as 'relief' and never as 'sustainable source of livelihood', therefore, their knowledge about the response service could have been shaped their perceptions about the service.

Similar pattern of responses were again observed in Agona Swedru. Even though there were mixed reactions on the respondents' perception of the service provision as shown in Fig. 4.1, majority of the respondents (52.7%) stated that the support was far below average. In Agona Swedru, 55.3% of the respondents mentioned that the support wasn't adequate. This was emphasised in the focus group discussions where most of the participants in the female group expressed that six (6) margarine cups of rice, a bottle of oil and the other foodstuffs and the non-food items such as the mats they received were woefully inadequate to sustain their large households for even a week especially when most of their source of livelihoods had been washed away by the floods, depriving them of any other alternative source of food.

Similar revelations were noticed in the discussions with the male group. But some of the participants mentioned that the service seemed to have been tilted in favour of their female counterparts. They described it as 'favouritism'. This revelation perhaps unveils the considerations and priorities that the disaster response organisations gave or attached to the most vulnerable group/individuals during the distribution of aid or resources. This is unquestionably a good practice by the response agencies and highly answers the question about considerations that were given the most vulnerable in the communities, though despondently misconceived by some of the males group of the

community. Thus, if there had been enough community outreach by disaster management agencies on such disaster management issues, this would not have been raised by some of the male participants in the FGDs as an issue against the response organisation. Rather they would have even extolled them and supported them to attend to even the physically challenged, aged and the children.

Nonetheless, getting such support from disaster victims – seen and described as relatively less impacted and vulnerable – would have been much difficult as has been stressed by Geipel (1982). This is because solidarity wanes with the influx of response agencies and relief resources, whilst competition rises (Geipel, 1982). Therefore, the response agencies adherence to the good practice by giving priority, during the relief distribution, to the most vulnerable presented a bad image of the service/assistance to those who felt discriminated.

### *4.1.2 Local Perception of Organisations' Performance on Response Activities*

The respondents were asked to state their perceptions on the performance of the disaster response organisation on disaster response activities. As detailed in Table 4.1, the respondents held varied perceptions on the response agencies perceptions. Overall, but for performance on repairs rated as good, performances on six selected response activities were rated as ordinary with performances on other five activities seen by the residents as below average. It is observed in Ashaiman that, but for social cohesion, which is activities directed towards avoiding intergroup divides during the flood disaster, and repair activities which were rated as 'good', performance on the other activities were rated below average or at best as average The repair and construction of the three bridges in Jericho, Lebanon, and Roman down were much appreciated by the

victims. This was mentioned in the FGDs held with the male and females in the Ashaiman.

**Table 4.1: Respondents' Perception of Organizations' Performances**

| ACTIVITY | ASHAIMAN | | AGONA SWEDRU | | TOTAL | |
|---|---|---|---|---|---|---|
| | Mean | Remarks | Mean | Remarks | Mean | Remarks |
| SWIFTNESS OF RESPONSE | 3.1 | Fair | 3.7 | Bad | 3.2 | Fair |
| RELIEF DISTRIBUTION. | 3.8 | Bad | 3.6 | Bad | 3.8 | Bad |
| DIRECTION AND CONTROL. | 3.7 | Bad | 3.3 | Fair | 3.6 | Bad |
| LOCAL INVOLVEMENT. | 3.1 | Fair | 3.5 | Bad | 3.2 | Fair |
| COMMUNICATION. | 2.9 | Fair | 3.5 | Bad | 3.0 | Fair |
| HEALTH SERVICES. | 4.4 | Very Bad | 3.9 | Bad | 4.3 | Very Bad |
| PROPERTY PROTECTION. | 4.1 | Bad | 3.8 | Bad | 4.1 | Bad |
| SOCIAL COHESION. | 2.6 | Good | 3.8 | Bad | 2.9 | Fair |
| DAMAGE ASSESSMENT. | 2.8 | Fair | 3.5 | Bad | 3.0 | Fair |
| REPAIRS. | 2.1 | Good | 2.8 | Fair | 2.6 | Good |
| SHIFT TO RECONSTRUCTION. | 4.6 | Very Bad | 3.3 | Fair | 4.3 | Very Bad |
| COMMUNITY OUTREACH | 3.1 | Fair | 4.1 | Bad | 3.3 | Fair |

*Source: Field Data, Jan 2013*

This informed the 'good' perception the residents had and/or have of the response agencies' performance on repairs. Thus, the residents conceivably are aware of the notorious activist behaviour of residents in Ashaiman, and the potential it could have had in surging extreme competition for relief resources, ignited tensions between and among individuals as well as inter-group rivalry, and possibly violent clashes. With none of these surfacing and/or occurring unnoticed because of its insignificance on

such environment, the residents thus acknowledge a good performance on building social cohesion.

Discoveries from interviews with resident non-victims, who witnessed the response operation in both study communities, did not sharply contrast those of the flood victims. These informants in the study communities saw the performances of the response agencies as ordinary with nothing so unique done. One of these respondents in Ashaiman stated that:

> *the conditions which influenced the outbreak of the floods have still existed three years since the floods occurred*, adding that *it does not amaze me because the occurrence of the floods brought more opportunities to most of the personnel in the response agencies to amass resources, therefore, the outbreak of similar floods in the community in the near future would be a blessing in disguise for them*.

In Agona Swedru, however, there was none of the activities on which the local people perceived the performance of response organizations as above average. Thus the organizations' performances on the selected activities were seen as either ordinary or bad. In the FGDs with the males, some of the participants, for instance, mentioned that but for their own decisions not to violently contest the seeming discrimination they felt, the unity that existed among the residents for several years could have been terminated. The residents, therefore, perceived the unity that existed during, and continued to exist in the community even after the execution of the post-flood response operation as being from the efforts of the resident/victims, and not from the efforts of the disaster response agencies.

Several factors influenced the kind of performances of the organizations in neutralizing the effects of the floods, and rebuilding the community at flood resilient levels. These include resource availability, institutions observation of bureaucratic procedures especially non-governmental organizations, as well as the cooperation of the service clients (the flood victims). The NADMO coordinators in Ashaiman and Agona Swedru mentioned these issues, in an interview, as some of the major challenges that frequently frustrated the execution of disaster response operations. It is these challenges that have shaped the perception of the respondents in patterns indicated in Table 4.1.

### *4.1.3 Respondents Impression on Disaster Response Organisations*

The mixed perceptions the respondents have of the disaster response and relief assistance have, unsurprisingly, shaped their impressions on these response agencies. As indicated in Table 4.2, a considerable proportion of the respondents raised that they have less confidence in the disaster response agencies regarding their ability to effectively handle disaster and post disaster situations. From the field data, majority of the respondents (66%) claimed that they have distrust and doubts about the disaster response system regarding their ability to meet the needs of disaster victims in the, whilst only 11.4% gave the organization a room for improvement. A female participant in the FGDs in Agona Swedru for instant stated that "*the response organizations did their humanitarian best and probably what was within their means, therefore, they deserve some credit*". Details of the finding have been illustrated in Table 4.2.

As seen in Table 4.2 below, 65.5% of the respondents in Ashaiman indicated distrust in the response system whereas 67.4% of the respondents in Agona Swedru expressed their distrust in the response system. More significantly, only 10.3% and 2.2% of the

respondents in Ashaiman and Agona Swedru respectively mentioned that the response organizations are capable of reducing flood risk factors in the communities.

**Table 4.2: Respondents' Impression on Disaster Response Organizations**

| RESPONDENTS' IMPRESSION | COMMUNITY | | | | | |
|---|---|---|---|---|---|---|
| | ASHAIMAN | | AGONA SWEDRU | | TOTAL | |
| | No. | % | No. | % | No. | % |
| **Distrust in the system** | 101 | 65.5 | 31 | 67.4 | 132 | 66.0 |
| **Capable of reducing flood risk** | 16 | 10.3 | 1 | 2.2 | 17 | 8.5 |
| **Response system very reliable** | 18 | 11.7 | 11 | 23.9 | 29 | 14.5 |
| **Agencies could do better** | 19 | 12.5 | 3 | 6.5 | 22 | 11.0 |

*Source: Field Data, Jan 2013*

Nevertheless, 1.8% and 23.9% of the respondents in Ashaiman and Agona Swedru respectively expressed their confidence in the response system describing them as reliable. Some participants in the female FGD held in Ashaiman added that it could be made better provided certain lessons in previous disaster events in the country are learnt and corrections made.

The opinions and ideas held by the residents in the study communities really affected their attitude towards the disaster response agencies, hence their failure to cooperate and comply with the response agencies. That is possibly the reason why residents along the Gbemi Stream in Ashaiman and the Akora River in Agona Swedru have failed to remove their structures, and are renovating them instead. Though some participant had divergent views, it was confirmed by a statement from a participant in the female focus group discussion held in Ashaiman, that '*the response agencies had not been reliable enough to command their cooperation*'. This held perception and/or conceived opinions of the residents about the disaster response agencies, coupled with

other factors, invariably shaped the behaviour and processes of the general response operation.

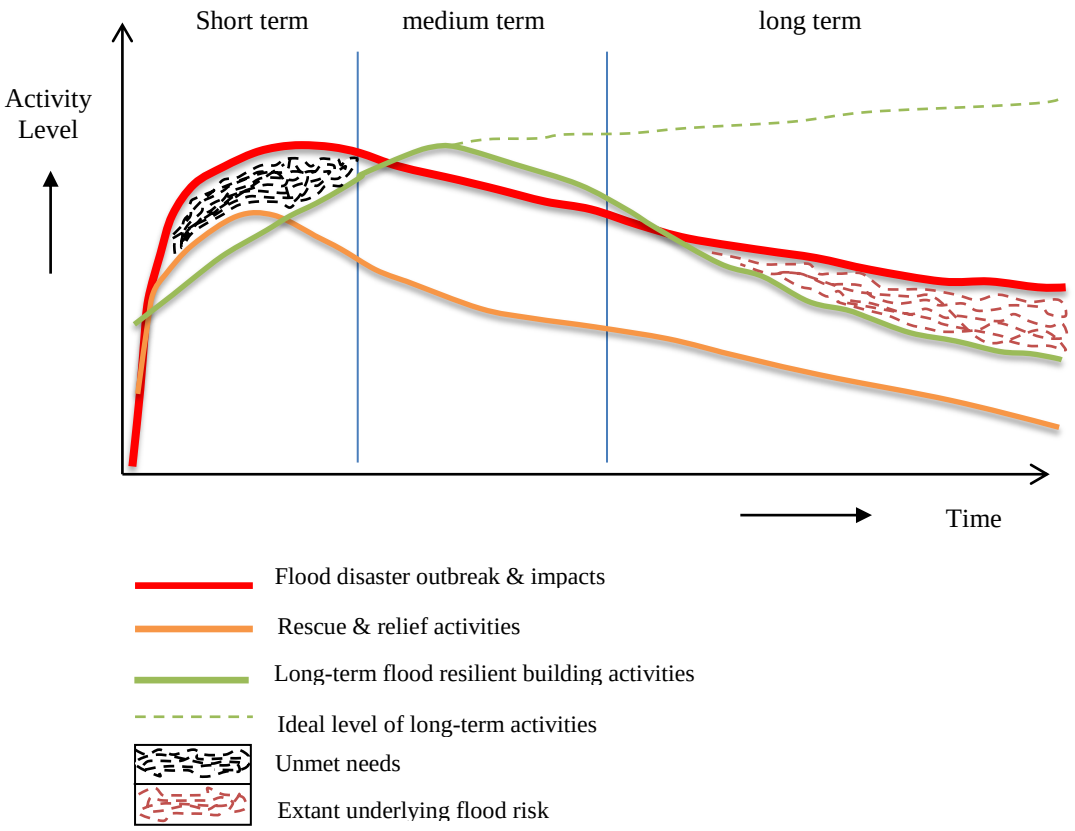
### *4.1.4 Behaviour of the Response and Recovery Operations*

The behaviour of the disaster response and recovery activities in the study areas was described and summarised in a model termed Activity Level Decay Model (ALDM). The key indicators through which the model was developed involved the activities that were undertaken following the floods, the time frames within which the activities were undertaken. This was classified into Short-Term Activities, Medium-Term Activities and Long-Term Activities. The various recommendations made by the key agencies or institutions towards making the settlements in both study communities safer from flood recurrence, the achievements made as of the time the study was being conducted, and field observations of developments along the Gbemi Stream and the Akora River in Ashaiman and Agona Swedru respectively.

The activities that were considered for this model ranged from rescue and relief services such as registration of victims, rate of influx of response organisations and relief resources, relief distribution and disbursement; through restoration services such as repairs and construction of collapsed infrastructures in the communities such as disconnected roads and damaged bridges; to flood reduction initiatives and activities. With flood risk reduction activities, one key activity, aside from public education on disaster risk reduction, recommended in Ashaiman was the dredging and concretising the floor and erecting concrete walls at the banks of the Gbemi Stream. Similarly, in Agona Swedru, one key activity recommended to make the localities along the bank of the Akora River less vulnerable to floods was to demolish structures located within about 30 meters stretch away from the river as well as dredge the channel of the Akora

River. Stakeholders' commitment to these recommendations as well as achievements made three years since the floods occurred formed the premises on which the ALDM was developed.

**Fig. 4.2: Activity Level Decay Model (ALDM)**




*Source: Author's Own Construct.*

The ALDM demonstrates the relationship between time on the one hand, and intensity of activity - commitment to prosecuting the activity as well as the level of interest of the public/community/disaster managers on the other hand. The model demonstrates observation of similar response behaviour in both Ashaiman and Agona Swedru in terms of the disaster relief processes as well as the social and environmental service provision following the floods. ALDM communicates the behaviour of the disaster response and recovery activities in Ashaiman and Agona Swedru in terms of the

progressive shift from short-term activities to the execution of sustainable flood risk reduction initiatives since the outbreak of the June 2010 floods in these respective urban areas.

The advanced ALDM shown by Fig. 4.2 reveals that within the respective study communities, the impulse of interest and commitment to both the relief activities and flood resilient or sustainability building activities were high with the outbreak of the floods. Rescue and relief activity is indicated by the brown curve in the model. It relates to activities geared towards providing material security, stability, protection and support for the affected population of the community. Thus, they include activities aimed at giving reassurance of hope and life. Indicated by the green curve in the model are the flood resilient/sustainability building activities. They concern activities aimed at ensuring a balance and harmony within the natural and human environment in order to create a flood resilient community.

Thus, as rescue and relief activities pounced immediately after the floods to provide stability and comfort to the affected population, the flood resilient building activities also sprang up with the aim creating equilibrium between the natural and human environment. This is a recommendable pairing adequate enough to comprehensively deal with the stresses of modern life such as the floods, and reposition the settlements on levels less vulnerable to future flood outbreaks. Thus, in restoring the communities back to a proper sense of well-being, a well-executed rescue and relief services coupled with long-term flood resilient initiatives were much suitable. But seen from Fig. 4.2 above, interest and commitment to these activities decayed with time as the memories of the floods and their impacts waned, thereby affecting the execution or implementation of the risk or vulnerability reduction activities in the study communities.

The ALDM reveals that the salience of undertaking the flood resilient and mitigation activities in the study communities is short-lived, and has tended to fall below the hazard/disaster curve in the long-term period after the jurisdiction returns to normalcy. The flood hazard or disaster is indicated in the model by the red curve, and it relates to flood risk factors, flood hazards and flood disaster impacts. This process is clearly a true irony of the standard Recovery Continuum Framework by FEMA (2011) in which interest and commitment to sustainability measures or initiatives intensifies in the long-term period following the restoration of normalcy.

The ALDM reveals a sharp drop from the hypothetical level of the long-term flood resilient building activities, which has been indicated on the model by the broken-green curve, to a level far below the flood hazard and flood risk factors curve. Therefore, key underlying flood risk factors that triggered the outbreak of the June 2010 flood disasters in the study communities are still prevailing not fully mitigated or yet to be mitigated. The existence of these flood risk factors makes outbreak of similar floods, perhaps worst situations, more predictable.

Another significant character of the response operation explained by the model is the element of 'unmet needs'. This element surfaced in the response operation as a result of factors such as limited resources, delays, corruption, and level of expectation of the victims. From the field data it was discovered that most of the needs of the victims of the floods were not met. These were mentioned in almost all the four discussion groups in the study communities. Delays in distributing the relief resources to the registered victims as well as limited resource, as admitted by the NADMO coordinator for Ashaiman Municipality in an interview, for instance, implied that problems of the victims might have been worsened before the aids were given as emphasised by Ingram et al., (2006) and Oxfam (2005).

The analysis of the field data confirmed the delay of response services. Overall, 48.5% of the total respondents from the study communities mentioned that they got the support or assistance within a month; with 10% claiming they received assistance two months later. Details on the time frame of receipt of relief assistance are presented in Table 4.3. This is quite a length of time sufficient enough to worsen the plight of the already incapacitated flood victims. Though they might have been given temporary shelters or some form of items from some individuals, friends and relatives from within or outside the communities, delays in response services might have created 'window of vulnerability of the victims to worse physical and health situations'. From the FGDs in the respective study communities, it was discovered that some of the promised medical services were not adequately fulfilled. This could have exposed the victims to worse health situations and possibly death.

**Table 4.3: Time frame for Receipt of Relief Support**

| TIME FRAME | COMMUNITY | | | | | |
|---|---|---|---|---|---|---|
| | ASHAIMAN | | AGONA SWEDRU | | TOTAL | |
| | No. | % | No. | % | No. | % |
| **Within three days** | 24 | 15.6 | 4 | 8.6 | 28 | 14 |
| **A week later** | 42 | 27.3 | 13 | 28.3 | 55 | 27.5 |
| **Within a month** | 71 | 46.1 | 26 | 56.5 | 97 | 48.5 |
| **More than a month** | 17 | 11 | 3 | 6.5 | 20 | 10 |

*Source: Field Data, Jan 2013*

It has been underscored by the United Nations (2008) that much of the lives loss during a disaster or hazard event occurs in the first 24-48 hours. This emphasises the need of offering necessary relief support to disaster victims in periods over a week or even months. The first two days after the outbreak of the disaster is very critical in achieving success in terms of reconditioning and re-establishing the community. Even if lives are not lost during the disaster event, there might be further psychological and physiological deteriorations of the victims and re-establishing them would be more difficult if not impossible.

Though the relief service were marred by scarce, inappropriate and bad conditioned relief resources as was admitted by the NADMO coordinator in Ashaiman, the level of expectations of the victims and demands exerted pressure on the response service most especially on the relief service. This was influenced by their socio-economic background. The floods deprived most of the respondents their source of livelihood. It was identified from the field data that the affected population were predominantly self-employed (about 63.5% of the total respondents), with majority of them operating home-based businesses, and more significantly about 12% of the respondents being unemployed (*See Appendix 'A' for details*). Their expectations coupled with their conditions of living, therefore, contributed to the emergence and surge of the element of 'unmet needs' as demonstrated by the ALDM.

These unmet needs were the main pivot around which most community and individual agitations, demonstrations and protestations revolved. In one of the FGDs in Agona Swedru, a participant in a male group mentioned that:

> *no one would sit down and be unconcerned about something due him but ending up in wrong hands; most of us seriously fought for our take of the resources though not in a violent way.*

This implies that competition over the limited resources within the community were very keen. With the limited resources available for distribution most of the victims rarely had their expected needs met.

In Ashaiman, for instance, reports indicate that there were demonstrations against corruption in the relief distribution service and unfulfilled medical services promised the flood victims. This exposes perhaps a subtle potential for inter-group and -individual rivalry and conflicts within the study communities because according to

UNDP (2011) disasters can deepen conflict over resources especially when they occur in places where people face high levels of poverty and competition over limited resources is high. There were even extreme situations where some respondents in both study communities mentioned that they received nothing from the response agencies or individuals. But as noticed during the FGDs, this was due partly to the discouragement and demotivation by the circumstances that surrounded the response operation or more importantly, as a result of their absence from the community during the time the support arrived. Thus, most of victims had relocated or moved to stay with their friends and relatives outside the community.

The ALDM reveals that the flood disaster response and recovery operations in Ashaiman and Agona Swedru have suffered from what is termed the "Issue Attention Cycle" (Downs, 1972). Interest in addressing the flood problems of the communities leaped into prominence, remained there for a short time, and – though still largely unresolved – have gradually faded from the centre of public attention. The behaviour of the disaster response operations and processes in the study communities reflects most of the stages of the cycle, and these have been explained in the following subsections.

*4.1.4.1 Period before the Floods.*

In the pre-flood period some highly undesirable social and environmental conditions existed within the study communities but they did not capture much public attention, even though some experts or interest groups in the study communities were already alarmed by it. Evidences of these were observed in both study areas. In Ashaiman, prior to the heavy downpour in June 2010, the main water channel in the community

had been the dumping site for refuse and plastics, with most informal structural developments by the local community people along the Gbemi Stream.

Similar developments existed in the Agona Swedru. There were reports of unpopular local attitude and habit of throwing refuse into the Akora River as well as building houses along the banks of the river. The objective conditions regarding the problem were far worse during the pre-flood stage than they were by the time the public and the multi stakeholders became interested in it. The study discovered that the major causes of the floods that in Ashaiman and Agona Swedru included among others the rainfall, waste disposal habits and settlement growth and development close to banks of the streams that drain the respective communities.

Interview with the Planning Officer at the Planning Department of the Agona West Municipal Assembly revealed that the continual occupancy of the areas near or very close to the Akora River has for years rendered and continue to expose the community to flood disaster. The planning officer stressed the office's knowledge of the dire environmental consequences that had, for a long period, lied ahead of the community considering the character of development along the Akora River. The officer further emphasised that:

> *the outbreak of floods had been much predictable considering the apathetic attitude on the part of the community in complying with the building regulations and land use demarcations.*

These statements are true indication of expert's admission of knowledge of the existing condition, which might have eluded majority of the local community people in the Agona Swedru.

*4.1.4.2 Risen Enthusiasm in Addressing the Flood Problem*

With the frightened occurrence of the flood disaster, there were a sudden upheave of enthusiasm or eagerness, both by the community people and the stakeholders in disaster management in Ghana, to arrest the issue. This alarmed outbreak of the flood disaster on June 20, 2010 was accompanied by a strong interest about the communities' ability and responsibility to "solve the problem" or "do something effective" within a relatively short time. After every major disaster, most Ghanaians expect and often demand that government officials as well as disaster management institutions do something to address the disaster and its causes. Within this period, as shown in the ALDM, there was particularly, the influx of relief services both from governmental and non-governmental organisations, individuals and religious bodies. Thus the impulse of relief services rose with the rise of the flood disaster.

It was discovered from the field data, that the community as well as institutional interest in providing relief, restoring normalcy and preventing such inhumane event from occurring in the future were excessively elevated with the outbreak of the floods. There were influx of agencies and organisations including NADMO, the Ghana Red Cross and Crescent Society, the Catholic Relief Agency, the Adventist Development and Relief Agency, the Ahmadiya Muslim Mission, the print and electronic media, as well as individual philanthropists to sympathise and provide support for the affected population.

An interview with the Municipal NADMO coordinator in Ashaiman revealed, that plans were quickly advanced to rebuild the collapsed bridges so as to restore normalcy within the community. This is shown in plate 4.1 below. Similarly, in Agona Swedru, work begun on the construction of the Texaco Bridge. This was executed within two months in order to restore social life and commercial activities that had been badly

affected as a result of the collapse of the bridge. These were some of the intermediate activities that were undertaken in the communities to restore and facilitate commercial and livelihood activities.

These are evidence of the public, community as well as institutional interests in dealing with the post-flood situations in the study communities following the floods. In both study communities, it was discovered through interviews with the NADMO coordinators as well as the Municipal Planning Officer in Agona Swedru, that following the outbreak of the floods, experts recommended long-term measures towards preventing future recurrence of similar flood event and demonstrated a hopeful commitment towards prosecuting the agenda. In Ashaiman, recommendations such as dredging and concretising the main water channel in the community were made.

**Plate 4.1: Reconstructed Bridge in Roman Down**

*Source: Field Photography, Jan., 2013*

In a focus group discussion in Ashaiman, it was confirmed that the collapsed bridges at, Lebanon and Roman down localities were reconstructed within the assured time, and the dredging of the water channel was executed by the officers responsible as soon as possible. Below is the dredged water channel in the Ashaiman community.

**Plate 4.2: The Dredged Water Channel in Roman Down**

*Source: Field Photography, Jan., 2013.*

Interview with the Planning Officer at Agona Swedru revealed that as a long term measure to preventing the recurrence of floods, there was a recommendation to dredge the channel of the Akora River and remove structures located close to the river. The planning officer emphasised that even though it was to affect some structures and houses located close to the banks of the river, the recommended project had been appreciated by the community during the heat of the flood disaster since it was aimed towards repositioning the community at safer levels in terms of flood recurrence. Therefore, in both study communities, the outburst of the flood disaster prompted high community and institutional interest and concern in sustainably addressing the flood problem.

*4.1.4.3 Realization of Cost of Significant Progress*

With time, there was a realization that the cost of "solving" the flood problem was very high. The manifestation has been the disinclined attitude of the parties involved in prosecuting the issue. Inertia has set in in both communities whereby the initially demonstrated overwhelming desire and interest of the stakeholders, both the community and the institutions, have dwindled upon a realisation of a resisting force – cost. The cost has been in terms of finance and sacrifices or compromises. Effectively

solving the flood problems in the study communities did not only demand a great deal of money but also required major sacrifices by large groups in the communities. This has been emphasised by Ibid that it takes uncompromising sacrifices to have a successful execution of a development project directed towards benefiting an entire community.

Aside from the heavy downpour, the planning officer in Agona Swedru also mentioned emergence of settlements along the banks of the Akora River, especially in the Zabu Zongo, Mahondwe, Sawmill and Nkubem localities as one of the fundamental causes of the flood. The officer added that the development has altered the course of the river making the river overflow its banks usually in rainy seasons. This is an indication that sacrifices were necessary and indispensable in Agona Swedru in terms of resettlements and vacation of the affected areas to make way for the project.

But field observations as well as revelations during the FGDs proved that after the impacts of the flood started waning, and stability was gradually being restored, the community, especially those affected by the project, then realised that part of the solution to solving the flood problems of the communities involved sacrifices and compromises geared towards the interest of the community in totality. This is a decision hardly appreciated in most predominantly hopeless, poor, uninformed individuals or population. The field data indicates that majority of the respondents in both study communities have their highest education up to basic level, with a considerable size of the respondents with no taste of formal education. (*see appendix 'A' for details*).

The data, therefore, confirmed the Agona Swedru planning off.icer's admission in an interview that the areas that were severely affected by the floods were the poor old

settlements in Agona Swedru located along the Akora River, with poor quality houses or deteriorated houses, poor inhabitants, low education levels, clumsy/congested houses, as well as poor drainage characteristics. This demonstrated the potential difficulty of full appreciation of the projects by such ill-informed or educated settlements. Thus, it emphasised the anticipated challenge of community resistance to execution of the recommended projects.

The planning officer in Agona Swedru unreservedly stated in an interview, that one of the constraints that have yet prevented or delayed the dredging of the Akora River has had to do with finance. The officer, however, added that:

> *though financing has been the key constraint, preliminary measures to relocate the affected population living close to the banks of the river have proven futile*.

In the FGD held with victims, they mentioned that some of them have dwelt in the area since birth, and even those who were not born in the community have dwelt there for a considerable number of years. Some of the participants in the two FGDs further expressed their unwillingness to vacate their houses, even though some parts of their houses have been marked to be removed.

Similar responses and expressions were recorded in the FGDs in Ashaiman, where some of the participants stated that "*it would be very difficult to vacate an area where one has virtually lived all his/her life*". Though some of the participants in the FGDs mentioned that they have no power or authority to resist the implementations of the project, field observations reveal otherwise. In Agona Swedru, for instance, as the affected population realized how difficult and how costly a solution to the problem would be for them, some reactions have surfaced. This includes frustration of the

system by defying some of the orders and instructions from the institutions responsible for undertaking the long-term flood mitigation projects.

**Plate 4.3: Demolition Orders Defied By Residents in Mahodwe.**


*Source: Field Observation and Photography, Jan., 2013.*

Confirming the responses in the FGDs, it was noticed in a field observation in Agona Swedru, that some houses, a church building and many other structures had been marked to be removed. But since December 6, 2010 when these orders were given, none of the buildings have been cleared. Instead, some of the houses and the structures are being renovated by the inhabitants. The Plate 4.3 is example of some the houses and a church building in Agona Swedru that have been marked for demolition, yet being still occupied, and even being renovated by the residents.

In Ashaiman the Municipal NADMO coordinator stated that cost has been the major factor that has delayed the concretisation of the Gbemi stream, a project which he emphasised as very critical to addressing the perennial flood problem of the community. The Ashaiman Municipal Public Relations officer has disclosed in an

interview that the construction or concretisation of the Gbemi stream is highly a capital intensive venture, and because of this the advancement of the project has been slow even though government and World Bank promised the start of the project by June 2011 (http://www.modernghana.com/news/331264/1/ashaiman-flooding-a-year-after.html). These are revelations of inertia in towards the commitment to solving the flood problem in Agona Swedru and Ashaiman as time passed.

*4.1.4.4 Gradual Decline of Stakeholders Intense Interest*

The identified cost have, almost imperceptibly, caused and transformed stakeholders' commitment levels into a situation of gradual decline in the intensity of the community interest as well as the virtual sleeping of the institutions over the problem. Asked whether they feel threatened by the order, a female participant in Agona Swedru revealed in the FGDs that:

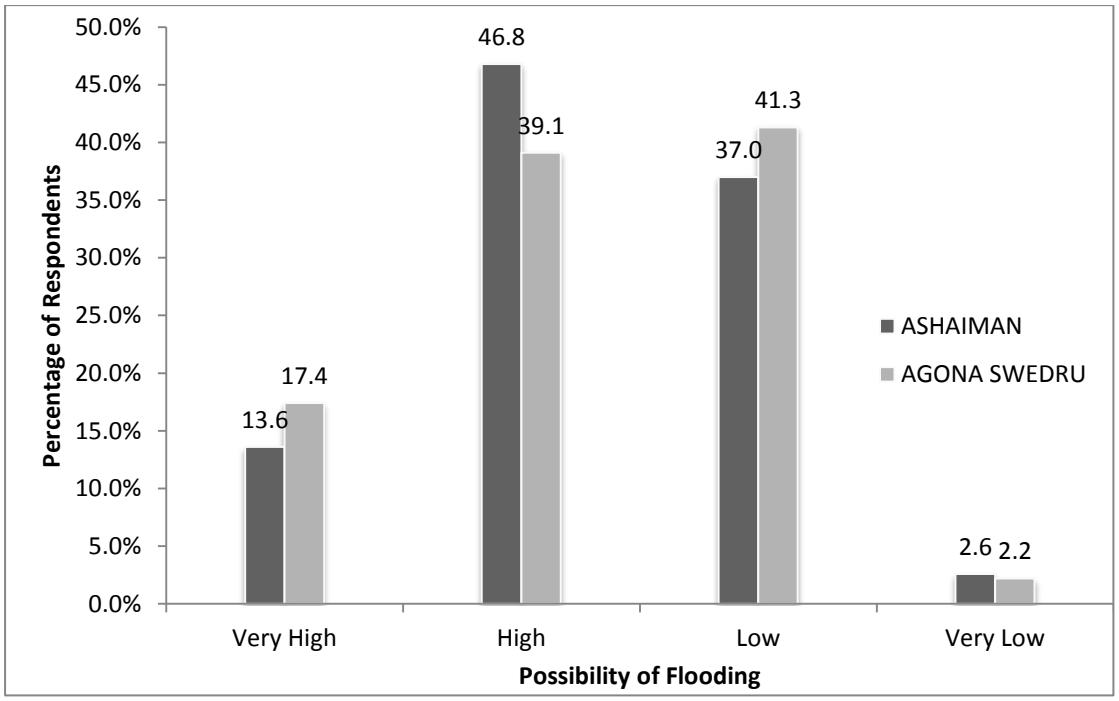
> *since 2010 that we refused to obey the order, the only thing we have been told by the officers is, that when the flood occurs again they would not come to our aid, but we pray that it would not happen again*.

This statement is a clear demonstration of the respondents' unwillingness to comply with the order, thereby, frustrating the process. The developments stress Berke et. al. (1993) observation, that the success of a disaster response and recovery process is affected by the characteristics of the concerned community with respect to its relationships and level of cooperation with the agencies.

Thus, it is exhibited by the ALDM that the interest of the respondents' has waned with time. The respondents are reluctant in supporting the some of the fundamental recommended projects such as the demolition of the illegal and ill-situated structures along the banks of Akora River. Most of the respondents claimed that even some of the

residents are renovating their structures. These have happened, despite their envisioned possibility of flood recurrence in the communities. It is revealed from the field data that a considerable proportion of the respondents in both study communities envision outbreaks of similar floods in the future as illustrated in Fig. 4.3.

**Fig. 4.3: Possibility of Flood Recurrence**




*Source: Field Data, Jan 2013*

The drive from the stakeholder institutions in addressing and undertaking the long-term sustainable measures also has waned with time. This manifestation is reinforced by the level of capacity of the institutions in charge of undertaking such task. Thus, prevalence of institutional barriers has contributed to the recession of the organizations' commitments. The uncompromising political interest '*politicization of issues'* that has conspicuously become the standard of the social, cultural and political spaces in the country, has been one of the deadlocks to efficiency in most socio-economic sectors of the country. The execution of the post-flood response operation in the study communities have been marred by the element of politics.

The Planning Officer in Agona Swedru, though being cautious, emphasised in an interview, that one critical issue that has reinforced the community's disregard for building regulations and development orders from 'authorities' has been political interferences. The officer added that it has been very phenomenal especially when certain presumably harsh but prominent and sustainable programmes needed to be implemented. This emphasises the observation made by Rubin et al. (1985) that political leadership and organisational knowledge or capacity influences post disaster response and recovery efficiency. Thus, efficiency in executing disaster response operation is achievable if political leaders become willing to project the sustainable interest of the entire affected community over the parochial interest of the few party loyalists in the community.

Institutional capacity has influenced the pattern of post flood developments in the communities. The National Co-coordinator of the National Disaster Management Organisation (NADMO) has called for amendment of the Act 517 establishing the organization to make it more effective and relevant. The coordinator has revealed that NADMO needs legal empowerment to be able to check developers whose activities did not comply with building regulations. It was again emphasized that the amendment of the Act would help strengthen NADMO to enforce some development provisions which some people flouted. This is perhaps the lapse in the system which has thwarted successful enforcement and removing of structures from along the banks of the Akora River, thereby making the community still live in a flood risk environment.

*4.1.4.5 Period after the Floods*

With attention on the Agona Swedru and Ashaiman flood disasters waned, attention shifted onto other events such as the devastating October 2011 flood in Accra. This flood attracted the attention of national institutions and the public. For instance, with

the outbreak of this new flood in 2011, President Mills appealed to victims of the floods to remain calm as efforts are made to rescue and offer them assistance. The president assured them that:

> *the government will do everything in its power to bring this situation under control*", and further emphasised that "*you have seen all of us here because of the concern that we have for this rather disturbing situation*" (http://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=222361).

These statements, expresse0d the government's commitment to sustainably address the pressing issue at hand in the heat of the floods. The critical question is whether the interest in the problem would endure till it is effectively solved and flood resilient or mitigation measures undertaken to make the settlements in Accra safe from floods.

Thus, issues concerning the Ashaiman and Agona Swedru floods seem to have virtually moved into a dusk realm of lesser attention from national and local institutions as well as the public. As a result of this, some flood risks are gradually accumulating within the study communities. These could trigger similar flood disasters within the study communities in the near future. Though it has been mentioned by the Ashaiman Municipal Public Relations Officer that community education and sensitisation programmes are being undertaken to curb the problem of throwing waste material into the stream (http://www.modernghana.com/news/331264/1/ashaiman-flooding-a-year-after.html), field observation indicated that the habit is still in place. Evidences are shown in the Plates 4.7 and 4.8. These show the level of attitude held by the residents, and the ineffectiveness of the waste disposal campaigns.

**Plates 4.4 & 4.5: Refuse Dumped into the Gbemi Stream**


*Source: Field Observation and Photography, Jan, 2013.*

The resurfacing of such conditions within the communities make the outbreaks of flood is inevitable. This could start another cycle of response and recovery operations in the study communities in the near future. However, the programmes that have been drawn to help solve the flood problems of these communities documentarily still persist, though the attention seems to have shifted elsewhere. This pattern of the response operations and its dynamics are unsustainable and less efficient because it sanctions the recurrence of similar floods in the study communities. The character of the response and recovery operations in Ashaiman and Agona Swedru did not match with FEMA's Recovery Continuum Framework, a standard which prescribes intensification of disaster mitigation and resilient building initiatives or activities in the Long Term Phase of response operations (FEMA, 2011).

## 4.2 Challenges that Affected the Success of Disaster Response Operations

### *4.2.1 Residents' Behaviour during Response Operations (anxiety)*

The interviews with the NADMO coordinators revealed that one critical challenge to the response operation was anxiety of the victims of the disasters. Anxiety is a normal reaction to extreme conditions such as those from extreme flood disasters. Though anxiety rarely results in the inability to act, it does lower the disaster victims' ability to effectively reason through complex problems. The interviews revealed that the anxiety

affected particularly, giving accurate account of the lost valuables and assessment of the impacts of the disaster. Thus, the assessment of damages is done hand-in-hand with the affected population who might be in the state of nervousness due to the shock felt from the disaster. This eventually frustrated the disaster response organizations in undertaking the damage assessment, a function highly essential to plan for assistance.

Thus, the victims' anxiety tended to thwart effective and well informed damage assessment, a revelation discovered through an interview with the NADMO coordinator in Agona Swedru. Ill-informed damage assessment affected the response and recovery operations. Research has revealed that, damage assessment helps among others to identify the immediate needs of disaster victims, and enables first responders and emergency managers to recognise required materials and human resources (McEntire, 2002). Oaks (1990) also emphasize this issue, that "after disasters, the damage assessment process is fundamental to relief and reconstruction as it triggers the beginning of formalized disaster relief and recovery aid".

### *4.2.2 Corruption in Resource Distribution*

When disasters strike, humanitarian organizations work to quickly and accurately ascertain the supplies required to meet the relief needs of the affected population. An assessment team with individual expertise in areas such as water/sanitation, health care, and nutrition is dispatched to the affected area. These personnel are often complemented with local hands. This early rough projections of the numbers of beneficiaries informs the logisticians in making estimates of the needed resources required to neutralise the effects of the disaster.

The interviews held with the resident non-victims revealed that resource diversion by the response personnel and the local community members who assisted in the response operations deprived many victims their take of the relief resources.

> *There were seemingly ceaseless influxes of reports and grievances about emergency response personnel habitually or deliberately exploiting the system for personal expansions*.

This was mentioned by the NADMO coordinator in Ashaiman, adding that these reports failed to identify the exact response personnel caught with such an act. Therefore, it made it difficult to question them. This was especially crucial in the victim registration exercises, damage assessment and relief distribution services. This was mentioned in the FGDs.

The NADMO coordinator in Agona Swedru, emphasised that formal training and orientation are given to the personnel of the organisation regarding their code of conducts in disaster situations especially separation of duty from their personal interest. But added swiftly, that since it is a human institution one cannot have a perfect team. Though relief resources were often not enough, the little available were leaked through this fraud, and it had been one of the causes of the demonstrations, protestations and antagonism against the activities of the response organisations. These were expressed by participants of the FGDs in Ashaiman.

### *4.2.3 Appeals Management*

Following the flood disasters, preliminary appeals for donations of cash and relief supplies were launched. This appeal was the basis for mobilization of resources from multi-stakeholders both locally and internationally. The NADMO coordinator in Agona Swedru indicated in the interview that most organisations did not respond early enough due, perhaps, to their internal bureaucratic organisational procedures that needed to be followed. Some even did not respond at all to the appeal. The appeal, therefore, became under-funded and relief services became impinged. A report from the Adventist Development and Relief Agency (ADRA) has emphasized this

challenge. It indicated that their response time in delivering relief items to disaster victims has usually been a bit tardy due to the processes that must be followed in sending proposal, getting approval and money transferred from supporting offices.

Challenges faced in the resource mobilisation facilitated delays in the service delivery, a statement by the NADMO coordinator in Ashaiman. The delays in offering the relief services was one of the major factors that triggered community agitations, suspicion of corruption, dissatisfaction and the seemingly unending distrust in the NADMO and some other organisations concerned with disaster management in Ghana. Thus the plight of the victims worsened before the aid got to them. This made most of them unappreciative of the little that got to them, hence their reluctance in cooperating with the response agencies. This was mentioned by the Municipal NADMO coordinator in Agona Swedru.

### *4.2.4 Institutional Capacity*

Institutional capacity was one of the challenges that affected effective execution of the response operation. It was observed in Ashaiman that only one functioning computer existed in the NADMO coordinators office through which administrative work is undertaken and data stored. There are doubts as to whether the internets were effectively working. This perhaps affects information flow between and among the various NADMO offices across the country, and even with the other stakeholders in in the community and the country at large. The fundamental capital through which a well-integrated response could be initiated in the event of disasters has not been in existence or has existed in limited quantities or poor states. Resources such as the computer could have facilitated effective and appropriate transfer of situational analysis of events as they unfolded. This could have informed appropriate mobilisation of resource from across the country to ensure a successful rescue and relief service. Ill-

furnished offices imply lack of effective and swift inter-office interactions, a development that in a long ways obstructs disaster response.

Limited by the Constitutional Act that established it, the respective NADMO offices could do little in enforcing the resilient building initiatives. The Act 517 limits the organisation as to the level it reaches in enforcing certain disaster management recommendations. Therefore, NADMO could not undertake some key activities which, from their evaluation of the situation, could have made the communities safe from floods. The National Co-coordinator of NADMO has on many occasions called for an amendment of the Act 517 establishing the organization to make it more effective and relevant. The implication is that, the Act did not allow NADMO to enforce demolition activities in the study communities. Hence some key underlying causes of the floods have still not been mitigated, especially the existence of settlement in the water ways.

### *4.2.5 NGOs Approach to Disasters*

The NADMO coordinators in the study communities indicated during the interview that:

> *operations of most Non-Governmental Organizations have been more relief oriented. Most of the organisations interested in the humanitarian activities and disaster events in the country have tended to concentrate their activities more on relief services. They have always waited for the disaster outbreak before offering support to the affected population. Hardly do they invest in sustainable and resilient building activities. Most of these organizations invested little or virtually nothing in mitigation measures in the study communities.*

Identified was that the activities of most of the NGOs who responded to the floods in Ashaiman and Agona Swedru did not go beyond relief services. This revelation emphasises CRED (2004) observation, that though literature on disaster management currently embraces vulnerability and risk reduction approaches, efforts of most institutions are still geared towards relief services, and that aid is still dominating disaster management activities. This approach of NGOs, according to the NADMO coordinator in Ashaiman, helped in providing comfort for the flood victims, but did not help in ensuring a balance between the human and the physical environment.

# CHAPTER FIVE

# SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

## 5.0 Introduction

This chapter summarizes the findings of the study. This is presented in the form of a matrix in which the findings under each specific objective are highlighted and remarks made. It further presents the conclusions of the study. Lastly, the chapter presents the recommendations made to help improve execution of disaster response operations in disaster affected communities.

## 5.1 Summary of Findings

The study sought to explore the post-flood disaster response mechanisms and effectiveness in Ghana using the June 2010 flood incidences at Ashaiman and Agona Swedru as the case studies. To achieve the set of objectives, the study adopted multiple methodologies. Random sampling was first used to sample housing units located along the banks of the Akora river and the Gbemi stream in Agona Swedru and Ashaiman respectively. The flooded areas had similar socio-economic characteristics hence to avoid repetitions a number of housing units were sampled. Also time constraint and limited resource availability influenced the sampling. Criterion purposive sampling was used to select the respondents from each sampled housing unit. The define criterion through which the respondents were sampled was "victims of the June 2010 flood". The questionnaires were then administered to these sampled respondents for their responses on issues concerning the execution of the flood response operation. To obtain more insights on issues such as quality of relief service delivery, response activities observed, and demands on the response agencies two Focus Group Discussions were held in each of the study communities. Eight people formed a group, and there were separate groups for males and females.

Additional information was sought from some key stakeholders including the NADMO coordinators in the respective study communities as well as the Planning Officers through interviews. To generate less interest-laden findings, two informants in in each of the study communities were purposively sampled and interviewed. Field observations were then conducted identifying the state and developments along the banks of the Gbemi Stream and the Akora River. Records were taken through photographs. Lastly, reports, text and documentarily analysis were conducted as secondary sources of data to compliment the complement the primary data. From these data, case description were developed, and patterns matched against the Recovery Continuum Framework, a standard which prescribes intensification of mitigation measures in the Long Term Phase of disaster response operations.

It was identified that Ghana has an emergency operating procedure which perfectly match the principles provided in the Recovery Continuum Framework. The National Standard Operating Procedures for Emergency Response serves as the framework for executing response operations in the country. This operating procedure functions within the Ghana Disaster Management Model (GDMM). It serves as the feedback loop to the GDMM, informing the definition and redefinition of the risk environment as well the management defined risk. There is, therefore, a perfect framework in Ghana for managing post-disaster situations in every community in the country.

However, several factors such as institutional capacity, NGOs approach to disaster management, corruption, poor cooperation of community members influenced the behaviour of the response operation in the study communities. These factors have derailed the execution of the long term mitigation measures in the study communities. The challenges faced in executing the response operations in the study communities have caused the pattern of the response operation to deviate from the principles defined

by the Recovery Continuum Framework. Details of the findings are presented in Table 5.1 below.

**Table 5.1: Summary of Findings**

| OBECTIVE | FINDINGS | REMARKS |
|---|---|---|
| Disaster response strategy(ies) used in Ghana | There exist a framework (NSOPER) with seven task force teams that perfectly commensurate the ICS recommended by the UNDP. This operation procedure functions within the Ghana Disaster Management model, and it is ideal to act as a feedback loop informing the definition and redefinition of the risk environment as well as effectively managing the risk environment. | This disaster response operation procedure is capable of establishing the necessary platform (winning community's trust and compliance) through which sustainability measures involving long-term flood risks reduction and flood resilient building activities could uninterruptedly be executed. |
| Effectiveness of post-flood disaster response strategies in the study areas | The local people have mixed perceptions of the relief support received as well as performances on response activities. Whilst some perceive the assistance and the organisations' performances as poor, a considerable proportion of them perceive them as average.<br><br>Generally, the intensity of the institutional and public interest as well as commitment to undertaking long-term activities geared towards building flood resilient community have tended to wane with time. This is described and explained in a model called Activity Level Decline Model which reveals that the path of the disaster response activities have tended to suffer from Issue Attention Cycle | Majority of the respondents, therefore, have no confidence in the response organisations though some still give them a room for improvement.<br><br>The behaviour of the response strategies makes the reduction of flood risk factors as well as building flood resilient community in the long-term rare. |
| Challenges that affect the disaster response strategies | Anxiety of the affected population affected the quality of damage assessment<br><br>Community resistance to the execution of flood risk mitigation measures<br><br>Institutional backdrops (limited capacities)<br><br>Interest of NGOs tilted in favour of or concentrated highly on offering relief services to the neglect of investing in long-term flood mitigation and prevention activities. | These challenges frustrated the successful progression of the response operation processes form the short-term activities through the medium term activities to the long-term sustainability activities |

## 5.2 Conclusions

Following from the findings of the study, it can be concluded, that existing frameworks and models for managing disaster situations in Ghana place emphasis on incorporating risk definition and reduction as well as vulnerability reduction in all phases of disaster management. Thus, Ghana's disaster management frameworks have progressively shifted from the traditional methods, which focused highly on rescue and relief missions, to a more sustainable measure which focuses on mitigations against recurrence of similar events in future. Thus, the existing disaster management model have virtually subdued reactive principles and developed proactive orientations.

However, several challenges ranging from institutional backdrops and community cooperation among others have caused the proactive orientations to virtually exist only on paper. Some persisting community specific interest or individual parochial interests, institutional interests as well as limited institutional capacities have affected the effective observation and implementation of the key principles underlying the disaster management models especially the emergence response section of the model. Exercising the post-disaster emergency response operations in Ashaiman and Agona Swedru has suffered most of these challenges because most stakeholders have failed to act because of protection of images, the communities have failed to cooperate with the institutions, the organisations have been limited by cost among others. Such developments engulfed the response operations in the study communities causing it to deviate from following the sustainability path as described by the Recovery Continuum Framework.

## 5.3 Recommendations

From the analysis of the information collected through the various methods, the following recommendations are made to improve the disaster response management in

the country. Thus, seeing post-flood disaster periods as *'window of opportunity'* for reestablishing and resituating the affected community in a state or condition less vulnerable to the outbreak of similar disaster events over a considerable period of time, the following recommendations are outlined to shape disaster response operations in the country.

a. Inter-organisational platforms and forums should be annually organised, through which information and ideas on effective disaster prevention, preparedness, response and recovery activities could be exchanged. This could help reshape the structure and operation of most of the actors and institutions in disaster management in Ghana hence make them more appropriate and efficient in meeting demands of present day disaster management. More importantly, the established annual disaster management platform could cause many NGOs, whose activities are highly focused solely on relief services, to orient their efforts and activities towards investing in disaster mitigation and risk reduction measures such as embarking on education outreach, construction of water drains.

b. If assistance is truly a matter of life and death, time does not permit the collection and analysis of all data to the extent required for wise decision making. Utmost priority should be placed on the speed of the response. Therefore, a speedy cross-sectorial needs assessment should be conducted jointly by responding agencies as prescribed in the National Standard Operating Procedure for Emergency Response in Ghana. Multitude of mostly proprietary assessment as well as tasks geared towards finding facts, partly for research and/or to serve specific organisational interest, which are now characteristic of most response and relief efforts should not be the focus. Strict

adherence to protocols in disaster situations should be made more flexible. The interest of the affected populations must be prioritised over strict procedures and bureaucracies. Stakeholders must show administrative commitments and provide the resources for this joint undertaking of damage assessment to facilitate quick determination of the appropriate needs of the affected population.

c. Economic assessment of the impacts of the flood disasters and the creation of information systems on the needs of the affected population must be segregated (Amin and Goldstein, 2008). Information system for management of needs during disaster response and recovery must contain data segregated to reflect the needs of specific social groups such as school-age children, women, and well-defined group of households (based on location or community). This would help inform shaping of the resource allocation procedures. This would further help overcome the issue of distribution of similar resources across the overall affected population, thereby convincingly satisfying the aspirations of the individual beneficiaries of the service (affected population).

d. The media must play a role on the resource allocation process (monitoring of the relief distribution). The responsibility of the media in pre- and post-flood disaster situations should transcend giving early warnings, and offering disaster education to the public. The media should become involved in the joint assessment of the needs of the flood affected community, monitoring of the distribution of the relief resources, and even be involved in allocating the resources to the victims. This would help curb issues of diversion of resources to unintended group of people within the community, often time leaving the truly affected population discounted or ignored. Media reporting serves as a

coordinating mechanism as operations unfold, and as a means to monitor effectiveness of relief during and at the close of an operation.

e. Resource mobilisation methods towards alleviation of the suffering of flood affected population must be strengthened. Timely mobilization of financing and goods from multi stakeholders and administering relief to vulnerable beneficiaries at flood disaster sites is very crucial in ensuring a well-embraced flood disaster response operation. Therefore, logistics is central, and it's crucial to the effectiveness and speed of response for major humanitarian programs, such as health, food, shelter, water and sanitation. Well established and proactive means of mobilising resources informed by the community based disaster risk and hazard profiles could help prevent some of the problems regarding relief mobilisations and distributions. Data on community specific disasters, periods of occurrences, and frequency of their occurrences should inform the type of relief resources stored in the warehouses of the decentralised NADMO offices (i.e. if such decentralised warehousing system is effectively activated and functions within the organisational structure). This developed community specific disaster profiles must be disseminated to all stakeholders/actors engaged in disaster management in Ghana. This would alert them as to the peak times of specific type of disasters within specific geographical spaces within the country, thereby putting all the necessary structures and procedures well on standbys, and swiftly activating them for operation in times of break.

f. There are untapped local sources that can contribute to the improvement of peoples living conditions particularly in disaster situations. The role of the community must not be ignored in mobilising resources for emergency

response operation. Communities' willingness to participate in disaster situations must be a key factor in mobilising the resources for disaster response. The communities must not be treated by the disaster response agencies as being helpless, for treating them as such would more likely make them act as if they are. The attitude and action of the disaster management agencies operating in Ghana should motivate the communities to appreciate their role in pre- and post-disaster situations as a social, religious and traditional obligation for mutual help. Having adequately established this through intensive community outreach, religious organisational visits, and media sensitisations, community-based disaster mobilisation funds could be activated to serve us immediate/instant resort for relief in disaster situations before even established donor agencies and governmental organisations draws in.

g. The type and quantity of relief supplies needed must be published as soon as possible to a mobilization table through which donations could be pursued against demand. Since donations may be either in cash or in-kind, logisticians must work with donors to insure that in-kind donations are appropriate and useful to the relief need. This would be informed by the published relief supplies needed. Simultaneously, any pre-positioned supplies available to the organization (NADMO) must be assessed, and procurement activities begun as necessary. More importantly, stakeholders in disaster response and recovery management (both governmental and non-governmental organisations) must flexibly define their structures, making their mode of operations as flexible as possible, appropriate to allow for quick disbursement of resources in order to avert delays in giving out relief when disaster strikes, a development which might worsen the plight of the affected population.

h. As a form of their social responsibility of operation within Ghana, the media's role in resource mobilisation for disaster management must be harnessed. There is an important role the media can play in educating society on various issues including disasters, and thus motivate people to give towards such efforts. A quick survey on resource mobilisation methods by Mutakyahwa (2003) has revealed that the media fundraising method is yet to be exploited although it is estimated that its use is to increase. People are ready to respond positively if well informed about certain issues or areas of concern within their community. The media (television, radio and the print) must be used to reach individuals and corporate organisations in mobilising funds for emergency situations.

i. The emergency response organisations or actors in Ghana should anticipate and consider anxiety as a critical issue in disaster situation, and adequately plan to address anxieties in disaster situations. They should do so by providing – but not withholding - information from the affected population. The disaster response organizations should explain to the people what the authorities are doing to arrest the situation and restore normalcy in the community. This would build the peoples' confidence in the system; hence they would be less nervous about the situation. This could ensure the provision of accurate information from the affected population to inform effective damage assessment - an exercise very critical in deciding the appropriate material and human resources for the response operation.

j. Community-based disaster management volunteer groups, through which activities such as local arrangements for mutual support for neighbours and friends could be executed, should be established and strengthened where they already exist. So that in disaster situations, a neutral disaster management

volunteer group from a community within a considerable geographical location (in terms of swiftness of arrival) relative to the disaster affected community could be quickly resorted to in assisting with the victim registration exercises as well as the relief and resource distribution activities. This would, to a large extent, limit the corruption in the registration exercises as well as limit the outflows in the resource distribution activities. This is a measure which could be taken to ensure that some administrative mandates, if not all, of the disaster response organisations, is met with minimal complaints from the respondents; hence build the peoples trust in the emergency response system. This established trust would, therefore, enhance community compliance to recommendations geared towards building flood resilient building measures.

k. NADMO should consider it a priority in furnishing their respective offices across the country in order to facilitate effective inter-office interactions through which integrated response measures could be experienced. In equipping the capacity of the disaster management organisations (especially NADMO), there should be high emphasis on devising means to either internally and externally develop means of raising funds to finance the project, because clearly the route to good disaster response operations is a firm and financial investment in emergency planning, and one of these is through the media platform as fore mentioned. Again, though limited constitutionally, NADMO could liaise with the other institutions within their areas of jurisdiction (Metropolitan assemblies, Municipalities, Districts) such as the planning offices which have the authority to enforce certain activities including demolitions of illegal and informal settlements located in unsafe places, to undertake such actions that lie off their operation spheres.

Notwithstanding these findings, there is the need for a further thorough study on the long term effects of institutional neglect of proper post-disaster management. Also the study area must be extended to include a much wider area of the country. This would present a broader perspective of the scenario.

# BIBLIOGRAPHY

Abney, G. and Hill, L. (1966) Natural Disasters as a Political Variable: The Effect of a Hurricane on an Urban Election, *American Political Science Review, Vol. 60 (4), pp.974-81*

ActionAid International (2006) Unjust waters: Climate change, flooding and the protection of poor urban communities: experiences from six African cities. ActionAid International, London

African Research Bulletin (2004) *Political, Social and Cultural Series, Vol. 41 (2),* Wiley Blackwell.

Alesch, D. J. (2004) Complex Urban Systems and Extreme Events: towards a theory of disaster recovery. 1st International Conference of Urban Disaster Reduction. Kobe, Japan, 19 Jan 2004.

Amin, S. and Goldstein, M. (2008) Data Against Natural Disasters: Establishing Effective Systems for Relief, Recovery and Reconstruction. The International Bank for Reconstruction and Development/ World Bnak. Washington DC.

Anderson, M. B. (1991) Which Costs More: Prevention or Recovery? *Managing Natural Disastersand the Environment,* ed. Alcira Kreimer and Mohan Munasinghe. Washington DC: The World Bank.

Angotti, T. (1998) Ciudad Guayana: From Growth Pole to Metropolis, Central Planning to Participation. Paper Presented at the Latin American Studies Association Conference, Chicago, September 1998.

Annan, K. (2003) Message for the International Day for Disaster Reduction 8 October 2003, available at http://www.unisdr.org/eng/public_aware/world_camp/2003/pa-camp03-sg-eng.htm.

Barthel, F. and Neumayer, E. (2010) A trend analysis of normalized insured damage from natural disasters. Working Paper No. 40.

Bariweni, A., Tawari C. C. and Abowei, J.F.N. (2012) Some Environmental Effects of Flooding in the Niger Delta Region of Nigeria. *International Journal of Fisheries and Aquatic Sciences. Vol. 1 (1), pp. 35-46, 2012.* Maxwell Scientific Organization 2012.

Berke, P. R., Kartez J. and Wenger. D. (1993) Recovery after Disaster: Achieving Sustainable Development, Mitigation and Equity. *Disasters, Vol. 17 (2), pp. 93 – 109.*

Brown, J. D. (2001) Using surveys in language programs. Cambridge: Cambridge University Press

Bloom, D. E. and Khana T. (2007) The Urban Revolution. *Finance and Development*: *pp. 8-14. September 2007*.

Burby, R. J. and Deyle, R. E. (2000) "Creating Hazard Resilient Communities through Land-Use Planning." *Natural Hazards Review, Vol. 1 (May 2000), pp. 99-106.*

Caribbean Disaster Emergency Response Agency (CDERA) (1996) Special Security Concerns of Small Island States.

Chambers, R. (2004) *Ideas for Development*. IDS Working Paper 238. Sussex: IDS.

Christopolos, I. (2006) The elusive "window of opportunity" for risk reduction in post-disaster recovery. Session 3 Discussion Paper: Pro Vention Consortium Forum 2006: Strengthening Global Collaboration in Disaster Risk Reduction, Bangkok, February 2 – 3, 2006.

Clinton, W. (2006) *Lessons Learned from Tsunami Recovery: Key Propositions for Building Back Better.* A Report by the United Nations Secretary-General‟s Special Envoy for Tsunami Recovery. New York: Office of the UN Secretary-General's Special Envoy for Tsunami Recovery.

Cohen, L., Manion, L., and Morrison, K. (2000) Research Methods in Education. 5th ed. London: Routledge Falmer.

Comfort, L. (2005) Risk, security, and disaster management. *Ann. Rev. Polit. Sci. Vol, 8. pp. 335–356*

Conroy, M. E. (1973) On the rejection of 'growth center' policy in Latin American regional development planning. *Land Economics, Vol. 49, pp. 317-380.*

Corbridge, S. (ed.) (1995) *Development Studies a Reader*. London: Arnold.

OFDA/CRED (2011) International Disaster Database -www.emdat.be- Universite Catholique de Louvain, Brussels. Accessed 8-1-2011.

CRED (2009) Annual Disaster Statistical Review 2008: The Numbers and Trends. Université Catholique de Louvain. Jacoffset Printers, Melin (Belgium).

CRED (2004) Thirty Years of Natural Disasters 1974-2003: The Numbers Centre for Research on the Epidemiology of Disasters, UCL Presses Universitaires De Louvain. Belgium

Crompton, R. P. and Mcaneney, J. (2008) Normalised Australian insured losses from meteorological hazards: 1967–2006. *Environmental Science and Policy* 11.

Cuny, F. (1983) *Disasters and Development.* New York and Oxford: Oxford University Press.

Dance, K. W. and Hynes, H. R. N. (1980) Some effects of agricultural land use on stream insect communities. *Environ. Pollut. (Series A), Vol. 22, pp. 14-28*

Daily Graphic (2005) Ghana among the Worse Hit by Torrential Rains, *Daily Graphic*, 28 July 2005

DMC (2000) *Ten-Day Bulletin.* DEKAD 19 Report (1-10 July, 2000). Nairobi, Drought Monitoring Centre

Downs (1972) Up and Down With Ecology: The Issue-Attention Cycle. Public interest 28.

EEA (2001a) *Sustainable Water Use in Europe. Part 3: Extreme Hydrological Events: Floods and Droughts*. Environmental Issues Report No. 21. Copenhagen, European Environment Agency

Federal Emergency Management Administration (2010) Introduction to the Incident Command System (ICS). Student Manual, August 2010.

FEMA (2008) National Incident Management System. FEMA Publications, Washington DC.

FEMA (2011) National Disaster Recovery Framework. Strengthening Disaster Recovery for the Nation. FEMA Publications, Washington DC.

Fukuda-Parr, S. and Ponzio, R. (2002) *Governance: Past, Present, Future Setting the Governance Agenda for the Millennium Declaration, HDR.*

Friedmann, J. (1966) Regional development policy: a case study of Venezuela. Cambridge, Massachussetts: MIT Press.

Geipel, R. (1982) *Disaster and Reconstruction: The Friuli (Italy) earthquakes of 1976*. London: George Allen and Unwin Publishers Ltd.

Ghana Statistical Service (2005) 2000 Population and Housing Census of Ghana. *The Gazatteer, Vol. 1,* GSS. Accra, Ghana.

GSS (2005) *Population Data Analysis Report. Vol. 1, Socio-Economic and Demographic Trend Analysis.* GSS, Accra, Ghana.

Gilbert, A. (1974) Growth Poles: the instant solution to regional problems? In: R.S. Thoman (ed.): *Proceedings of the Commission on Regional Aspects of Development. Vol. 1. Methodology and case Studies. pp. 111-128*. Toronto: Allister Publishing.

Given L. M. (2008) The Sage Encyclopedia of Qualitative Research Methods. Sage: Thousand Oaks.

Graumann, J. V. (1977) "Orders of magnitude of the world's urban and rural population in history", *United Nations Population Bulletin 8,* United Nations, New York, pages 16–33

Grant, R. and Yankson, P. (2003) *City Profile Accra*. Cities, *Vol. 20 (2), pp. 65-74.*

Haas, J. E., Kates R. E., and Bowden, M. J. (1977) *Reconstruction Following Disaster*. Cambridge, MA: MIT Press.

Henderson, V. J. (2000) The Effects of Urban Concentration on Economic Growth. National Bureau of Economic Research Working Paper, No. W7503, January. Cambridge, MA.

Hennink, M. M. (2007) *International focus group research: A handbook for the health and social sciences*. Cambridge University Press: Cambridge.

Herrmann, J. (2007) Incident Command System (ICS). New York Disaster Interfaith Services (NYDIS)

http://www.ghananewsnow.com/2010/08/03/ashaiman-flood-victims-hit-the-streets-over-unfair-distribution-of-relief-items/

http://www.ghanadistricts.com/districts/?r=3&_=52&rlv=climate.

http://agonawest.ghanadistricts.gov.gh/?arrow=nws&read=35495

http://agonawest.ghanadistricts.gov.gh/?arrow=nws&read=39775

http://www.modernghana.com/news/331264/1/ashaiman-flooding-a-year-after.html

Hamza, M. and Zetter, R. (1998) Structural Adjustment, Urban Systems, and Disaster Vulnerability in Developing Countries. *Cities, Vol.15, pp. 219-229.*

IBIS (2003) Baseline report on local government, civil society and private sector organizations and activities in Ashaiman. Ghana: Institute for Democratic Governance and IBIS.

International Journal of Sociology and Anthropology (2012) *Peri-Urban Poverty: Can Micro-finance be a Panacea? ISJA, Vol. 4, pp. 190-198*

Ingram, J. C., Franco, G., Rio C. R. and Khazai, B. (2006) Post-disaster Recovery Dilemmas: Challenge in Balancing Short-term and Long Term Needs for Vulnerability Reduction, Environmental Science Policy, and doi:10.1016/j.envsci.2006.07.006.

International Federation of Surveyors (FIG) (2010) *Rapid Urban and Mega Cities: The Need For Spatial Information Management*. FIG, Copenhagen V, Denmark.

IEG (Independent Evaluation Group) (2006b) Indonesia: Second Village Infrastructure Project (Loan 4100) and Kecamatan Development Project (Loan/Credit 4330/3453). Project Performance Assessment Report. Washington, DC: World Bank.

IFRC (2001) World Disasters Report 2001. International Federation of Red Cross and Red Crescent Society, http:www.ifrc.org/publicat/wdr2001/[Geo-2-334]

IFRC/RCC (2010) Disaster management and risk reduction: strategy and coordination. Plan 2010-2011.

IIED (2007) Adapting to Climate Change in Urban Areas: The possibilities and constraints in low- and middle-income nations. *Human Settlements Discussion Paper Series- Climate Change and Cities-1*. International Institute for Environment and Development, London.

Jha, A. K., Bloch, R. and Lamond, J. (2012) Cities and Flooding: A Guide to Integrated Urban Flood Risk Management for the 21st Century. World Bank. https://openknowledge.worldbank.org/handle/10986/2241.

Jonah K. (1989) The Social Impact of Ghana's Adjustment Program, 1983- 86, in Bade Onimodeed. *The IMF, the World Bank and the African Debt, Vol. 2, The Social and Political Impact*, London: Zed

Karley N. K. (2009) Flooding and Physical Planning In Urban Areas in West Africa: Situational Analysis of Accra, Ghana. *Theoretical and Empirical Researches in Urban Management, Number 4 (13) / November 2009*. Heriot Watt University, Edinburgh. EH14 4AS, Scotland, United Kingdom

Keller, *E. A. (*2002) *Introduction to Environmental Geology*. 2nd ed. Prentice Hall, Upper Saddle River, New Jersey, U.S.A.

Kennedy, J., Ashmore, J., Babister, E. and Kelman, I. (2008) The Meaning of „Build Back Better": Evidence From Post-Tsunami Aceh and Sri Lanka. *Journal of Contingencies and Crisis Management*. *Vol. 16 (1), pp. 24 – 36.*

Kessides, C. (2005) The Urban Transition in Sub-Saharan Africa: Implications for Economic Growth and Poverty Reduction. World Bank African Region Working Paper Series No. 97.

Kirschenbaum, A. (2004) Measuring the Effectiveness of Disaster Management Organizations. *International Journal of Mass Emergencies and Disasters* March 2004, *Vol. 22 (1), pp. 75–102*

Klein, N. (2007) *The Shock Doctrine: the rise of disaster capitalism*. New York: Metropolitan Books.

Konadu-Agyemang, K. (2001) A survey of housing conditions and characteristics in Accra, an African city. *HABITAT Intl, Vol. 25, pp.15-34.*

Korli, F. M. (2010) Improving Urban Housing through Development Control : A Case Study of Agona Swedru. Town and Country Planning Department, Agona West Municipal Assembly, Agona Swedru, Ghana.
http://www.hdm.lth.se/fileadmin/hdm/alumni/papers/SDD_2010_242/Frank_Matey_Korli-Ghana_-_Proposal.pdf.

Kunii, O., Kanagawa, S., Yajima I., Hisamatsu, Y., Yamamura, S., Amagai, T. (2002) The 1997 haze disaster in Indonesia: its air quality and health effects. *Arch Environ Health Vol. 57 (1), pp. 16–22*.

Lewis, J. (1999) *Development in Disaster-Prone Places: Studies of Vulnerability*. London: Intermediate Technology Publications.

Liamputtong, P. (2009) Qualitative Research Methods. Oxford University Press, USA; 3 ed. (August 3, 2009)

Lloyd-Jones, T. (2007) Building back better: how actions research and professional networking can make a difference to disaster reconstruction and risk reduction. Research Symposium 2007. Reflections on practice: capturing innovation and creativity.

The World Development Report, 2003. *Sustainable Development in a Dynamic World, Transforming Institutions, Growth and Quality of Life.* The World Bank, *Oxford University Press.* P. 1.

McEntire, D. A. (2002a) Understanding and Improving Damage Assessment. *IAEM Bulletin (May). Vol. 9 (12).*

McEntire, D. (2001) Triggering agents, vulnerability and disaster reduction: towards a holistic paradigm. *Disaster Prevention and Mitigation*. *Vol. 10 (3), pp. 189 – 196.*

McEntire, D. (2000) Sustainability or Invulnerable Development? Proposals for the Current Shift in Paradigms. *Australian Journal of Emergency Management. Vol. 15(1), pp. 58 – 61.*

McEntire, D. (1999) Correspondence. *Disasters*. *Vol. 24 (1), pp. 78 – 79.*

McEntire, D. (1998) Pendulum Policies and the Need for Relief and Invulnerable Development. *International Journal of Mass Emergencies and Disasters*. *Vol. 16 (2), pp. 213 – 216.*

Mileti, D. (1999) *Disasters by Design: A Reassessment of Natural Hazards in the United States*. Washington, D.C. Joseph Henry Press.

Munslow and Brown (1999) Complex Emergencies: The Institutional Impasse. *Third World Quarterly. Vol. 20 (1), pp. 207- 221*

Mutakyahwa, R. G. (2003) Resource Mobilization by Non Profit Organizations in Tanzania: Trends, Challenges, and Opportunities (Forthcoming).

Mpofu, B. (2000) Assessment of Seed Requirement in Southern African Countries Ravaged by floods and Drought 1999/2000. SADC Food Security Programme. http://.www.sadc-fanr.org.zw/sssd/mozcalrep.htm [Geo-2-339]

NADMO (2005) National Disaster Management Organization www.unisdr.org/.../Ghana-report-establishment-national-platform.doc.Accessed 30.04.10

Nyarko, B. K. (2000) Flood Risk Zoning of Ghana: Accra Experience. *International Archives of Photogrammetry and Remote Sensing*. *Vol. XXXIII, Part B7*. Amsterdam.

Oaks, S. D. (1990) The Damage Assessment Process: An Overview. pp. 6-16 in ed. Bolin, Robert. *The Loma Prieta Earthquake: Studies of Short-Term Impacts*. Program on Environment and Behavior Monograph #50, Institute of Behavioral Science, University of Colorado: Boulder, Colorado.

Oxfam (2005) Sri Lanka after the Tsunami: the challenges ahead. Briefing Note. February 2005.

O'Brien *et al. (*2006) Climate Change and Disaster Management. Overseas Development Institute, Blackwell Publishing, 9600 Garsington Road, Oxford, OX4 2DQ, UK and 350 Main Street, Malden, MA 02148, USA. pp 74

Parr, J. B. (1999) Growth Pole Strategies in Regional Economic Planning: A Retrospective View. Part 1: Origins and Advocacy. *Urban Studies, Vol. 36 (7), pp. 1195- 1215.*

Pelling, M. and Dill, K. (2006) Natural Disasters as Catalysts of Political Action. Chatham House ISP/NSC Briefing Paper 06/01, Royal Institute of International Affairs, London, U.K.

Penouil, M. (1972) Growth Poles in Underdeveloped regions and Countries. The Hague.

Pielke, R. A. (2006) *Climate change and disaster losses workshop, understanding and attributing trends and projections.* White paper prepared for the workshop. Hohenkammer, Germany

Powell, W. G. (2009) Identifying Land Use/Land Cover (LULC) Using National Agriculture Imagery Program (NAIP) Data as a Hydrologic Model Input for Local Flood Plain Management. Applied Research Project, Texas State University-San Marcos, Retrieved from: http://ecommons.txstate.edu/arp/296/.

ReliefWeb (2002) Natural Disasters. ReliefWeb: Project of the United Nations Office for the Coordination of Humanitarian Affairs, http://www.reliefweb.int/w/rwb.nsf.

Régnier, P., Neri, B., Scuteri, S., and Miniati, S. (2008) From emergency relief to livelihood recovery: Lessons learned from post-tsunami experiences in Indonesia and India. *Disaster Prevention and Management. Vol. 17 (3), pp. 410 – 429.*

Rubin, C. B., Saperstein M. D. and Barbee, D. G. (1985) *Community Recovery from a Major Natural Disaster*. Monograph no. 41. Boulder: University of Colorado, Institute of Behavioral Science.

Shanmugaratnam, N. (2005) Tsunami victim's perceptions of the proposed buffer zone and its implications in Eastern Sri Lanka. Eldis in affiliation with Department of International Environment and Development Studies, Norwegian University of Life Science.http://sacw.insaf.net/free/SriLankaTsunami_Reflections.pdf.

Songsore, J. (2004) Urbanization and Health in Africa: Exploring the Interconnections between Poverty, Inequality and the Burden of Disease. Ghana University Press, Accra.

Songsore J. (2003) Regional Development in Ghana: The theory and the reality. Woeli Publishers. Accra

Songsore, J. (2003b) Towards a Better Understanding of Urban Change: Urbanization, National Development and Inequality in Ghana. Ghana University Press, Accra.

Stewart, D. W., Shamdasani, P. N., and Rook, D. W. (2007) *Focus groups: Theory and practice*, 2nd ed. Thousand Oaks, CA: Sage.

Steps, C. (2009) *Hurricane Katrina - Has Mississippi Fallen Further Behind? Trends and Challenges in Mississippi's Disaster Recovery*. The Steps Coalition. Available Online: http://www.stepscoalition.org/downloads/news/headlines/k+4_report.pdf.

Swiss R. (2010) Natural Catastrophes and man-made disasters in 2009. Sigma.Zurich: Swiss Re.

Thompson, M. T. (1964) Historical Floods in New England. Geological Survey Water-Supply Paper 1779-M, United States Government Printing Office, Washington, D.C.

UNDHA (2001) United Nations Department of Humanitarian Affairs: Internationally Agreed Glossary of Basic Terms Related to Disaster Reduction. http://www.unisdr.org/glossaire.htm [Geo-2-335]

United Nations (2005) *Financing Urban Shelter – Global Report on Human Settlements*, New York.

United Nation (2008) Disaster Preparedness for Effective Response. *Guidance and Indicator Package for Implementing Priority Five of the Hyogo Framework.* New York and Geneva.

United Nations (2004) *World urbanization prospects: The 2003 revision*. New York: Upper Saddle River.

United Nations (2006) *World Urbanization Prospects: The 2005 Revision*, United Nations Population Division, Department of Economic and Social Affairs, CD-ROM Edition – Data in digital form (POP/DB/WUP/Rev.2005), United Nations, New York.

UNDP (2011) Disaster-Conflict Interface Comparative Experiences. Bureau for Crisis Prevention and Recovery. UNDP.

UNDP (1994) Disasters and Development. Disaster Management Training Programme (DMTP). Madison: University of Wisconsin, Disaster Management Center; *2nd ed.*

UNDP (2004) Reducing Disaster Risk: A Challenge for Development, UNDP, New York.

UN-Habitat (2006) State of World Cities2006/7. The Millennium Development Goals and Urban Sustainability: 30 Years of Shaping the Habitat Agenda. Nairobi, Kenya.

UN-HABITAT (2010) *State of the World's Cities Report 2010/11 – Bridging the Urban Divide*, Earthscan, London, forthcoming publication.

United States Environmental Protection Agency (USEPA) (2002) Water Quality Monitoring for Coffee Creek (Porter County, Indiana). Retrieved from: http/www.usepa/research.htm.modecode = 62-28-00-00, (Accessed on: September 29, 2006).

UN/ISDR (2005) Hyogo Framework for Action 2005 – 2015: Building the Resilience of Nations and Communities to Disaster. Extract from the final report of the World Conference on Disaster Reduction. Available online: http://www.unisdr.org/wcdr/intergover/official-doc/L-docs/Hyogo-framework-for-action-english.pdf.

UN/ISDR (2011) Hyogo Framework for Action 2005-2015. Building the resilience of nations and communities to disasters. Geneva: United Nations.

UNDP (2004) Reducing Disaster Risk: A Challenge for Development. A Global Report, New York: UNDP – Bureau for Crisis Prevention and Recovery (BRCP), available at http://www. undp.org/bcpr/disred/rdr.htm.

US National Weather Service Manual 10-950, April 26, 2006

Vale, L. J. and Campanella, T. J. (2005) *The Resilient City: How Modern Cities Recover From Disaster.* New York: Oxford University Press

Welch, H. E., Symons P. E. K. and Narver, D. W. (1977) Some Effects of Potato Farming and Forest Clear Cutting on New Brunswick Streams, Fisheries and Marine Service. Environ. Can. Technical Report No. 745, St. Andrew's New Brunswick.

White, P., Pelling, M., Sen, K., Seddon, D., Russell, S. and Few, R. (2005) Disaster Risk Reduction: a development concern (London: DFID)

Wilkinson, S. (2004) Focus groups: A feminist method. In S. N. Hesse-Biber and M. L. Yaiser (ed.), *Feminist perspectives on social research. pp. 271–295.* New York: Oxford University Press.

Wisner, B., Piers B., Terry C. and Ian D. (2004) *At Risk: Natural Hazards, People's Vulnerability and Disasters*. 2nd ed. London: Routledge.

World Bank (2008) Development of the Cities of Ghana – Challenges, Priorities and Tools. *African Region Working Paper Series No. 110. January, 2008.* World Bank, Washington.

World Bank (2010) Response to Pakistan Floods: Evaluating Lessons and Opportunity. The World Bank. Washington, DC.

World Bank (2011) UNDP Climate Change Country Profile, Ghana. The World Bank. Washington, DC.

World Bank (2011) Five Feet High and Rising: Cities and Flooding in The 21st Century. Policy Research Working Paper 5648.The World Bank. Washington, DC.

WDR (2003) Dynamic Development in A Sustainable World. The Spatial Organization of Cities: Deliberate Outcome or Unforeseen Consequence? World Bank: Washington DC.

World Meteorological Organization (2007) *Global approach to address flash floods*, in MeteoWorld (June 2007), Geneva: WMO
www.hrc-lab.org/publicbenefit/downloads/wmo-flashflood.pdf

Yankson, P. (2000) Houses and Residential Neighborhoods as Workplaces in Urban areas: The Case of Selected Low Income Residential Areas in Greater Accra Metropolitan Area (GAMA), Ghana. *Singapore Journal of Tropical Geography, Vol. 21 (2), pp. 200-214.*

Yankson, P. W. K. and Gough, K. V. (1999) The Environmental Impact of Rapid Urbanization in Peri-Urban Area of Accra, Ghana. *Danish Journal of Geography, Vol. 99*

Yin R. K. (1994) Case Study Research Design and Methods. Second edition. Thousand Oaks: Sage.

Zeigler, Donald J., Brunn, Stanley D. and Williams, Jack, F. (2003) World urban development. In Brunn, Stanley D., Jack F. Williams and Donald J. Zeigler (ed.), *Cities of the world: World regional development.* Lanham: Rowman & Littlefield. *pp. 1 – 46*

# APPENDIX A

**Table 5.2: Demographic Background of Respondents**

| Variables | Ashaiman | | Agona Swedru | |
|---|---|---|---|---|
| | **Frequency** | **%** | **Frequency** | **%** |
| **Gender** | | | | |
| Male | 77 | 50 | 22 | 47 |
| Female | 77 | 50 | 24 | 53 |
| **Level of Education** | | | | |
| Basic | 72 | 47 | 29 | 63 |
| Secondary | 37 | 24 | 9 | 20 |
| Tertiary | 6 | 4 | 1 | 2 |
| None | 39 | 25 | 7 | 15 |
| **Marital Status** | | | | |
| Married | 112 | 73 | 25 | 55 |
| Single | 37 | 24 | 18 | 39 |
| Divorced | 3 | 2 | 1 | 2 |
| Separated | 2 | 1 | 2 | 4 |
| **Occupation** | | | | |
| Government worker | 6 | 3 | 3 | 7 |
| Businessman / woman | 93 | 61 | 27 | 58 |
| With private company | 11 | 7 | 4 | 9 |
| Farming/fishing | 23 | 15 | 9 | 19 |
| Unemployed | 21 | 14 | 3 | 7 |
| **Mean Monthly Expenditure** (GH¢) | 404.76 | | 318.50 | |
| **Mean Household Size (persons)** | 7 | | 5 | |

*Sourec: Field Data, Jan. 2013.*

## APPENDIX B

## QUESTIONNAIRE

This questionnaire is designed to collect data on a research topic titled "EVALUATING POST-FLOOD DISASTER RESPONSE STRATEGIES: CASE STUDY OF ASHAIMAN AND SWEDRU FLOOD INCIDENCES".

This research is purely an academic exercise and all information given shall be used solely for this purpose. The information given by respondents shall be treated as confidential as possible.

### RESPONDENTS FROM THE COMMUNTIY (FLOOD VICTIMS)

### SECTION A: DEMOGRAPHIC DATA

1. Name of community ……
2. Sex: Male [ ] Female [ ]
3. When were you born? 19……..…..
4. Level of education: i) Basic [ ] ii) Secondary [ ] iii) Tertiary [ ]
   iv) None [ ]
5. Marital Status : Married [ ] Single [ ] Divorced [ ] Separated [ ]
6. Household size ……..
7. What work do you do? ……..
8. What type of work do you do?
   i) Government work ii) Businessman/woman. iii) With a private company iv) Farming/fishing v) Other (specify) ……
9. Place of work: i) Home based ii) Within the community iii) outside the community

10. Apart from your main work, do you have any other source of income? i) YES ii) NO
11. If yes name them
    i) …….
    ii) …….
    iii) …….
    (Please indicate how much you approximately earn for each of the other sources of income mentioned above?)

12. What is your estimated monthly expenditure? ……

**SECTION B: PATTERN OF FLOODING INCIDENCE IN THE COMMUNITY**

13. How long have you been staying in the community? ……

14. List some of the major flood disasters that you have been experiencing in the community? ……

15. How often do you experience flooding in the community?
    i) Decade [ ] ii) Yearly [ ] iii) Quarterly [ ]iv) Half of each year [ ]
    v) If other, specify ……

16. When was the last time the community experienced major flooding? ……

17. Which part(s) of the community was worst affected? ……..

18. What times of the year do you usually experience this flooding?....……

19. What time of the day do you usually experience flooding?……..

20. What were some of the effects of the floods that occurred in the community?
    ……
    ……

## SECTION C: EFFECTIVENESS OF RESPONSE

21. What sort of assistance did you receive when you suffered the flooding?

**Security** ……

**Relief items**……

**Medical**……..

**Other** ……..……..

22. Which organization/s provided the support? ……

23. Did you receive any support from NADMO? i) YES ii) NO

24. What type of support did you receive from NADMO?

……

……

25. What time frame did you receive the support?

i) Within three days ii) A week later iii) Within a month iv) Other (specify)……

26. How do you assess the support you received during the disaster?

i) Very good ii) Good iii) Fair iv) Bad v) Very bad

27. Can you explain your answer? ……..

……...

……...

……...

28. How would you rate the performance of the organization/s that provided assistance during the disaster?

| Activities | Very Good | Good | Fair | Poor | Very Poor |
|---|---|---|---|---|---|
| Swiftness of response | | | | | |
| Relief item distribution | | | | | |
| Direction and control | | | | | |
| Local involvement (formation of saving group) | | | | | |
| Communications | | | | | |
| Health services | | | | | |
| Property protection | | | | | |
| Building social cohesion | | | | | |
| Damage assessment | | | | | |
| Repairs | | | | | |
| Shift from relief to reconstruction | | | | | |
| Community outreach | | | | | |

29. What do you think should have been done by NADMO officers, which they didn't do? ……..

30. How has it changed your attitude or perception towards NADMO?
    i) Distrust in the disaster response system in meeting needs of flood victims
    ii) Incapable of reducing flood risk
    iii) Very reliable for meeting the needs of disaster victims
    iv) Other (please specify) ……..

31. How would you assess the state of the environmental/physical conditions (eg. water channels, waste disposal etc.) of the community before the occurrence of the flood?
    i) Very poor ii) Poor iii) Good iv) Very good

32. What has been the state of these environmental/physical conditions of the community after the execution of the response operation?

i) Has improved ii) Hasn't changed iii) Getting poorer iv) Other (specify)……

33. What is the possibility of flood recurrence in your community?
    i) Very High ii) High iii) Low iv) Very low

34. What activities did you witness the response organization/s undertake in the community within these periods

| PERIOD | ACIVITIES/MEASURE UNDERTAKEN |
|---|---|
| **Short Term** (days after flood) | |
| **Medium Term** (weeks after flood) | |
| **Long Term** (year(s) after flood) | |

35. Were you given any form of education in terms of floods and its mitigation measures? i)YES ii) NO

36. If yes, how useful has the education been to you? ……..

37. Apart from NADMO, what other organization offered relief and response assistance? …….

38. How did you see the above mentioned organization cooperate with NADMO?
    i) NADMO directed and controlled all activities
    ii) They worked independently
    iii) Other (please specify)…….

39. How would you describe the activities of NGOs during flood response operations?

i) Duplicating NADMO's activities ii) Complementing NADMO's activities iii) Highly pursuing their organizational interest. v) Other (specify)……

40. What roles did you play in the response operation? .....

41. During the disaster, were you given any relocation directives? i) YES ii) NO (If NO, skip to question 43)

42. If yes, how did you evaluate the directives?
    i) Very necessary ii) Unnecessary iii) Lacks community input
    iv) Had community input

43. Were you willing to comply?
    i) Very willing
    ii) Never willing
    iii) Not decided
    iv) Other (specify) ……

44. Did you have problems with the relief distribution and response service? i) YES iii) NO

45. How did you react to the above stated problems you faced with the response from the organization/s?
    i) Stopped cooperating with the organization
    ii) Didn't involve myself in the exercise again
    iii) Organized demonstrations against the organization
    iv) Complained through the media
    v) Ignored the problems

46. How quick was your reaction to the challenges?
    i) Hours after the outbreak of the flood ii) Days after the flood occurred iii) Weeks after the flood occurred iv) A month after the flood incidence v) Other, please specify……

47. How did your reaction affect the response in any way?
    i) Halted/disrupted the response process
    ii) Maximized swiftness and flexibility of response efforts
    iii) Prompted better and fair response services
    iv) Had no effect on the response

## SECTION D: RECOMMENDATIONS

48. From your perspective, what should be done to improve the performance of the organization/s (NADMO)? ……...
49. What should be the role of the community in Disaster Risk Management (specifically, response operations)? ……
50. Do you think NGOs and Faith Based Organizations have a role to play in Disaster Risk Reduction in your community? i) YES ii) NO
51. Explain your answer ……

**THANK YOU**

## APPENDIX C

## INTERVIEW GUIDE (NADMO CORDINATOR-ASHAIMAN)

1. When was the last time the Ashaiman witnessed severe floods.
2. Which areas in Ashaiman frequently witness floods?
3. What caused the June 2010 floods?
4. What was the impact of the June 2010 floods?
5. How many victims were registered in the June 2010 floods?
6. Were you able to adequately meet the needs of the victims of the June 2010 floods in terms of relief?
7. Did you register complaint(s) from the victims about the relief distribution? YES NO
8. If yes, what were some of the complaints you registered?
9. Apart from the relief distribution, what other activities were performed during the 2010 flood response operation?
10. What local capacity building activities have been undertaken after the June 2010 floods?
11. Which organization(s) assisted in the June 2010 response operation?
12. How did the organizations mentioned above cooperate with NADMO in the response execution?
13. Were there any challenges in coordinating the activities of the above mentioned agencies? YES NO
14. If yes, what were some of the challenges you encountered?
15. What roles did the local people play in the June 2010 flood response operation?
16. What was the local community cooperation with response agencies?

17. Did elements of politics surface in the June 2010 flood response operation? YES NO
18. If yes, how did politics manifest itself in the 2010 response operation?
19. How did such politics affect the 2010 response operation?
20. What are some of the challenges you faced in executing 2010 flood response operation?
21. What institutional constraints affected the execution of the 2010 flood response operation?
22. What recommendations were made following the assessment of the causes and impacts of the June 2010 flood?
23. How have the recommendations been accomplished/ implemented?
24. Does the Municipal NADMO office has a storehouse where relief resources are kept for quick dispatch in times of floods?
25. Within the NADMO structure what is the procedure through which resources are mobilized for disbursement and distribution to flood victims?
26. What should be done to make NADMO more capable of ensuring and building flood resilient communities in Ghana?

**THANK YOU**

## APPENDIX D

## INTERVIEW GUIDE (NADMO COORDINATOR -AGONA SWEDRU)

1. When was the last time the Agona Swedru witnessed severe floods.
2. Which areas in Agona Swedru frequently witness floods?
3. What caused the June 2010 floods?
4. What was the impact of the June 2010 floods?
5. How many victims were registered in the June 2010 floods?
6. Were you able to adequately meet the needs of the victims of the June 2010 floods in terms of relief?
7. Did you register complaint(s) from the victims about the relief distribution? YES NO
8. If yes, what were some of the complaints you registered?
9. Apart from the relief distribution, what other activities were performed during the 2010 flood response operation?
10. What local capacity building activities have been undertaken after the June 2010 floods?
11. Which organization(s) assisted in the June 2010 response operation?
12. How did the organizations mentioned above cooperate with NADMO in the response execution?
13. Were there any challenges in coordinating the activities of the above mentioned agencies? YES NO
14. If yes, what were some of the challenges you encountered?
15. What roles did the local people play in the June 2010 flood response operation?
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17. Did elements of politics surface in the June 2010 flood response operation? YES NO
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19. How did such politics affect the 2010 response operation?
20. What are some of the challenges you faced in executing 2010 flood response operation?
21. What institutional constraints affected the execution of the 2010 flood response operation?
22. What recommendations were made following the assessment of the causes and impacts of the June 2010 flood?
23. How have the recommendations been accomplished/ implemented?
24. Does the Municipal NADMO office has a storehouse where relief resources are kept for quick dispatch in times of floods?
25. Within the NADMO structure what is the procedure through which resources are mobilized for disbursement and distribution to flood victims?
26. What should be done to make NADMO more capable of ensuring and building flood resilient communities in Ghana?

**THANK YOU**