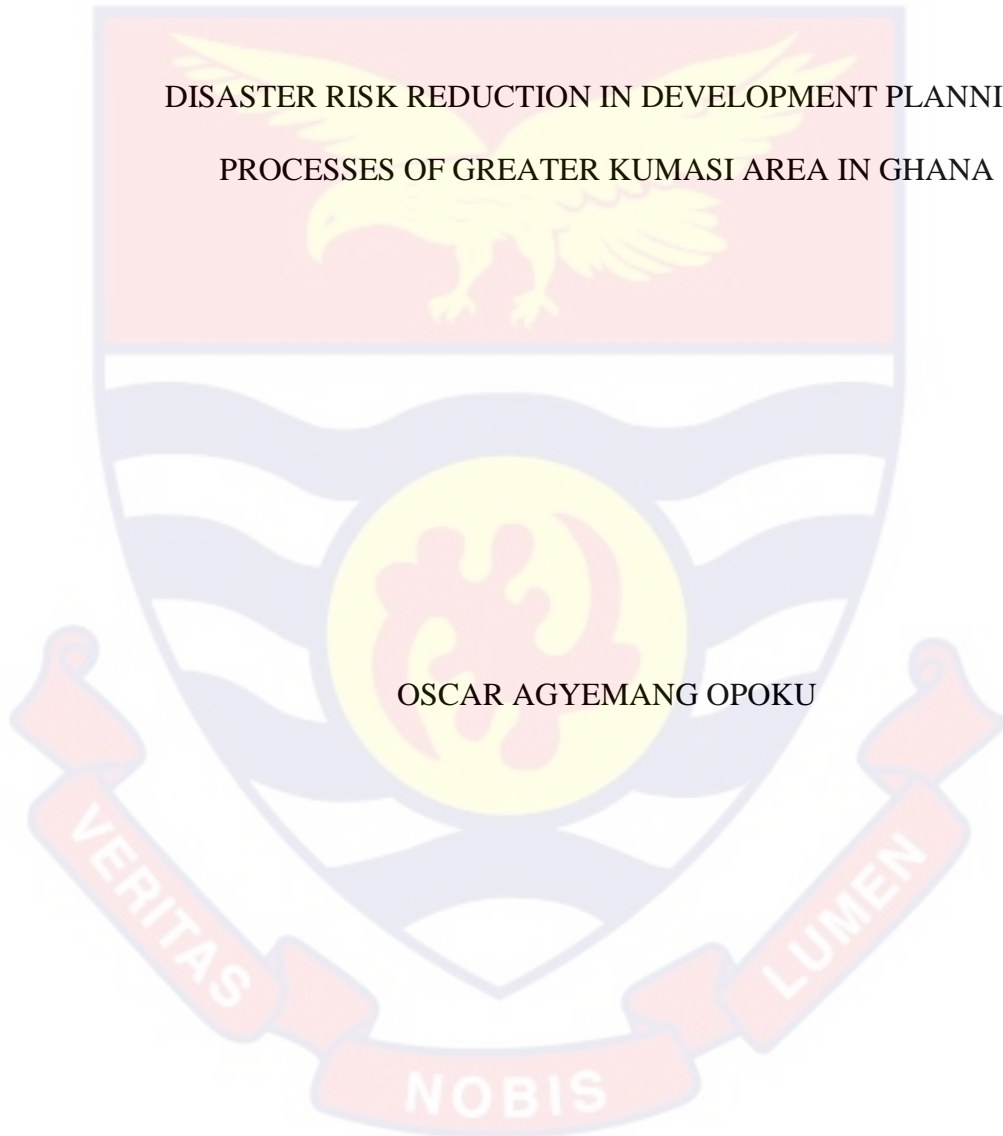UNIVERSITY OF CAPE COAST

DISASTER RISK REDUCTION IN DEVELOPMENT PLANNING

PROCESSES OF GREATER KUMASI AREA IN GHANA

OSCAR AGYEMANG OPOKU

2024

UNIVERSITY OF CAPE COAST

DISASTER RISK REDUCTION IN DEVELOPMENT PLANNING

PROCESSES OF GREATER KUMASI AREA IN GHANA

BY

OSCAR AGYEMANG OPOKU

Thesis Submitted to the Department of Geography and Regional Planning of

the Faculty of Social Sciences, College of Humanities and Legal Studies,

University of Cape Coast, in partial fulfilment of the requirements for the

award of Doctor of Philosophy Degree in Geography

JULY 2024

DECLARATION

Candidates' Declaration

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

Candidate's Signature:…………………...……… Date………………..……

Name: Oscar Agyemang Opoku

Supervisor's Declaration

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

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

Name: Prof. Kwabena B. Antwi

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

Name: Dr. Kwabena K. Agyemang

ABSTRACT

The study evaluated the disaster risk planning practices of selected Metropolitan, Municipal, and District Assemblies (MMDAs) in the Greater Kumasi Area of Ghana. It employed action research using a mixed research approach. The participants included officials from various disaster response institutions, MMDAs, traditional authorities, assembly members, and community dwellers. In total, 427 respondents, including 399 households and 28 key informants, were involved in the study. The study gathered primary data through the use of questionnaires and interview guides. Secondary data was also collected from policy documents, laws, and plans related to disaster management. The quantitative data underwent descriptive and inferential analysis using SPSS software, while the qualitative data were transcribed, coded, and analysed thematically. The study's findings highlighted that integrating disaster risk reduction (DRR) into the development planning process was ineffective. Although households demonstrated awareness of the risks, their involvement in planning was insufficient. There were gaps and role conflicts among the disaster response institutions. The capacity of various institutions to implement DRR was hindered by limited resources, inadequate staff and skills, and insufficient funding. The study recommends that the Disaster and Emergency Management Committees of the MMDAs ensure the inclusion of participatory processes in development planning. It also suggests revitalising community-based disaster volunteer groups and clubs and establishing effective coordination mechanisms among disaster response institutions.

KEY WORDS

Disaster Risk Reduction

Disaster Management

Greater Kumasi Area

Early warnings

Disaster Preparedness

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While I duly acknowledge and appreciate the contributions of the authors whose works I consulted to enhance my understanding and contribute to the existing knowledge in my research area, I take full responsibility for any limitations or deficiencies present in the entirety of my work.

DEDICATION

To my Uncle, Mr. Emmanuel Boamah Asafo Agyei and to the memory of my

late granny, Mr. Oscar Opoku Agyemang

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LIST OF ABBREVIATION

AI	-	Artificial Intelligence
AMMA	-	Asokore Mampong Municipal Assembly
BDA	-	Barekese District Assembly
CBDRM	-	Community-Based Disaster Risk Management
CCA	-	Climate Change Adaptation
CDC	-	Centers for Disease Control and Prevention
CIDA	-	Canadian International Development Agency
CSM	-	Cerebro-Spinal Meningitis
DDR	-	Disaster Risk Reduction
DRM	-	Disaster Risk Management
DRP		Disaster Risk Planning
DRR	-	Disaster Risk Reduction
FAO	-	Food and Agricultural Organisation
GEF-UNDP	-	Global Environment Facility – United Nations Development Program
HFA	-	Hyogo Framework for Action
IBM	-	International Business Machines Corporation
ICT	-	Information and Communication Technology
IDNDR	-	International Decade for Natural Disaster Reduction
IGES	-	Institute of Global Environment Strategies
IoT	-	Internet of Things
IPCC	-	Intergovernmental Panel on Climate Change
ISDR	-	International Strategy for Disaster Reduction
ITU	-	International Telecommunication Union

KMA	-	Kumasi Metropolitan Assembly
LGS	-	Local Government Service
LGSS	-	Local Government Superannuation Scheme
M&E	-	Monitoring and Evaluation
MMDAs	-	Metropolitan/Municipal/District Assemblies
MTDP	-	Medium-Term Development Plan
NADMO	-	National Disaster Management Organisation
NDPC	-	National Development Planning Commission
NIDM	-	National Institute of Disaster Management
NSOP	-	National Standard Operating Procedures
OST	-	Open System Theory
RCCs	-	Regional Co-ordinating Councils
SCC	-	Smart Sustainable City
SD	-	Sustainable Development
SFDRR	-	Sendai Framework for Disaster Risk Reduction
SGDs	-	Sustainable Development Goals
UNDP	-	United Nations Development Program
UNDRR	-	United Nations Office for Disaster Risk Reduction
UNGA	-	United Nations General Assembly
USD	-	United States Dollar
WB	-	Word Bank
WCED	-	World Commission on Environment and Development
WHO	-	World Health Organisation
WMO	-	World Meteorological Organisation

CHAPTER ONE

INTRODUCTION

Background to the Study

The current worries about the world and the ongoing debate regarding climate change and the danger of disasters all point directly to the word "environment." Humans and their fast-paced growth directly conflict with the environment, which often has terrible environmental consequences (National Institute of Disaster Management, nd). Catastrophic events have been occurring since ancient days. These events include flooding, earthquakes, volcanic eruptions, tornadoes, hurricanes, fire outbreaks, tsunamis, and landslides (Asumadu-Sarkodie, Owusu & Jayaweera, 2015).

On the other hand, man-made risks include social disputes, industrial and chemical risks, accidents on the road and in the air, nuclear accidents, pollution, etc. Different hazards have distinct effects on the people, their way of life, the environment, the business, and infrastructure (Murshed, 2006). Flooding and fire outbreaks have recently become a global pandemic affecting almost every facet of life and socio-economic development. Therefore, there is the need to highlight some critical cross-cutting but neglected issues to bring them to the centre stage of development, thus mainstreaming disaster risk reduction.

To effectively incorporate disaster management into the development planning process, it is necessary to examine each planned activity, programme, and project from both the perspective of mitigating existing disaster risks and minimising the likelihood of generating new disaster risks. The concept of disaster risk reduction emphasises a new global perspective on

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catastrophe and risk management. The International Strategy for Disaster Reduction [ISDR] (2004:3) defines disaster risk management (DRM) as "the systematic process of using administrative decisions, organisation, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters. This comprises all forms of activities, including structural and non-structural measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards."

Disaster risk planning refers to identifying, analysing, and implementing measures to mitigate the impact of potential disasters on a community or organisation. It involves developing strategies, policies, and actions to reduce vulnerabilities and increase resilience in the face of natural or human-made hazards. According to the United Nations Office for Disaster Risk Reduction [UNDRR], disaster risk planning is crucial for effective disaster management and sustainable development (UNDRR, 2021). It involves conducting risk assessments, setting priorities, and establishing early warning, preparedness, response, and recovery mechanisms.

Disaster risk planning aims to minimise the loss of life, infrastructure damage, and economic disruption caused by disasters. It involves collaboration among various stakeholders, including government agencies, non-governmental organisations, community groups, and the private sector. The planning process typically includes hazard mapping, vulnerability assessments, the development of evacuation plans, the establishment of

emergency shelters, communication strategies, and capacity-building initiatives (UNDRR, 2021).

In contrast to the reactive nature of the disaster management cycle, disaster risk reduction aims to lessen the likelihood of disaster occurring in the first place. This suggests that preparations are being made or planning is done to avert disaster. It is usually the result of bureaucratic ignorance or neglect that the underlying causes of these tragedies (such as risk, hazards, and vulnerability) are even examined. After 16 years, the UNDP Disaster Management Training Programme's "causal factors of disasters" are still cited by many in disaster management. Upon closer inspection, it becomes clear that most of these "causal factors" may be traced back to anthropogenic factors (UNISDR, 2015). Therefore, there is a need to carefully integrate DRR into the development planning processes of the various Metropolitan/Municipal/District Assemblies (MMDAs) in Ghana.

Given this, the Medium-Term Development Plan (MTDP) process, which envisages the four-year development plan for the various Metropolitan Municipal District Assemblies (MMDAs) in Ghana, should integrate disaster risk reduction into it for a sustainable implementation of developmental projects as well as securing lives and properties. It is widely noted that societies that are well-informed and prepared to respond to disasters and, significantly, to mitigate them are more resilient and more likely to rise from poverty. Integrating disaster risk planning into development plans and policies can lead to more resilient communities and sustainable development (Birkmann et al., 2019). By considering potential hazards and associated risks,

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decision-makers can make informed choices about land use, infrastructure development, and resource allocation.

Sustainable Development Goal 11 seeks to "make cities inclusive, safe, resilient and sustainable." Target 11.5 of this goal is to "reduce the adverse effects of natural disasters. Thus, significantly, reduce the number of deaths, number of people affected and substantially decrease the direct economic losses caused by disasters, including water-related disasters, with a focus on protecting the poor and the people in vulnerable situations". To achieve this goal, disaster risk reduction, which has either the preventive motive or reduction of disaster risk, cannot be overlooked (UNDP, 2015).

Similarly, the Sendai Framework for Disaster Risk Reduction 2015-2030 is a landmark international agreement adopted by United Nations member states at the Third UN World Conference on Disaster Risk Reduction, held in Sendai, Japan, in March 2015. This framework aims to substantially reduce disaster risk and losses in lives, livelihoods, and health, as well as in the economic, physical, social, cultural, and environmental assets of people, businesses, communities, and countries (UNDRR, 2015). It builds on the Hyogo Framework for Action. It outlines four priority areas: understanding disaster risk, strengthening disaster risk governance, investing in disaster risk reduction for resilience, and enhancing disaster preparedness for effective response and recovery. The Sendai Framework emphasises the need for inclusive, multi-hazard, and multisectoral approaches to disaster risk reduction, encouraging the involvement of various stakeholders, including governments, civil society, the private sector, and the scientific community (UNDRR, 2015).

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Given this goal, the United Nations Office for Disaster Risk Reduction (UNDRR) has been working to raise awareness and commitment towards sustainable development practices that will reduce disaster risk and increase the well-being and safety of society. Resilience focuses on the ability of a community to undergo disturbance and maintain its function and control (Gunderson & Holling, 2008). Resilience cannot be achieved without significant modification in the management of cities and towns. Therefore, the UNDRR (2019) has appealed to all key stakeholders, including local government, city officials, departments, the private sector, civil society, non-governmental organisations, community-based organisations, and research institutions, to contribute their quota towards creating a resilient environment. Given this, DRR should be effectively integrated into development planning processes to ensure community sustainability and to make communities more resilient.

Problem Statement

Humanity and its rapid development processes directly conflict with the environment, often leading to disastrous consequences (National Institute of Disaster Management, nd). In Ghana, disaster management in metropolitan, municipal, or district assemblies [MMDAs], including Kumasi, is complex primarily as a result of rapid urbanisation and its related effects, which repeatedly escalate the exposure of humans and properties to hazards as well as create new forms of risks (Adjorkor, 2019).

A metropolis, municipality, district or community might be exposed to man-made disasters. Many communities, individuals, economic, infrastructure, and environmental dangers may arise from such events. Many

people and cultures have been affected, both temporarily and permanently, by the aftermath of these calamities and their subsequent management (Murshed, 2006).

In Ghana, the incidence of disasters (floods and fire outbreaks) increased from 962 in 2016 to 1,134 in 2017 and 2 217 in 2019. Also, floods, domestic and commercial/bushfires affected 3,386 communities, 1,073 schools, 28 095 houses, 17 and 957 hectares of farmlands in 2018 (National Development Planning Commission [NDPC], 2019). Moreover, the number of people affected increased from 287, 399 to 314 644 in 2018, while domestic and commercial fire shot up by 453 percent in the Ashanti region, of which Greater Kumasi forms a significant portion, leading in terms of the total number of people affected by disasters in 2018 (NDPC, 2019). Most of these destroyed lives and properties could have been protected if disaster risk reduction measures had been implemented to cater for these catastrophic events.

Currently, the Sendai framework for disaster risk reduction was adopted by member states in the Third World Conference on Disaster Risk Reduction, held from 14 to 18 March 2015 in Sendai, Miyagi, Japan. This is to build on the weaknesses and "unfinished business" of the Hyogo framework with the expectation of having a "substantial reduction of disaster risk and losses in lives, livelihoods and health and the economic, physical, social, cultural and environmental assets of persons, businesses, communities, and countries" (UNDRR, 2015: p6). Despite the ongoing discourse and essence of disaster risk reduction, there is a dearth of empirical research on how DDR has been integrated into the various MMDAs MDTP and its subsidiary matters.

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This study seeks to fill this gap by evaluating the various MDTPs of the selected MMDAs in the Greater Kumasi Area.

Previous research, however, shows that institutions have not focused on integrating disaster risk reduction in the policies and planning of the MMDAs and disaster risk planning as a whole. Some studies focused on the collaboration among disaster management organisations (Adjorkor, 2019; Noran, 2014; Cheema, Mehmood, & Imran, 2016). Chong and Kamarudin (2017) and Kapucu (2012) are two such studies that looked at problems and obstacles in disaster management. Despite this, research on disaster management in Ghana has focused on how various disasters have impeded or aided the country's efforts to develop its economy and society. Osei (2013), Gyireh and Nunbogu (2015), and Asumadu-Sarkodie, Owusu, and Jayaweera (2015) all examine floods, whereas Addai, Tulashie, Annan, and Yeboah (2016) examines fire outbreaks. Therefore, this study aimed to fill a knowledge gap by investigating disaster risk planning in the Greater Kumasi Area.

Objectives of the study

The study's primary purpose was to examine the integration of disaster risk reduction into the development planning processes of some selected MMDAs of the Greater Kumasi Area in Ghana.

The specific objectives were to:

1. Review the disaster risk reduction policies and acts and their contribution to disaster risk planning at the national level;

2. Examine community understanding of disaster risk and participation in disaster risk reduction;

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3. Analyse the roles and responsibilities of various response institutions in disaster risk reduction;

4. Assess the institutional capacity for disaster risk reduction and management in the selected MMDAs;

5. Evaluate the extent of integration of disaster risk reduction into the MTDPs of the selected MMDAs;

Research Questions

The study sought to find solutions to the following questions:

1. What are the policies and guidelines informing disaster risk planning for development planning of the MMDAs?

2. What is the community's understanding of disaster risk and participation in disaster risk reduction;

3. What are the roles and responsibilities of various stakeholder institutions in disaster risk reduction management?

4. What is the institutional capacity for disaster risk reduction and management in the selected MMDAs?

5. How have disaster risk reduction measures been incorporated into the MTDPs of the selected MMDAs?

Significance of the Study

Disasters and their management are of great concern to individuals, firms, governments, non-governmental organisations, and civil society due to their developmental and environmental repercussions. The study seeks to help residents be more aware and understand their changing risk environment, build their adaptive capacity, and be more resilient by employing proactive risk reduction measures. Also, it will strengthen the community and institutional mechanisms in disaster risk reduction. It would expose the

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MMDAs to new skills and prevention measures and recommend appropriate practices of community people towards disaster preparedness planning in selected MMDAs.

The study is expected to build on existing studies examining the coordination among disaster management institutions. Other studies conducted so far focused mainly on one disaster, such as a fire outbreak or flood; however, this study focuses on major disasters (fire and flooding) in the Greater Kumasi Area. This study examined the roles and responsibilities of disaster response institutions regarding disaster risk reduction. Also, role conflict, gap, and role strain will be examined among the disaster response institutions.

Although Ghana has rectified the Sustainable Development Goals and the Sendai Framework, little is known about the progress and achievement of SDG 11 and the priorities of the Sendai Framework in the Greater Kumasi Area. Therefore, this study examined the integration of disaster risk reduction into the development planning process of the various MMDAs. The evaluation of MMDAs MTDPs from 2014 to 2025 against the disaster risk reduction strategies and the priorities of the Sendai framework, as well as the collection of primary data from selected MMDAs in Greater Kumasi, permitted a deeper analysis and understanding of disaster risk planning.

The contribution to the living with risk framework and the mainstreaming of climate change into the development planning process framework developed by UNISDR (2004) and Agyemang and Antwi (2016), respectively, is another asset added to the literature by the study. The study introduced the disaster risk reduction activities and how their interplay with

development planning processes, coupled with the structures (NDPC, RCC, MMDAs, disaster response institutions such as NADMO, GNFS, community people, etc) and processes (national policies, acts and customs) to ensure effective disaster risk planning in Greater Kumasi Area.

The study's contribution to policy formulation is invaluable to existing knowledge. It emphasises the importance of conducting thorough research and engaging in meaningful consultations with relevant stakeholders when developing policies. Through extensive consultations, comprehensive data analysis, and the provision of various policy alternatives, the study has facilitated the creation of effective strategies for disaster risk planning. Also, it is recommended that the outcome of this study be considered when preparing a disaster risk reduction plan for Ghana.

Organisation of the study

The thesis consists of ten chapters. Chapter one (1) introduces the study and the background information and sets the rate at which the study is developed. The chapters are explained as follows. Essential highlights of the study include a problem statement, research objectives, and research question. Also, essential parts of this chapter are their meaning, the scope of the study, and the definitions of key terms. This chapter also provides a section on how the entire thesis is drawn up.

Chapter two (2) presents an in-depth review of the literature concerned, the theoretical background explained in the study's different concepts, and clarification of the various concepts such as disaster, risk, hazard, disaster risk reduction, and medium-term development plan. This chapter also discusses development planning processes and the roles of the various institutions involved in disaster management and policy evaluation

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processes. A theoretical review and conceptual framework are also presented in this chapter. The policy reviews and empirical assessment of literature relating to the evaluation of disaster risk reduction strategies, understanding of disaster risk, integration of DRR into development planning processes, methods or procedures in the planning process of the various Metropolitan, Municipal and District assemblies, is considered in chapter three (3). The research methods chosen and the data collection methods are discussed in Chapter Four (4). The chapter explains why the analysis involves adopting action research and evaluation as a tool for assessment. In addition, Chapter Four discusses issues of ethical consideration and challenges to data collection and resolution. The model used the assumptions, and the reporting of the statistical results is discussed in Chapter Four.

The fifth chapter presents the data analysis and results on the evaluation of policies, acts and agencies on integrating DRR into the development planning process of the various MMDAs. Chapter six (6) analyses the community's understanding of disaster risk and participation in the DRR. The roles and responsibilities of disaster response institutions in DRR were presented in Chapter Seven (7). Chapter eight (8) considers institutional capacity for DRR. Chapter nine (9) presents how DRR is integrated into the MTDPs of the various MMDAs and the challenges of implementing disaster risk reduction by the selected MMDAs. Chapter ten (10) provides the summary, conclusion, recommendations and suggestions for further studies. Moreover, the current study will contribute to the literature, conceptual framework, and practice. Lastly, it also proposes knowledge gaps to be explored for future studies.

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CHAPTER TWO

THEORETICAL AND CONCEPTUAL PERSPECTIVES OF

DISASTER

"More effective prevention strategies would not only save tens of billions of dollars but hundreds of thousands of lives as well. Funds currently spent on intervention and relief could be devoted to enhancing equitable and sustainable development instead, which would further reduce the risk of wars and disasters. Building a culture of prevention is not easy, however. While the cost of prevention has to be paid in the present, its benefits lie in the distant future. Moreover, the benefits are not tangible; they are wars and disasters that do not happen"

Annan (1999)

Introduction

The chapter covers theoretical and conceptual issues that are related to the study. It begins with an in-depth discussion of the concept of disaster. Under this, the concepts of Disaster Risk Reduction (DDR) are introduced concerning how the concepts have been employed to ensure sustainable cities and communities. Some theoretical issues are then introduced. Disaster risk reduction policies at the meso-level of development and the roles and responsibilities of various response institutions in DDR were considered. This was to examine the collaboration amongst the response institutions regarding disaster incidence to identify the oversight responsibilities, responsibilities gap and the conflict roles for effective disaster management.

The importance of stakeholder participation in disaster risk reduction management is also acknowledged and reflected in the discussion of stakeholder participation. This is consistent with assessing the institutional capacity for disaster risk reduction and management. In order to help clarify the input and output variables for disaster risk reduction management, the conceptual framework for the study—disaster risk reduction and disaster management—is introduced.

Definition of Concepts

Disaster

The etymology of disaster, which derives from two Latin words, "dis" (bad) and "aster" (star), is rooted in a form of fatalism, which dominated the philosophy of disasters for centuries and continues to influence the perceptions of many individuals and communities across continents. The typical offshoot of fatalism is the worldview that disasters cannot be controlled, much less prevented. Therefore, the only option is to provide victims with relief and humanitarian aid. The United Nations Office of Disaster Risk Reduction (UNDRR, 2009) defines a disaster as "a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its resources".

According to Surya, Begum, and Rita (2013), a disaster can be any tragedy, calamity, catastrophe, or extreme incident that takes place in any region and is caused by either man-made or natural causes and results in the suffering of humans, the loss of lives, and the damage or destruction of property. The incidence of disasters is not out of the ordinary. They

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materialise how humans go about their daily lives, organise their societies and distribute their resources. Disasters are cataclysmic events that multiple people experience simultaneously, have a sudden onset, and have a finite amount of time.

Disasters are common occurrences that can take place in both developing and developed nations. They have the potential to result in significant loss of life and property. They are typically evaluated based on the number of lives lost, the amount of property damaged or lost, the number of injuries suffered, and the amount of environmental degradation. According to Pascapurnama et al. (2018), significant disruptions like terrorism and human-induced disasters establish an emergency for nations and raise the pressure on interest groups, both of which necessitate prompt answers and reactions.

Unfortunately, deliberations on catastrophes are enriched in misconceptions, myths, and beliefs in less developed nations such as Ghana (National Disaster Management Organisation, 2010). This might discourage individuals and sometimes prevent them from treating emergency circumstances seriously. Some people believe that disasters are made by God or punishment from a deity and, therefore, are bound to occur once people sin against their god or deity. According to the National Disaster Management Organisation [NADMO] (2010), the world has been struck by an increasing number of disasters in the last several decades. These catastrophes have affected more than 2.5 billion people, been responsible for the deaths of over 500,000 people, and resulted in economic losses of approximately 700 billion US dollars. Disasters have a detrimental influence on people's lives and their ability to make a living. They have cost the world economy around US$3

trillion over the past two decades, from the year 2000 to the year 2019 (Centre for Research on the Epidemiology of Disasters [CRED] & United Nations Office of Disaster Risk Reduction [UNDRR], 2020).

Disasters are responsible for the destruction of the environment and the deterioration of utility services, both of which present a significant obstacle to the daily operations of life and the progression of development. According to Ciottone (2016), a disaster can be defined as any event that causes the processes already in place in society to become overwhelmed. The general rule of thumb is that the magnitude of the occurrence must be greater than the capacity of society to deal with it. Earthquakes, tsunamis, and landslides are just some of the natural hazards that can occur in the event of a catastrophe. Floods, fires, epidemics (COVID-19), and other disasters can all be attributed to human activity. Natural catastrophes that are both rapid and intense substantially damage a country's economic bearing, producing suffering for a more comprehensive section of the population. These types of disasters are more likely to occur in developing countries. According to Adjorkor (2019), the effects of this kind of disaster are multifaceted and affect all elements of domestic and international economics, politics, and society.

Disaster Management

Disaster management looks at efforts to prevent the occurrence of disasters and to mitigate their effects when they do occur. From a governance perspective, disaster management is a crucial concept, as disaster management organisations are generally created by governments and mandated to provide disaster-related services to the general public. Disaster management

organisations' operations are typically governed by national, state, and international laws (Noran, 2014).

In recognition of the fact that climate change will exacerbate disaster risks, which will hurt lives and property (Advocacy and Capacity Building for Disaster Risk Reduction and Preparedness in Ghana Project Final Project Report, 2017), disaster management organisations are typically under pressure to provide better services to citizens. However, providing guidelines for disaster management and response organisation operations does not necessarily enhance disaster management. For disaster management organisations, incompatibilities in infrastructure, structure, culture, overlapping responsibilities, and difficulties in filtering and validating disaster information in crises remain challenging.

Local or regional disaster management necessitates a multidisciplinary approach to addressing the pre- and post-impacts of a disaster. Individual property is destroyed, people are injured and displaced, and critical societal infrastructure such as roads, water, communication systems, and electricity networks are damaged during a crisis. Disaster management is essential for mitigating the effects of disasters on affected individuals, communities, and the nation. It includes preparation, response, and restoration of damaged structures. In general, disaster management requires planning, forecasting, preparedness, monitoring, prognosis, early warning, damage assessment, and the ability to manage relief (Gyireh & Nunbogu, 2015).

Management of disasters necessitates the organisation of both human and material resources to prevent disasters or mitigate their effects if they do occur. It also includes the plans, policies, and programmes implemented to

mitigate the effects of a catastrophe on a country. To Sinha and Srivastava (2017), it encompasses the development and implementation of disaster rehabilitation and recovery plans and the organisation, coordination, evaluation, and monitoring of various actors. Palanivel, Saravanavel and Gunasekaran (2015: p6) assert that "*disaster management involves multiple aspects, including mapping of disaster-vulnerable areas, proper understanding of the type and degree of causative parameters involved, mitigation or prevention planning, assessing disaster-caused damages, and rehabilitation*".

Disaster management also requires considering all policies and strategies to address and manage disaster causes effectively. The actions of a large number of autonomous national and international organisations influence effective disaster management. Citizen participation and engagement initiatives are crucial throughout the disaster management life cycle. Catastrophe incidents transcend disciplinary boundaries; therefore, they cannot be effectively addressed by focusing on isolated cases.

Hazard

It is a prospective undesirable physical event that may result in death, property damage, social and economic disturbance, or environmental deterioration (National Disaster Management Organisation, 2010). It can also be defined as a harmful phenomenon, substance, human action, or condition that has the potential to inflict death, injury, or other health consequences, property damage, loss of livelihoods and services, social and economic disruption, or environmental degradation (UNISDR, 2009). Similarly, a

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natural or man-made trigger event might endanger people's lives and property, leading to a disaster (UNDRR, 2009).

Vulnerability

It looks at the degree to which a community, household, or individual is susceptible to the dangers to which it is exposed and its ability to adapt to those hazards (The Intergovernmental Panel on Climate Change [IPCC], 2007). It also considers the factors that increase the risk of harm to a system, asset, or community from a hazard (UNDRR, 2009).

Physical, social, economic, and environmental vulnerabilities are all possible, with the majority arising either from a lack of development or unplanned or dangerous development. Unsafe housing and infrastructure, weakened communication systems and networks, and inadequate utilities and services all contribute to the escalation of disaster-related direct and indirect economic losses.

People from all walks of life who cannot protect themselves from the risks they face owing to a lack of social protection fall under the umbrella term of "social vulnerabilities", which includes people with low incomes, children, women, aged, disabled, and others. Inadequate business continuity planning, insurance coverage, and the location of economic drivers (such as factories, ports, and tourist attractions) in high-risk areas all contribute to a weakened economy.

Reckless development creates environmental vulnerabilities by depleting or damaging natural resources or ecosystem services, such as the loss of mangroves, which leaves coastal settlements vulnerable to storm surges, or the loss of forest cover on mountain slopes, which increases the risk

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of landslides and flooding. Like toxic effluents being discharged into water bodies or noxious gases being emitted into the air can cause health disasters, excessive water withdrawal from aquifers can worsen hydrological drought.

Resilience

This focuses on the ability of a society or community to resist, absorb shocks, and recover from a hazard's effects within a time and efficient manner (UNDRR, 2009). Resilience focuses on the ability of a system or community to resist, absorb, and recover from a hazard's effects in a given period. Therefore, a community is resilient if it can absorb, resist, or bounce back aftershocks of hazard's effect using its resources.

Risk

The existence of susceptible elements in potentially hazardous settings. The interaction between the features of the exposed system and the hazard determines the likelihood (or frequency) of the occurrence of a specific event with negative consequences and the severity of those effects (Olhoff et Schaer, 2010).

Smart Cities

Thanks to information and communications technology advancements, virtually every facet of human existence has been revolutionised. Cities have always been hotbeds of creativity, so it should come as no surprise that they are also leading the way in developing and adopting digital technology. Digital technologies, made possible by ICTs, are rapidly being relied on by many urban centres throughout the world to address societal issues, raise living standards, and better manage emergencies (Ahvenniemi, Huovila, Pinto-Seppa, & Airaksinen, 2017; Kourtit & Nijkamp, 2018). Smart city movements

are commonly used to describe the initiatives and actions facilitated by ICT. Since its inception in the early 2000s, the "smart city" notion has seen numerous iterations. Many innovative city projects and efforts have been launched during this period, and this trend is anticipated to continue (Angelidou, 2015; Marsal-Llacuna, Colomer-Llinas, & Melendez-Frigola, 2015).

The term "smart city" has been defined and described in several ways, depending on the audience and the stakes. Governance, mobility, infrastructure development, information technology development, and environmental management are all critical to the various conceptualisations of "managed cities" that have been proposed (Chourabi et al., 2012). According to the definition provided by the Climate Group, Associated Regional and University Pathologists [ARUP], Accenture, and the University of Nottingham (2011: p45), a "smart city" is one that *"uses data, information and communication technology for efficient and enhanced services; monitors government progress toward effective delivery of services on climate change mitigation and adaptation; effective infrastructure planning and management; removes organisational bottlenecks and promotes cross-sector collaboration; and creates the enabling environment for innovation"*. Also, a "Smart City" is "an urban environment that, supported by pervasive ICT systems, can deliver sophisticated and innovative services to inhabitants in order to improve the overall quality of life" (Caragliu et al., 2009, p. 169).

Seeing the city as a system is necessary for developing a smart city. One must take a holistic approach to delivery and strategy for this to be possible. Therefore, in an integrated urban system, trees and green spaces

contribute to the cooling of streets, urban waste serves as an input for the generation of energy, recycled water from houses serves as water for washing vehicles and greenhouse agriculture use, and apartment buildings use organic waste as manure (ARUP, 2010).

Smarter communities are more likely to entice skilled workers who can boost their local economies by fostering new methods of doing things more efficiently (Angelidou, 2015). It is also anticipated that ICT-enabled innovative solutions will aid in improving the urban quality of life, increasing the transparency of urban management, and resolving some persistent problems associated with urban inequality, an ageing population, and public safety and security (Manville et al., 2014).

Smart cities are projected to give solutions for coping with one of the most significant challenges facing society today: the rise in the frequency and severity of catastrophic events. This challenge is related to the main emphasis of this study. These include events that are caused by climate change, natural disasters such as earthquakes, and man-made events such as nuclear events (Huovila, Airaksinen, Pinto-Seppa, Piira, & Penttinen, 2016). Over the past three decades, the examination of loss occurrences reveals a rising tendency in the annual frequency of climate-induced, natural, and human-made disasters, which motivates this action (Hoeppe, 2016; Smith & Katz, 2013). For instance, the previous six years (2014-2020) have been the warmest on record since 1850, and last year was the warmest of all time, both of which are strong indicators of global warming (World Meteorological Organisation, 2020).

In cities with a higher concentration of people and resources, extreme heat and several other adverse events can cause billions of dollars in economic

loss. Some estimates put the annual cost of urban disasters at around USD 300 billion, with the potential to rise to over USD 400 billion if cities, including Greater Kumasi, do not improve their resilience before 2030 (Word Bank, 2016). In light of these dangers, it is evident that a critical contribution of innovative city solutions, technologies, and initiatives should be strengthening the city's ability to withstand natural disasters.

This is explained because, as urban populations grow, so does the pressure on cities to provide for their residents' requirements without causing a corresponding spike in resource use. It is essential to automate or digitise disaster risk reduction measures like early warning so that homes and people in disaster-prone areas have enough time to prepare before a disaster strikes.

According to the findings of the Global Commission on the Economy and Climate (2014), establishing connections between cities focused on production can both stimulate economic growth and contribute to the fight against climate change. Densification, integrated infrastructure, and appropriate urban governance are some of the additional approaches that have been advocated, along with cost-effective investments, appropriate waste management, and transit. The research emphasised that many cities are making progress toward implementing disaster risk reduction strategies to preserve the citizens of those communities and their properties.

Sustainable Cities

Modern notions of innovative sustainable governance are based on four pillars: (i) openness, (ii) accountability, (iii) stakeholder engagement, and (iv) citizen participation. These ideas, impacted by Information and Communication Technology [ICT], the Internet of Things [IoT], and Artificial

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Intelligence [AI], have led to a wide range of citizen behaviour and e-government interactions. Prior misunderstandings of the smart city focused solely on the motivations of municipal authorities and lower-level government employees to adopt and implement technological solutions. The smart city concept revolves around using data management and analytics platforms, as well as networked sensors, to enhance the performance of infrastructure in urban areas (Strielkowski et al., 2022). Among other things, this helps communities get ready for the possibility of a natural or man-made calamity.

A notable definition of sustainable development is coined by the World Commission on Environment and Development (WCED 1987), also known as the Brundtland Commission: "Sustainable development is development which meets the needs of the present without compromising the ability of future generations to meet their own needs" (p. 43).

For Elkin, McLaren and Hillman (1991), for instance: "sustainable urban development must aim to produce a city that is 'user-friendly' and resourceful, in terms not only of its form and energy efficiency but also its function, as a place for living" (p. 12). It has also become more common to link policies about the environment in cities to policies about social and economic development. Growing the economy is a critical topic in poorer countries' cities. For example, the World Health Organisation (1992:102) states that the goal of "sustainable urban development" should be for cities (or urban systems) to continue to support increasingly productive, stable, and inventive economies while also doing so with substantially lower levels of resource usage. This was stated in the context of "sustainable urban development" (p. 102).

According to Trindade et al. (2017) and Ahvenniemi et al. (2017), sustainability is an essential component of the foundation of any Smart City development. According to Rua et al. (2021), practises such as the rehabilitation, regeneration, or renovation of buildings are unquestionably in line with the environmentally responsible growth of smart cities (Ye et al., 2021; Parra-Dominguez et al., 2021). It is a new idea of urbanism that avoids demolition and rebuilds as a transition model to more sustainable cities (Parra-Dominguez et al., 2021).

Sustainable development (SD) and disaster risk reduction (DRR) are inextricably tied. Hard-won development gains can be undone by a single significant disaster or "shock" incident, which refers to a disaster with a rapid onset, such as an earthquake, flood, or fire outbreak. This can set back development by several years. According to research published by the Institute for Global Environment Strategies (2016), a "stress" incident, also known as a disaster with a gradual beginning, such as drought, rising sea levels, or saline intrusion into groundwater stocks, can also produce socio-economic damage that lasts for a lengthy period.

"A smart sustainable city is an innovative city that uses information and communication technologies and other means to improve quality of life, the efficiency of urban operation and services, and competitiveness while ensuring that it meets the needs of present and future generations concerning economic, social, environmental as well as cultural aspects" (International Telecommunication Union [ITU], 2021: p16). A smart, sustainable city (SSC) emphasises the necessity for cities to be sustainable (resilient and inclusive) and smart, which refers to a city's ability to function digitally. This concept

was developed by International Business Machines Corporation [IBM]. An information and communication technology (ICT) infrastructure that enables the provision of services and the facilitation of efficient decision-making lies at the heart of an ecosystem for an innovative and sustainable city.

Cities and communities are encouraged to use a human-centric approach to urban development, considering human values when deploying digital and technology solutions. This is done so the communities and cities can be considered smart and sustainable. The planning and development of SSCs make it possible to offer citizens high-quality and innovative services and create an urban environment that is secure, pleasant, and welcoming to people of all backgrounds.

Natural disasters do not just threaten sustainable and resilient urban futures. Everyday occurrences, such as viral and parasitic diseases, traffic accidents, and flooding, may have a more significant aggregate effect on human health and welfare (UNISDR, 2011). The Sendai Framework for Disaster Risk Reduction [SFDRR] can contribute to the transition from risk reduction to development precisely at this intersection of poverty and risk. This change must necessitate more coordinated and programmatic approaches to urban design and administration that acknowledge the potential advantages that cities and their economies of scale provide for interrupting cycles of risk accumulation (Birkmann et al., 2016).

Furthermore, Sustainable Development Goal Eleven, entitled "Sustainable Cities and Communities", focused on "making cities inclusive, safe, resilient and sustainable". According to UNDP (2016), the SDG 11 set the following target to be achieved by 2030:

"11.1 ensure access for all to adequate, safe and affordable housing and essential services and upgrade slums;

11.2 provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with particular attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons;

11.3 enhance inclusive and sustainable urbanisation and capacity for participatory, integrated and sustainable human settlement planning and management in all countries;

11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage;

11.5 significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations;

11.6 reduce the adverse per capita environmental impact of cities, including by paying particular attention to air quality and municipal and other waste management;

11.7 provides universal access to safe, inclusive and accessible green and public spaces, in particular for women and children, older persons and persons with disabilities;

11.8 Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning;

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11.9 substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and development and implementation, in line with the Sendai Framework for Disaster Risk Reduction 2015–2030, holistic disaster risk management at all levels; and

11.10 Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilising local materials."

Community Development

In its broadest sense, development can be understood as improving a nation's economic and social conditions. More specifically, it refers to enhancing methods for managing natural and human resources to create prosperity and better people's lives. Development's economic, social, and human components are intricately intertwined. Community development has become a renowned academic profession from various academic fields such as sociology, economics, political science, planning, geography, and many more. According to Ploch (1976), as mentioned in Mattessich and Monsey (2004:59), one definition of community development is "participation in a process to achieve improvement in some aspect of community life, where normally such action leads to the strengthening of the community's pattern of human and institutional relationships" (Mattessich & Monsey, 2004; p. 59).

Instructing individuals on how to cooperate to find solutions to shared issues is at the centre of these various community development ideas. Other authors have defined community development as an action, result, or outcome.

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For example, local decision-making and programme development that results in a better place to live and work (Huie 1976 cited in Mattessich & Monsey 2004) or a group of people initiating social action to change their economic, social, cultural, and environmental situation (Christenson & Robinson 1989 cited in Mattessich & Monsey 2004). In the community development literature, this concept is generally referred to as social capital or social capacity, which describes the abilities of residents to organise and mobilise their resources to accomplish consensually defined goals (Christenson & Robinson 1989 cited in Mattessich & Monsey 2004).

Disaster Management Cycle

The disaster management cycle describes the order in which disaster events and their consequences are managed. According to Chong and Kamarudin (2017), earlier researchers emphasised various cycle phases. They concluded that, despite disparities in approach, the overall disaster management cycle can be divided into pre-disaster and post-disaster phases. Pre-disaster phases included disaster prevention, mitigation, and preparedness, whereas post-disaster phases included disaster response, rehabilitation, and reconstruction. In general, disaster management consists of four phases: disaster prevention and mitigation, disaster preparedness, disaster response, and disaster recovery. Figure 1 depicts the various stages of the disaster management cycle.
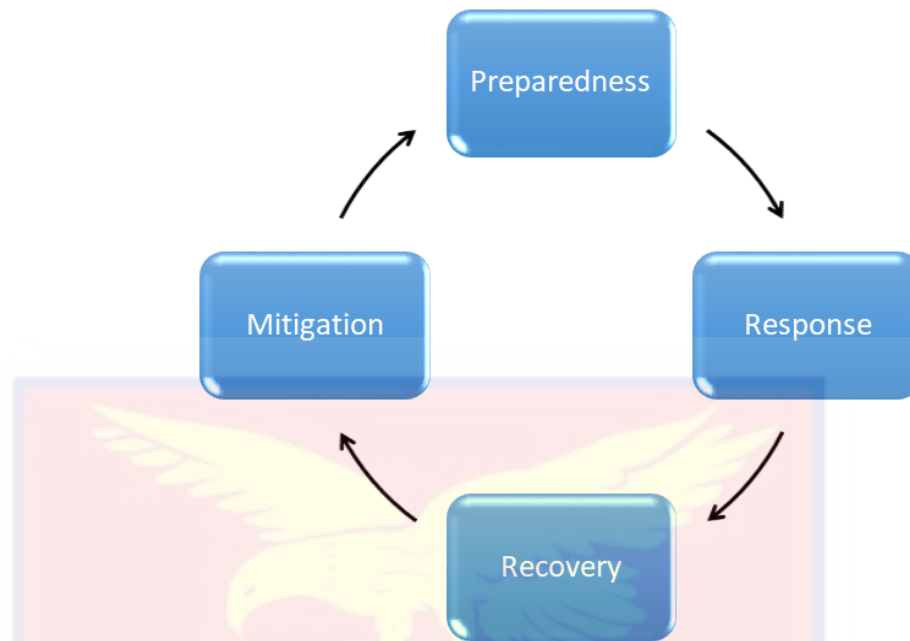
Figure 1: Disaster Management Cycle
Source: Disaster Risk Reduction (2009)

Disaster Prevention and Mitigation

Disaster prevention refers to the actions taken to reduce the likelihood that a disaster will occur, while disaster mitigation refers to the activities performed to reduce the severity of the effects of a natural disaster should it occur. "disaster prevention" refers to measures to stop an occurrence or a potential hazard from damaging people or their assets in the economy. Planning in order to avoid catastrophic events is essential. Although it is impossible to avoid the adverse effects of risks and catastrophes completely, it is possible to significantly mitigate their impact by taking several preventative actions and employing several mitigation tactics (UNDRR, 2017).

Disaster mitigation aims to lessen the likelihood of dangerous outcomes while lowering the risk. Implementing public education and awareness campaigns, drafting policies and plans for disaster management, and fortifying vulnerable structures are all examples of measures that fall under "mitigation." The goal of mitigation is to either wholly forestall the

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progression of potential dangers into actual disasters or at least lessen the impact of disasters when they occur (DRMTM, 2016).

Both structural and non-structural approaches can be taken to mitigate the effects of a disaster. "structural mitigation" refers to the alterations or actions made to buildings to defend against natural catastrophes or man-made emergencies. Individuals usually take these direct measures to protect their lives and possessions. Examples include creating hazard-resistant structures such as seawalls, levees, windbreaks, and buildings. Non-structural mitigation refers to the policies, awareness campaigns, knowledge generation, and participatory procedures that can help minimise risks and their associated impacts (DRMTM, 2016).

Potential mitigation techniques include a family emergency plan and buying flood insurance for your home. However, nature has its method of giving mitigation measures through the activities of the ecosystem (DRMTM, 2016). While human beings typically carry out structural and non-structural mitigation actions and strategies, nature has its way of offering mitigation measures.

Even though the phrases mitigation and prevention of natural disasters are sometimes used interchangeably, there is a fundamental distinction between the two. Preventing man-made disasters, including chemical accidents and fire breakouts, is a significant component of disaster preparedness and mitigation efforts. On the other hand, disaster mitigation is essential to risk reduction for natural hazards (DRMTM, 2016; Sinha & Srivastava, 2017). Thus, disaster prevention focuses on the measures that are taken to stop an occurrence or a potential hazard from having a damaging

impact on people. In contrast, mitigation focuses on the measures implemented to reduce the likelihood of dangerous outcomes or lower the disaster risk.

Disaster Preparedness

Actions and activities are carried out as part of disaster preparedness to protect against a potential disaster and to provide an adequate response if one does occur. Instead of being a separate sectoral activity, disaster preparedness provides a framework for developing valuable, pragmatic, and synchronised planning efforts on the part of governments (DRMTM, 2016). This is because disaster preparedness involves an ongoing and integrated course of action resulting from various risk reduction actions and resources. Information management, early warning systems, official training, acquiring and storing relief goods, hazard and risk vulnerability assessments, developing a database on collaborating agencies, research, and mobilising equipment for simulation are all examples of such measures.

A thorough plan for responding to disasters and emergencies is essential to handle threats and crises effectively. According to Mashi, Oghenejabor and Inkani (2019), making preventive efforts to prevent the development of disasters or designing methods to attain a high level of awareness for inevitable disaster events is of utmost importance. Disaster preparedness can either prevent the onset of disasters or achieve a high level of awareness.

Disaster Response

During the phase known as "response," various actions are carried out to satisfy the needs and fulfil the requirements of those affected. It entails

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making emergency services and other resources readily available to victims in a region affected by a disaster. Disaster response goals are to create and provide rapid relief to maintain life, promote wellness, and raise morale within the community that the disaster has touched. These tasks, frequently referred to as emergency response services, include the search and rescue of victims, the transportation of victims to safe havens, the evaluation of the disaster, the registration of victims, and the distribution of relief supplies (NADMO, 2010).

Aside from that, there are actions such as providing medical services, coordinating and communicating, providing first aid, and providing emergency medical treatment. "A well-prepared response is much more effective than ever", claims research published by Baidoo (2018: p6). It is essential to be aware that knowledge and resources are two fundamental criteria for an effective response and that without them, the programmes, plans, and policies that have been put in place would not provide any outcomes. According to the DRMTM (2016), the motivation behind responding to disasters is to prevent more damage and loss, reduce casualties, alleviate hardships, re-establish the essential support systems, and consequently build a platform for recovery.

Disaster Recovery

This concludes the cycle of catastrophe management and describes its last step. It entails engaging in actions to return individuals and community members affected by a disaster to their usual lives. The process of recovering from the effects of a disaster is an essential component of its management and handling. According to Johnson and Olshansky (2016), recovery management is essential because the aftereffects of disasters continue to manifest

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themselves over time. Many people escape the initial calamity, but as a result, they have ongoing struggles with their health, finances, and the disintegration of their social and network systems. It may take several years for victims of natural catastrophes to heal physically, and the mental wounds they suffer may remain for the rest of their lives. The rehabilitation of infrastructure, the promotion of self-reliance and activities that generate money, the restoration of utility service, and the creation of permanent structures for modifications and lodging are all measures performed during this period.

It is impossible to understate the significance of the part that community members and regular citizens play in this crucial stage. When individuals are actively involved in developing plans and strategies for disaster recovery, they are given the ability to take action in the case of a disaster rather than simply playing a passive role and accepting support from the government. When governance is decentralised, and the central government provides support in the form of money, and the development of skills, recovery from disasters may be accomplished most effectively.

According to Pascapurnama et al. (2018), implementing sound practices in the pre-disaster stages is necessary to respond to disaster scenarios effectively. As a result, people are more susceptible to common prospective dangers, such as risks to their food and security. It is essential to remember that the four stages of the management cycle overlap with one another, and the severity of the damage plays a vital role in determining how long each stage lasts. According to Sinha and Srivastava (2017), disaster management is a complicated endeavour, and as such, it should be adaptable, risk-driven, integrated, coordinated, progressive, and professional to be effective.

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International Strategies and Frameworks for Disaster Risk Reduction

The topic of "International Strategies and Frameworks for Disaster Management" encompasses various approaches and frameworks developed at the international level to enhance disaster management and response efforts. These strategies improve preparedness, coordination, and resilience across countries and regions. International strategies and frameworks for disaster management often emphasise the importance of collaboration, cooperation, and knowledge sharing among nations. They promote the exchange of best practices, lessons learned, and technical expertise to build capacity and enhance disaster risk reduction measures.

In December 1987, the United Nations General Assembly declared the 1990s as "The International Decade for Natural Disaster Reduction (IDNDR)" to raise awareness about the importance of reducing disaster risk (UNISDR, 1999). The primary objective was to minimise the loss of economic and social resources after natural disasters, particularly in developing countries. As a follow-up to this declaration, the General Assembly established a particular office in Geneva to coordinate related activities and set specific goals to be achieved by the end of the decade (Coppola, 2015).

The Yokohama Strategy and Plan of Action

After the United Nations' first conference in Yokohama, Japan, in 1994, the Yokohama Strategy and Plan of Action for a Safer World was adopted as a global disaster preparation, prevention, and mitigation strategy. It aimed to enhance coping mechanisms and facilitate a swift recovery (UNISDR, 2016). This plan emerged from the International Decade for Natural Disaster Reduction (1990-2000) and the Global Conference on

Natural Disaster Reduction held in 1994. The strategy focused on creating a more secure world and emphasised the need for world-class risk management (Coppola, 2015). This strategy served as a pivotal document in creating global strategies for disaster preparedness, prevention, and mitigation (UNISDR, 2016). It aimed to enhance coping mechanisms and facilitate a more rapid disaster recovery process.

The Yokohama Plan of Action focused on several key areas. It called for developing and implementing comprehensive disaster management plans at the national and local levels, emphasising risk assessment and early warning systems (UNISDR, 2016). The plan recognised the importance of integrating disaster risk reduction into sustainable development policies, plans, and programs to minimise vulnerabilities.

Furthermore, the Yokohama Strategy highlighted the significance of promoting international cooperation and collaboration in disaster risk reduction efforts. It stressed the need to exchange knowledge, experience, and technology among countries and the importance of building capacities and capabilities at all levels (UNISDR, 2016). The strategy and action plan were formulated in response to the increasing recognition of disasters as a severe threat to economic and social stability. It aimed to foster a culture of safety and resilience by addressing the root causes of vulnerabilities and promoting sustainable development practices (UNISDR, 2016).

Overall, the Yokohama Strategy and Plan of Action for a Safer World provided a framework for comprehensive disaster risk reduction initiatives. It underscored the importance of integrating risk reduction measures into

development policies, enhancing early warning systems, and strengthening international cooperation to build disaster resilience.

The Hyogo Framework for Action

At the second global conference on disaster reduction in Kobe in 2005, the international community developed and adopted the Hyogo Framework for Action (HFA) for 2005-2015. The framework aimed to enhance the resilience of nations and communities against disasters over ten years (UNISDR, 2005). It emphasised integrating disaster risk reduction into sustainable development policies, strengthening institutions and capacities, and implementing risk reduction approaches in emergency preparedness and response (Coppola, 2015). Also, this comprehensive framework aimed to reduce the loss of human lives and socio-economic assets while building resilient communities capable of effectively managing hazards (UNISDR, 2016). The HFA addressed the challenges identified in the Yokohama Strategy, outlining five priorities for action, guiding principles, and pragmatic approaches to achieving resilience.

The HFA consisted of five priority areas for action, which included:

1. Ensuring political commitment: Governments were encouraged to prioritise disaster risk reduction and integrate it into their policies and plans.

2. Risk assessment and early warning systems: The framework emphasised the need for accurate risk assessments and the development of effective early warning systems to enable timely response and evacuation.

3. Knowledge sharing and capacity building: The HFA promoted the exchange of information, expertise, and lessons learned between

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countries and aimed to enhance the capacity of individuals, communities, and organisations to manage disasters effectively.

4. Addressing underlying risk factors: The framework focused on tackling the root causes of vulnerability, such as poverty, inequality, and environmental degradation, to reduce the impact of disasters.

5. Strengthening disaster preparedness and response: The HFA aimed to improve disaster response capabilities, including the coordination of emergency services, establishment of contingency plans, and provision of necessary resources and support during and after disasters.

The Hyogo Framework for Action provided a strategic blueprint for disaster risk reduction efforts at the national, regional, and global levels, emphasising the importance of proactive measures to prevent or minimise the impact of disasters (UNISDR, n.d.).

The HFA emphasised the need to make disaster risk reduction a national and local priority, requiring institutional support for implementation. It called for the identification, assessment, and monitoring of disaster risks, as well as the enhancement of early warning systems. The framework highlighted the importance of utilising innovation, knowledge, and education to foster a safety culture. It also focused on reducing underlying risk factors and strengthening disaster preparedness for effective response at all levels (UNISDR, 2016).

Sendai Framework

After the devastating earthquake and tsunami in Sendai, Japan, in 2011, a third world conference on Disaster Risk Reduction was held in March 2015; 187 member countries established a new plan of action and framework,

known as the Post-2015 Framework or Post-HFA or the Sendai Framework for Disaster Risk Reduction 2015-2030. It focused on building resilience locally, nationally, regionally, and globally (Aitsi-Selmi et al., 2016). It provides a roadmap for disaster risk reduction efforts over 15 years to substantially reduce disaster risk and the associated loss of lives, livelihoods, and assets (UNISDR, 2015).

This framework aimed to address health concerns, which were not adequately covered in the previous framework, and emphasised their relationship with disaster risk reduction, climate change, and sustainable development (UNISDR, 2016). While the Hyogo Framework made progress in engaging stakeholders and improving disaster risk reduction, there was a need for more significant efforts to address underlying vulnerabilities arising from poverty, inequality, and inadequate urban planning and land use.

The Sendai Framework represents a decisive shift towards containing and reducing risk, prioritising resilience building as a critical component of the 2020 Agenda for Sustainable Development (UNISDR, 2016). It requires coordinated action at the local, national, regional, and international levels to achieve its objectives. Integrating health concerns and focusing on comprehensive risk reduction, the Sendai Framework aims to foster a safer and more resilient future for communities worldwide. It included recommendations related to guiding principles, implementation measures, and focus areas to reduce disaster losses and damages by specific percentages by 2030 (Coppola, 2015; UNISDR, 2015).

The Sendai Framework emphasises four priority areas for action (UNISDR, 2015):

1. Understanding disaster risk: It highlights the importance of improving understanding of disaster risk, including the underlying factors and drivers and the exposure and vulnerability of communities and assets to hazards.

2. Strengthening disaster risk governance: This priority area focuses on enhancing the governance mechanisms for disaster risk reduction at the national, regional, and global levels. It promotes the integration of DRR into policies, plans, and programs, as well as the engagement of all relevant stakeholders in decision-making processes.

3. Investing in disaster risk reduction for resilience: The framework emphasises the need for increased investment in disaster risk reduction and resilience-building measures. It highlights the importance of allocating resources to prevent and reduce disaster risks and strengthen preparedness, response, recovery, and rehabilitation capacities.

4. Enhancing disaster preparedness for effective response and recovery: This priority area focuses on strengthening disaster preparedness measures, including early warning systems, contingency plans, and the capacity to respond to and recover from disasters. It emphasises the importance of involving all relevant stakeholders and ensuring coordination and cooperation across sectors.

The Sendai Framework also recognises the cross-cutting nature of disaster risk reduction and its linkages with other global frameworks, including the Sustainable Development Goals (SDGs) and the Paris Agreement on climate change. It calls for synergies and coherence between

these frameworks to achieve sustainable development and resilience (UNISDR, 2015).

Critiques of international strategies and frameworks for disaster management often revolve around implementation challenges. Despite the existence of these frameworks, the actual adoption and implementation of policies and practices at the national and local levels may vary significantly. Limited resources, political will, and institutional capacities can hinder the effective translation of international guidelines into meaningful action. Also, the one-size-fits-all nature of some international strategies may not fully address the unique context and challenges individual countries or regions face. Flexibility and adaptability are crucial to account for diverse social, cultural, economic, and environmental factors influencing disaster management.

Furthermore, the dynamic nature of disaster risks, including the emergence of new hazards and the impacts of climate change, necessitates ongoing updates and revisions to international strategies. Continuous evaluation and improvement are required to ensure these frameworks remain relevant and responsive to evolving challenges.

In conclusion, international strategies and frameworks for disaster management provide valuable guidance and direction for countries to enhance their disaster preparedness and response efforts. While these frameworks contribute to knowledge sharing and cooperation, challenges related to implementation, contextual relevance, and adaptation remain essential considerations for effective disaster management at the international level.

Disaster Management in Ghana

Institutional Structure

National Disaster Management Organisation Act, 1996 (Act 517) made the National Disaster Management Organisation [NADMO] the leading government group in charge of dealing with disasters and other events in the country. This part of the constitution that sets up NADMO gives it the legal authority to carry out disaster prevention, response, and recovery activities in the country. NADMO works under the Ministry of the Interior and ensures that all national, regional, district, and zone civil organisations work together. NADMO works using a method that is not centralised. NADMO has a National secretariat, sixteen (16) Regional secretariats, two hundred and sixty-one (261) Metropolitan, Municipal, and District secretariats, and more than nine hundred (900) zonal offices all over the country (NADMO, 2019). When disasters happen in Ghana, the organisation works with other groups like the Metropolitan, Municipal, and District Assembly, the military and other security forces, bilateral and multilateral donors, UN agencies, private institutions, philanthropists, and beneficiaries. These organisations and bodies help manage disasters in the country in many ways.

Since it started, NADMO has worked with other organisations to handle big disasters in Ghana, like the outbreak of Cerebro-Spinal Meningitis (CSM) in the Northern region in 1997, which killed about 1,356 people. Also, 150 million cedis were spent on managing and stopping the cholera outbreak in Central and Greater Accra, which killed 117 people (NADMO, 2019). In recent years, the organisation has dealt with floods, fires, droughts, and cholera outbreaks. The most significant event was the "twin disaster" on June

3, 2015, when floods and a fire at a GOIL fuel station happened at the same time in Accra, killing many people and destroying much property.

Before the National Disaster Management Organisation (NADMO) started, the Disaster Relief Committee's work was done by the National Mobilisation Programme (Osei, 2013). After the famine, bushfires, drought, and deportation of about 1.2 million Ghanaians from Nigeria in 1982 and 1983, NADMO was set up. This scheme changed into NADMO when the NADMO Act 517 was passed in 1996 (Osei, 2013). In 2010, a National Disaster Management Plan was made per Act 517 to help manage disasters in a more organised, unified, and efficient way. The plan gives NADMO instructions on how to do its job and ensure disasters are correctly handled in Ghana.

The National Disaster Management Plan [NDMP] outlines how to deal with and handle disasters at different stages of the disaster management cycle (National Disaster Management Plan, 2010). The Plan was written for the first time in 1997 and then looked at again in 2007. Also, the National Standard Operating Procedures [NSOP] explain what each party should do and how they should do it, as well as how to avoid doing the same thing twice (NADMO, 2010). This is considered the operating part of the National Disaster Management Plan [NDMP]. The National Contingency Plan was drawn in 2008 to help people get ready for floods, earthquakes, and post-election/ethnic violence. In 2010, it was looked at again and expanded to include oil spills and pandemic flu. The Plan gives each interest group a way to do its job well and respond to different kinds of disasters in a timely,

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consistent, and coordinated way so that the possible effects on people, the economy, and the environment are minimal.

After over 20 years of work, a new rule was passed to give NADMO a fresh start and strengthen its operations (NADMO, 2019). NADMO Act 2016 (Act 927), a new NADMO law, was passed in 2016 to replace the old NADMO Act 517 and fix problems with how the country dealt with crises. The new Act of 2016 (Act 927) requires the creation of regulations for things like emergency management plans, reporting procedures for disaster management, the state and level of preparedness for a declared emergency, the terms of a mutual aid agreement, evacuation procedures, public safety measures, and the buying of goods, equipment, personnel housing, and other services in times of disaster and emergency. With the new NADMO services bill passed in 2016, Ghana's disaster management will likely focus more on working together and being proactive in dealing with disaster risks. According to a UNDP Report (2017), disaster management in Ghana has moved from a reactive to a proactive approach to preventing and reducing risks. The World Bank helped design a Disaster Risk Management (DRM) Country Plan to strengthen the institutions in charge of dealing with disaster risks.

Institutional Capacity of the Response Institutions

In general terms, capacity is "the ability to perform functions, solve problems and set and achieve objectives" (Fukuda-Parr et al., 2002, p. 14). Capacity is the combination of all the strengths, attributes and resources available within a community, society or organisation that can be used to achieve agreed goals (UNISDR, 2009). Similarly, capacity combines people, institutions and practices that permit countries to reach their development

goals. Capacity building invests human capital, institutions and practices (World Bank, 1998). Capacity building is any support that strengthens an institution's ability to effectively and efficiently design, implement and evaluate development activities according to its mission (UNICEF Namibia, 1996). It can also be seen as the process by which individuals, groups, organisations, institutions and societies increase their abilities to perform functions, solve problems and achieve objectives; to understand and deal with their development needs in a broader context and in a sustainable way (Lusthaus, Anderson & Murphy, 1995).

Many people have a hazy and undefined understanding of institutional capacity. This concept is referring to a very narrow set of characteristics. However, because every facet of capability appears to be significant in its own right, it can be quite challenging to identify the most essential ones. Why is this the case? One approach to describe this is to state that the capacity of a country derives more from the interrelationships within that country's institutional framework than specific components of that system.

According to Morgan (1996), capacity building enhances an individual's, group's, institution's, or organisation's ability to recognise and address development challenges through time. According to the Canadian International Development Agency [CIDA] (1996), "capacity building" refers to the process through which individuals, groups, institutions, organisations, and society improve their capabilities to recognise and address development concerns sustainably. According to the United Nations Development Programme [UNDP] (1998), capacity development is a concept that is more extensive than organisational development because it emphasises the overall

system, environment, or context within which individuals, organisations, and societies operate and interact (and not just a single organisation).

It can also refer to any system, effort, or process that has as one of its primary goals of strengthening the ability of elected chief executive officers, chief administrative officers, department and agency heads, and programme managers in general-purpose government to plan, implement, manage, or evaluate policies, strategies, or programmes that are designed to have an impact on social conditions in the community (Cohen, 1993).

Evolving Concept of Institutional Capacity

The concept of institutional capacity has evolved over the years: "the concept of institutional capacity is a moving target since the field has evolved from an initial focus on building and strengthening individual organisations and providing technical and management training to support integrated planning and decision-making processes between institutions. Today, institutional capacity often implies a broader focus of empowerment, social capital, and an enabling environment, as well as the culture, values and power relations that influence us" (Segnestam, Pearsson, Nilson, Arvidsson & Ijjasz, 2002). Such a broad notion of capacity seems to have emerged first in the development co-operation context.

The reason for this is that while technical assistance has a high success rate in finishing infrastructure projects, it has a considerably lower success rate in building up local ability to administer these systems over the long term. As a result, they started relying increasingly on consultants from other countries. Therefore, development cooperation projects trained national specialists and bolstered institutions, usually government agencies. It soon became apparent,

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however, that to generate an internal dynamic of transformation, such capacity building had to be consistent with the country's broader political, economic, and social environment (OECD, 2000; Fukuda-Parr, 2002; GEF-UNDP, 2000).

This idea of capacity, however, is just as applicable to developed nations. Indeed, public governance is receiving more attention in studies of public administration in OECD nations, emphasising the broader institutional context within which specific policies are implemented. Both rich and developing nations are now focusing on the need for public sector and regulatory reforms (OECD, 1997; World Bank, 2000). The idea of institutional capacity clarifies this more general concept of ability. Institutions can be either concrete entities (such as government agencies) or more abstract ones (such as norms, processes, or practises) that prescribe roles for actors, limit their freedom of action, and form their expectations (Keohane, 1988).

Whether formal or informal, institutions serve as authoritative frameworks for the ongoing interactions of citizens, businesses, nonprofits, and governments; thus, institutional capacity is a more general "enabling environment" that serves as the foundation for interactions between individuals and groups. Training people and bolstering organisations will only be effective over the long term if it aligns with existing institutions or aids in transforming them (OECD, 1999). Only then will actions be based on rules, processes, and practises that can be maintained over time.

Levels of institutional capacity

Assessment frameworks have been developed by multilateral and bilateral cooperation development agencies that account for this broader

concept of capacity (Lafontaine, 2002). The micro level, which refers to the individual; the meso level, which refers to the organisation; and the macro level, which refers to the broader institutional context, are the usual levels of institutional capability distinguished by such frameworks (Forss & Venson, 2002). In the larger institutional setting, there are three tiers. As seen below, there are five distinct tiers of capability. This subsection aims to focus more on the connection between the various stages.

1) The individual: skills and performance

The effectiveness of any action or policy depends on the performance of persons in the roles they are tasked with doing. Are these people motivated to do what they do? Do individuals work jobs that have a strong sense of purpose? Are they capable of performing the duties associated with their jobs? Is training available? Do they offer the appropriate monetary or otherwise incentives to encourage responsibility or professional advancement? The degree to which one is self-motivated is essentially a matter of choice. People often desire to do well in their endeavours and take on new challenges, even when presented with terrible circumstances, because it gives their lives meaning. However, many individual performance factors are tied to higher-level difficulties with capacity.

One issue that immediately comes to mind is the inadequate number of staff members. "While [enabling reforms] may not require a significant amount of administrative capacity, the successful implementation of affirmative changes is contingent on government staff who are both qualified and committed. Regrettably, in nation after nation, good reform programmes are established in every detail but one: who will implement them? The

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problem is well-known, but the obvious implication that there is a need for an efficient and professional civil service to put policies into effect is rarely put into practise. It is far simpler to work under the assumption that, in some way, effective policies will automatically be put into place. They never do" (Schiavo-Campo, De Tommaso & Mukherjee, 1997: p4).

If there is a staff shortage, each worker's performance will likely decline since he or she will have to handle an excessive number of responsibilities. For instance, in many nations that are still in the process of developing or transitioning, government officials are frequently the ones responsible for disaster risk reduction and other environmental concerns (Peeva, 2003). However, the shortage of personnel has deeper roots at the level of an organisation or the entire public sector. These deeper issues include a lack of financial resources and the low priority assigned to climate policy (Peeva, 2003). This is true not only for the public sector but also for the private sector, which needs to allot sufficient employees to follow up on public policy development.

In a broader sense, an organisation or the public sector that is poorly managed can hinder the performance of its personnel, even if those personnel have high levels of qualification. It is possible that the laws and practises of an organisation, whether public or private or the civil service as a whole, could play a role in whether or not financial or non-financial incentives are made available. For example, if salaries are low, significant investments in training may result in workers leaving for jobs with multinational organisations that pay higher.

According to Zakri, Singh and Villarin (2000:39), the UNDP-GEF Capacity Development Initiative discusses the "perennial drain of human resources to other groups such as intergovernmental or private agencies". In many developed and developing nations, civil service independence is the exception rather than the rule. This is another critical issue that has to be addressed. Political appointments have the potential to substantially impede the career growth of public servants, which has the effect of reducing motivation. Some countries may have no permanent civil service (Tudela, 2003).

Even one's interest in disaster risk reduction, which can significantly contribute to motivation, is primarily contingent upon a nation's cultural and societal values. It could also be contingent on the particular regulations that govern the civil service. For instance, due to the significant personnel mobility within the Dutch government, certain civil servants who have worked on disaster risk issues may later work in other sectors where they can handle disaster issues (OECD, 2002c).

In this regard, personnel of the various disaster response institutions should be equipped and given the needed training and skills to discharge their duties and responsibilities as expected. Moreover, personnel should be adequately motivated to fulfil their duties and mandate. Furthermore, for effective and efficient integration of DRR into development planning processes, needed logistics should be provided to facilitate their work. This ensures effective integration of DRR into the development planning processes.

2) The organisation: management capacity

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According to Schiavo-Campo et al. (1997), regulatory reforms and significant public programmes are examples of affirmative reforms, while enabling reforms are defined as eliminating barriers to economic activity. Additionally, the performance of organisations is an essential factor in determining the capacity of institutions. To ensure the successful implementation of any policy, including disaster risk reduction policy, it is vital to develop a deeper understanding of what motivates both public and private businesses and the structure of the incentives those firms offer to their employees. Do these organisations have distinct missions that are also compatible with one another? Have they considered whether or not they have the necessary management practises and resources for such missions? Have they been able to adjust to new missions by, for example, recruiting new personnel or reorganising the management structure as necessary? Is there a good flow of information between the technical team and the top management? In the same vein, does the senior management support the technical staff? These are some of the fundamental management challenges that affect the performance of a business.

The fact that there may be significant variations in organisational management between countries suggests the various opportunities for advancement open to companies from inside those countries. As a result, cultivating capabilities at the organisational level is frequently essential. Nevertheless, the performance of organisations is also very much dependent on the broad institutional environment of the country, which is represented by the following three levels of institutional capability up the hierarchy. Therefore, for effective integration of DRR into the development planning of

the various MMDAs, there should be cointegration and coordination between staff and management regarding disaster risk reduction; various MMDAs should have distinct missions that are also compatible with one another, and various disaster response institutions should be able to implement disaster risk reduction policies.

3) National systems: networking capacity

On their initiative, some well-managed organisations' willingness to accept a new challenge is typically crucial to the success of any new policy, such as disaster risk reduction. Choosing the appropriate organisations to collaborate with in the context of development cooperation is crucial to the success of any project (OECD, 2000). However, in many instances, the overall effect of isolated initiatives may be pretty modest, no matter how beneficial, as nationwide actions typically require the collaboration of numerous organisations. They necessitate cooperation between ministries and agencies at the same institutional level and between different institutional levels, such as between the central government and regional, provincial, or local governments. In addition, they require the cooperation of numerous private organisations, enterprises, and non-governmental organisations.

However, the ability to network or cooperate between organisations requires particular talents on the part of those organisations. What makes a network of organisations effective at accomplishing their missions? Typically, it requires managing issues "horizontally" across organisations instead of "vertically" within them. However, several factors appear to be crucial for the network's performance, including the ability to ensure the participation of critical actors, the availability of rules of procedure and financial provisions

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for the network itself, the appropriate allocation of responsibilities; the sufficient authority of the organisation(s) in charge of coordinating actions; and the adaptability, but also the stability of the institutional arrangements that have been established. For instance, the OECD (2002a) indicates that the failure to assign unambiguous responsibilities is one of the most significant obstacles to compliance with inventory requirements in some nations.

Again, the efficacy of such networks may depend on the abilities of particular individuals or organisations. However, these institutional arrangements will be more effective if the public sector has created a management culture emphasising policy integration and public participation and developed specific processes to manage horizontal issues. In Ghana, NADMO should coordinate the activities of the various disaster-responsive institutions to integrate DRR into development planning processes effectively. Key stakeholders should be brought together and harness their activities and responsibilities to integrate DRR into development planning processes effectively.

4) The regulatory framework and public sector setting

Public governance, the actions of individuals, organisations, or networks of organisations are embedded in a broader institutional context, i.e., the public sector setting and the body of laws and regulations in the country. In general, the efficacy of the public sector in performing its primary functions, or public governance, is crucial to the success of any particular policy. The majority of the capacity that is specifically developed for a particular policy, such as disaster risk reduction policy, will likely rely on this "enabling environment" that exists to some extent prior to the establishment of

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the specific policy. Numerous aspects of public administration are relevant to the discussion of institutional capacity.

First, the political economy significantly affects governance, including how governments are selected, monitored, and replaced, as well as how political institutions make decisions on policy issues. Political instability or a weak government typically makes it difficult for a nation to implement sensible policies like climate change. In addition, a legislative process may erect numerous institutional barriers to the passage of essential decisions or give too many special interests a voice, thereby preventing the adoption of any ambitious and innovative policy framework. As is the case in the United States with the ratification of an international agreement, even constitutional rules may present unique obstacles. In Mexico, energy is a constitutionally protected state monopoly (Tudela, 2003).

Secondly, the capacity of citizens, groups, and associations to make their voices heard, monitor government actions, and participate in the decision-making process is increasingly regarded as a prerequisite for effective governance. This capability is contingent upon the availability of political rights and civil liberties, including media independence, and the government's capacity to provide transparent information.

Thirdly, the background for the success of any policy, including disaster risk reduction policy, is the quality of the civil service and its overall capacity to implement sensible and coherent policies. In turn, this capability will depend on factors such as the civil service's independence from political pressure and special interest groups, the government's ability to collect sufficient resources and reform the public sector to promote individual

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responsibility and innovation, and the stability/adaptability of public institutions.

Fourthly, the rule of law refers to the respect of citizens for societal rules and, more specifically, to the effectiveness of the judiciary, the enforceability of contracts, the incidence of crime, and the control of corruption. In turn, this will depend on various factors, including political independence, a free press, transparent access to information, and the control of corruption.

If capacity is inadequate at this level, the difficulty of developing capacity assumes an entirely different form. It no longer relies on initiatives from a specific context, such as climate policy. Here, expansive initiatives, such as reforming the public sector or enhancing the efficacy of the judiciary, are required.

5) Social norms, values and practises

The public sector operates within an even broader cultural, economic, and social environment, as indicated by social norms, values, and practices. Government actions alone will not accomplish significant disaster risk mitigation or adaptation results. Acceptance of government policies and regulations by citizens, businesses, and non-governmental organisations, as well as their initiatives in this regard, are necessary for the success of any policy.

There is no universal set of norms, values, and practises conducive to effective climate change action. Nevertheless, it is likely that norms, values, and practises will aid public policies, such as climate policies, when they foster cooperation between individuals and institutions, participation in public

policy, and a sense of individual or collective responsibility towards the environment, as well as acceptance of the Rule of Law. Some cultural contexts tend to be more sensitive to long-term environmental and social concerns. If capacity at this level is low, improving public participation, increasing public awareness, and promoting environmentally responsible education will be crucial to policymaking (Kalas & Benton, 2017).

This expansive definition of institutional capacity, which includes social norms, values, and practises, could be seen as obscuring the distinction between the capacity and willingness to implement a specific policy or international commitment. For instance, a party could contend that, in a narrow sense, it can assume a particular commitment because it has the necessary human and financial resources but that its civil society is not prepared to accept this policy due to its values or way of life. Is this national government unwilling to carry out a specific policy or commitment? It may not be possible to answer this query, nor is it necessary. Simply put, this would indicate clear priorities for capacity building, which would need to concentrate on public awareness and education to stimulate the development of values and norms about the problem issue (OECD, 2003).

The institutional capacity assessment aims to identify the strengths and requirements for integrating and implementing DDR measures in the MDTP of the various MMDAs in the Greater Kumasi Area. To maximise sustainability, the process must be highly inclusive and participatory, as it must be directed and owned by local stakeholders (Food and Agricultural Organisation [FAO], 2015; Kalas & Benton, 2017).

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Community Participation

There is growing concern that intended results cannot be achieved unless capacity development is a participatory, empowering partnership in which those involved sense a high degree of ownership. Particularly in labour-related matters, the complete participation of representatives of workers and employers and their respective organisations is essential to ensuring the overall process's viability. In recent years, community participation, which refers to the direct engagement of average citizens in planning, governance, and overall development programmes at the local level, has become an integral part of democratic practise (Jayal, 2001).

However, involving the community in a "bottom-up" approach would be the most effective method to implement disaster risk management successfully [DRM] (UNIDNDR, 1994). Community participation is an effort to cultivate a sense of ownership and enthusiasm for various community development activities by involving community members in planning, implementation, and evaluation (Syam, 2009). Community participation in flood disaster management could be undertaken at various stages of the disaster management planning process. The community participation process could be developed from the mitigation, preparedness, and response, including rehabilitation, and reconstruction stages. This aligns with the world's paradigm shift from relief and response to prevention and mitigation. This approach is a new trend and a vital role in DRM.

The participation ladder framework encourages the participation of the community people in almost all the stages of development. Abarquez and Myrshed (2004) combined this concept of participation with DRM, creating a

new concept 'Community Based Disaster Risk Management' (CBDRM): "A process of DRM in which at risk communities are actively engaged in the identification, analysis, treatment, monitoring and evaluation of disaster risks in order to reduce their vulnerabilities and enhance their capacities" (Abarquez & Myrshed, 2004, p.9).

Concept of Planning

According to Davidoff and Reiner (1973:12), "Planning is the process of determining future actions based on a series of alternatives". He argued that the planning process consists of three phases: the selection of objectives and criteria, the identification of alternatives, and the direction of action towards the selected objectives. It is argued that the planning environment should consider the knowledge of the community and the interests of those who benefit from the process. It is also regarded as a response to future uncertainty and involves identifying problems, prioritising needs, mobilising, allocating, and utilising scarce resources to meet competing needs (Kendie, 2000).

In this context, planning is an ongoing, integrative, problem-solving, and participatory endeavour (Fagence, 1984). Individuals, households, enterprises, government agencies, and non-governmental organisations engage in some form of planning, even during a natural disaster. Thus, planning affects nearly every aspect of our daily existence and how everyone participates in planning (Kendie, 2000). According to Hall (1975), planning is organising a series of actions to achieve one or more stated objectives.

McLaughlin (1969) coined the term 'systems approach' to characterise the concept of planning; the 'system' that planners must deal with consists of interconnected human activities that involve communication. The systems

perspective holds that planning can never be completed; only specific stages of the plan can be completed because development is an infinite process that necessitates a cyclical approach to planning, with each stage signalling the beginning of the following process. Thus, planning is regarded as both a resource allocation tool and a concept for the future. The primary objective of implementing this explanation is to increase the integration of the various components of the planning process and the level of community participation.

Medium-Term Development Plans

Medium-Term Development Plans (MTDPs) are strategic frameworks governments use to outline their development priorities, goals, and initiatives over a medium-term horizon, typically spanning three to five years. These plans bridge long-term visions and annual budgets, providing detailed policy implementation and resource allocation guidance to achieve socioeconomic development objectives (OECD, 2019). In Ghana, MTDP spans four years, and the National Development Planning Commission provides its guidelines.

MTDPs encompass various sectors, including economic growth, infrastructure development, education, healthcare, and environmental sustainability. They set specific targets, performance indicators, and timelines to monitor progress and ensure accountability. The plans are usually developed through a consultative process involving various stakeholders, such as government agencies, private sector entities, civil society organisations, and development partners, to ensure a comprehensive and inclusive approach (World Bank, 2017).

Effective MTDPs align with international development frameworks, such as the Sustainable Development Goals (SDGs) and Sendai Framework

and are designed to address both current challenges and future opportunities. They provide a clear roadmap for achieving sustainable development, fostering economic resilience, and improving the quality of life for citizens (UNDP, 2018).

The goal of the Local Government Superannuation Scheme [LGSS] Medium Term Development Plan [MTDP] is "to achieve the status of decentralised public administrative system with capacity to support the initiation and implementation of policies and plans to accelerate economic growth and poverty reduction towards improving the quality of life of the citizenry (Office of the Head of the Civil Service, [OHCS], 2021).

The MTDP document contains the programmes, projects, detailed activities and budgets of each of the directorates of the LGSS. The implementation of the MTDP is to enhance efficiency and effectiveness in the management of Local Government Service (LGS) for the mutual benefit of all stakeholders. These MTDPs of the various MMDAs are formulated and prepared for four years on projects and policies to be implemented. The annual action plan of the various MMDAs is prepared from out of these plans. Therefore, it forms a framework or guidelines for developmental activities for the various MMDAs within four years. Therefore, there is a need to integrate the Disaster Risk Reduction measures into these plans of the various MMDAs that are disaster-prone in the Greater Kumasi Area to help reduce or prevent the incidence of disaster in the respective areas. As indicated in Agenda 21, environmental issues should be considered, as well as development planning and disaster risk reduction, as championed by the Sendai Framework and the New Urban Agenda.

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Development Planning Processes

Development planning processes are crucial for effective and sustainable development initiatives. These processes involve systematic and participatory approaches to identify, prioritise, and implement development goals and strategies. Several key steps are typically involved in development planning, including problem identification, goal setting, strategy formulation, resource allocation, implementation, and monitoring and evaluation (M&E) (World Bank, 2019). This section will discuss these steps in detail, highlighting their importance and how they contribute to the overall development planning process, as indicated by Figure 2.
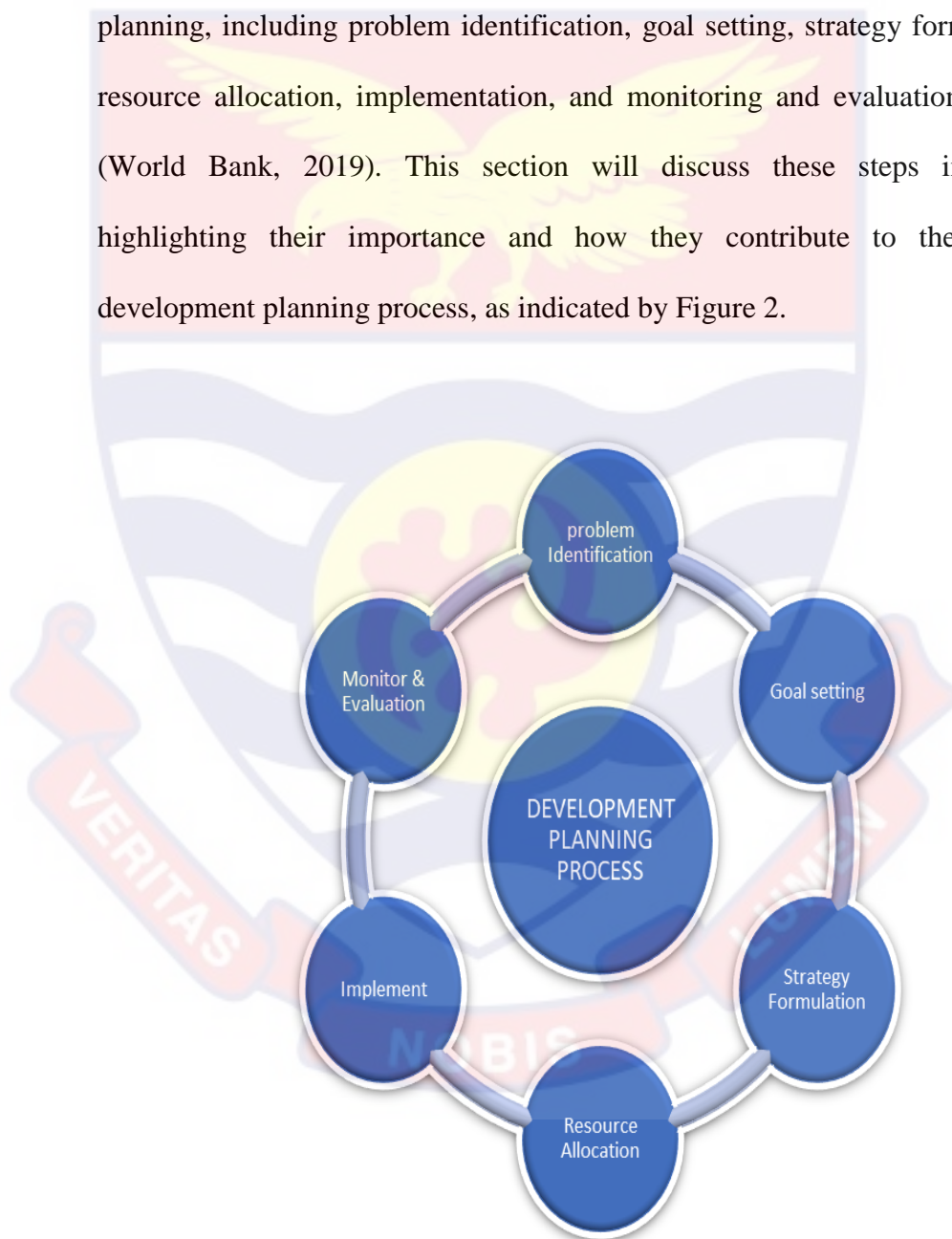
Figure 2: Development Planning Processes
Source: UNDRR (2009)

The first step in development planning is problem identification. This involves conducting a comprehensive analysis of the current situation, identifying the key challenges and issues that must be addressed (UNDP, 2017). The problem identification process often includes data collection, stakeholder consultations, and various analytical tools and techniques to understand the underlying causes and drivers of the identified problems.

On the other hand, data gathering and analysis is a critical component of the development planning process that occurs during the problem identification and strategy formulation stages. It involves collecting relevant data, and analysing data to gain a comprehensive understanding of the current situation, including the challenges, opportunities, and potential solutions (Weiss, 1995). Data gathering and analysis provide a factual and evidence-based foundation for decision-making and strategy formulation. It helps identify trends, patterns, and insights that inform the development of effective strategies and action plans.

Once the problems have been identified, the next step is goal setting. This involves brainstorming and exploring various alternative courses of action to achieve the desired goals (Mintzberg et al., 2014). Goals provide a clear vision and direction for development efforts and help guide the planning process (United Nations, 2015; Johnson, 2019). Goals should be specific, measurable, achievable, relevant, and time-bound (SMART), and they should reflect the priorities and aspirations of the stakeholders involved.

After setting goals, the development planning process moves on to strategy formulation. This stage includes analysing the problem, identifying potential solutions, and selecting the most appropriate strategies (Brown &

Williams, 2020). Strategies may involve actions such as policy changes, resource allocation, partnerships, or capacity building initiatives. Strategies are the broad approaches and actions that will be employed to achieve the identified goals (World Bank, 2019). This stage is where the policy objectives, programmes, projects, and activities to be implemented are stated. They should be evidence-based, considering the available data and research, and should align with the local context and the capacities of the implementing institutions.

Resource allocation is a critical step in development planning, as it involves determining the financial, human, and technical resources required for implementing the chosen strategies (UNDP, 2017). Also, it includes planning how they will be distributed to support the implementation of strategies (Jones et al., 2021). Resource allocation decisions should be based on an assessment of the costs and benefits of different options, taking into account the availability of resources and the potential impact of investment decisions.

Once the strategies and resources have been identified, the implementation phase begins. Implementation involves translating the plans and strategies into action by mobilising the necessary resources, coordinating the activities of various stakeholders, and monitoring progress towards the desired outcomes (United Nations, 2015). A detailed plan is created to execute the chosen strategies (Smith et al., 2022). Effective implementation requires strong leadership, coordination mechanisms, and the active involvement and participation of all relevant stakeholders.

The final step in the development planning process is monitoring and evaluation (M&E). M&E involves systematically tracking progress, assessing the effectiveness and impact of the implemented interventions, and making adjustments as needed (World Bank, 2019). Monitoring involves tracking progress, comparing actual results against planned objectives, and taking corrective actions when necessary (Mintzberg et al., 2014). Monitoring and control help identify deviations, address issues, and ensure that the plans remain on track to achieve the desired goals. Evaluation criteria may include feasibility, cost-effectiveness, alignment with project values, and potential impact on stakeholders or beneficiaries. This step ensures that the chosen option is well-aligned with the project's goals and resources. M&E provides valuable feedback to decision-makers and helps ensure accountability and learning from both successes and failures.

In conclusion, development planning processes are multifaceted and involve several interrelated steps, including problem identification, goal setting, strategy formulation, resource allocation, implementation, and monitoring and evaluation. These processes require active participation and collaboration among stakeholders, and they should be evidence-based, context-specific, and flexible to adapt to changing circumstances. By following these systematic and participatory approaches, development planning can lead to more effective, sustainable, and inclusive development outcomes.

Policy

The Centers for Disease Control and Prevention [CDC] definition of "Policy" is "a law, regulation, procedure, administrative action, incentive or

voluntary practice of governments and other institutions" (CDC, Office of the Associate Director for Policy, 2011: p3). Public policy refers to a proposed course of action of government or guidelines to follow to reach goals and objectives. It is continuously subject to the effects of environmental change and influence" (Roux, 2002). Policy documents often come with the endorsement or signature of the executive powers within an organisation to legitimise the policy and demonstrate that it is considered in force. Such documents often have standard formats that are particular to the organisation issuing the policy.

The health and safety of a population can be improved through policies because they are often implemented at the system level. A policy approach may be the best option to improve the health of huge populations at little cost. National, state, municipal, and organisational policies are all possible types (CDC, Office of the Associate Director for Policy, 2011). Policy outputs include enactments like statutes and bills, policy handbooks, administrative guidelines, and codified rules and regulations (Kraft & Furlong, 2010).

To paraphrase what Ranson (1995: 440) calls the "codification and publicising the values which are to inform future practise and thus encapsulate prescriptions for reform", this is the main reason why governments create and implement policies. Olssen et al. (2004: 72) state, "policy here is taken to be any course of action... related to the selection of goals, the definition of values, or the allocation of resources", which is consistent with this view.

Policy Evaluation

The concept of evaluation can be used for a diverse array of actions. Evaluations are carried out in every aspect of life, either in an unofficial or

official capacity. The term "evaluation" refers to an effort that is more methodical and scientific in nature, with a focus on the impacts as well as the efficiency, effectiveness, relevance, reliability, and sustainability of the endeavour. Evaluating a policy involves putting evaluation principles and procedures to use in order to investigate a policy's content, its execution, or its impact. Evaluation is the process by which we come to comprehend the merit, worth, and utility of a policy, and it is the activity that we will focus on in this paragraph.

According to Her Majesty's Treasury (2011: p12), policy evaluation "uses a range of research methods to systematically investigate the effectiveness of policy interventions, implementation, and processes, and to determine their merit, worth, or value in terms of improving the social and economic conditions of various stakeholders". Evaluation of public policy, as a result, plays an important role, one that begins with the identification of diverse policy challenges and continues with the selection of the most effective course of action from among the many available options.

Public policy evaluation has advanced to a higher level of sophistication over the years. It has built its methodology by beginning with a straightforward analysis of the results and moving on to a cost-benefit analysis. Built on the fundamental concepts of generating revenue while minimising expenses, the new technique also emphasises non-monetary policy outcomes. These include measuring factors that hinder growth, such as equity, effectiveness, organisational and human factors, and so on. The examination of policies has also moved towards a more proactive, rather than a reactive, stance.

Criteria for evaluation

The simplest and most common criterion that is used in policy literature and implementation is to determine if statutorily prescribed goals are attained and to what extent this has been accomplished. The evaluation criteria, as a result, concentrate either on the objectives themselves or on the means-ends linkages that exist between strategies and objectives. Poister (2008) adds other performance characteristics, such as efficiency, sufficiency, and appropriateness, to the mix. Suchman (1968) suggests a five-dimensional model for assessing success or failure, which includes the following categories: effort, performance, adequacy, efficiency, and procedure. Equity, efficiency, Pareto optimality, and public interest are the four elements that makeup Frohock's criteria for the examination of policies, and they have garnered a significant amount of attention from the academic community (Frohock, 2006).

Economic criteria

This basically relies on cost and benefit analysis. These include impacts on the economy, expected public sector revenues, government spending, etc. The most common economic criteria are costs. These may include: "borrowing costs--the costs of borrowing funds", "decrease in net worth--decreases in assets and liabilities", "direct costs--directly attributable to the policy alternative", "indirect costs--additional impacts not included in the goals", "intangible costs--costs that cannot be counted or quantified", "monetisable costs--can be expressed in dollars", "one-time fixed costs--new capital expenditures, equipment, training, etc. ", "operations and maintenance costs--ongoing costs of the alternative", "opportunity costs--other things that

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could have been done with the same resources instead", and "tangible costs--can be counted and quantified."

Equity criteria

Equity refers to the fairness in the distribution of a policy' cost, benefits, and risks across population subgroups. It considers how policy impacts are distributed amongst different groups of people. Factors that can affect the distribution of impacts include location, ethnicity, sex, residence, income, and occupation. Equity means that similarly situated people should be treated equally (Kucinich, 2011).

In its most basic form, equity can be understood to refer to justice, uprightness, and equality. A system of additional legislation that is founded upon precedents and established norms is an example of equity since it adheres to the concepts of fairness and impartiality. In situations in which common law cannot be applied, the field of law known as equity can offer a solution to the problem. Therefore, equity can be defined as the distribution of effects and efforts among the many groups that make up a society.

Policies that aim to redistribute money, as well as social benefits and employment opportunities in the public sector, are frequently advocated and evaluated using equality as the criterion. The right to equality has been extended to all citizens in the majority of democratic regimes around the world, regardless of factors such as caste, creed, sex, and money. Evaluators of public policies are faced with the following question: to what extent are the policies able to assist less fortunate members of society, and to what extent have the policies contributed to a reduction in social inequality? However, in the eyes of several academics, the idea of equality is not devoid of the

possibility of disagreement. According to their perspective, equality, fairness, and justice are all ideas that contain subjectivity and are linked to political power.

Efficiency

Efficiency can be defined as the process of maximising benefits while minimising expenses. This can be evaluated by subtracting benefits from costs or dividing benefits by costs. To put it another way, it is the ratio of the number of outputs created and the quality of those outputs to the resources (including capital and personnel) that were invested. After that, it is a measurement of how effectively the resources (once they have been transformed into inputs) have been used. In most people's minds, economic sanity and efficiency are interchangeable terms. When we talk about efficiency in terms of money, we are referring to the ratio of the amount of money gained from the output to the amount of money spent on the inputs.

The most challenging aspect of determining an appropriate efficiency rating is determining the number of various inputs that should be considered adequate for generating the desired outputs. A good perspective on public policy in terms of identifiable units, such as programmes, projects, or individual work processes, is required in order to make judgements about how efficiently something is being done. However, it might be challenging to analyse government organisations and particular programmes by breaking them down into more manageable parts in many situations. Once more, there could be issues relating to subjectivity.

Effectiveness

The chance of accomplishing the aims and purposes of the policy is what is meant by its effectiveness. It focuses on the degree to which a policy is successful in achieving its objectives. It relates to the degree to which the planned outputs, also known as immediate aims, and intended impacts are being or have been prescribed, which means that in practise, it may be acceptable to focus on the effects, particularly on the outcome side, for two reasons that are related to one another: i) the benefits for the intended beneficiaries are expressed at the point of effects, which makes effects a much more significant measure of achievement than outputs; ii) because effects are more directly derived from the inputs and activities of the respective development scheme than are the impacts, effects will be less influenced by intervening external factors, and they can be assessed more quickly and with greater reliability.

The process of measuring efficacy is not a straightforward activity. Quantification or measurement of the impact can be challenging in many cases. It is not simple to measure the qualitative impact of policies such as those pertaining to education, the environment, or health, for instance. We may be able to determine the rate of literacy, but we cannot determine the level of enlightenment among the population. We may be able to quantify the ratio of doctors to the population or the number of hospital beds, but it is difficult for us to determine the actual impact these factors have on the level of health.

Technical criteria

Technical criteria considers the availability of necessary resources, skills and competencies for the alternative approach. It refers to the availability and reliability of technology needed for policy implementation.

Political criteria

Political criteria focuses on acceptability of the policy option to various relevant stakeholders that hold political power (voters, legislators, parliamentarians, president etc). It refers to the consistency with government priorities, effect on tax payers and impact on the private sector. It considers the likelihood that a policy would be adopted and accepted by politicians as a working document (Chambers & Wedal, 2005). Political viability asks whether or to what extent a proposed policy alternative will be acceptable to relevant powerful groups, decision makers, legislators, administrators, citizens, neighborhoods, unions, or others.

Administrative criteria

Administrative criteria focusses on the degree of ease of implementation of alternative approach, financial/managerial factors needed to achieve the set goal. It refers to the likelihood that a department or agency can implement the policy or deliver the program (Chambers & Wedal, 2005). It looks at the capacity required actually to operationalise the policy. This also considers whether the public agency can implement the alternative policy, whether the proposed policy commits top managers, and whether resources, skills, money, training, and expertise are readily available.

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Social Acceptability

The extent to which current social norms or cultural values may oppose the policy action. It also refers to the extent to which the public at large will accept and support a policy proposal (Caputo, 2011).

Policy Evaluation Challenges

While all evaluations encounter challenges, some are particularly relevant to policy evaluation, and some of these are listed below. Many of these challenges can be quickly addressed by using an appropriate design, indicators, and methods. These challenges include;

- Lack of resources or clear responsibility for evaluation

- Lack of solid evidence base to support policy

- Fear of evaluation and lack of familiarity with policy evaluation methods

- External and contextual factors such as economic conditions or public awareness

- Lack of "control" over policy implementation

- Access to appropriate data

- Rapid pace of policy

- Lack of appropriate measures

- Political scrutiny and desire for quick production of results

- Difficulty in identifying appropriate comparison communities

Theoretical Framework

This focuses on the various theories that were employed to guide the study. These theories include integrated resource planning and system theories

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underpinning this study. These theories are explained in detail subsequently, respectively.

Integrated Resources Planning Theory

The study argues for an integrated approach to disaster planning (Nichols & Von Hippel, 2000). Nichols and Von Hippel (2000) asserted that it is a process that encompasses multiple objectives and strives for resilient and durable strategies, plans, and projects in the face of the unexpected. In addition, it involves the examination of all technically feasible development options, their economic and financial consequences, as well as their environmental and social consequences.

Nichols and Von Hippel (2000) characterised integrated resource planning as comprising not just a procedural component but also an analytical component as well. In order to provide evidence in favour of this idea, Brody (1999) and English et al. (1993) believe that the decision-making process should be analysed from both a process and an analytical perspective, taking into consideration the numerous effects that it has on the goals. According to Flowers (1998), integrated resource planning is a process that develops, implements, and constantly improves comprehensive resource management plans. This definition of integrated resource planning is intended to be as wide as possible. It is a transparent and open procedure, and all of the relevant parties are invited to participate in it.

Brody (1999) exemplifies the essential distinctions that exist between traditional planning theories, despite the fact that there are other substantial distinctions to be made. Because of this, participatory methods give methodical treatment to the aspects of planning outcomes that are important to

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all of the many stakeholder groups. Brown et al. (1999), who were motivated by this discussion, came to the conclusion that stakeholders encompass the entire range of parties affected by planning outcomes (key, primary, and secondary stakeholders), and that they may include governments, suppliers and financial businesses, domestic and commercial resource users, and social groups (for example, the ability of local government and local organisations to advance the idea of democratic planning).

Again, this is compatible with conventional thinking about development, which places a strong emphasis on the economic and political empowerment of local communities (Mohan & Stokke, 2000), as well as an interest in the ways in which culture and context influence one's knowledge and behaviour (Storper, 2001). The presumption is that society can be changed from the 'bottom up,' and that active engagement in local processes may alter the greater allocation of resources and power. This evaluation is supported by Fink (2005) as well as Cosgrove and Rijsberman (1999).

Support and facilitation of disaster management participation by households, community members, disaster response institutions, and others who are adversely impacted by disasters that claim lives and property are required (Gordon, 2006; Brody, 1999). A participatory process solicits input from stakeholders but also provides outputs as participants learn from one another and from the growing body of data and analysis that serves as a critical support for planning. This is among the priorities (understanding disaster risk; strengthening disaster risk governance; Investing in disaster risk reduction; and enhancing disaster preparedness for effective response and recovery) of the Sendai framework which seeks to collaborate and coordinate

the activities and contributions of stakeholders regarding disaster management for effective disaster risk reduction.

Systems Theory

Since Aristotle's assertion that knowledge is derived from the understanding of the whole and not that of the single parts (Aristotle's Holism), researchers have been battling with systems and parts in terms of their contents and their relative dynamics. Aristotle claimed that knowledge is obtained from the understanding of the whole rather than that of the single parts. This historic endeavour led to the development of what is now known as "systems theory" during the previous century (von Bertalanffy, 1968). This strategy demands taking into consideration not just all of the contextual factors but also the connections that exist between them. The systems approach to capacity development is a multidimensional concept; in this context, capacity development refers to an all-inclusive strategy involving various levels (national, regional, and municipal), bodies, organisations, and institutions, in addition to the civil society, private or public organisations, and individuals.

According to Capra (1997), systems theory is an integrative theory concerning every system in nature, in society, and many scientific disciplines. Additionally, it provides a framework with which we can explore phenomena using a holistic perspective. Consider the observable reality as an integrated and interacting unicum of events, in which the individual qualities of the separate parts are harmonised (Checkland, 1997; Weinberg, 2001; Jackson, 2003). Systems thinking is the result of shifting one's focus from one part to the whole (Checkland, 1997; Weinberg, 2001; Jackson, 2003).

On the other hand, the relationships between the parts themselves and the events that they cause through their interaction become considerably more essential, which leads to the result that "system elements are rationally connected" towards a shared objective (Luhmann, 1990). The systemic perspective maintains that we cannot fully appreciate a phenomenon by merely dissecting it into its component pieces and then reconstructing it; rather, we need to take a more global view in order to comprehend how it operates, as this is the only way to achieve complete comprehension. Although we can begin by analysing the most fundamental aspects of a phenomenon, in order to truly appreciate the phenomenon in its totality, we need to observe it from a higher level as well: a holistic perspective (von Bertalanffy, 1968). This will allow us to fully comprehend the phenomenon in its whole (Boulding, 1956; Maturana & Varela, 1975; Senge, 1990).

Systems theory spans a broad field of inquiry with a variety of conceptualisations and areas of interest. It demonstrates how organisational activities follow a process that begins with taking inputs from the environment, transforming those inputs based on the structure and practises of the organisation, producing outputs for the stakeholders of the organisation, and gathering and using feedback mechanisms to improve all activities (Luhman & Cunliffe, 2012).

A system can be defined as an entity, which is a coherent whole (Ng, Maull & Yip, 2009), in such a way that a boundary is recognised around it in order to separate internal and external elements, as well as to identify input and output pertaining to and emerging from the entity. As a result, systems theory is a theoretical perspective that studies a phenomenon seen as a whole

rather than simply as the sum of its fundamental components. In order to comprehend the organisation, functionality, and results of an entity, the primary focus is placed on the interactions and relationships that exist between its many components. A civilisation is said to have a system if there is an interrelationship that exists between all of its aspects and components. According to Manning (1967), the important factors in public problems, issues, policies, and programmes must always be addressed and evaluated as interdependent components of a comprehensive system. This is the only method to ensure proper analysis.

According to the definition provided by Anderson and Johnson (1997), a system is a group of "interacting, interrelated, or interdependent components that form a complex whole". Components both tangible and immaterial can be found in a system. Some examples of tangible components are people, property, equipment, and financial resources. Processes, regulations, information flow patterns, relationships, human interactions, and even underlying sets of beliefs and value systems are examples of intangible aspects. The transmission and reception of information that has been processed through other components of the system is what constitutes feedback in a system. Systems are dependent on feedback. Any system needs to have feedback because it enables the system to recalibrate and adapt itself to achieve maximum output.

Scholars who work from the perspective of systems theory draw on the information and concepts created within other disciplines. This is one of the distinguishing characteristics of systems theories, which also explains why the development of these theories occurred simultaneously across a number of

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fields. Examples of this can be found in the fields of natural and ecological sciences (organic aspects, homeostasis and equifinality) (Hannan & Freeman, 1977), chemical and biological disciplines (autopoietic aspects; Maturana & Varela, 1975), sociology and psychology (cognitive aspects; Clark, 1993), information technology (cybernetic aspects; Beer, 1975), and so on. As a direct consequence of this, we now have access to a variety of system viewpoints, one of which is smart systems (system thinking).

A complex of interacting parts is what Von Bertalaffy (1956) means when he talks about a system. In order to establish general principles that are applicable to a wide variety of systems, Von Bertalanffy encourages the use of "systems thinking" across all academic disciplines. He presents "system" as a new scientific paradigm, which stands in contrast to the analytical and mechanical paradigm that is characteristic of traditional science (von Bertalanffy, 1950). The concentration on interactions that characterises generic system theory is one of its most important ideas. The centrality of relationships in sustaining the idea that the behaviour of a single autonomous element is distinct from the conduct of the element when it interacts with other components is demonstrated by the fact that the behaviour of the element changes.

The differentiation between open, closed, and isolated systems is an additional fundamental principle. In open systems, there is a constant flow of information, as well as the exchange of energy, matter, and people with the surrounding environment. Exchanges of information and substance do not take place in closed systems; instead, only exchanges of energy take place. There is no movement of elements in a completely isolated system. Several different

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approaches were explored, all of which built on generic systems theory. There are many different theories of systems, some of which include the open system theory, the viable system model, and the viable system approach. The Open System Theory (OST) investigates the connections that exist between different types of organisations and the environments in which they operate (Anshu, Arunachalam, Kuwahara & Soleimanifar, 2021). The idea of an open system is utilised in Katz and Kahn's (1978) analysis of the organisation. The organisation is viewed as a system that is developed by energetic input-output, and the energy that comes from the output is thought to revitalise the system.

To put it another way, the system is capable of modifying its behaviour. According to Golinelli and Pastorello (2002), the system and the environment both show distinct degrees of complexity when it comes to catastrophe management. This is due to the fact that the environment possesses degrees of complexity that the system is unable to perceive. When applied to organisations, the viable system model focuses on conceptual tools for understanding the organisation of systems in order to redesign them by engaging in the following activities: i) change management, ii) understanding the organisation as an integrated whole, iii) evaluating the essential functions of implementation, coordination, control, intelligence, and policy (Beer, 1972; Espejo & Harnden, 1989; Espejo et al., 1999; Christopher, 2007).

Weaknesses of Systems Theory

Systems theory often grapples with the complexity of real-world systems, which can lead to oversimplification. While the theory aims to understand the interactions within a system, it might neglect some nuanced details and dynamics of individual components. This can result in too

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generalised models and fail to capture specific, critical interactions and outcomes (Skyttner, 2005).

Implementing systems theory in practical scenarios can be challenging due to its abstract nature. Translating theoretical concepts into actionable strategies requires a deep understanding and significant expertise, which may not always be available. This gap between theory and practice can hinder its effectiveness in real-world applications (Checkland, 1999).

Comprehensively Applying systems theory requires substantial resources, including time, data, and expertise. The need to gather extensive data and perform complex analyses can be resource-intensive, making it difficult for organisations with limited capacities to utilise the theory fully. This can be particularly problematic in developing countries where resources are already constrained (Midgley, 2003).

Strength of using Systems Theory to examine the integration of Disaster Risk Reduction (DRR) into Development Planning Processes in Ghana

Systems theory's strength lies in its ability to provide a holistic view of the interdependencies and interactions between different system components. In the context of integrating DRR into development planning in Ghana, this holistic perspective is crucial. It allows policymakers and planners to understand how various sectors (such as infrastructure, health, environment, and economy) interact and influence each other in the face of disasters. By recognizing these interdependencies, more effective and resilient development strategies can be devised, ensuring that DRR measures are seamlessly integrated into broader development plans (Turner et al., 2003).

Systems theory helps identify systemic risks that may not be apparent when examining individual components in isolation. For Ghana, this means recognizing how vulnerabilities in one sector (e.g., poor infrastructure) can amplify risks in others (e.g., public health during a flood). Using systems theory, planners can identify and address these systemic risks, leading to more robust and comprehensive DRR strategies that mitigate cascading effects during disasters (Gallopin, 2006).

The holistic nature of systems theory encourages multi-stakeholder engagement, as it necessitates input and collaboration from various sectors and levels of governance. In Ghana, this can lead to more inclusive and participatory planning processes, where the perspectives and expertise of different stakeholders (government agencies, disaster response institutions, local communities, NGOs, and the private sector) are integrated. This collaborative approach can enhance the effectiveness of DRR integration by ensuring that all relevant factors and viewpoints are considered, leading to more sustainable and widely supported development outcomes (Renn, 2008). This permitted the study to use the system theory.

Conceptual Framework

This study adapted various conceptual frameworks including that of Agyemang and Antwi (2016) framework for climate change adaptation mainstreaming and Sendai framework for disaster risk reduction 2015 to assist the integration of DRR into development planning process of the various MMDAs.

Some of the entities responsible for development planning in Ghana have been named in the National Development Planning System Act, 1994

Act 480. The National Development Planning Commission (NDPC) is one such institution; it is in charge of both national- and subnational-level planning, respectively. It is the job of the Regional Co-ordinating Councils (RCCs) to oversee the MMDAs' coordinated planning efforts. District-level development planning falls within the purview of the MMDAs. The conceptual framework that depicts the interrelationship among key concepts and variables or constructs are depicted by Figure 3.
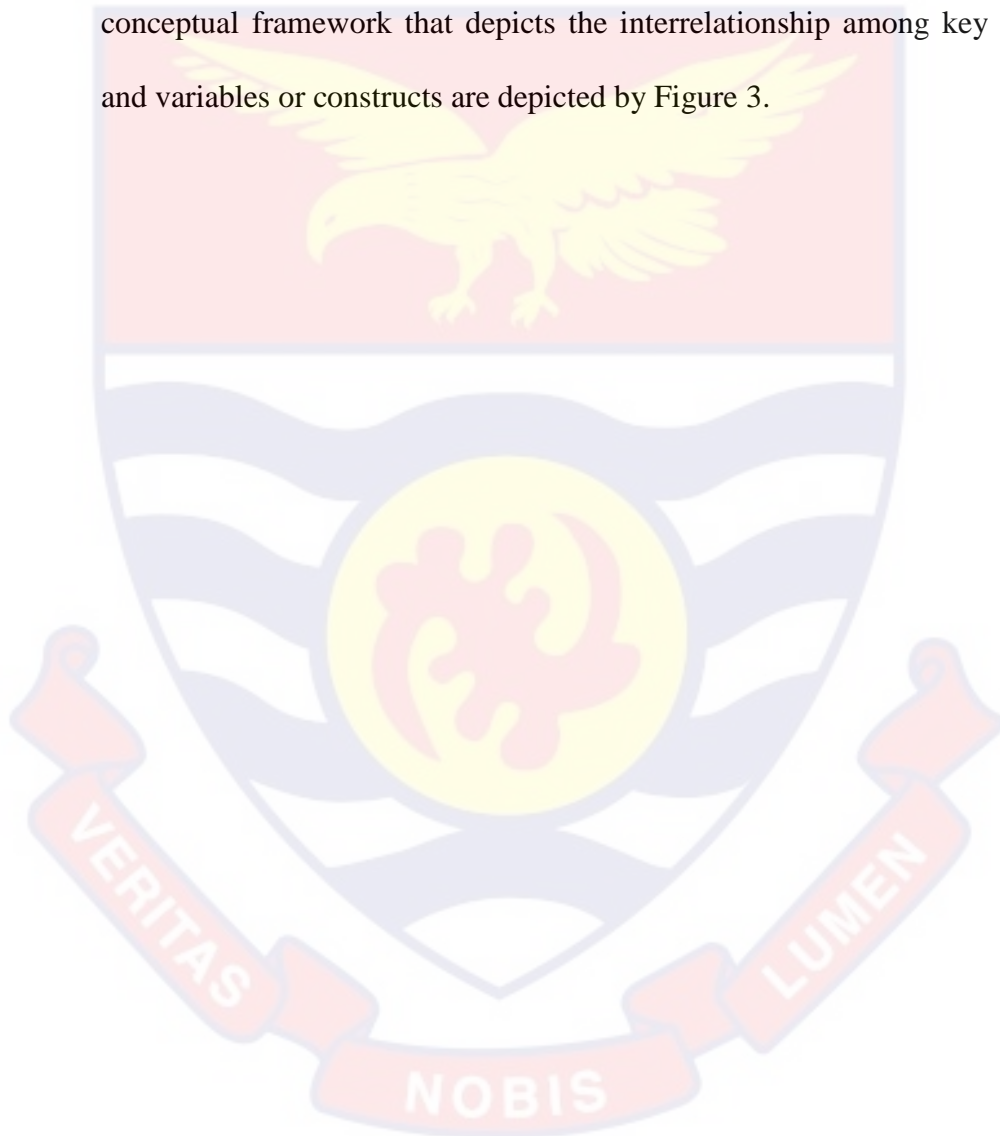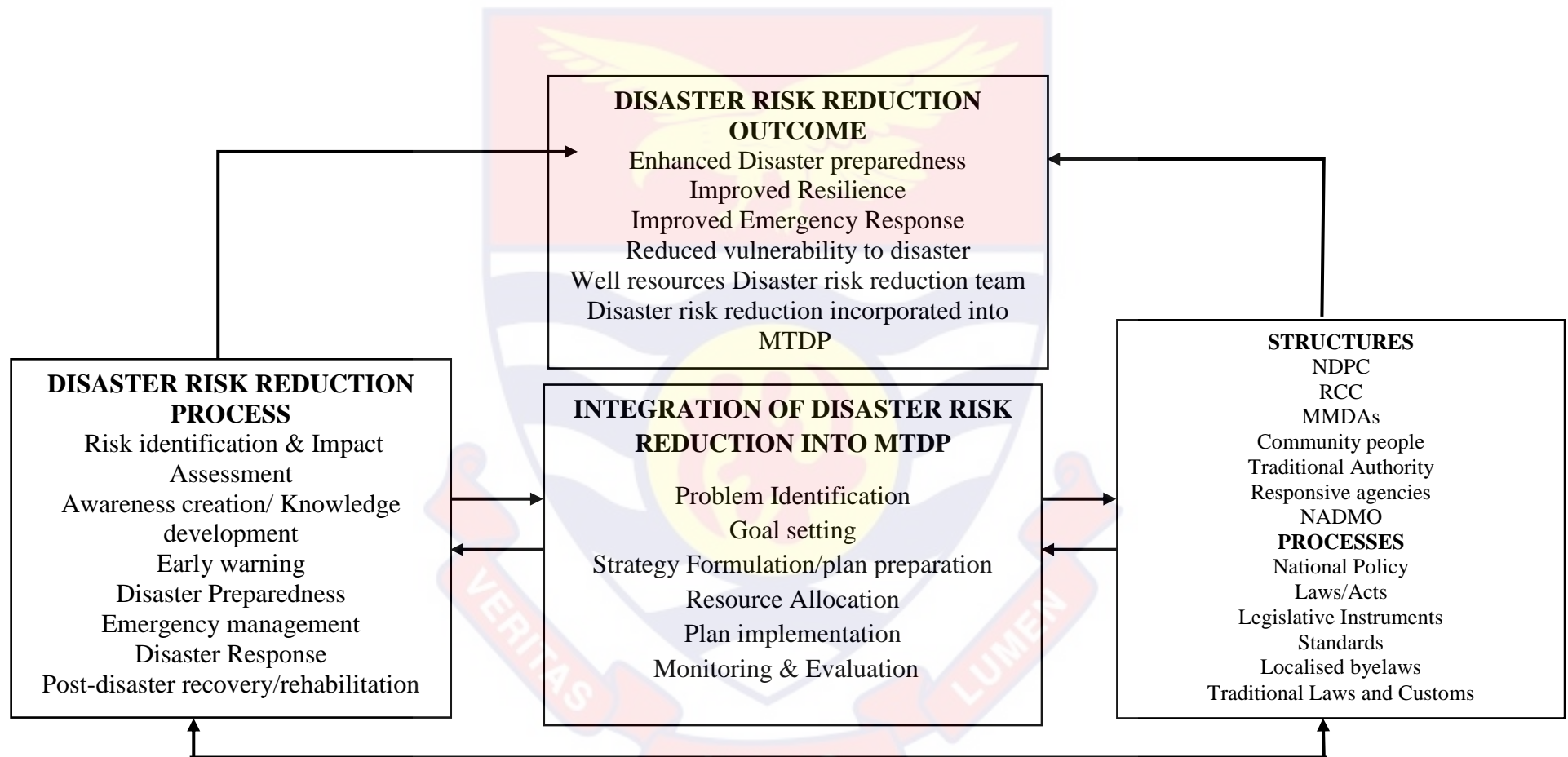
Figure 3: Conceptual Framework on Disaster Risk Planning

Source: Sendai Framework (2015) and Agyemang and Antwi (2016)

While systems like national policy, regulations, standards, legislative instrument, bye laws, and traditional laws and customs provide general frameworks for planning, they are not the only factors to be considered. These policies and regulations including the Acts of the various disaster response institutions that spelt out the responsibilities of them as well as the integration of DRR into development planning processes. The planning procedure, and by extension, integration of DRR programmes and activities into planning process, are informed by the structures (NDPC, RCC, MMDAs, NADMO, disaster responsive institutions, community people and traditional authorities) and processes as depicted in Figure 3.

Disaster risk reduction processes include; risk identification and impact assessment, awareness creation, early warnings, disaster preparedness, emergency management and disaster response. All these processes are considered in the planning processes that considered; participatory problem analysis, establishment of goals and objectives, plan development and execution, monitoring and evaluation.

Regarding the integration of DRR activities into the planning processes, it should consider the following; identification of areas/communities vulnerable to disaster, disaster preparedness, response, post-disaster recovery, plan preparation, plan implementation as well as Monitoring and Evaluation. The planning process should integrate DRR measures. The outcome of the integration of DRR in the planning process include enhanced disaster preparedness, improved resilience, improved emergency response, reduced vulnerability to disaster or risk, well-resourced disaster risk reduction team/DVGs, development of sustainable livelihoods and improved well-being.

Limitation

The conceptual framework adapted on the integration of DRR into the development planning process of the various MMDAs is not a perfect framework which can explain all the activities and processes within a particular system. However, it helps to situate the study into context. Geographically and planning wise, it assists in explaining or evaluating how DRR strategies have been integrated, implemented and monitored in the development planning processes of the various MMDAs in Ghana.

Also, the idea that planning is not static but an endless process, it can only be assessed based on a point/time. This is why the study sought to evaluate MTDPs from 2014 till 2025. Lastly, the idea that the integration of DRR strategies into the development planning process of the various MMDAs will lead to improved disaster preparedness, improved resilience, enhanced emergency response is not always true as some integration of DRR activities may still not be enough to address or prepare the community before disaster strikes due some natural aspect of disaster that cannot be easily predicted.

Chapter Summary

This section captured the various key concepts such as disaster, disaster management cycle, disaster risk reduction, planning, community participation, institutional capacity, among others. Also, the various theories that underpinned the study including integrated resource planning, system theory, and system thinking. Lastly, the conceptual framework of the study was illustrated showing the various relationships and direction among the key concepts and variables understudied.

CHAPTER THREE

EMPIRICAL REVIEW

Introduction

Disaster risk reduction (DRR) is an essential field of study and practice that aims to minimise the impacts of natural and man-made hazards on communities and enhance their resilience. Over the years, numerous empirical studies have been conducted to explore and evaluate the effectiveness of various strategies, approaches, and interventions in disaster risk reduction. These empirical studies play a crucial role in advancing knowledge and informing evidence-based practices in the field. Empirical reviews on disaster risk reduction provide a systematic and comprehensive analysis of existing literature, research findings, and case studies. The aim is to synthesise and evaluate the available evidence to identify trends, patterns, and gaps in the understanding and implementation of DRR measures. By examining a wide range of studies, these reviews offer insights into the effectiveness of different approaches, the factors influencing their success or failure, and the implications for policy and practice.

This chapter presents a review of relevant related literature regarding the research problem. For this review, this chapter is divided into the following sub-headings; understanding of risk; community participation in disaster risk reduction; integration of DRR into development planning process. The various sub-headings mentioned were further explained subsequently respectively.

Understanding of Disaster Risk

The study conducted by Aldunce, Beilin, and Handmer (2018) focuses on examining the changes in resilience before, during, and after a significant flood event in an urban area in Central Chile. The researchers aimed to gain insights into the dynamics of resilience and how it evolved in response to the flood. The study employed a mixed-methods approach, combining quantitative surveys and qualitative interviews. The researchers collected data from residents of the affected urban agglomeration using structured questionnaires and conducted in-depth interviews with key stakeholders involved in disaster management and recovery.

The findings of the study revealed several important insights. Firstly, the flood event significantly impacted the resilience of the community, causing changes in various dimensions of resilience. Specifically, the flood had a negative impact on physical infrastructure, social networks, and community cohesion, while also affecting individual and collective psychological well-being. Secondly, the study identified different stages of resilience during the flood event. The pre-flood stage demonstrated relatively low levels of resilience, with limited preparedness and inadequate infrastructure.

During the flood, the community exhibited a higher level of resilience due to the mobilisation of resources and community support. However, the post-flood stage showed a decline in resilience due to challenges faced in recovery and rebuilding processes. Thirdly, the study emphasised the importance of adaptive capacities in building resilience. It highlighted the need for flexible and adaptive strategies to cope with changing conditions

during and after a flood event. The study also underlined the significance of social networks and community participation in enhancing resilience.

Koks, Jongman, Husby, and Botzen (2015) focuses on combining hazard, exposure, and social vulnerability to provide insights for flood risk management. The researchers aimed to improve the understanding of these three components and their interactions to enhance flood risk assessment and inform effective risk management strategies. The study employs a quantitative approach and utilises a comprehensive dataset that includes information on flood hazards, exposure of assets, and social vulnerability indicators. The researchers analysed this dataset to explore the relationships between flood hazard, exposure, and social vulnerability. The study highlights the significance of considering both the physical hazard and the exposure of assets when assessing flood risk. It emphasises that high levels of exposure to flood-prone areas can significantly contribute to overall risk, even in regions with relatively low flood hazard. Secondly, the study emphasises the importance of considering social vulnerability as a crucial factor in flood risk management. It highlights those areas with high social vulnerability are more prone to experiencing severe consequences from flood events. Social vulnerability is influenced by factors such as poverty, population density, education levels, and access to resources. Thirdly, the study identifies and categorises different types of flood risk profiles based on the combination of hazard, exposure, and social vulnerability. These profiles provide valuable insights for designing targeted and context-specific flood risk management strategies. For example, areas with high hazard and exposure but low social vulnerability require

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different interventions compared to areas with lower hazard but high social vulnerability.

Aldunce, Beilin, Howden, and Handmer (2020) study focuses on examining the state of participatory research in the field of climate change adaptation through a systematic review of academic literature. The authors aimed to provide insights into the current trends, approaches, and outcomes of participatory research in the context of climate change adaptation. The study utilised a systematic review methodology to identify relevant academic literature on participatory research in climate change adaptation. The authors analysed and synthesised the findings from the selected studies to identify common themes, methodologies, and key outcomes.

The study highlights the increasing recognition of the importance of participatory approaches in climate change adaptation research. Participatory research engages local communities, stakeholders, and vulnerable groups in decision-making processes, empowering them to contribute to adaptation strategies and enhance their resilience. The study also identifies a range of participatory methodologies and tools employed in climate change adaptation research. These include participatory vulnerability assessments, scenario planning, participatory mapping, and collaborative decision-making processes. The use of these methodologies allows for the co-production of knowledge, local knowledge integration, and the development of context-specific adaptation measures.

Moreover, the study emphasises the positive outcomes and benefits of participatory research in climate change adaptation. These include improved understanding of local contexts, increased ownership and acceptance of

adaptation measures, enhanced social learning, and increased resilience at the community level. Furthermore, the study discusses the challenges and limitations associated with participatory research in climate change adaptation. These include issues related to power dynamics, representation, and the need for long-term engagement and support.

Community understanding of risk and participation in disaster risk reduction

Community participation is increasingly recognised as a key component of effective disaster risk reduction (DRR) strategies. Engaging local communities in DRR planning and implementation processes can enhance resilience, improve risk awareness, and promote sustainable development. This empirical review aims to analyse existing literature on community participation in disaster risk reduction, exploring its benefits, challenges, and factors that contribute to successful engagement.

Numerous studies have highlighted the advantages of community participation in DRR. For instance, several authors have found that involving local communities leads to increased knowledge and awareness of risks, resulting in improved preparedness and response (Béné et al., 2019; Fekete et al., 2020; Seyedin & Ramalingam, 2021).

Fekete et al. (2020) utilised descriptive design of the quantitative approach where surveys were used to gather data on community resilience and disaster preparedness from various communities. The data was analysed quantitatively to compared the effectiveness of different community-based disaster management practices. Active community participation was found to be crucial for enhancing resilience and effective disaster management. Also,

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strong social networks and social cohesion were identified as vital components for community resilience. Moreover, effective allocation and management of resources at the community level significantly improved disaster preparedness and response.

Seyedin and Ramalingam (2021) conducted in-depth case studies in communities that have experienced disasters to understand the role of social networks and cohesion. The study used qualitative design where interviews were conducted for community members, local leaders, and disaster management officials to gather insights. Content analysis was used to analyse the interview data to identify themes and patterns related to community-based disaster management. Strong social cohesion was found to be a critical factor in effective disaster management and recovery. Also, engaging the community in disaster preparedness and response planning enhances resilience and recovery efforts. Community participation also strengthens social networks and fosters social cohesion, which are vital for effective community-based disaster management (Seyedin & Ramalingam, 2021).

Shaw et al. (2015) conducted a comprehensive study to explore the significance of active community involvement in disaster risk reduction (DRR) initiatives. The study utilised multiple case studies from different regions affected by natural disasters. These case studies were selected to represent a diverse range of geographic, social, and economic contexts. Data were gathered through qualitative methods such as interviews, focus group discussions, and participant observations. These methods were employed to gain in-depth insights into community involvement in DRR initiatives. The

collected data were analyzed using thematic analysis to identify common themes and patterns related to community involvement in DRR.

The study found that active involvement of community members in DRR initiatives empowers individuals and promotes a sense of ownership. When community members are actively engaged, they are more likely to take responsibility for disaster preparedness and response activities, leading to more sustainable outcomes. Also, community involvement leverages local knowledge and resources, which are essential for effective DRR. Community members possess valuable insights into local hazards, vulnerabilities, and coping mechanisms that can be integrated into DRR planning and implementation. Moreover, active participation of communities improves communication and coordination among stakeholders. It facilitates better information sharing and collaboration between community members, local authorities, and DRR organisations, leading to more efficient and effective DRR efforts. Furthermore, communities that are actively involved in DRR initiatives tend to exhibit higher levels of resilience. Engaged communities are better prepared to anticipate, respond to, and recover from disasters, thereby reducing the overall impact of disasters on lives and livelihoods. Lastly, the study found that DRR initiatives with strong community involvement are more likely to be sustainable in the long term. Community engagement ensures that DRR activities are relevant to local needs and priorities, fostering long-term commitment and support

Manyena (2019) used qualitative research methods, including interviews, focus group discussions, and participant observations, to explore the barriers to community participation in DRR. The study included a

comparative analysis of different communities that had experienced varying degrees of success in DRR engagement. This approach helped to identify common challenges and best practices. Analysis of policy documents, DRR plans, and community reports was conducted to understand the institutional context and support for community participation. It was found that financial and resource limitations were identified as significant barriers to effective community participation in DRR. Also, institutional constraints, such as lack of political will, inadequate policy implementation, and insufficient support from government agencies, were found to impede community engagement. Moreover, the study also identified social and cultural factors that hinder participation, such as community power dynamics, gender roles, and social hierarchies, which can marginalise certain groups from participating in DRR activities. Furthermore, many communities lack awareness and education about DRR, which limits their ability to engage effectively. This highlights the need for awareness-raising and educational programs.

Addressing these constraints requires efforts to secure adequate funding, allocate resources appropriately, and establish inclusive and enabling institutional frameworks that encourage and support meaningful participation. Overcoming these barriers can contribute to more equitable and effective decision-making processes, fostering greater community ownership, and ultimately enhancing the outcomes of various initiatives.

Paton et al. (2020) utilised qualitative research methods, including in-depth interviews and focus group discussions, to explore the impact of power dynamics, social hierarchies, and resource distribution on community participation in disaster risk reduction (DRR). Researchers engaged in

participant observation in various communities to gain first-hand insights into the social dynamics and their effects on DRR efforts. The study found that power dynamics and social hierarchies often marginalise certain groups, such as women, minorities, and the poor, preventing them from participating in decision-making processes related to DRR. Also, unequal distribution of resources was identified as a significant barrier to effective participation. Communities with limited access to resources were less able to engage in DRR activities. Moreover, the involvement of marginalised groups in DRR decision-making processes was often minimal, leading to DRR strategies that did not fully address the needs and vulnerabilities of these groups.

Bruns, Nolan and Tseng (2021) employed a mixed-methods approach, combining quantitative surveys and qualitative interviews to investigate the impact of language barriers, cultural differences, and low literacy levels on community participation in DRR. Quantitative data were collected through surveys distributed to diverse communities, assessing their experiences and challenges related to communication and participation in DRR. In-depth interviews were conducted with community members, DRR practitioners, and local leaders to gather detailed insights into the specific barriers faced by different groups. The study included a comparative analysis of communities with varying levels of linguistic and cultural diversity to understand the differential impacts of these barriers. Language barriers were found to hinder effective communication and participation in DRR significantly. Communities with limited proficiency in the dominant language faced challenges in understanding DRR information and participating in initiatives. Also, cultural differences affected the engagement of community members in DRR

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activities. Cultural norms and practices sometimes conflicted with DRR strategies, leading to reduced participation. Moreover, low literacy levels were identified as a barrier to understanding and accessing DRR information. This hindered the ability of community members to participate meaningfully in DRR processes. The study highlighted the need for tailored communication strategies that consider language diversity, cultural contexts, and literacy levels. These strategies include the use of local languages, visual aids, and culturally appropriate communication methods.

Mordzeh-Ekpamp (2010) investigated the role that the community played in the planning process of the Bui dam project in the middle of Ghana's western region. The purpose of this study was to investigate the manner in which communities that were likely to be affected by the Bui Dam Project in the Tain district of the Brong-Ahafo region participated in the planning process for the project. The research utilised a case study methodology and concentrated on the design of the Bui Dam Project developed by the consultant and afterwards utilised by the construction company. The communities of Gyaamah, Bongase, and Bui camp/village were investigated for the purpose of determining which communities had been directly impacted by the disaster. In order to collect data, several methods such as focus group discussions, questionnaires sent to households, and in-depth interviews with representatives from institutions and organisations were utilised. In addition to the usage of the Statistical Product for the Service Solution (SPSS), the qualitative methods method was also utilised in the analysis of these data sets.

The most important takeaways from the study are that communities were not adequately involved in the decision-making process of the Bui Dam

Project, communities' concerns were not adequately pursued, compensation has been delayed and issues involving land has not been adequately resolved so far, minority groups have not adequately participated in the planning process, and finally, the project could be a potential source of conflict between communities and Bui.

The report suggested that there should be an increased focus on community engagement, that the process of compensation should be sped up, that affected households and communities should be given title documents, and that there should be an improvement in institutional collaboration. The report also suggested that communities should be kept informed about the progress that is being made on the dam, that a mechanism should be laid down for resolving conflicts and that it should be made plain, that standards should be legally enforced, and that gender mainstreaming should be taken seriously in all aspects of the project.

The study titled "Community Perceptions and Response to Flood Risks in Nyando District, Western Kenya" examines the attitudes and actions of the local community towards flood risks in the Nyando District in 2010. The study provides insights into how the community perceives and copes with the challenges posed by floods. The researchers conducted surveys and interviews to gather data on community perceptions and responses to flood risks. They found that the residents of Nyando District generally had a high level of awareness regarding flood risks and recognised the potential dangers associated with them. The community identified several factors contributing to the occurrence of floods, including deforestation, poor drainage systems, and climate change.

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In terms of response and preparedness, the study revealed that the community relied on both traditional and modern approaches. Traditional coping mechanisms included early warning systems based on indigenous knowledge and practices, while modern strategies involved the use of technology and formal disaster management structures. However, the study also highlighted some challenges faced by the community in dealing with flood risks. These included limited resources, inadequate infrastructure, and a lack of coordination between different stakeholders involved in disaster management.

The study titled "Enhancing Local Level Emergency Management: The Influence of Disaster Experience and the Role of Households and Neighbourhoods" conducted by Murphy, Falkner, Mcbean, Dolan, and Kovacs in 2005 focuses on improving emergency management at the local level. The study specifically examines the impact of disaster experience on the preparedness and response of households and neighbourhoods. The researchers investigate how past experiences of disasters shape the attitudes and behaviours of individuals and communities when it comes to emergency management. They emphasize the importance of learning from previous disasters and incorporating that knowledge into future planning and preparedness efforts.

The study highlights the role of households and neighbourhoods in disaster management. It emphasises that effective emergency management is not solely the responsibility of government agencies but also requires active participation and engagement from individual households and local communities. The researchers discuss various ways in which households and

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neighbourhoods can contribute to enhancing emergency management, such as sharing information, supporting vulnerable members, and fostering community resilience. Furthermore, the study underscores the need for collaboration and coordination between different stakeholders involved in emergency management, including government agencies, non-governmental organisations, and community groups. It stresses the importance of establishing networks and partnerships to facilitate effective communication and cooperation during times of crisis.

The study titled "Adolescents' Perceived Risk and Personal Experience with Natural Disasters: An Evaluation of Cognitive Heuristics" by Greening, Dollinger, and Pitz in 1996 focused on understanding how adolescents perceive and evaluate the risks associated with natural disasters. The study examines the role of cognitive heuristics in shaping adolescents' perceptions and responses to natural disasters. The researchers explore how personal experiences with natural disasters influence adolescents' perceived risk of future events. They investigate the cognitive heuristics, which are mental shortcuts or strategies individuals use to simplify decision-making, that adolescents employ when evaluating the risks and potential impacts of natural disasters.

The study employs surveys and interviews to gather data on adolescents' perceptions, personal experiences, and cognitive processes related to natural disasters. The researchers analyse the responses to identify patterns and relationships between personal experiences, perceived risk, and cognitive heuristics. The findings suggest that adolescents' perceptions of risk are influenced by their personal experiences with natural disasters. Those who

have experienced a disaster first-hand tend to perceive a higher level of risk compared to those who have not. Additionally, the study reveals that adolescents often rely on cognitive heuristics, such as the availability heuristic or the representativeness heuristic, when evaluating the potential impacts and likelihood of future natural disasters. The study provides insights into the cognitive processes underlying adolescents' risk perceptions and highlights the importance of personal experiences in shaping their perceptions. The findings contribute to understanding how individuals, particularly adolescents, form judgments and make decisions related to natural disasters.

Integrating DRR into Development Plans

Several studies have highlighted the benefits of integrating DRR into development plans. For example, a study by Kelman, Mercer and Gaillard (2015) examined the integration of DRR into the local development plans in the Philippines. The findings suggested that incorporating DRR measures into development plans resulted in improved risk awareness, enhanced coordination among stakeholders, and increased resilience at the community level. Another study by UNDP (2017) analysed the integration of DRR into national development plans in several countries, including Nepal and Mozambique. The research demonstrated that integrating DRR into development plans led to improved risk governance, enhanced institutional capacities, and increased investments in disaster risk reduction measures. Overall, empirical evidence suggests that integrating DRR into development plans is a promising strategy for reducing disaster risks and enhancing resilience. However, it is essential to note that the specific outcomes and

effectiveness of integration efforts can vary depending on the context, institutional capacities, and implementation approaches.

Chapter Summary

Disaster risk reduction (DRR) involves minimising the impact of hazards on communities and enhancing their resilience. Empirical reviews analyse existing literature, research findings, and case studies to synthesise evidence and identify trends, gaps, and practical strategies in DRR. These reviews cover topics such as policy integration, community-based initiatives, early warning systems, climate change, and social factors. They contribute to knowledge advancement, inform decision-making, and facilitate the development of effective DRR strategies.

Studies reviewed shows that poor understanding of disaster risk makes household more vulnerable. It emphasised the need for inclusive communication and long-term engagement to address power dynamics and enhance outcomes. Community participation in DRR was recognised as vital, promoting risk awareness, social cohesion, and effective decision-making. However, challenges such as financial constraints, institutional barriers, power dynamics, and language barriers can impede participation. Trust, collaboration, inclusive communication, capacity-building, and recognition of local knowledge were identified as facilitators of successful community engagement. Also, integrating DRR into development plans improved risk awareness, coordination, and resilience at the community and national levels. However, outcomes can vary depending on context and implementation approaches.

CHAPTER FOUR

RESEARCH METHODS

Introduction

In this chapter, the research methodology that was used to gather information, procedures adopted in conducting the research, the techniques used in analysis and the presentation of data collected are presented. This chapter, therefore, focuses on the research philosophy, research approach, research design, study area profile, population, sampling technique, data collection instruments, data collection procedures, ethical consideration and data analysis technique applied in the study.

Research Philosophy

Research philosophy encapsulates the different principles and opinions about the way data about a given phenomenon ought to be collected, processed, analysed, and utilised (Creswell, 2011; Vveinhardt, 2018). Kuhn (1970:175) defines research philosophy as a "set of beliefs, values and techniques which are shared by members of a scientific community, and which acts as a guide or map, dictating the kinds of problems scientists should address and the types of explanations that are acceptable to them." To produce research within a predetermined framework of accepted ideology or philosophy is, then, a central goal of paradigms (Johnson & Clark, 2006).

According to Goldkuhl (2012) there are several research philosophies, and these include the philosophy of positivism, epistemology, existentialism, realism, axiology, pragmatism and interpretivism. However, these philosophies can be broadly categorised as being aligned with positivism or interpretivism (Galliers, 1990). Interpretive study seeks to understand the

contextual meaning people assign to social phenomenon (Myers, 1977; Orlikowski & Baroudi, 1991; Walsham, 2006). The interpretivist philosophy drives on the assumption that there is subjective reality and for that matter the meanings and interpretations people give to a phenomenon is more important than the sheer numbers. Hence, this philosophical perspective does not aim at achieving generalisability and replicability of findings.

The positivist philosophy on the other hand ascribes to the assumption that there is only objective truth; that is, truth is one and singular. For that matter, interpretations do not matter, instead, having statistical power is the more important. Hence, it seeks to ensure that methods and findings of a research are replicable, generalisable and highly valid and reliable. Hence the research philosophy underlying this study is the positivist paradigm. As a philosophy, positivism adheres to the view that only "factual" knowledge gained through observation (the senses), including measurement, is trustworthy (Rosenbery, 1988). According to the principles of positivism, it depends on quantifiable observations that lead themselves to statistical analysis. Moreover, in positivism studies the researcher is independent from the study and there are no provisions for human interests within the study making the researcher objective (Crossan, 2003).

Nevertheless, none of these philosophies can independently predict the reality of human or truth about an object. Therefore, there was the need to employ pragmatism as the appropriate philosophy that underpinned the study. As an alternative to the Positivist and Interpretivist paradigms, pragmatism emerged from the work of philosophers who argued that no single scientific

method could ever provide access to the 'truth' about the world. Therefore, focusing on only one research paradigm was inadequate.

However, these philosophers (Alise & Teddlie, 2010; Biesta, 2010; Tashakkori & Teddlie, 2003a; Patton, 1990) claimed that a worldview was required in order to give research methodologies that were deemed to be best appropriate for researching the phenomenon at hand. To better understand the actual behaviour of participants, the beliefs that stand behind those behaviours, and the consequences that are likely to follow from different behaviours, these theorists sought out research methods that could be more practical and pluralistic. As a result, the Pragmatic paradigm emerged, which promotes the use of several techniques (mixed methods) to gain insight into human conduct.

This paradigm promotes a non-singular reality ontology (the idea that there is no one reality and that people each have their unique interpretations of reality), a mixed methods methodology (the use of both quantitative and qualitative approaches), and a value-laden axiology (the practice of conducting research that benefits people). Therefore, this philosophy provided the platform to use mixed method as the appropriate research approach for the study.

Research Approach

Generally, there are three primary research approaches widely used in research. Namely quantitative approach, qualitative approach and mixed method approach. In this study, the mixed research approach, thus, both quantitative approach and qualitative approach was used for the study taking into consideration strength and weakness of the approaches. The study employed "quali-quanti" type of mixed approach. This is the case in which

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qualitative aspect of the study is conducted first before the quantitative aspect is conducted.

Qualitative research is inductive, and the researcher generally explores meanings and insights in a given situation (Strauss & Corbin, 2008; Levitt et al., 2017). It is described as an effective model that occurs in a natural setting and enables the researcher to develop a level of detail from high involvement in the actual experiences (Creswell, 2009). It consists of a set of interpretive material practices that makes the world visible. It is multi-method in focus, involving an interpretive, naturalistic approach to its subject matter (Denzin & Lincoln, 2006). It is a type of social science research that collects and works with non-numerical data that seeks to interpret meaning from these data that help us to understand social life through the study of targeted populations or places (Punch, 2013).

On the other hand, quantitative approach is the most suitable design if principles of statistical inference are applied to generalise findings to a population (Asiamah, Mensah & Oteng-Abayie, 2017). More specifically, the quantitative research was used because it used systematic empirical investigation of observable phenomena through mathematical, statistical or conceptual techniques to establish a relationship between variables. A quantitative approach was reckoned appropriate on the basis that the quantitative approach helps to collect information from masses of participants and provide room for analysis of secondary data if it is needed. In this study, data were gathered from households of the selected MMDAs in order to supplement the evidence from the stakeholders of disaster management.

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Research Design

According to Creswell (2016), the phrase "research design" refers to a set of assumptions and principles that explain the procedures and methods that are used to collect and analyse data. This set of assumptions and principles is used to guide the collection and analysis of data. According to Creswell (2016), the type of study design selected typically provides a general picture of which procedures and assumptions are to be used in the process of data collection and analysis. Action research was utilised throughout this investigation.

Action research is a type of applied research in which the researcher strives to generate results or a solution that will be of practical value to the people with whom the research is working, while at the same time expanding their theoretical knowledge. In the process of directly intervening in problems, the researcher strives to produce outcomes that are practical and, in many cases, liberatory, while simultaneously seeking to reform existing thinking in the field that is being researched. Action research, much like case studies, is typically limited to a single organisation. This makes it difficult to generalise the findings, and it also means that different researchers may come to different conclusions about what happened. Therefore, this study was limited to only Greater Kumasi Sub-region and solicited ideas and experience from stakeholders and households in selected MMDAs on the appropriate measures to minimise disaster risks.

Profile of Study Area

The study was conducted in Greater Kumasi Area in the Ashanti Region of Ghana. Greater Kumasi Ares (Kumasi Metropolitan Area and its

Surrounding seven districts); Afigya-Kwabre District, Kwabre-East District, Ejisu-Juaben Municipality, Asokore-Mampong Municipality, Bosomtwe District, Atwima-Kwanwoma District and Atwima- Nwabiagya District) (Figure 4). However, in this study, the researcher purposely selected Kumasi Metropolis, Asokore mampong Municipal, and Bosomtwe District. These were ubanised and peri-urbanised communities with similar characteristics regarding environmental sustainability issues, developmental challenges and were highly prone to disaster risks.

Kumasi, the capital of the Ashanti Region is an important commercial centre for the regional economy. Also, it plays the role of the transport and logistics centre for linking other regions and even surrounding landlocked countries such as Burkina Faso, Mali and Niger. The Kumasi Metropolis is located in the transitional forest zone and is about 270km north of the national capital, Accra and it located between Latitude 6.35 N and 6.40 S and Longitude 1.30 W and 1.30 E and elevated 250 to 300 meters above the sea level. Asokore Municipal has a total land area of 23.91 km2 and it is located to the north eastern part of KMA. It shares boundaries with KMA to the east, south, and west, Kwabre East Municipal to the north-west and Ejisu Municipal to the south-east.

Recent years have seen a steady decline in the quality of the urban environment in Kumasi, which may be attributed to the inadequacy of public services as well as the high congestion in both the city centre and the outlying areas. These issues have surfaced as a direct consequence of Kumasi's rapid population growth and the urban sprawl that has occurred in suburban districts that extend beyond the city's borders. A Comprehensive Urban Development

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Plan was developed for the Greater Kumasi Conurbation (Kumasi City and its surrounding urbanising portion of adjoining districts) in order to address this problem. The purpose of this plan was to promote Kumasi as a vast metropolitan city that is capable of accommodating its current population (443, 981 - 2021 Census) and projected huge urban population (5 million in 20 years), as well as a significant player in the economic growth of Ghana as a whole and its sub-regions.
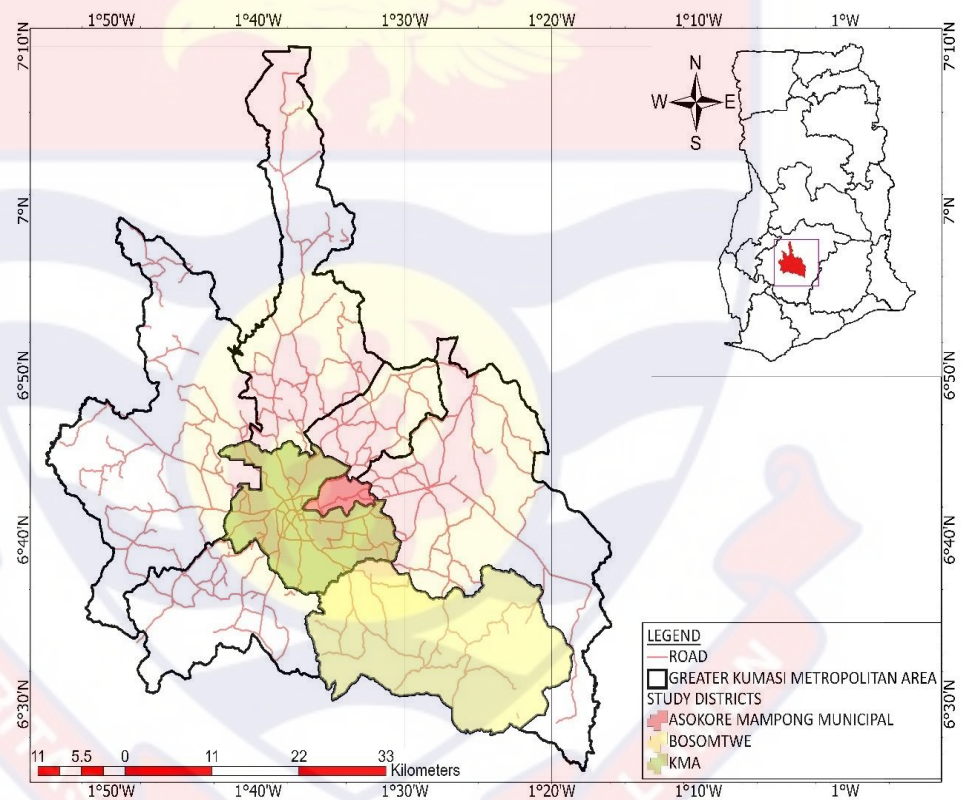
Figure 4: Study Area in National and Regional Context

Population

According to Wallen (2017), a population can be thought of as a group of people, elements, or objects that a researcher is interested in gathering data about. It is vital to describe the study's broad demographic, as well as the group that the study is primarily targeting, in addition to the population that is

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easily accessible. According to Asiamah et al. (2017), the general population of a study is essentially defined as the group of people within which participants of the study can be found. In this regard, the general population of this study comprises officials from Natural Disaster Management (NADMO), Ghana National Fire Service (GNFS), Ghana Ambulance Service (GAS), Ghana Police Service (GPS), Ghana Health Service (GHS), District Development Planning Officer (DPO), Environmental Protection Agency Officer (EPA), and Regional Economic Planning Officer (REPO). Aside these officials, traditional authorities, fire clubs and volunteers, assembly members of selected communities as well as community dwellers were included as respondents in the study. Households in the selected MMDAs (Kumasi Metropolis, Asokore Mampong Municipal and Bosomtwe District) were included in the study as respondents (Table 1).

Table 1: Population of the study

MMDAs	Total households
Kumasi Metropolis	413, 561
Asokore Mampong Municipal	188, 070
Bosomtwe District	160, 723
Total	762, 354

Source: Population and Housing Census 2021

Sampling Procedure

Sampling refers to the process of selecting a subset of a population to take part in a study. The purpose of sampling is to produce a subset of the population that is indicative of the whole. A representative sample is the number of participants large enough to yield findings that the entire population would have produced (Asiamah et al., 2017). In this direction, two main sampling approaches were used to select the right portion of the population.

Firstly, the purposive sampling approach was used to select one officer from the various institutions or stakeholders in each MMDA. Also, two (2) assembly members were selected from each MMDAs as well as a representative each from the traditional authorities. These officers were selected based on the fact that they were in a position to give in-depth knowledge and information regarding disaster risk reduction strategies. These officers were in charge or hold principal position in the various disaster response institutions or organisations that were responsible for disaster management.

Secondly, some towns or communities within the selected MMDAs were selected purposively based on the fact that they were highly prone to disasters such as floods, market/commercial fires and domestic fires. Then systematic random sampling technique was used to select three hundred and ninety-nine (399) households from the selected communities. The mathematical formula below given by Cochran (1977) was used to arrive at the sample size. That is:

$$S = N/ 1 + N (a)^2$$

Where 'N' is the sample frame (population), 'S' is the sample size and 'α' is the margin of error which in this case is (5%). The 95% confidence interval was chosen for this study because the study deals with human beings whose accuracy of information is subject to biases unlike the physical sciences with high degree of certainty. In this direction the study arrived at 399 sample size for households in the selected MMDAs (Table 2). In all, four-hundred and twenty-seven (427) respondents were involved in this study.

Table 2: Sample size distribution

MMDAs	Total households	Proportionate to size sampling	Sample
Kumasi Metropolis	413, 561	54.24	216
Asokore Mampong Municipal	188, 070	24.67	98
Bosomtwe District	160, 723	21.08	84
Total	762, 354	100	399

Source: Author's Compilation (2023)

Source of Data

Both primary and secondary source of data were consulted. The primary data was captured through the administration of questionnaire to the selected households of the various MMDAs. Also, interview guide which was administered to the selected stakeholders/officials/traditional authorities/ assembly members formed part of the primary data collection tool. On the other hand, secondary data were gathered in conducting the systematic review of various policies on disaster management and risk disaster reduction strategies. In addition, Medium Term Development Plans of the various selected MMDAs were evaluated. Other information and documents that were gathered from the National Development Planning Commission website/office, policies, laws and plans from the various MMDAs website were evaluated.

Data Collection Instruments

Four main data collection instruments: Questionnaire, interview guide, document analysis guide/desktop review checklist and observational checklist were used to collect information for the study. Questionnaires were used because of their proficiency to be administered to a large sample size within a short period. In addition, a questionnaire gives respondents the liberty to

express their feelings without nervousness as responses remain anonymous (Creswell, 2016). The questionnaire was designed using the 5-point Likert scale where respondents were asked to use 1 = strongly agree 2= agree 3 = neither agree nor disagree 4= disagree and 5 = strongly disagree to express their views on the observable variables provided.

As a way of ensuring accuracy in the data collection, the questionnaire was designed with both close-ended and open-ended questions. The open-ended questions allowed respondents to freely give their reasons and other comments in the space provided.

Patton (2002) reported that interviews provide the researcher with a method to discover "what is in and on someone else's mind" (p. 341). Merriam (2009) also supports the need for interviewing as part of a qualitative study to "discover and uncover the experiences of the participants" (p. 93). Also, interview guide was employed in gathering data from the stakeholders. These were in-depth interviews that were conducted for the institutional representatives or stakeholders on roles and responsibilities of various response institutions in disaster risk reduction, the institutional capacity of the various response institutions to disaster risk reduction, how disaster risk reduction measures have been incorporated into the MTDPs of the MMDAs, and implementation of DRR measures in MTDP plan implementation. The interview guide that was used for the study comprised mainly open-ended questions which were answered by the respondents with few closed-ended questions. These questions were based on the research objectives in thematic areas such as: "the roles and responsibilities of various response institutions in disaster risk reduction; "the institutional capacity for disaster risk reduction

and management;" integration of disaster risk reduction measures into the MTDPs of the MMDAs; "implementation of DRR measures in MTDP implementation of the MMDAs;" and "challenges of disaster risk reduction management of MMDAs."

Furthermore, focus group discussions were conducted for disaster volunteers and disaster club members in some selected communities and schools respectively. This considered various disaster risk reduction activities conducted by these groups, educational programmes or sensitisation programmes conducted by these groups, training and resources of members of these groups and how their plans were considered in the plans of the MMDAs.

Lastly, desktop review was conducted. This employed secondary data from articles, policies, laws, plans among others in order to review the disaster risk reduction management policies at the Meso level of development planning process, how disaster risk reduction measures had been incorporated into the MTDPs of the MMDAs, and implementation of DRR measures in MTDP plan.

Table 3: Specification of Data Collection Instrument and unit of analysis

Instrument	Population/unit of analysis
Questionnaire	399 households from all the MMDAs
Interviews	15 officials, 5 each, - from each of the MMDAs
	3 traditional authorities, 1 each from MMDAs
	6 assembly members, 2 each from MMDAs
	REPO, EPA officer, First Aid officer,
Observational checklist	9 MTDPs, 3 each from the selected MMDAs (2014-2025)
Total	427

Source: Author's Compilation (2022)

Validity and Reliability of Data

Reliability is about consistency and capacity of a measure to get comparable outcomes whenever a test is conducted. In contrast, validity test is utilised as a part of assurance of an estimation on the off chance that it truly mirrors the idea under the investigation. To guarantee validity of data collection instrument, expert assessment was sought from different researchers who knew about the subject under investigation. To test reliability of the instrument, Cronbach Alpha Coefficient was employed. The Cronbach alpha gives a coefficient of inter-item correlations. The Cronbach alpha ranges from 0 and 1 and an estimation of at least 0.7 is considered as evidence of reliability (Table 4).

Table 4: Reliability Test

Constructs	Alpha Cronbach
Disaster Prevention and Mitigation	0.73
Disaster preparedness	0.71
Disaster Response	0.70
Disaster Rehabilitation and Recovery	0.71
Governance	0.70
Overall	0.75

Data Source: Field Data (Opoku, 2022)

Table 4 shows the reliability of the various constructs used in the study. Alpha Cronbach test was run and the results show that all the constructs (Disaster prevention and mitigation, disaster preparedness, disaster response, disaster rehabilitation and recovery and governance) were all reliable since their values were either 0.70 or more. Therefore, it is accepted that the constructs were reliable and the items on the questionnaire was consistent

The questionnaire was validated through pre-text exercise. Pre-testing excise was undertaken prior to the main study in the Asokwa Municipality of the Ashanti Region. In the course of the activity, the following element were taken into consideration: problematic questions, what questions work well, what questions sound strange, what questions can be eliminated and what needs to be added. Is the survey too long? Does the questions touch on their privacy? Are respondents losing interest? Do they understand the questions? These activities were reckoned necessary because it aided in streamlining the final questionnaire and the entire data collection activities.

The Interview guide, on the other hand, was used to elicit information from key stakeholders/officials from the various institutions in charge of disaster management in the various MMDAs. The interviews were conducted using one to one (face-to-face) approach. This approach is deemed appropriate because it helps to attain an in-depth understanding of the participant's apprehension disaster risk reduction strategies and its integration into the MTP implementation of the various MMDAs.

With regards to qualitative data, trustworthiness was ensured. Trustworthiness refers to the degree of confidence in data, interpretation, and methods used to ensure the quality of a study (Pilot & Beck, 2014). In order to ensure trustworthiness, four principles or measures should be observed including: credibility, dependability, transferability and confirmability.

On credibility, triangulation of research instruments was used to ensure that. This reflects on how accurate the findings of the study are and how true they are? Also, the study ensured that critical stakeholders with credible background or in-depth information about disaster risk management were

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interviewed. Data that were gathered from interviews were validated with that of the secondary data and the data gathered from the households. Also, the same questions were asked in different ways to different stakeholders and from other sources through different methods to answer the same questions.

On transferability, it focuses on how the findings of the study can be applicable to other MMDAs. The study used a detailed description in showing how the findings of the research can be reflected to other region, circumstances or situations. Confirmability, it looks at how objective the researcher is in the study. Therefore, interviews were transcribed and sent back to the participant or interviewee to cross check and approve that the transcript were the exact words or conversation that were carried out in the interview sessions. This helped to ensure that findings were not biased and in favour of the researcher. Furthermore, dependability examines the extent to which the findings of the study could be repeated or replicated by other researchers. To ensure this, audit trail or inquiry audit was also employed to document step by step approach of the research method employed and how data were gathered for duplication and verification of data.

Pre-Testing

The data collection instruments were pre-tested before the actual data collection from 12th to 15th June 2022. Pre-testing excise was undertaken prior to the main study in the Asokwa Municipality in the Ashanti Region. In the course of the activity, the following element were taken into consideration: problematic questions, what questions work well, what questions sound strange, what questions can be eliminated and what needs to be added. Is the survey too long? Does the questions touch on their privacy? Are respondents

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losing interest? Do they understand the questions? These activities were reckoned necessary because it aided in streamlining the final questionnaire and interview guide and the entire data collection activities.

Policy documents sourced

Objective seven of the study sought to review the policies and acts related to the integration of disaster risk reduction into the MTDP of the various MMDAs. Therefore, it was required to review selected policies and acts including Land Policy, Land Use and Spatial Planning Act, National Disaster Management Organisation Act, National Ambulance Service Act, Ghana National Fire Service Act, and Environmental Protection Agency Act.

Data Collection Procedures

First, an introductory letter was sought from the researcher's department to spell out the purpose of the study, permission and essence of participating in such study to respective respondents and participants of the study.

Second, the researcher applied for ethical clearance from the Institutional Reviewed Board for the permission to administer the research instruments to their respective respondents. The board examined the research instruments and reviewed it to enhance its quality, clarity, and highly reduce any risk associated with it that will harm the respondents in any way.

The third approach to the data collection process was based on obtaining permission to carry out the research from the authorities of the various MMDAs. This was done from 9th June, 2022 to 11th June, 2022. After that, respective officials or stakeholders were identified and interview dates and time were booked with them. Four weeks were used to conduct the

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various interviews with the participants (From 20th June to 15th July, 2022). Interviews were both conducted early in the morning and late in the evening when participants were about to start work or go home. Telephone interviews were also conducted for critical stakeholders with tight daily schedules of work and who preferred such type of interview.

On the other hand, community entry was conducted for the various selected communities from 9th June -to- 13th June 2022. Traditional authorities, assembly members and disaster volunteers were identified, appointments were booked for interviews and focus group discussions. Afterwards, selected households of the accessible population were identified, and questionnaire were self-administered to the entire respondents to express their view on the phenomenon under study. Due to the recent outbreak of the COVID'19 Pandemic, the respondents were provided with hand sanitiser to sanitise their hand and nose mask to wear to avoid the spread of the virus. After the sanitization exercise, the respondents were then given a brief introduction to the purpose of the study. However, interview schedules were conducted for households who could not speak or write English. The administration of questionnaire took place within four (4) weeks, thus, from 18th June to 12th August, 2022 (a week each for AMMA and BDA and 2 weeks for KMA).

Data Processing and Analysis

Analysis means organising and interrogating data in ways that allow researchers to see patterns, identify themes, discover relationships, develop explanations, make interpretations, mount critiques, or generate theories. It often involves synthesis, evaluation, interpretation, categorisation,

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hypothesising, comparison, and pattern finding (Hatch, 2002). Similarly, data analysis is a process of inspecting, cleaning, transforming, and modelling data with the goal of discovering useful information, suggestions, conclusions and supporting decision-making. To De Vos et al. (2005), data analysis is a process which brings order, structure and meaning to the mass of data collected. The data analysis took two primary forms. The data were processed for a meaningful interpretation hence the responses were coded into Statistical Product and Service Solution (SPSSv26.0). Descriptive and inferential analysis were performed, and results were presented using tables and figures. Specifically, frequencies, percentages, means and standard deviations as well as inferential statistics such as t-test and ANOVA were used to analyse the quantitative data that were retrieved from the administration of the questionnaire.

Qualitatively, data from interviews conducted were transcribed verbatim. Salient features that were in line with the research questions and topics were compiled and coded. The study relied heavily on the recording of speech and writing of actions and pronouncements by the people being studied. Therefore, recurring themes were identified and interpreted. Direct quotations or verbatim expressions of the participants formed an integral part of the analysis. A structured procedure was used in analysing the qualitative data. This involved identifying and coding similar categories or segments as identified (Crang, 2005).

The coding schemes with the aid of Nvivo software (version 11.0) made the analysis more systematic. Convergences and divergences responses were noted and interpreted accordingly. In view of capturing the actual

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responses and actions by respondents, relying on the triangulation method, direct quotations from the respondents were used. This method allowed varied experiences to be shown, voices to be heard and representations to be made (Smith, 2001). Thematic analysis was employed to analyse the qualitative data based on the research questions.

Data Management

The research objectives required both qualitative and quantitative data that were not available from other sources. Some data existed that could be used to situate and triangulate the findings of the proposed research, and which supplemented data collected as part of the proposed research. For these reasons, the research project involved both primary and secondary data collection. Public data-where possible, the researcher used online and electronic archives including the Medium-Term Plans of the various MMDAs, policies and acts of disaster response institutions.

Quantitative data were coded, inputted and stored in a widely available spreadsheet format (e.g. Excel). This data were backed up regularly; because of likely problems with viruses and hardware in developing countries. This included regular email sharing with the research assistant, so that up-to-date versions were stored on UCC institution's server.

Qualitative data were backed up and secured. There were some potential sensitivities around some of the data collected, so the project established a system for protecting data while being processed, including use of passwords and safe back-up hardware. There data were deleted and formatted from all drives and storage devices/UCC institutions' server six months after the study. Also, the hardcopies were locked up in the researcher's

drawed and protected from unathourised people and were discarded correctly six months after the study.

Problems Encountered on the field

The study faced some challenges during the fieldwork that requested some measures to overcome against these to ensure the success of the study. During the questionnaire administration, some of the respondents could not read nor write. Therefore, interview schedule were conducted for those respondents to ensure a more excellent completion and return rate. Some of the respondents expressed concern about research fatigue. However, the principal researcher explained the purpose of the study and the essence of participation and majority of them were convinced and participated in the study.

In the qualitative data collection, thus the interviews, some officials were very busy due to their close-fitting schedule and the nature of their work. However, appointment times with these participants were rescheduled a number of times to suit them, and they were willing to participate in the study.

Ethical Consideration

The University of Cape Coast approved the study, Institutional Review Board (UCC-IRB) with ID (UCCIRB/CHLS/2022/36 (appendix). All respondents were provided with written informed consent before entering the study. With participants who were not able to communicate in a written form, the researcher assisted them by reading and recording answers that the participants provided through the interview schedule. In addition, the researcher did not include items demanding the personal identity of respondents, such as names and contacts. The anonymity and confidentiality

of the respondents were highly paramount and hence protected in the instrument. Finally, the respondents were not coerced to be part of the study.

Chapter Summary

The research philosophy discussed in this study encompasses different principles and opinions about collecting, processing, analysing, and utilising data in research. It mentions various research paradigms, including positivism, interpretivism, and pragmatism. The positivist philosophy emphasises objective truth and focuses on replicability, generalisability, validity, and reliability of findings through quantifiable observations and statistical analysis. Interpretivism, conversely, emphasises subjective reality and the contextual meaning people assign to phenomena. It prioritises meanings and interpretations over numbers and generalisability. Pragmatism is a philosophy that advocates for a practical and pluralistic approach to research, combining multiple methods to shed light on human behaviour. This philosophy was adopted.

The research approach used in the study is a mixed method approach, combining both quantitative and qualitative approaches. The qualitative approach is inductive and explores meanings and insights in a natural setting, whilst the quantitative approach applies statistical techniques to establish relationships between variables and generalise findings to a population. The study employed a "quali-quanti" mixed approach, where the qualitative aspect was conducted first to gather information and provide insights for the quantitative aspect. The research design employed in the study was action research, which enabled the researcher to work directly with the people

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involved in the study to develop practical solutions and generate theoretical knowledge.

The study focused on the Greater Kumasi Sub-Region in Ghana. It included officials from various disaster response institutions and emergency services such as disaster management organisations, Ghana Fire Service, Ghana Police Service, Ghana Ambulance Service, Environmental Protection Agency, Metropolitan/Municipal/District Assemblies, traditional authorities, assembly members, community dwellers, and households as participants.

The study utilised both primary and secondary sources of data. Primary data was collected through questionnaires, interviews, and focus group discussions, whilst secondary data was gathered from policy documents, laws, and plans related to disaster management. Data collection instruments were validated through pre-testing, and data were collected using various procedures such as community entry, interviews, and self-administered questionnaires. Data analysis involved both quantitative and qualitative techniques. Quantitative data were processed using statistical software for descriptive and inferential analysis, whilst qualitative data were transcribed, coded, and analysed thematically. Validity and reliability of the data were ensured through expert assessment, pre-testing, and triangulation. The study also addressed ethical considerations by obtaining informed consent from participants, ensuring anonymity and confidentiality, and protecting the data collected.

CHAPTER FIVE

EVALUATION OF POLICIES, ACTS AND AGENCIES ON THE

INTEGRATION OF DRR INTO DEVELOPMENT PLANNING

PROCESS OF THE VARIOUS MMDAS

Introduction

This chapter considered the evaluation of policies that affect the implementation of DRR strategies in the Greater Kumasi Area of Ghana. Policies evaluated included Land Policy Act, Environmental Protection Act, Land Use and Spatial Planning Act, NADMO Act, National Ambulance Act and Ghana National Fire Service Act. All these policies and acts were evaluated for the effective and efficient integration and implementation of DRR into the planning process of the various MMDAs of Ghana.

The process was initiated with the identification of problem, key stakeholders and the criteria for evaluation. The criteria adopted in evaluating the policies and acts included: efficiency, equity, technical feasibility, political viability, administrative operability in quest to ensure the effective and efficient integration and implementation of DRR strategies into the planning process of the various MMDAs.

Though validity and reliability of the criteria adopted ensured that the results produced were the same or similar when others conduct same studies using same criteria or method of evaluation. However, different perspectives and the positionality of the researcher may influence the process leading to the subjectivity of the result. Therefore, the researcher tried to minimise the subjective nature of policy evaluation by providing adequate information

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regarding the criteria used, measurement and scores given to a particular criterion as well as the reasons for assigning such score.

Identification of the Problem

The problem set for the analysis of policies and acts was to ensure the integration and implementation of DRR into the planning process of the various MMDAs in Greater Kumasi Area. Practical collaboration and system workings of the various disaster responsive institutions as well as disaster management institutions with the various MMDAs were the pace setters to influence the effective and efficient integration and implementation of DRR strategies in the planning process of our local government. Therefore, there was the need to evaluate known policies and their contributions to the effective integration and implementation of DRR strategies in the planning process of the various MMDAs in Greater Kumasi Area. The specific objectives of the evaluation were; how policies contributed to the integration of DRR into the planning process of MMDAs in Greater Kumasi and how policies influence the implementation of DRR in the local development of MMDAs in Greater Kumasi Area.

The policy documents needed for this exercise included: Land Policy, Environmental Protection Authority Act, Land Use and Spatial Planning Authority Act, NADMO Act, National Ambulance Act and Ghana National Fire Service Act. These policies clearly indicated how DRR strategies should be integrated into the planning process of the local government as well as implementation of DRR strategies in the local development of the MMDAs. This is the passionate call made by the Sendai framework as a result of the conference in Sendai. The Sendai Framework (2015) had four main priority

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and several targets to achieve by 2030. These included: understanding disaster risk: strengthening disaster risk governance; investing in disaster risk reduction for resilience; and enhancing disaster preparedness for effective response and recovery.

These policies were chosen due to their implications they have on disaster management. Disasters such as floods and fire outbreak occur primarily in space, thus, on land and therefore, were of concern for the environment and land. This called for the evaluation of the Land policy, Environmental Protection Act, Land Use and Spatial Planning Act, NADMO Act, National Ambulance Act and National Fire Service Act. NADMO, NAS, GNFS are the key disaster response institutions. Collaboration amongst these institutions would provide the platform for effective integration and implementation of DRR strategies into the development planning process of the various MMDAs in the Greater Kumasi Area.

Criteria for Evaluation

The study adopted a multi-criteria approach to evaluate these policies for effective integration and implementation of DRR strategies into the development planning process of the various MMDAs in the Greater Kumasi Area. These criteria were economic, equity, technical, political and administrative.

Land Policy of Ghana

Due to some flaws in the different statutes that colonial and post-colonial governments had formed, Ghana's land policy was developed to address the situation. These statutes included the Public Lands Ordinance, which was passed in 1876 (Cap 134), the Land Appropriation Ordinance,

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which was passed in 1901, the Kumasi Lands Ordinance, which was passed in 1943 (Cap 145), the Land and Native Rights Ordinance, which was passed in 1927 (Cap 143), the Akim Abuakwa (Stool Land) Act (No. 28), which was passed in 1958, and the Stool Land Act, which was passed in 1960 (Act 27) (Ghana Lands Commission, 1999).

The purpose of the Land Policy is to support various socioeconomic activities carried out in accordance with the principles of sustainable resource management and to ensure that viable ecosystems are preserved. Additionally, the Land Policy seeks to ensure that all segments of Ghanaian society make responsible use of the nation's land and all of its natural resources (Ghana Lands Commission, 1999). To achieve the set policy objectives, the Ghana Lands Commission set out various implementation approaches and indicators for the Land Policy of 1999.

Table 5: Implementation, approaches and indicators

Implementation	Approaches	Indicators
Securing Ghana's International Boundaries and Shared Water Resources	Secure and manage the boundaries of Ghana by the Joint Border Commission of neighbouring countries Manage shared waterbodies with neighbouring countries. Prohibit smuggling across international borders	resources to secure border joint committees, joint Border control and transboundary water bodies Resolved cross-border conflicts of settlement and farming
Facilitating Equitable Access to Land	Ensure access to land by all persons. No valid transaction in private lands between or among private entities or traditional authorities MMDA should develop planning schemes for all land uses. Transparent and open	Land-use schemes at district levels. Adequate compensation for compulsory government land acquisition. Number of land banks Number of Land bonds for financing Appropriate levies,

Table 5 Continued

	land market	penalties and/or taxes on allocated, but undeveloped lands. Reasonable time to land request. Facilitate the development of land management knowledge and skills
Securing of tenure and protection of land rights	Traditional land ownership is legitimate Disposal of land-based resources on land and future generation No compulsory land acquisition without appropriate payment and time Customary practices must approve land transfer or stewardship. Customary laws precede government if land is not utilised for the purpose for which it was acquired. Land disposal should not render a land title holder, his kith and kin and descendants completely landless. Structures on lands without title or development permit may be demolished at the cost of the developer.	Speed up title registration Production of large-scale maps of land parcels Require stool, skin, clan, family and other landowners to survey and demarcate their land Early warning mechanism to detect land disputes
Ensuring planned land use	Forest reserves, strict nature parks, wildlife sanctuaries shall be fully protected. Permanent forest and wildlife estates are available for other uses determined by land-use plan. Inland and coastal wetlands and environmental conservation areas but can allow socio-	Plan and service land before disposal No development in a minimum of 100 metres off the high water mark of water bodies Social and economic activities on hills only with appropriate technology No draining of wetlands. Development and protection of a greenbelt

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Table 5 Continued

	economic developments which conserved ecosystem Land for socio-economic activities will be guided by population density, growth and distribution pattern. Government may intermediate in facilitating investors access to land.	Maintenance of adequate tree cover to protect urban areas. Resolve land conflict before economic activities are undertaken. Implement district, regional and national land-use plan and Atlas.
Enhancing land capability and land conservation	No mining on primary forest covers. Land use to be based on sustainable methods of soil protection Ecosystems with biodiversity or scenic beauty may be declared a protected area	Shrines, sacred groves and others will be demarcated and protected.
Developing adequate institutional capacity and capability	Restructure, and strengthen land administration agencies International cooperation and support in all aspects of land policy Human development programmes for land sector institutions Collaboration with the traditional landowners Educate the public on land policy	Inter-ministerial and interagency cooperation to coordinate land-use policies and plans. Establish a Geospatial Framework database. Develop a land information system

Source: Land Commission (1999).

The implementation strategies can be grouped into six themes with focus on securing the land of Ghana to developing adequate institutional capacity and capability to manage. Indicators set out were deciphered from the policy document as being funded for border security and development of land information management system.

Environmental Protection Act 1994 (Act 490)

The land policy and NADMO Act of Ghana are backed and executed with the aid of the Environmental Protection Agency Act of 1994 (Act 490). The Environmental Protection Agency has 19 functions grouped into policy formulation on the environment, coordination with other agencies for environmental protection, issuing of permits and guidelines for discharge of pollutants, environmental impact assessment, education and research and levy collection. Functionally, the environmental protection agency is supported by the Finance Ministry and National Environmental Fund to able be to carry out its responsibilities.

Land-Use and Spatial Planning Acts 2016 (Act 925)

The Land Use and Spatial Planning Authority was established by the Land Use and Spatial Planning Act of 2016 (Act 925). The purpose of the Land Use Planning Act is to revise and consolidate laws on land use and spatial planning, provide for sustainable development of land and human settlements through a decentralised planning system and ensure judicious use of land (Government of Ghana, 2016). Its specific functions performed through its authority are research; development of planning standards; monitoring of compliance with planning standards; management of information system; formulation of spatial development framework; education, training and capacity building and communication and public relations. Also, the land use and spatial act is deemed to establish a fund to help in its operation but with financing from the Ministry of Finance of Ghana.

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National Disaster Management Organisation Act 2016 (Act 927)

The NADMO Act of Ghana was assented on 22nd September, 2016 to back the activities of NADMO. The purpose of NADMO as enshrined in the act is 'to manage disasters and similar emergencies and to develop the capacity of communities to respond effectively to disasters and emergencies.

The NADMO has 22 functions grouped into policy formulation on disaster prevention, disaster risk reduction, and climate risk management, coordination with other agencies for disaster risk reduction and climatic related issues, gather data, prepare, co-ordinate, monitor and update disaster management plans of the district, municipal, metropolitan, region and national, identify, map up hazards, vulnerability and risk situations in the MMDAs, region and national, ensure effective communication on disaster risk reduction at all levels and among disaster responsive institutions, organise, sensitise and educate people on disaster management as well as equipping Disaster Volunteer Groups, and schools. NAMDO also register victims, store relief items, organise technical and capacity training, simulation exercise for staff and relevant institutions, as well as analysing disaster data, conducting research on disaster and emergencies and disseminating outcome to respective vital stakeholders.

The NADMO Act also created the district/municipal/metropolitan, regional and national disaster management committees which are charged to prepare plans, co-ordinate, prevent and manage disasters that occur at all level. Moreover, the NADMO Act established a National Disaster Management Fund which is to provide finances for the development and operation of disaster prevention, disaster risk reduction, climate change risk reduction and

other disaster management programmes. It has its sources from moneys appropriated for the Organisation by Parliament; fees accruing to the Organisation in the performance of its functions under this Act; three per cent of the share of the District Assemblies Common Fund for each District Assembly subject to the formula approved by Parliament in accordance with article 252 of the Constitution; advances from the Contingency Fund referred to in article 177 of the Constitution; money that accrues to the Fund from investments made by the Organisation; grants, donations and other voluntary contributions to the Fund; and other moneys that may in any manner become lawfully payable to the Organisation for the Fund.

National Ambulance Service Act 2020 (Act 1041)

The National Ambulance Service Act, 2020 which was passed by parliament and assented to by the President on 29th December, 2020 to established the National Ambulance Service to provide for the effective and efficient administration and management of emergency care services and related matters. Ambulance services include:

- Taking care of sick and injured due to illness or emergencies, transporting persons to health facilities, and from a hospital to any other health care facility.

- Ensure public safety during public gatherings and ceremonies through attending to duty calls (protecting persons from injury or death), public information, education and training on safety measures to be undertaken in emergency or disaster situations as well as first aid training to general public.

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- Ensure disaster management through provision of emergency care and ambulance services during a disaster; provision of communication linkage among agencies and institutions responsible for disaster management; training of emergency medical technicians or health professionals in life support courses.

Its specific functions performed through its authority are twenty-four (24) hour access to ambulance services to the general public, persons involved in accidents, disasters and any related emergencies; training of staff, volunteer groups or other personnel on emergency care services; collaborate with the relevant agencies and volunteer groups in providing emergency care services.

Ghana National Fire Service Act 1997 (Act 537)

The Ghana National Fire Service Act which was passed by parliament and assented to by the President on 29th August, 1997 to re-established the National Fire Service to provide for the management of undesired fires and to make provision for related matters. GNFS is to prevent and management undesired fire. Ghana National Fire Service responsibilities include:

- organise public fire education programmes to create and sustain awareness of the hazards of fire; and heighten the role of the individual in the prevention of fire;

- provide technical advice for building plans in respect of machinery and structural layouts to facilitate escape from fire, rescue operations and fire management;

- inspect and offer technical advice on fire extinguishers;

- co-ordinate and advise on the training of personnel in fire fighting departments of institutions in the country;

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- train and organise fire volunteer squads at community level; and

- offer rescue and evacuation services to those trapped by fire or in other emergencies

Ghana Health Service and Teaching Hospitals Act 1996 (Act 525)

The Ghana Health Service and Teaching Hospitals Act, 1996 which was passed by parliament and assented to by the President on 30th December, 1996 established the Ghana Health Service to: implement approved national policies for health delivery in the country; increase access to improved health services; and manage prudently resources available for provision of health services.

The Service shall perform the following functions:

- Provide health services or contract out service provision to other recognised health care providers to ensure access to health services at the community, sub district, district, and regional levels;

- set technical guidelines to achieve policy standards set by the Ministry;

- plan, organise, and administer comprehensive health services with a focus on primary health care;

- develop mechanisms for the equitable distribution of health facilities distribution;

- supervise and oversee the Service's health facilities; contract with teaching hospitals to treat referred patients;

- encourage people to adopt healthy lifestyles and behaviours;

- provide efficient systems for disease surveillance, control, and prevention;

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- manage the Service's resources and properties to guarantee the best use of them;

- decide, with the Minister's consent, the charges for health services supplied by the Service; and

- conduct any other function that is pertinent to the promotion, protection, and restoration of health

Stakeholders for disaster risk reduction strategies

This section presents the various stakeholders in undertaking disaster risk reduction strategies. In all, about twenty 20 stakeholders were identified, and they comprised, mainly, disaster response institutions such as NADMO, GNFS, GAS, EPA, GPS, governmental agencies, Non-governmental agencies, community leaders, traditional authorities. The key stakeholders have different positions (supporting and opposing) based on their actions and mandates with different levels of power (very low, low, moderate, high, and very high) (Table 7). This helped to examine the levels of power and position of the various critical stakeholders regarding disaster risk reduction.

According to Table 6, those placed in the supporting category were government agencies, land commission, and traditional leaders of Greater Kumasi Area. In contrast, those with less supporting position were assembly members, and community people. Traditional leaders, especially chiefs were assigned very high power which can be negative or positive; community members and assembly members were assigned with moderate power.

Table 6: Stakeholders, their Position and Power

Stakeholders	Evaluated position	Power (+, -)
Community people	Support	Moderate (+, -)
Traditional leaders	Support	Very high (+, -)
Assembly members	Support	Moderate (+, -)
Land commission	Support	High (+, -)
EPA	Support	Very high (+)(-)
GAS	Support	High (+, -)
GNFS	Support	Very high (+, -)
NADMO	Support	Very high (+, -)
GPS	Support	High (+, -)
Ghana Armed Forces	Support	High (+, -)
GMet	Support	Very high (+, -)
LUSPA	Support	High (+, -)
NDPC	Support	Very high (+, -)
MMDAs	Support	Very high (+, -)
Information	Support	Moderate (+, -)

Source: Opoku (2022)

This is due to the fact that chiefs are custodians of the land and therefore are responsible for selling of all kinds (undulating, swampy, flat etc) of lands to individuals and companies for building purposes, among others. Therefore, if we are to talk about disaster risk reduction issues, then their effort would be needed crucially. The positive influence of chiefs and family heads is to follow the layout and planning schemes in selling lands to people while the negative aspect was the issue of selling swampy and reserved lands to people.

The National Development Planning Commission is charged with the responsibility to develop development plans and policy framework guidelines concerning the development of national, sectoral, regional, and MMDAs plans. NDPC developed the various MTDPs guidelines for MMDAs to follow to integrate the disaster risk reduction into the MTDPs of the various MMDAs. Therefore, NDPC has very high positive power to influence all the

MMDAs to integrate their MTDPs with DRR strategies. They also review, monitor and evaluate MTDPs of the various MMDAs to ensure that they conform to the guidelines regarding DRR.

Different government agencies were assigned different influence and power due to their functionalities. NADMO which is tasked by the NADMO Act of 2016 to coordinate the disaster response institutions and department in preventing, managing and reconstructing or redevelopment of community when disaster strikes have moderate influence on disaster risk reduction. This is due to the low administrative capacity as well as technical and financial support to implement its policies.

The Land's Commission and Land Use and Spatial Planning Authority has a high power of influence which can be used positively and negatively; positively, if they ensure buildings and structures conform to a well-developed plan and negatively, when the plans developed are not good and environmentally inclined.

Ghana National Fire Service, EPA, and NADMO in collaboration with the various MMDAs are in one way or other able to control development in their various locality. Thus, through recommending building permits submitted by people to Spatial Committee for final approval to be given to people to build. Through this, GNFS ensures that each permit submitted follow all protocols to ensure that the building is assured or prevented from undesired fire outbreak. EPA also ensures that the building is environmentally friendly and do not disturb the ecosystem and the health of the living organism found in the area or community where such building is built. However, they

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are rated as moderate due to their operational challenges that makes it difficult for them to execute their functions effectively and efficiently.

GMet was assigned moderately positive. Information is crucial and the bedrock of disaster risk reduction. Therefore, GMet disseminate information regarding weather conditions to critical stakeholders, especially, NADMO for the spread of it to the grassroots or local people for effective planning and adaptation. United Nations Office for Disaster Risk Reduction [UNDRR] (2021) indicated that "better information leads to better decisions". However, due to the breakdown of CREW PROJECT and poor information dissemination amongst the disaster response institutions, GMet was rated moderately because information on weather conditions and predictions of rainfall and other information do not reach the community people timely.

Criteria for evaluating policies and acts

In examining the contribution of policies and acts to disaster risk reduction integration into MTDPs of selected MMDAs was complemented with a set of indicators that were used to reduce the subjectivity and improve upon the objectivity of the intended evaluation. The indicators included efficiency, equity, technical feasibility, political viability and administrative operability. Efficiency was analysed as the direct cost used to execute the policy and opportunity cost of the policy. Other dimensions of efficiency were direct and indirect benefits derived from the policy.

Also, equity included horizontal equity, vertical equity, transitional and intergenerational equity. Technical feasibility was the next indicator. It included ex-ante and ex-post objectives achieved while consideration for political viability was based on the acceptability of the policy by actors or key

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stakeholders, how appropriate the objectives of the policy synchronised with the integration of DRR into development processes and the responsiveness. Moreover, political viability was also assessed to examine the legal frame and backing being used to support the policy. Lastly, administrative operability looked at logistics, staff capacity and cooperation between the agencies and departments.

All the indicators were evaluated based on a Likert scale of low, moderate and high in their roles in integrating disaster risk reduction into the MTDP of the various MMDAs. The policies and acts were seen as moderately supportive in integrating disaster risk reduction in the development planning processes of the MMDAs.

Table 7: Evaluation of the integration of DDR

Evaluation criteria	Policy	Acts				
	Land	NADMO	GNFS	NAS	EPA	Land Use
Efficiency	Moderate	High	High	High	High	Moderate
Cost of operation	High	High	High	High	High	Low
Opportunity cost	Low	High	Moderate	Moderate	Very low	Low
Direct benefits	High	High	High	High	Very low	Very high
Indirect benefits	High	High	High	High	Very high	High
Equity	Low	Low	High	High	Low	Moderate
Horizontal	High	High	Moderate	High	High	Very high
Vertical	Moderate	Very High	Very High	Moderate	High	Low
Transitional	Very Low	Low	Low	Moderate	High	Moderate
Intergenerational	Moderate	Moderate	Moderate	Moderate	High	High
Technical feasibility	Moderate	Moderate	Moderate	Moderate	High	High
Ex-ante	High	High	High	Moderate	Very high	Very high
Ex-post	Low	Low	Low	Low	Low	Low
Political viability	High	moderate	High	High	High	Moderate
Society acceptance	Low	High	High	High	Moderate	Low
Legal backing	Moderate	Very high	Very high	Very high	Very high	Very high
Administrative Operability	Low	Very Low	Very Low	Low	Low	Low
Logistics	Very low	Very Low	Very Low	moderate	Very low	Low
Capability of staff	Moderate	Low	moderate	moderate	Low	Very low
Cooperation	Moderate	moderate	moderate	moderate	Low	Low
Total Valuation	Low	moderate	moderate	moderate	Moderate	Moderate

Source: Opoku (2022)

NADMO Act, National Ambulance Act, Ghana National Fire Service Act, Land use and spatial Act and Environment Policy were in the moderate category while Land Policy was evaluated as low. Arriving at this value was based on the average of all values assigned to the indicators. The reasons for the values are explained per the sub-headings of the indicators for the evaluation.

Efficiency of Policies

Horizontally, the policies and acts cover all persons by protecting all lands (objective 4 of Land Policy). Per this horizontal equity was judged as high. Horizontal equity of the policy emanates from the democratic rule based on the 1992 Constitution of Ghana which respects all persons irrespective of ethnicity, religion and age. Horizontal equity is a common attribute of all United Nations countries because of the quest to protect human rights (Van der Auwera, 2014).

Vertical equity was relatively very high as the policy and acts give more attention to the disaster risk reduction. Especially, NADMO Act, EPA Act, and GNFS Act give high attention to DRR. In contrast, Land policy, Land Use and Spatial Planning Act and GAS Act give moderate attention to disaster risk reduction.

Transitional equity of policies and acts were in the very high and high categories, with reasons based on their objectives, implementation and approaches. Examples include implementation 4 approach 1 (forest reserves, strict nature parks, wildlife sanctuaries shall be fully protected).

The opportunity cost of these policies and acts are various uses to which government would have put the direct cost in elevating the country's

poverty and improving the standard of living of the citizenry. However, the opportunity cost is meagre for disaster risk reduction, because no government in the world would be able to manage disaster risk reduction without policies and agencies to execute the policies.

Also, if disasters are prevented or well managed, then the people will be better off economically, socially, environmentally as well as securing their lives and properties. The direct benefits of a policy should be very high together with the indirect benefits which are expected, essentially, to be high because of the ecosystem services and disaster risk reduction to the Greater Kumasi Area.

Equity of Policies

Horizontally, the policies and acts cover all persons by protecting all lives and properties (Objective of NADMO and Ghana Health Service and Teaching Hospitals Act and National Ambulance Service Act.). Horizontal equity was judged as high. Horizontal equity of the policy emanates from the democratic rule based on the 1992 Constitution of Ghana which respects all persons irrespective of ethnicity, religion and age. Horizontal equity is a common attribute of all United Nations countries because of the quest to protect human rights (Van der Auwera, 2014).

Transitional equity of policies and acts were in the very high and high categories. The Land Policy and Environmental Protection Act sometimes deprives its responsibilities. Also, intergenerational equity was very high as all the policies and acts sought to conserve land, lives and properties for current and future generations of Ghana. The Land Policy implementation and approach elaborate a clear indication of intergenerational equity. In totality,

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equity of the policies and acts to DRR is very low, confirming findings by Alagia (2014) which attest to low equity of formal government policies which disenfranchise community people.

Technical Feasibility

Technically, the focus was on ex-ante and ex-post factors of the policies and acts in disaster risk reduction. The ex-ante factor was very high for land policies and the acts. The Environmental Protection Agency's objectives which are to secure the environment and protect and improve its quality also record a high ex-ante. The Land Use and Spatial Planning Authority's objectives of ensuring the creation of appropriate zoning schemes with measures to prevent encroachments or breach of zoning schemes and controlling physical development in uncontrolled or less controlled but sensitive areas such as forest reserves, natural reserves, coastal wetlands, water bodies, water catchment areas, open spaces and public parks show the high ex-ante. However, ex-post scores assigned to the policies and acts were in the category of shallow, with reason being the inability of the policies and acts to achieve their set indicators.

The land market objective of the Land Policy has not been achieved. Greater Kumasi has the highest land market price with high demand from urban folks in the Ashanti region of Ghana. This has resulted in illegal land sales, racketeering and speculation. The emergence of the land guard phenomenon and land conflicts in Greater Kumasi are proof of the evil land market system. Therefore, people develop their buildings and others any how without permit over night before even the MMDAs and critical stakeholders are aware of it.

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Another technical defect of the land policy is that it states that structures on a land may be demolished at the developers' cost. The phrase, 'may be', does not give a convincing ability to implement and achieve the objective of destroying illegal structures; hence, it leaves it at the prerogative of the planner or district.

Lastly, Land Use and Spatial Planning Authority Act was enacted because previous town and country planning schemes were not binding and enforcing. But having waited for physical developments to reach their peak before an authoritative land scheme was implemented in 2016 means the act cannot achieve much. Cooperation among agencies is an integral part of achieving ex-post. However, the policies and acts on land and disaster management do not establish any type of cooperation beyond the statement in Land Use and Spatial Planning Authority should develop land use schemes. The Land Policy, National Ambulance, Ghana National Fire Service, environmental, NADMO and Land Use and Spatial Acts acknowledge the role of traditional authorities in integrating disaster risk reduction into development planning processes.

Political viability

Legal frames which give impetus to the policies and acts are the PNDC law 238 and Ghanaian Constitution of 1992. The fourth Republic Constitution of 1992 and PNDC Law 238 in 1990 established disaster management as an integral part for development of Ghana. The Environmental Pretention Agency Act 490 and Land Use and Spatial Planning Authority Act 925 give the legal backing for the environmental and land protection.

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Discussion

The study found that the policies and acts were moderately efficient in disaster risk reduction as well as integrating disaster risk reduction into development planning processes. Equity levels were moderate, technical feasibility was moderate and ex post was very low. Political viability was high for Environmental Protection Agency Act, Ghana National Fire Service Act, National Ambulance Service Act, NADMO Act, and Ghana Health Service and Teaching Hospitals Act. At the same time, Land Policy and Land Use and Spatial Planning Authority Acts were moderate due to their inability to provide a platform to harness or integrate DRR into development planning processes. Administrative operability was low due to inefficiency of agencies and commissions responsible to ensure that the policy and acts' objective are achieved were saddled with inadequate logistics, low staff capacity and cooperation challenges.

Comparing this evaluation to the DRR strategies, it came to bare that these acts and policy established the various key disaster response institutions. The responsibilities and duties of various institutions are enshrined in their respective acts and policy. The community members and key stakeholders accepted these institutions and their respective responsibilities and duties performed. These partly covers some strategies of DRR including; disaster preparedness, awareness creation, disaster knowledge and understanding of disaster risk, creation of disaster volunteer groups and clubs, setting goal and objectives for disaster risk planning, disaster response as well as monitoring and evaluation of disaster risk reduction. However, early warning system,

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implementation, funding, monitoring and evaluation of DRR is a significant challenge.

Based on the system theory as well as the conceptual framework, when different disaster response institutions play their roles as expected, with proper acts, policies and documentations enacted and implemented, there should be an effective integration of DRR into development planning processes to ensure that the environment or communities are resilience and sustained.

Chapter Summary

The chapter reviewed one government policy, thus, Land Policy and six acts (Land Use and Spatial Planning Act, Environmental Protection Act, Ghana National Fire Service Act, National Ambulance Service Act, NADMO Act, and Ghana Health Service and Teaching Hospitals Act). These policy and acts were selected due to their contribution to disaster risk reduction and its integration into the development planning process. The policy and acts were evaluated using the multi-criteria, thus, efficiency, equity, technical feasibility, political viability and administrative operability. The study concludes that the policy and acts were moderately efficient in disaster risk reduction as well as integrating disaster risk reduction into the development planning process. Equity levels were moderate, technical feasibility was moderate and ex-post was very low. Political viability was high for Environmental Protection Act, Ghana National Fire Service Act, National Ambulance Service Act, NADMO Act, and Ghana Health Service and Teaching Hospitals Act. At the same time, Land Policy and Land Use and Spatial Planning Acts were moderate due to their inability to provide platform to harness or integrate disaster risk reduction into development planning process. Administrative operability was

low due to inefficiency of agencies and commissions responsible to ensure that the policy and acts' objectives are achieved were saddled with inadequate logistics, low staff capacity and cooperation challenges.

CHAPTER SIX

COMMUNITY UNDERSTANDING OF RISK AND PARTICIPATION

IN DISASTER RISK REDUCTION

Introduction

There is a saying that "you cannot discuss about us without involving us," this contributes to the concept of community participation as defined by Abrams (2002) as "the theory that the local community should be given an active role in programs and improvements directly affecting it". Thus, it is essential to involve people or community in decision-making or matters that affect them. "Participation means the involvement of intended beneficiaries in the planning, design, implementation and subsequent maintenance of the development intervention. It means that people are mobilised, manage resources and make decisions that affect their lives" (Price & Mylius, 1991: p6).

To achieve the seven targets and four priorities of the Sendai framework by the end of 2030, which focuses on the prevention of new and reducing existing disaster risk, community participation cannot be overlooked. Therefore, one objective of the study was to examine the community participation regarding disaster risk reduction. Data were gathered from household heads regarding disaster risk reduction; demographic characteristics, knowledge on disaster risk reduction, and involvement or participation in the various stages of disaster risk management.

Demographics of the Respondents

This section considers the background information of the household heads. These included the sex, age, marital status, religious affiliations, educational status, occupational status, number of household size, average monthly income and number of years lived in the various communities in the selected MMDAs in Greater Kumasi Area. This information is presented in Table 8.

Table 8: Background Characteristics of the Respondents

Characteristics	Frequency	Percent
Sex		
Male	153	42.7
Female	205	57.3
Total	358	100
Age		
Below 20	56	15.6
20-29	87	24.3
30-39	56	15.6
40-49	72	20.1
50-59	46	12.8
60-69	34	9.5
70 and above	7	2
Total	358	100
Marital status		
Never married	144	40.2
Married	205	57.3
Divorced	5	1.4
Widowed	3	0.8
Co-habiting	1	0.3
Total	358	100
Religious affiliations		
Christian	276	77.1
Moslem	79	22.1
Traditionalist	3	0.8
Total	358	100
Educational status		
No formal education	61	17
Basic education	153	42.7
Secondary	115	32.1
Tertiary	29	8.1
Total	358	100

Table 8 Continued

Occupation		
Artisan	61	17
Trading	79	22.1
Farmer	15	4.2
Civil servant	22	6.2
Public servant	29	8.1
Security	6	1.7
Health personnel	12	3.4
Financial assistant	16	4.5
Driver	25	7
Student	52	14.5
Unemployed	41	11.5
Total	358	100
Number of persons in a household		
1-3	107	29.9
4-6	151	42.2
7-9	73	20.4
10 or more	27	7.5
Average monthly income		
0	19	5.3
Less than 500	198	55.3
500-999	85	23.7
1000-1499	26	7.3
1500-1999	21	5.9
2000-2499	5	1.4
2500-2999	2	0.6
3000 and above	2	0.6
Number of years lived in the community		
Less than a year	36	10.1
1-4 years	81	22.6
5-9 years	57	15.9
10 years and above	184	51.4
Total	358	100

Source: Field Data (Opoku, 2022)   N=358

Table 8 shows that out of the 358 respondents involved in the study, 153 respondents were males. This shows that a little beyond half of the respondents were females. Though, males dominate regarding household head, but in this study, females dominated because in the absence of the household heads, any adult person in the house was considered.

On age, the youth or working class dominated (261, 72.9%) in the study while few of the respondents were aged (7, 2%). On the other hand, 56

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of the respondents were below 20 years. These were mostly students who partook in the survey. Table 8 also considered the marital status of the respondents. It shows that more than half of the respondents were married. This shows that most of the respondents were married and were living together with their wives and children and issues regarding disaster management is concerned with them as compared to respondents who were single and can quickly evacuate during disaster.

Table 8 shows that 153 respondents had primary education, followed by 115 respondents who had secondary form of education. Also, a few (29, 8.1%) of the respondents have tertiary education whilst a more significant number of respondents had no formal education. It could be realised that majority of the respondents had formal education and therefore, could read and respond accordingly to the demands of the questionnaire. Also, they may have foreknowledge formally or informally regarding disaster risk reduction.

On religious affiliations, it was found the study was dominated by Christians, followed by Muslims and traditionalists. This conforms with the Ghana Statistical Service report on the religious information in the Ashanti region (GSS, 2021).

With regard to the occupational status of the respondents, it cut across almost all the facet of occupational traits that exist in the Ashanti region of Ghana. According to Table 8, a more significant proportion was involved in trading (79, 22.1%), followed by artisans (61, 17%), students (52, 14.5%) and public servants (29, 8.1%). On the other hand, unemployed respondents formed 11.5 percent whilst the least number of respondents were into farming and security services. Due to the urbanised nature of the MMDAs, more than

half of the respondents were actively involved in white collar job or office work as compared with those unemployed, artisans and farmers.

Looking at the experience of the community people, the number of years lived were considered. Table 8 shows that more than half of the respondents had stayed there for more than 10 years while 36 of the respondents had stayed for less than a year. It depicts that majority of respondents had stayed in the various communities of the MMDAs for long time (5 years or more) and therefore, were familiar with issues regarding disaster issues.

Regarding the number of persons in a household, thus, household size, Table 9 that 107 respondents had 1-3 household size, 151 respondents had 4-6 household size while 27 respondents had either 10 or more household size. It came to bear that majority of respondents have more than 3 household size and therefore struggled much with the incidence of disaster.

On the average monthly income of the respondents, Table 8 shows that a little beyond half of the respondents earned less than Gh 1000 while only few (2) of the respondents earned Gh 3000 and above. A more significant proportion of the respondents also earned either 1000-1499 (26, 7.3%) or 1500-1999 (21, 5.9%).

Understanding of Disaster Risk

Disaster risk refers to the probability of experiencing loss of life, injury, destruction, and damage resulting from a disaster within a specified timeframe. This priority of Sendai framework focuses on enhancing the understanding of disaster risk in all its dimensions, including the identification of hazards, vulnerabilities, and exposure of people and assets to those hazards

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(United Nations, 2015). Objective one sought to examine the understanding of households on disaster, disaster risk or vulnerability, awareness of risk factors and potential causes of disasters. Data were gathered on these variables and the results are presented subsequently in Figures and Tables.
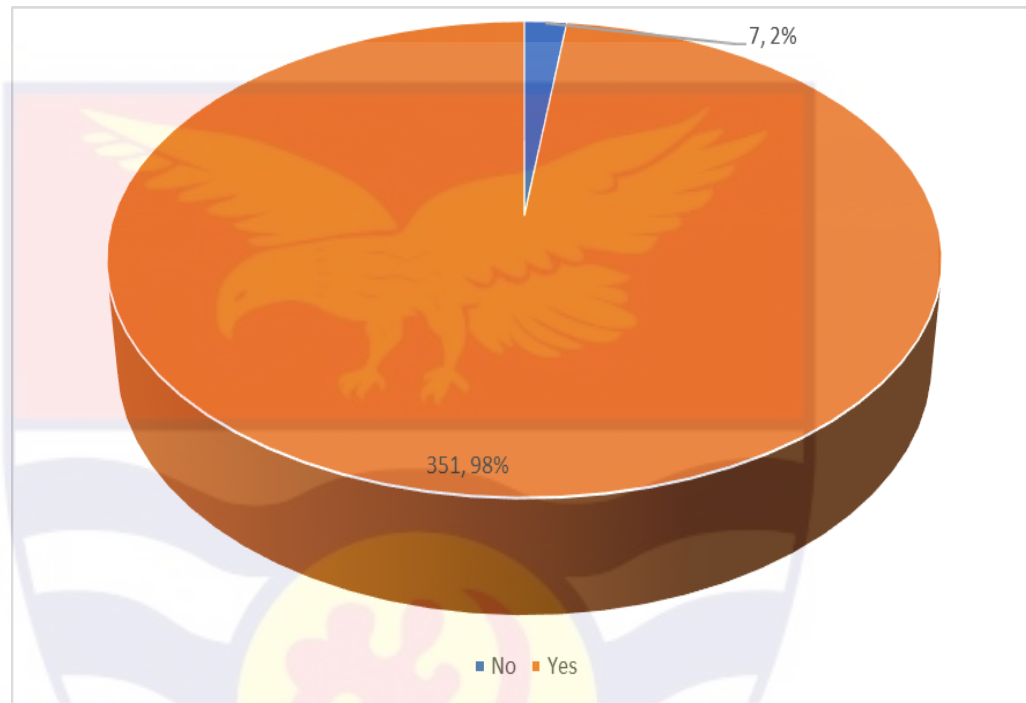
Figure 5: Respondents' experience with disaster
Source: Field Data (Opoku, 2022)

Figure 5 shows that about 98 percent of the respondents had experienced a disaster incidence before. Thus, majority of the respondents had experienced a disaster incidence before in their respective communities. Therefore, data were gathered from the respondents on the various types of disaster experience and the result is presented in Table 9.

Table 9: Types of disaster experienced by the Respondents

Type	Frequency	Percent
Fire	9	2.6
Floods	342	97.4
Total	351	100

Source: Field Data (Opoku, 2022)

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Amongst the respondents who had experienced a form of disaster incidence before, Table 10 shows that 342 had experienced floods whilst 9 of the respondents had experienced fire outbreak before. This shows that majority of the respondents had experienced floods as compared with those respondents who had experienced fire outbreak. It also came to light that most of the households did not experienced fire outbreak, however, the fire outbreak in Greater Kumasi commonly occurred in the public places such as market centers and stores among others.
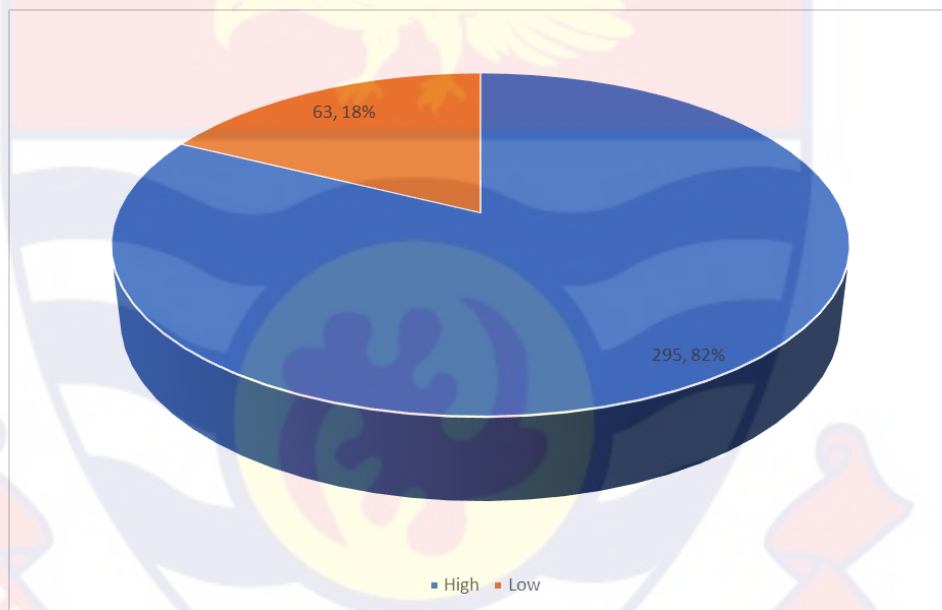
Figure 6: How risky/vulnerable is respondents to disaster
Source: Field Data (Opoku, 2022)

Figure 6 shows the level of risk perceived by the respondents about the disaster occurrences in their respective communities. It shows that majority (82%) of the respondents perceived that they were at a high risk or vulnerable to disaster. It implies that majority of the respondents were at a higher risk to disaster occurrences.

Data were gathered from the respondents on how frequent they experienced the type of disaster in their various respective communities and

the result is presented in Table 10. It shows that about 93 percent of the respondents indicated that they experienced disaster seasonally, followed by 20 respondents who experienced it annually whilst only 4 respondents experienced it quarterly.

Table 10: Frequency of disaster experience

	Frequency	Percent
Quarterly	4	1.1
Seasonal	334	93.3
Annually	20	5.6
Total	358	100

Source: Field Data (Opoku, 2022)

This shows that majority (93.3%) of the respondents experienced some form of disaster, thus, either fire outbreak or floods seasonally. For floods, it is commonly experienced in the raining season whilst fire outbreak was rampant during the dry season in Ghana.

Table 11: Concern of the respondents on disaster management in their community

Option	Frequency	Percent
Not concerned	14	3.9
Not very concerned	24	6.7
Somewhat concerned	33	9.2
Very concerned	287	80.2
Total	358	100

Source: Field Data (Opoku, 2022)

Table 11 shows that about 80.2 percent of the respondents were very concerned with disaster management in their respective communities,

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followed by 33 respondents who were somehow concerned whilst about 4 percent of the respondents were not concerned about the disaster management. This shows that majority of the respondents were very concerned about the disaster management in their respective communities knowing how risky they were.
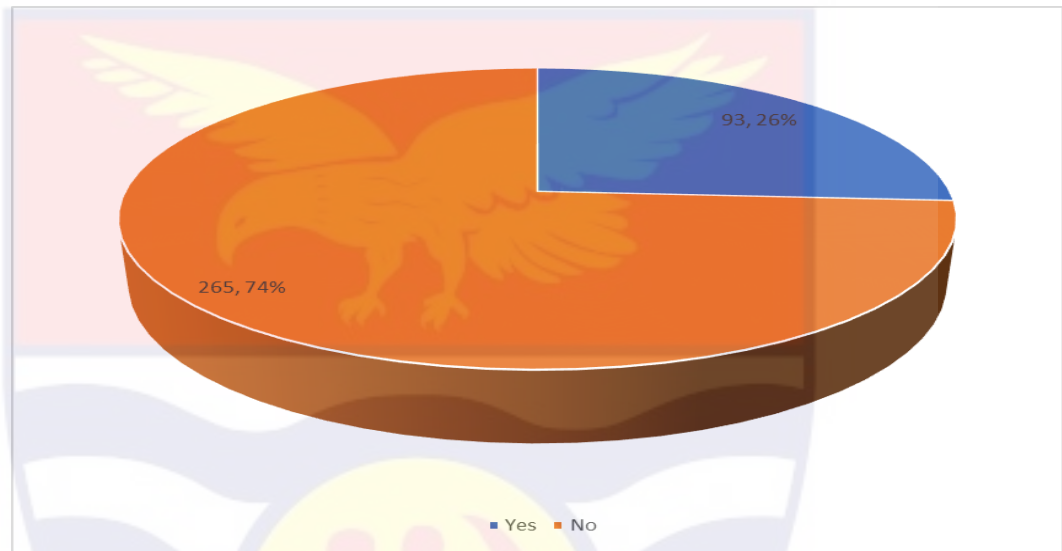
Figure 7: Respondents' awareness of disaster risk factors in their respective communities
Source: Field Data (Opoku, 2022)

As part of the indicators of understanding and knowledge about disaster risk, data were gathered from the respondents on their awareness of disaster risk factors in their respective communities and the result is presented in Figure 8. Figure 7 shows that about 74 percent of the respondents were aware of the disaster risk factors in their respective communities whilst few (26%) of the respondents were not aware.

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Table 12: Respondents views on the causes of disaster occurrences

Option	Frequency	Percent
construction of road	4	1.1
Poor electrical wiring	10	2.8
No bridge or gutter	14	3.9
No idea	17	13.1
Unstable power supply	20	5.6
Overflow of river banks	23	6.4
Poor settlement layout	25	7.0
Construction of bridge/converts	32	8.9
Indiscriminate waste disposal	40	11.2
Heavy downpour	42	11.7
Chocked gutters	131	36.6
Total	358	100.0

Source: Field Data (Opoku, 2022)

To confirm whether respondents were really aware of the risk factors of disaster in their respective communities, data were gathered from the respondents concerning the causes of disaster and the result is presented in Table 12. Table 12 shows that 131 (36.6%) of the respondents indicated that chocked gutters/small gutters were the leading causes of flooding, followed by 42 respondents who perceived heavy downpour/rainfall as the underlying factor causing flooding in their respective communities, 40 of the respondents indicated indiscriminate waste disposal whilst 17 of the respondents had no idea about the causes of disaster.

On the other hand, 20 of the respondents indicated that unstable power supply is the major causes of the fire outbreak in their respective communities and 10 respondents indicated poor electrical wiring of houses as the significant causes of fire outbreak.

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Community participation/involvement in the disaster risk reduction management of Greater Kumasi Area

In examining the community participation/involvement in the disaster risk reduction, this was examined at each of the disaster management cycle. The various disaster risk reduction cycles were categorised into: Disaster prevention and mitigation, disaster preparedness, disaster response, disaster rehabilitation and recovery and governance. The respondents were asked questions which they were to respond to based on a five-point Likert scale where 1= strongly disagree, 2= disagree, 3= neutral, 4= agree, 5= strongly agree. The responses between 1.0– 2.4 were concluded as Strongly Disagree, 2.5 - 2.9 as Disagree whilst 3.0 – 3.4 were concluded as "Undecided". Additionally, 3.5 – 4.4 were concluded as "Agreed" whilst 4.5 – 5.0 were concluded as "Strongly Agreed."

Disaster Prevention and Mitigation

This section examined respondents' perception on the things they do to prevent the occurrence of disasters as well as activities taken to lessen the impact of a possible disaster on both life and property caused by a potential hazard. Table 12 shows that 17.3 percent of the respondents agreed to the statement "I have been trained on how to prepare for a disaster" Thus, majority of the respondents disagreed (M=1.68, SD= 1.25) that they have been trained on how to prepare for a disaster. In addition, only 16.8 percent agreed that they have attended a first aid training before.

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Table 13: Disaster prevention and mitigation

Statements	% agreement	Mean	Std Dev
I have been trained on how to prepare for a disaster	62(17.3)	1.6788	1.25028
I have attended a first aid training	60(16.8)	1.6592	1.20738
I have participated in disaster or evacuation drill	48(13.4)	1.5810	1.12665
I have participated in a community or volunteer activity related to disaster preparedness or prevention	44(12.3)	1.53	1.091
I have been sensitised about disaster during its peak period	42(11.7)	1.55	1.062
I have emergency plans/flood insurance	37(10.3)	1.48	1.020
Overall		1.58	0.989

Source: Field Data (Opoku, 2022)

Also, the respondents disagreed to the notion that "they have participated in disaster or evacuation drill" (M=1.58, SD=1.3), "I have participated in a community or volunteer activity related to disaster preparedness or prevention" (M=1.53, SD=1.09), "I have been sensitised about disaster during its peak period" (M=1.55, SD=1.06), "I have emergency plans/flood insurance" (M=1.48, SD=1.02). Overall, respondents disagreed (M=1.58, SD=0.99) that they were either involved in decision making or participation regarding disaster prevention and mitigation.

Therefore, communities were not actively involved in decision making or participation in activities regarding disaster prevention and mitigation. Disaster prevention stage is vital to the disaster risk reduction, however, community people were neglected at this stage. The participation ladder model encourages community participation right from the bottom or the imitation of the project till the end of it.

Disaster Preparedness

This involves a set of actions or activities that are taken as precautionary measures in the advent of potential disasters. It is a crucial way of achieving goals in preventing and mitigating negative consequences of disaster occurrences. Data were gathered from the respondents on various statements under disaster preparedness and the result is presented in Table 14.

Table 14 presents on the various statements under disaster preparedness. It shows that 20.7 percent of the respondents agreed to the statement "Being prepared help my family and 1 during disaster or emergency" Thus, the respondents disagreed (M=1.80, SD= 1.36) that they have being prepare to help their family during disaster or emergency. Also, with storing of groceries, 13.4 percent of the respondents agreed to the statement "I have suppliers/things in my home that help during a disaster or emergency." Respondents living in disaster prone areas do not have some food stuff in their possessions to cater for them for some time during a disaster incidence.

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Table 14: Disaster Preparedness

Statements	f(%) agreement	Mean	Std Dev
Being prepared helps my family and 1 during disaster or emergency	74(20.7)	1.80	1.363
I have suppliers/things in my home that help during a disaster or emergency	48(13.4)	1.66	1.182
Our community has an early warning system	40(11.2)	1.59	1.103
Our community has a disaster response or emergency plan	41(11.5)	1.58	1.102
Our community members have been trained to assist others during disaster or emergency	42(11.7)	1.55	1.093
Our community has a disaster response team that decides what to do during a disaster or emergency	51(14.2)	1.6089	1.17305
Our community has an evacuation route	42(11.7)	1.5419	1.07280
Our community has shelter or open space identified where people can go to during a disaster or emergency	43(12)	1.5391	1.09359
We have a list of phone numbers or contacts to call during disaster	44(12.3)	1.51	1.068
We have a planned meeting place for the family during disaster	44(12.3)	1.56	1.126
Overall		1.59	0.996

Source: Field Data (Opoku, 2022)

Moreover, respondents disagreed (M=1.59, SD= 1.10) to the notion that "Our community has an early warning system." This includes mechanism put in place to send vital information regarding disaster to the community people in order for them to prepare themselves before the actual incidence of disaster or to update them when a disaster strikes. Therefore, not having them in place signals the inadequate communication between critical institutions responsible for disaster management and the various communities which rendered the various community in disaster prone areas very vulnerable.

Furthermore, respondents disagreed (M=1.59, SD= 1.10) to the notion that "Our community has a disaster response team that decides what to do during a disaster or emergency." Usually, some community members were being trained to respond to any disaster incidence or to inform appropriate response institutions when disaster strikes. It is believed that these people live in the community and are the first point of contact to assist in any disaster occurrences, however, due to poor motivational packages and management, there were no disaster response or rescue teams and even in communities where they existed, they were not vibrant or active. The current NADMO Act encourages the inauguration of Disaster Volunteer Groups (DVGs) in the various disaster-prone communities, however, this dream was not well achieved.

With regard to evacuation routes and shelter or open spaces to accommodate victims or community members during disaster incidents, respondents indicated that they do not have such provisions in their various communities. Thus, respondents disagreed (M=1.54, SD=1.07) to the notion that "Our community has an evacuation route." This dream is not materialised due to the poor settlement layout in some disaster-prone communities and urbanization of some communities. On the other hand, respondents disagreed (M=1.53, SD=1.09) to the statement that "Our community has shelter or open space identified where people can go to during a disaster or emergency." Even in communities where they did have these open spaces, they have been encroached.

With the first point of contact, respondents were asked whether they had some list of contacts to call during any disaster incidence, and the results

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suggested that only 44 (12.3%) of the respondents had some contacts of disaster response institutions. This results in community members wanting and worried about where to and how to contact these officers to come to their aid when a disaster occurs. It mostly rendered more community members contacting their assembly members before they could connect them to these appropriate institutions.

Overall, respondents disagreed (M=1.59, SD=0.99) to the statements concerning the involvement of community members in disaster preparedness. Disaster preparedness is critical to disaster risk reduction since it centered on issues regarding locating safe places in various homes, determining the best evacuation routes, being trained in first aid as well as informing household members on where to shut off utilities and assembly during a disaster strike. Therefore, when community members are not prepared with respect to these indicators, it renders them vulnerable.

Disaster Response

This included actions or activities undertaken directly after an incidence or disaster. Data were gathered on search and rescue efforts, evacuation, emergency health care, injury assessment, disaster assessments, registration of victims among others and the results were presented in Table 15.

Table 15: Disaster Response

Statements	f(%) agreement	Mean	Std Dev
Our community has a quick response team that come around when there is any disaster or emergency	33(9.2)	1.439	.988
My family and I were attended to during disaster incidence	29(8.1)	1.508	1.023
There is search and rescue operations during disaster event	29(8.1)	1.508	1.034
Assessment of disaster, its intensity, damage and loss are done during disaster occurrence	27(7.5)	1.441	.962
Registration of victims and provision of relief items during disaster occurrence	26(7.3)	1.449	.959
Our community has a shelter identified where people can go in the event of disaster	24(6.7)	1.422	0.967
Overall		1.46	0.857

Source: Field Data (Opoku, 2022)

Table 15 is an illustration of the responses gathered in relation to the disaster response of the respondents. With regards to the statement; 'Our community has a quick response team that come around when there is any disaster or emergency,' 33(9.2%) of the respondents agreed to it. However, respondents strongly disagreed (M=1.44, SD= 0.99) to this notion. This may be due to the fact that there are no disaster response teams in various communities and even in some communities where they existed, they were not vibrant or active and therefore, could not respond quickly to any disaster occurrences in the community. Respondents typically waited for the disaster response institutions to respond to them when there was a disaster. Respondents always complained that these institutions typically came in late

in some instances reported early were unprepared to rescue them from such disaster.

However, NADMO officials from Bosomtwe district and Asokore Mampong Municipal indicated that they had some community volunteers in various communities that they usually teamed up in search and rescuing of people and properties during a disaster occurrence. In view of this, the study identified some group of people in 'Sawaba' who were known by the community as a rescue team who helped community members during disaster occurrences such as flooding. Therefore, Table 15 shows that respondents indicated that there are inadequate search and rescue operations during disaster event and strongly disagreed (M=1.51, SD= 1.03) to this notion.

Assessment of disaster, its intensity, damage and loss were poorly done when there were incidence of disaster in various communities. At places, where they were done correctly, registration of victims and provision of relief items were politicised. Table 15 shows that respondents strongly disagreed to these statements: 'assessment of disaster, its intensity, damage and loss are done during disaster occurrence' (M=1.44, SD= 0.963), 'registration of victims and provision of relief items are done during disaster occurrence' (M=1.45, SD= 0.95). Nevertheless, these were among the major problems or challenges that the disaster risk reduction sought to avoid or address. When the community members are well informed and prepared before disaster strikes, the vulnerability and risk will be highly reduced. With little or no help, community people can bounce back to their livelihoods. NADMO officials confirmed that sharing of relief items was becoming a thing of the past unless there was a severe case that needed urgent attention. They indicated that they

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were now focused on prevention rather than responsive or sharing of relief items in order to reduce vulnerability and other matters related sharing of relief items and the cost involved.

Lastly, respondents strongly disagreed (M=1.42, SD= 0.97) to the statement; 'our community has a shelter identified where people can go in the event of disaster.' It shows that there are no reserve or designated places meant to cater for victims of disaster when it strikes. However, an interview with the regional disaster officials revealed that they usually relied on schools, churches, mosques and information centres as safe havens or shelter during disaster occurrences.

In summation, respondents strongly disagreed that they were involved in disaster response stage of the disaster risk reduction. This was due to the inadequate and inactive search and rescue teams in the various disaster-prone communities; disaster response teams were not quick in responding to disaster incidents; assessment of disaster was poorly done; and sharing of relief items was politicised.

Disaster Rehabilitation and Recovery

Data were gathered from respondents on activities undertaken to restore disaster victims and community members to normalcy and the result is presented in Table 16. Table 16 depicts how the community members were engaged in disaster rehabilitation and recovery activities of disaster risk reduction. With respect to the statement "Relief items are provided after a disaster occurrence", respondents strongly disagreed (M=1.40, SD= 0.87).

Table 16: Disaster Rehabilitation and Recovery

Statements	f(%) agreement	Mean	Std Dev
Relief items are provided after a disaster occurrence	22(6.1)	1.41	.87
Temporary shelter and rescue places are provided after a disaster incidence	29(8.1)	1.47	1.01
I have been involved in formulating disaster recovery plans	24(6.7)	1.43	.91
Counselling sessions are provided for victims after disaster occurrence	25(6.9)	1.45	.96
I received assistance from authorities after disaster occurrence	24(6.7)	1.39	.89
I received financial assistance after disaster occurrence	21(5.9)	1.35	.856
Overall		1.42	0.86

Source: Field Data (Opoku, 2022)

An interview with a NADMO official revealed that they were living up to their mandate, which is prevention rather than giving out relief items as the society had tagged them as their only responsibilities. This is a quote from him:

> *"Our purpose is to prevent the disasters from happening so we consider the latter part of the recovery and not giving the relief items to people but we consider trying to rebuild again making the person know why the disaster came and what the person and NADMO as the people can do together to prevent that disaster. That is what we always try to do so we consider the latter part of the recovery. The first part as I am saying, it comes because we think at that point you need it so once we are*

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able to bring the person back it is like give the person some comfort. It does not happen like as soon as disaster strikes. It takes some time before we will come back to you to make you know why these things happen and why we have to go back to the mitigation" (NADMO officer).

In addition, only 8.1 percent agreed that they were provided with shelter and rescue places after a disaster incidence whilst majority of the respondents strongly disagreed to this notion (M=1.47, SD= 1.01). Regarding temporary shelter or rescue place, respondents disagreed to the notion that they were provided with such things. However, an interview with the regional representative of NADMO revealed that, they usually hosted them in schools, churches, mosques among others.

"We do not have designated places or tents to mount for safe heavens or rescue purposes, but Ghanaians are kind people so normally you can even get people taking you into their homes so normally we ask "since the disaster happened, where have you been staying?" and he/she will respond "I have been staying at friend's place". So when we ask and still find out you do not have any place to stay then we will take you to our safe havens. So, we will take you to a school, church or any other place. Yes, normally we rely on the chiefs and assembly members in those communities to find us the safe havens and yes, it could be anywhere. We have situations the chiefs themselves cater for the affected persons in their palaces" (NADMO officer).

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Also, respondents strongly disagreed to these statements; "I have been involved in formulating disaster recovery plans", "counseling sessions are provided for victims after disaster occurrence" (M=1.45, SD= 0.96), "I received assistance from authorities after disaster occurrence" (M=1.39, SD= 0.89), "I received financial assistance after disaster occurrence" (M=1.35, SD= 0.86).

Overall, respondents strongly disagreed that their community members or leadership were involved in disaster risk reduction, especially, at the disaster rehabilitation and recovery stage. This may be due to the neglect of the community leaders in disaster rehabilitation and recovery plans; inadequate assistance by authorities to the victims after disaster incidents and sharing of relief items being politicised. On the other hand, in an interview, a NADMO regional rep had this to say:

> "No, people only come here when have an issue or there is a disaster. Their perceptions for coming to our offices are usually wrong. They assume when there is a disaster NADMO must provide some relief for them so you will find some people walking into our offices to collect items like rice and when they do not receive it, it becomes an issue. The media compound this, because they do not know it is not our duty to give out mattresses, rice among others but our core mandate is to prevent the disasters from happening. People have ever walked into our office to demand for cements and iron rods all because an assembly member may have used that as a campaign promise but if the individual had heard on the radio the exact

role of NADMO, the narrative would have been different. Again, our political parties also champion this perception, for example, at Dagomba line in Asokore Mampong. NADMO was fighting to relocate that settlement. Unfortunately, there was a fire out break and we saw that an opportunity to resettle the people since it had become difficult relocating them, however, before we could realise politicians loaded buses and trucks with food items, cement and iron rods to give to these people to rebuild. Therefore, these things arguably affect our work drastically. A similar thing happened at Santasi TUC."

Governance

This section examined respondents' views on the availability of systems and structures, mechanisms and legal framework to guide, coordinate and oversee DRR. Table 17 is an illustration of the responses gathered in relation to the disaster governance.

With regard to the statement; "Our community members/unit committees are involved in planning or coordinating with MMDAs on disaster", 36(10.1%) of the respondents agreed to it. However, respondents strongly disagreed (M=1.46, SD= 0.98) to this notion. Also, respondents strongly disagreed (M=1.53, SD= 0.91) to the statement; "Our community has benefited from government previous programmes or activities related to reducing risk or vulnerability during disaster".

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Table 17: Governance

Statements	f(%) agreement	Mean	Std Dev
Our community members/unit committees are involved in planning or coordinating with MMDAs on disaster	36(10.1)	1.47	.98
Our community has benefited from government previous programmes or activities related to DRR	23(6.4)	1.53	.91
Community members/unit committees are involved in implementation of disaster plans	28(7.8)	1.47	.960
Our community members/unit committees are involved in monitoring and evaluation of activities or projects related to disaster risk reduction management	36(10.1)	1.49	1.04
Overall		1.49	0.87

Source: Field Data (Opoku, 2022)

Moreover, respondents strongly disagreed (M=1.47, SD= 0.96) to the statement; 'Our community members/unit committees are involved in implementation of disaster plans.' Furthermore, on monitoring and evaluation of activities related to disaster risk reduction, only 10.1 percent of the respondents agreed that their community members/unit committee are involved in such exercise. This shows that majority of the respondents perceived neglect of their community leaders regarding monitoring and evaluation of projects related to disaster risk reduction managements.

In a nut shell, Table 17 shows that respondents were not actively involved in decision-making processes regarding the governance of disaster management. Respondents perceived the neglect of their community leaders in various stages concerning the governance of projects and activities related to disaster risk reduction.

An interview with an assembly member revealed that the project to curb flooding and fire outbreak from occurring in the various communities was beyond the community strength. To him, the cost involved in such project was also huge that the community could not bear it themselves.

> *"the assembly involve us in their project by just informing us that they are coming to do this or that. For instance, they are coming to dredge the 'Sisala stream' so they have informed us about it and when they will start. That is all. This is because my community people cannot do communal labour to dredge that stream, it is beyond their strength and demands big machines and huge money to do that" (IDI, Assemblyman, 45 years).*

However, interview with the various MMDAs planning officers indicated that the assembly goes typically to each and every area councils to solicit data regarding their developmental challenges and needs and these needs were prioritise and harmonised to prepare the 'Medium Term Development Plan' which is meant for the MMDAs. According to a development planning officer

> *"the planning unit normally go to the various community to gather data from them concerning their developmental challenges and needs. This is done in the various area and urban councils formed by the assembly members, unit committee members, key stakeholders and individuals for development and traditional authorities. We do this exercise every four years in order to prepare for the 'Medium Term Development Plan' of which our annual action plans are*

teased out from. Aside this process, if there is any critical need or emergency situation in an area or a community led programme, the assembly can add it up to its projects and support the community to carry out such project or activities. So we normally involve the community people through their leadership as I have explained earlier."

Discussion

It was revealed that majority (98%) of the respondents have experience some form of a disaster (floods or fire outbreak) incidence before in their respective communities. For floods, it was usually experienced in the raining season whilst fire outbreak was rampant during the dry season in Ghana. Most of the households did not experience fire outbreak, however, the fire outbreak in Greater Kumasi commonly occurred in the public places such as market centers, stores among others. About 82 percent of the respondents perceived that they were at a higher risk or vulnerable to disaster whilst a few (18%) of the respondents perceived it to be low. About 80.2 percent of the respondents were very concerned about the disaster management and about 74 percent of the respondents were aware of the disaster risk factors in their respective communities whilst a few (26%) of the respondents were not aware.

Moreover, 131 (36.6%) of the respondents indicated that chocked gutters/small gutters were the leading causes of flooding, followed by 42 respondents who perceived heavy downpour/rainfall as the underlying factor causing flooding in their respective communities. Forty of the respondents indicated indiscriminate waste disposal whilst 17 of the respondents had no idea about the causes of disaster. On the other hand, 20 of the respondents

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indicated that unstable power supply was the primary cause of the fire outbreak in their respective communities and 10 respondents identified poor electrical wiring of houses as the major cause of fire outbreak.

Therefore, it was revealed that the respondents were aware of disaster risk and its causes. This finding is similar to a study conducted in Nyando district in Western Kenya. The study examined community perceptions and response to flood risk in Nyando and found that the residents of Nyando district had a high level of awareness regarding flood risks and recognised the potential causes of it. Similarly, Greening et al. (1996) examined adolescents' perceived risk and personal experience with natural disasters and found that adolescents were highly aware of disaster risk. They further indicated that adolescents' perception of risk were influenced by their personal experiences with disasters.

In examining the community participation/involvement in the DRR, the community involvement or participation were examined at each of the stages of the disaster risk reduction. The various disaster risk reduction strategies were categorised into: Disaster prevention and mitigation, disaster preparedness, disaster response, disaster rehabilitation and recovery and governance. It was revealed that majority of the respondents had not been trained on how to prepare for disaster; they had not attended a first aid training before; they had not participated in disaster or evacuation drills; they had not participated in a community or volunteer activity related to disaster preparedness or prevention; they did not have emergency plans/flood insurance and; they were not either involved in decision making or participation regarding disaster prevention and mitigation. Therefore,

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communities were not actively involved in decision making or participation in activities regarding disaster prevention and mitigation. Disaster prevention stage is key to the DRR, however, community members were neglected at this stage. The participation ladder encourages community participation right from the bottom of the project till the end of it.

On disaster preparedness, the respondents disagreed that they have been prepared to help their family during disaster or emergency; 13.4 percent of the respondents agreed to the statement "I have suppliers/things in my home that help during a disaster or emergency." Moreover, respondents disagreed to the notion that "Our community has an early warning system." Therefore, not having them in place signals the inadequate communication between key institutions responsible for disaster management and the various communities which rendered the various community in disaster prone areas very vulnerable.

Furthermore, respondents disagreed to the notion that "Our community has a disaster response team that decides what to do during some disaster or emergency." With regards to evacuation routes and shelter or open spaces to accommodate victims or during disaster incidents, respondents indicated that they did not have such provisions in their various communities. In addition, respondents disagreed to the statement that "Our community has shelter or open space identified where people can go to during a disaster or emergency."

With the first point of contact, respondents were asked whether they have some list of contacts to call during any disaster incidence, and the results suggested that only 44 (12.3%) of the respondents had some contacts of disaster response institutions. Overall, respondents disagreed to the statements concerning the involvement of community members in disaster preparedness.

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Disaster preparedness is key to disaster risk reduction since it centered on issues regarding locating safe place in various homes, determining the best evacuation routes, being trained in first aid as well as informing household members on where to shut off utilities and assembly during disaster strike. Therefore, when community members are not prepared with respect to these indicators, it renders them vulnerable.

Concerning disaster response stage, respondents strongly disagreed that they were involved in disaster response stage of the disaster risk reduction. This was due to the inadequate and inactive search and rescue teams in the various disaster prone communities; disaster response teams were not quick in responding to disaster incidents; assessment of disaster was poorly done; and sharing of relief items was politicised.

On disaster rehabilitation and recovery, most of the respondents strongly disagreed that their community members or leadership is involved in disaster risk reduction, especially, at the disaster rehabilitation and recovery stage due to inadequate assistance by authorities to the victims after disaster incidents and sharing of relief items being politicised.

With regard to the risk governance, majority of the respondents perceived neglection of their community leaders regarding planning, monitoring and evaluation of projects related to disaster risk reduction managements. Respondents perceived the neglect of their community leaders in various stages concerning the governance of projects and activities related to disaster risk reduction.

Chapter Summary

As part of objective one, it sought to examine the understanding of households on disaster, disaster risk or vulnerability, awareness of risk factors and potential causes of disasters. In addition, the section explores the community participation of the respondents regarding the various strategies and activities of disaster risk reduction. Frequencies, percentages, means and standard deviation were used to examine these variables. The study found that the respondents were aware of disaster and understood disaster risk. Most of the respondents were familiar with the causes of disaster in their localities. Despite their knowledge on disaster risk, they were partly involved in the disaster risk reduction processes to ensure effective integration of DRR into development planning processes.
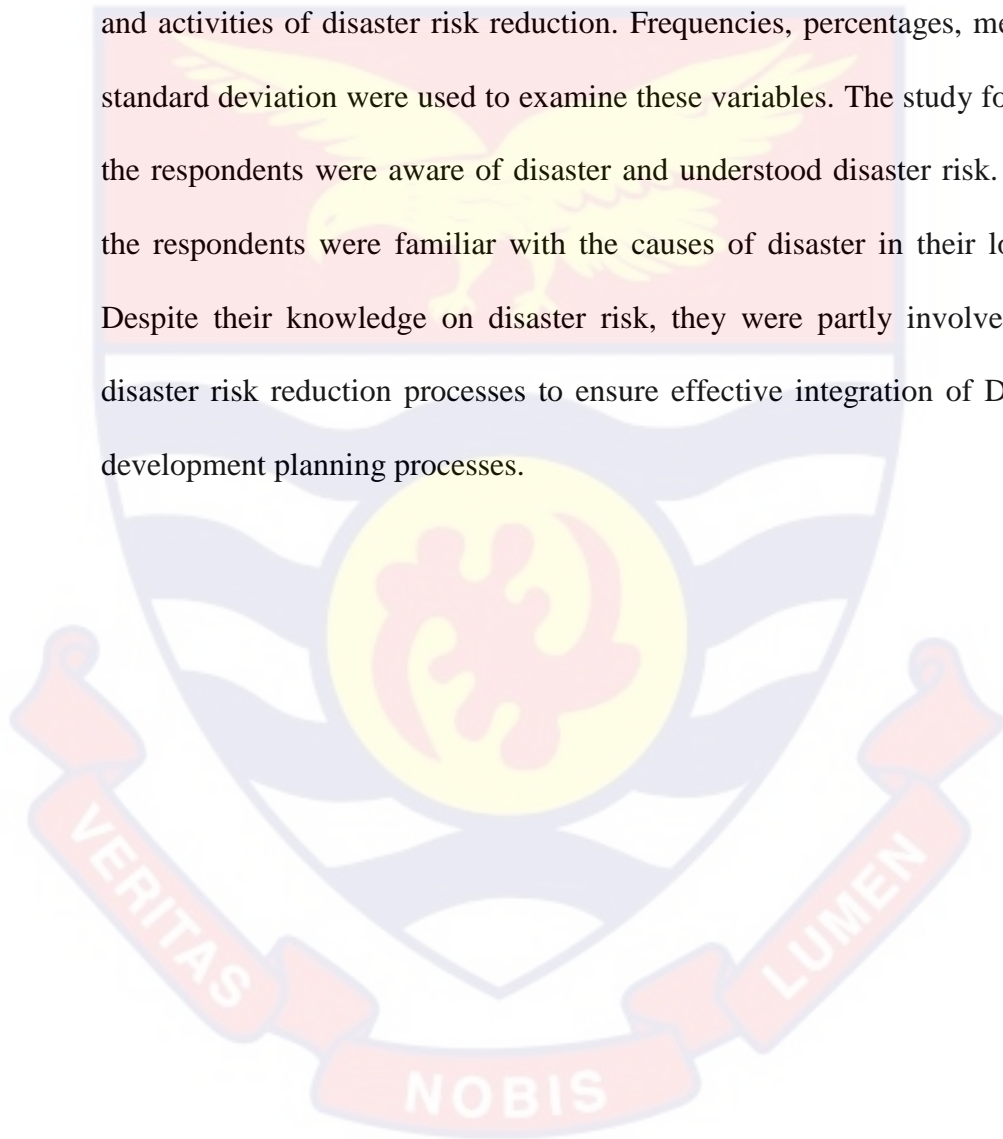
CHAPTER SEVEN

ROLES AND RESPONSIBILITIES OF VARIOUS RESPONSE

INSTITUTIONS IN DISASTER RISK REDUCTION

Introduction

Many organisations interplay in disaster management. For effective and efficient disaster management, every organisation or institution has a role to play for its success. Therefore, this chapter focuses on the roles and responsibilities of the various response institutions in disaster risk reduction management. Data were gathered from in-depth interviews with participants of respective institutions as well as policies, acts, documents and, academic literature. The roles and responsibilities of these institutions are discussed in detailed in the subsequent sub-headings.

National Disaster Management Organisation (NADMO)

The National Disaster Management Organisation (NDMO) was established to serve as a central point of contact for disaster and emergency management in the country. It is mandated by the organisation's charter to provide relief aid in any place, and as a result, the organisation has regional, Metropolitan/Municipal, District and zonal offices. NADMO has a new Act 2016 (Act 927) that moves NADMO from being a reactive organisation to a proactive one after twenty years of operation. "The object of the Organisation is to manage disasters and similar emergencies and to develop the capacity of communities to respond effectively to disasters and emergencies." Moreover, this Act 2016 (Act 927) grants permission to the organisation to co-ordinate, collaborate with communities and relevant institutions in prevention,

mitigation, preparedness and monitoring of disaster and climate change related activities at the district, regional and national level of development:

"NADMO as our motor says "prevention pays" we considered everybody to be part of our stakeholders besides that we have our major stakeholders that we work with. When it comes to fire, we team up with the Ghana National Fire Service, the Ghana Health Service, the Military, the Police to curb fire situations and because it is fire, electrical items may be involved so we also team up with Electricity Company of Ghana [ECG] (NADMO officer).

Other Responsive Organisations

The Ghana Police Service (GPS)

The Ghana Police Service is a collaborating organisation of the National Disaster Management Organisation. They cordon off the disaster area (secure the place and prevent people from tempering with the scene), control and direct traffic and sometimes set up safety zones around the disaster area to prevent pilfering and further damage to lives and property. They set up on-scene police command post, arrest and detain intruders. In an interview session, officials at the public relation office at the Police Headquarters in Kumasi stated that:

"the Police is called upon in almost all disaster situations except for extreme situations when the Military is called for instance the Melcom Disaster situation and during central market fire outbreak. Also, the military are involved when it is about ammunitions or missiles. Randomly, the police go to

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radio to inform the people about disaster and how to comport themselves in such situations. However, sometimes, some universities also bring request for such training or information and we deliver" (IDI, GPS officer, 38 years).

"Normally, we do investigations after the disaster strikes and make recommendations after the investigation. Police are always the first people to be at the scene, when we get to the scene, we call other related organisations to assist. Practically, we rescue people from the disaster. Moreover, when it comes to the explosives, it is the work of the military. We fall on the military when there is explosives or maybe when our numbers are not overstretched based on the magnitude of the disaster. We call upon the military" (IDI, GPS officer, 38 years).

He further added that:

"In the rehabilitation and recovery stage, we continue to provide security to the victims that were rendered homeless in their new havens until they are rehabilitated or are sent back to their various homes or new apartment. We assist in investigation to identify the root cause of the disaster and other relevant information." (IDI, GPS officer, 38 years).

The Ghana National Fire Service (GNFS)

NADMO counts the Ghana National Fire Service as one of its many partners. By coordinating the country's fire and rescue services, the institution aids in disaster management. They evaluate and assess the whole spectrum of anticipated fire and rescue-related dangers that societies confront, perform

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prevention and protection activities such as fire education and simulation exercises and respond to incidents in a suitable manner. Ghana's National Fire Service was created out of "the then fragmented Railways, Ports and Harbours, Accra City, Kumasi City, and the Sekondi/Takoradi Municipal Fire Brigades" in 1963 by the Ghana National Fire Service Act (Act 219). This replaced the "Asafo Companies" that were established by the traditional authorities. "The primary aim of the Ghana National Fire Service at its establishment in 1963 by Act 219 was firefighting and extinguishment, and to render humanitarian services."

Following that, the Ghana National Fire Service Act (Act 537) was adopted in 1997 to re-establish the Ghana National Fire Service with the goal of preventing and managing unwanted fires, as well as other connected concerns, with a broader mission. The goal of Act 537 was to broaden the GNFS's responsibilities, taking into account current developments in fire services around the world, from firefighting to fire prevention and safety. The Ghana National Fire Service focuses more on catastrophe response than community preparedness and readiness when it comes to allocating its technical resources.

The Ghana Red Cross Society (GRS)

The Ghana Red Cross Society (GRS) is a humanitarian organisation. If there is a humanitarian crisis, the Red Cross steps in to help the government. The Ghana Red Cross Society was established by an Act of Parliament in Ghana. Specifically, it was established by the Ghana Red Cross Society Act, 1958 (No. 10). This Act provides the legal framework for the operation of the Society within Ghana, granting it the authority to carry out its humanitarian

missions in alignment with the principles of the International Red Cross and Red Crescent Movement. Food security is a major focus of the organisation, which helps farmers to produce on a huge scale. The Ghana Red Cross Society provides emergency first aid to those in need whilst they wait for more serious medical attention at the country's hospitals. According to a Ghana Red Cross officer, they establish first aid teams in the various communities to attend to victims whenever there is a disaster incidence.

The GRS has regional and district response teams that locate and treat those who have been hurt or are in need of medical attention. As soon as that is done, they begin a fast evaluation. The Disaster Management Department focuses mainly on activities "to minimise vulnerabilities and disaster risks and limit the adverse impact of hazards" through executing their programmes on "disaster preparedness, disaster response, food security, restoring family links, and refugee movement."

The study revealed that Ghana Red Cross Society (GRS) was to set up first aid response teams in the various communities, especially, among the disaster-prone areas in the country so they could respond to victims during a disaster incidence. In an interview with a GRS officer, he confirmed that their main priority is to provide first aid to victims of disaster by saying that; "our responsibility is to train local people in the various community how to give out first aid to victims when disaster occurs."

The Ghana Health Service (GHS)

The Ghana Health Service is an autonomous organisation established under Act 525 of 1996 to provide fair, efficient, accessible and responsive health care systems to citizens. The Ghana Health Service supports response

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and relief efforts by providing cure to disaster victims during a crisis. The institution declares emergencies in hospitals and dispatch medical teams to a disaster location or scene. The institution also collaborates with the Disease and Epidermic department of NADMO by providing public education and awareness on post flood related health issues. Moreover, they are to manage resources available effectively and efficiently to provide quality health services to disaster victims.

United Nations Development Programme (UNDP)

The UNDP works with government and persons across all levels of the society to transform development, eradicate poverty and reduce inequality, strengthen governance and peace building and support climate and disaster resilience. For instance, with funding from the Norwegian Government in 2013, the National Disaster Management Organisation together with the UNDP started the Community Resilience through Early Warning (CREW) Project. The project was aimed at building capacities in the country to lessen disaster risk by establishing an integrated early warning system that is systematic and people-centered. The UNDP also, in partnership with NADMO, inaugurated a new short course that seeks to enhance the abilities of public officers involved in disaster risk management and guarantee its mainstreaming in the development process (UNDP, 2016). It is essentially the UN coordinating agency responsible for disaster risk management within the UN system.

The CREW project also took place in the greater Kumasi area, however, due to sustainability issues, the project stalled with all its gadget and

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devices installed but not working. The following are quotations from an interview with a NADMO officer:

> *"When it comes to flooding or rainstorm, you see the seasons we do not wait for the meteorological agency to let us know it is about to rain. We always make sure we are ahead of the situation, so when we know maybe when it gets to the season when the rains will come, we make sure before it gets to the rainy season, we do lots of these educations for people to understand the situation and one other role we have taken seriously is NADMO teamed-up with the Norwegian embassy. They were able to provide us with an app. It is called CREW that is the abbreviation, we term it the CREW (Community Resilience through Early Warning) project and we teamed-up with the Norwegian Embassy, thus, the German Technical Organisation [GIZ]. This app is able to provide us information whether the rains will be heavy or it is not going to be heavy. So once we get the alert that the rains in the clouds are going to be heavy rains, NADMO since everybody is a stakeholder when we go to the communities we have disaster volunteer groups. They are in the community so once we get this information all that we do is that we relay this information to these people in the community. They also relay the information to the assembly members in the community. They also move ahead to let the people in the community know the situation at hand (IDI, NADMO officer, 48 years).*

This shows that the UNDP has been supportive regarding disaster risk reduction by providing capacity training as well as equipment to improve upon early warning system in the Greater Kumasi Area. However, maintenance and continuity of these training is a challenge.

National Ambulance Services (NAS)

The National Ambulance Service is a collaborating organisation in disaster management in Ghana. The National Ambulance Service was established on the 29th December, 2020 by the Act 2020 (Act, 1041). The "object of the service is to provide for the effective administration and management of emergency care services nationwide." The Service was established to offer proficient and timely pre-hospital emergency medical care to sick and injured persons and subsequently transport them safely to health centres. They ensure the provision of timely emergency care services for persons involved in accidents, disasters and any other related emergencies. In disaster situations, the services administer first aid to disaster victims and help to evacuate these persons from the disaster scene to selected medical facilities. In addition, NAS provide medical aid to victims of disaster before handling it over to the health personnel in the various health care centres. An interview with an official from ambulance service revealed that always, they were the first people to reach the scene since most community members called their hot lines. Then they called the respective organisations depending on the type of disaster or incidence.

> *"When we get to the scene and we see that the thing is not safe,*
>
> *for example; 1. people have been trapped in a vehicle, then we*
>
> *call the fire service because they have the gadget to extricate,*

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2. When the scene is not safe for example armed robbers or where there is fire, gun shots and things, then, we call the police people. Then they too come. We see that Ghana, we have fire, ambulance and the police. And again, let's say you are being called to a scene and there is chemical, then we call those people who are in charge of controlling the fumigation and things, thus, the Environmental officers." (IDI, NAS officer, 33 years).

Ghana Meteorological Services

The Ghana Meteorological Agency exist to offer valuable and consistent information by collecting, processing, storing, analysing and disseminating findings to end users such as the general public and other organisations. The Department in collaboration with NADMO provides cost effective weather and climate services by disseminating information to support socioeconomic growth of the country with special regard to the protection of lives and property as well as the environment (Ghana Meteorological Agency Website, 2016). To fulfill its mandate, information dissemination is done through the local radio stations using local dialects to reach many audiences. Currently, the Ghana Meteorological Agency used to spread valuable information regarding the forthcoming of rain, type and intensity amongst others on the national television as well as through various social media handlers.

"We take daily readings of the weather elements in our various weather stations, then we process it, send it to our main office in Accra to finally process it and bring us feedback to

disseminate to the general public. When we have the information from the headquarters, we have officers that go on television and radio stations to disseminate the information to the general public. Moreover, we have social media platforms that we spread information to various agencies and department that we collaborate with, including NADMO and Information Service Department of the various MMDAs" [IDI, GMet officer, 28 years].

Preparedness and Organisational linkages in roles

Understanding disaster hazard is important for instance, knowing risk assessment, risk mapping, and early warning systems in order to reduce impact through coordination with all relevant agencies. Simulation exercises are done in collaboration with other Organisations. Respective organisations occasionally organise floats in their specialty to create awareness on disaster issues. When asked about frequency in conducting simulation exercises, participants from the Ghana National Fire Service responded in the affirmative, however, they mentioned that such exercises were usually done at the request of companies.

Normally, the was good relationship between the MMDAs and other related organisations that they deal directly with such as NADMO, GHS, EPA, GPS, TA and GNFS. Therefore, the was strong relationship between the various MMDAs in Greater Kumasi Area and NADMO, EPA, Traditional Authorities (TA) and GNFS. However, data gathered shows that there were poor relationship amongst organisations such as Red Cross, EPA, Ghana Ambulance Service (GAS), TA and GPS.

Table 18: Relationship amongst Disaster Risk Reduction Institutions

	MMDAs	NADMO	GNFS	TA	GPS	GAS	RC	GHS	EPA
MMDAs									
NADMO	S								
GNFS	S	N							
TA	S	S	F						
GPS	S	S	S	VW					
GAS	S	F	F	VW	W				
Red Cross	F	W	W	VW	W	W			
GHS	S	S	S	F	W	S	F		
EPA	S	S	W	VW	VW	VW	VW	VW	

Note: (VERY STRONG (VS), STRONG(S), NEUTRAL(N), FAIR(F), WEAK(W), VERY WEAK(VW))

In an interview with a NADMO official, he posited:

"When there is flooding, we do not call the ambulance service. Sometimes the reason we don't call them is when it rains heavily even if you call them, they can't reach the situation where we are but we usually call them. Because most of the streets around are all flooded; the car cannot cross them. So the fire service usually manoeuvres their way and get there. Here at Asokore-Manpong, we don't have ambulance station. We have fire service that are very closer to us; Manhyia fire, we have the KNUST fire. So KNUST can manoeuvre their way to the municipality. But we do not have ambulance. So that is why our first sector of contacts are the police and the fire services so that they would support us quickly to make sure we wouldn't even have casualties".

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Overlap and Gap of Roles and Duties

Functions and activities of most disaster management organisations seem to overlap which often results in conflict situations regarding which appropriate organisation to handle specific issues. A NADMO officer complained, "most at times, Environmental Health Officers accuse as us taking over their job, Fire service officers accuse us of interfering with their responsibility, Works department also accuse us of interfering with their jobs, this problem affects the effective discharge of our duties". Most of these institutions above have overlapping roles in the different phases of disaster management.

Findings revealed that the capacity of staff of civilian organisation was not sufficiently enhanced to enable them effectively handle crises in the country. Also, there were conflicting roles between Ghana Ambulance Service and Ghana Red Cross since they all provided first aid services to victims. Sometimes, the decision had to be as where should the Ghana Red Cross hand over to the Ghana Ambulance Service and where should they work together or hand-in-hand. Moreover, with the security services, similar conflicting roles were seen as to when should they involve the Ghana Police Service and or Military personnel and where should one hand over to the other. In an interview with an ambulance service official, he noted:

> *"In Ghana, the emergency system has been limited to: When it came to EMT side, they have first respondent which is the First Aiders; for example, like red-cross, then EMT's will be second, then paramedics will be the third. But in Ghana, everything has been capitated to the EMT. The emergency system is first*

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respondent, second respondent, and the third respondent. First

respondent is the red-cross people, for example you can be

taught on how to save people but with not much equipment but

you would know the "A, B, C, D" of saving people. That is the

first respondent. Then the second respondent is a EMT like me.

Then the third respondent would be the paramedic". The

paramedics are more into, for example, more than doctors

because they do intubation and things inside the ambulance. So

they are the third respondents. It is not every case that they will

respond and it is not every case that EMT's will respond but in

Ghana, everything has been subjected to the second people

which is the EMT's. So we respond the first respondent, the

second respondent, and the third respondent" (IDI, NAS

officer, 28 years).

Mechanisms for Coordination

Institutional and Legal Frameworks

As previously stated in the literature, institutional frameworks exist
and define the mechanisms by which disaster management organisations
should operate with regard to disaster management in the nation. The
NADMO Act of 2016 (Act 927) gave NADMO the responsibility of
coordinating national emergency management initiatives. In order to
accomplish effective disaster management in Ghana, subsequent policy
documents were developed. The findings disclose, however, that
implementation obstacles have impeded the effective realisation of these
policy documents' objectives. In accordance with the requirements of the new

law (Act 927), NADMO is implementing measures to assist operationalise its National Contingency Plan. When it comes to disaster management, each organisation has its method of operation.

The Environmental Protection Agency (EPA) Act of 1994, Act 490, the Ghana Ambulance Service Act of 2020 (Act 1041), the Ghana National Fire Service Act of 1997, Act 537, and the Land use and Spatial Planning Authority Act of 2016 are all legal frameworks enacted by the government to prevent and mitigate the effects of natural disasters. Reduction of disaster risk is a focal point of coordinated economic development programmes and the various MMDAs' medium-term development plans for 2022-2025. According to these legal framework, there is synergy among the organisations related to disaster management, however, in reality, the story or action is far from all that exist in documents. An interview with a NADMO official revealed that "the concept of disaster risk reduction on paper is appealing and effective but, on the grounds, it is the complete opposite"

Inter Organisational meetings

One guaranteed strategy to accomplish and maintain good coordination among organisations is to ensure that communication and information are flowing freely and effectively between them. Communication helps people get ready for emergencies, send out warnings, and coordinate reactions. Round table conversations help disaster risk reduction committees and task forces improve communication amongst disaster management agencies across the country.

According to available information, the NADMO's headquarters is rapidly closing in on completing a nationwide network of emergency

operation centres. The purpose of this is to better monitor potential disasters around the country and effectively respond to them. The many agencies involved in disaster management will occasionally get together to discuss challenges and propose solutions. In an interview with an EPA official, this is what he had to say:

> *"There is a technical sub-committee where technocrats and expert meet regularly at the various MMDAs to inspect building permit. This is root level of community development and needs special attention. This is the platform where we make recommendations to the spatial and planning committee about which building permit is to be accepted or rejected. Despite the essence of these various committees, some MMDAs do not invite us to represent and add our expertise and comments to the various building permit that are submitted to them".*

It was revealed that most of the technocrats with expertise, especially among those institutions that were not closer to the premises of various MMDAs, were not often invited to such meetings due to inadequate finances or inadequate human resources of those institutions.

Resources and Technology

Exchange of resources is necessary for successful coordination amongst organisations in the field of disaster management. This helps to ensure that organisations can effectively respond to emergency circumstances. The participants disclosed that although they coordinate their resources towards reacting to catastrophe circumstances, there is not enough equipment,

finances, or assets to properly handle disaster scenarios. This is the case even when the participants coordinate their resources. For instance, in the event of flooding, the army will deploy boats to assist in the evacuation of victims who are stuck. On other occasions, the vehicle of the coordinating director is loaned in order to respond to urgent situations, as well as for monitoring and assessment.

Recognising the need for high level technology, stakeholders are working to establish a ground station that will have equipment that gathers satellite data on all types of natural disasters. This ground station will include divisions such as satellite weather and climate, virtual environmental laboratory, climate informatics, and high-performance computing. None of the organisations or institutions concerned with disaster management was self-sufficient with regards to resources and equipment. Sometimes, due to poor maintenance and sustainability issues such as the CREW Project, such resources or equipment were not utilised. Most of them relied on other departments or agencies for their resources and technology. Most of them complained about inadequate staff and training.

A NADMO official at the region posited:

> *"We need funds for capacity building and in-service training because most of our staff are not trained in disaster management since they all come to learn on the job. We equally need funding to increase our buffer stalls. These have become highly political".*

An EPA official noted in an interview:

> *"We need a complex office like the lands commission where various unit within the agency can really function. Now, we rely on Kwame Nkrumah University of Science and Technology for most of our laboratory works of which we should have run them here and managed by ourselves. Sometimes, samples collected on the field have limited days or period to spoil and therefore, needs quick attention but, for most cases, we have to rely on the university knowing all the risk involved" (IDI, EPA officer, 45 years).*

These show that most of the disaster response institutions and other key stakeholders relied on few resources and limited technology available in their operations which affect efficiency and effectiveness.

Monitoring and Evaluation

This involves the formation of project monitoring teams to ensure the preservation of reserved and protected areas and to assess disaster situations prior to and after their occurrence. The collected data indicates that monitoring and evaluation are severely lacking, and despite being designated as a key area for enhancing stakeholder participation and enhancing coordination, its implementation poses a challenge. Frequently, after disaster situations have returned to normalcy, organisations return to their usual routine activities, thereby causing recurring problems. This is also due to poor communication amongst the key stakeholders of disaster risk reduction. Moreover, due to poor coordination, cases where monitoring and evaluation exercises are organised, not all key stakeholders are involved.

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Discussions

Aside NADMO, many disaster response institutions interplay in DRR. For effective and efficient DRR, every organisation or institution has a role to play for its success. The study found that the various disaster response institutions perform their roles and functions as enshrined in their respective Acts. The study found that there was good relationship between the MMDAs and other related organisations that they deal directly with such as NADMO, GHS, EPA, GPS, TA and GNFS. Therefore, there was a strong relationship between the various MMDAs in Greater Kumasi Area and NADMO, EPA, TA and GNFS. However, there was poor relationship amongst organisations such as GRS, EPA, GAS, TA and GPS.

Weak or poor relationship among some organisations show the deviation from the integrated resources planning theory which is interested in processes that develop, implement, and continuously modify comprehensive management plans toward DRR. It ensures open and participatory process in which all key stakeholders are involved to ensure effective DRR in the various MMDAs. This also ensures the strengthening of disaster risk governance which is amongst the key four priorities of the Sendai Framework.

Moreover, with reference to the conceptual framework of the study, it was proposed that when disaster response institutions work in harmony and in a system manner where processes are ensured for effective integration of DRR into the development planning processes, communities would be enhanced, resilient and sustained. However, in the case where there is poor interrelationship amongst some key disaster response institutions as well as

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role gaps and role conflict, sustaining cities and improving disaster preparedness and response would be difficult to achieve.

Chapter Summary

This chapter focuses on the roles and responsibilities of the various response institutions in DRR. Also, the preparedness and organisational linkages in their roles and responsibilities, overlap and gap of roles and duties as well as mechanisms for coordination. Lastly, their roles and responsibilities were linked to the DRR. The study found that disaster response institutions played their roles and responsibilities toward DRR. However, there were some role conflicts and gaps as well as weak relationships among some institutions which undermined the achievement of DRR outcome as expected in the conceptual framework of the study.
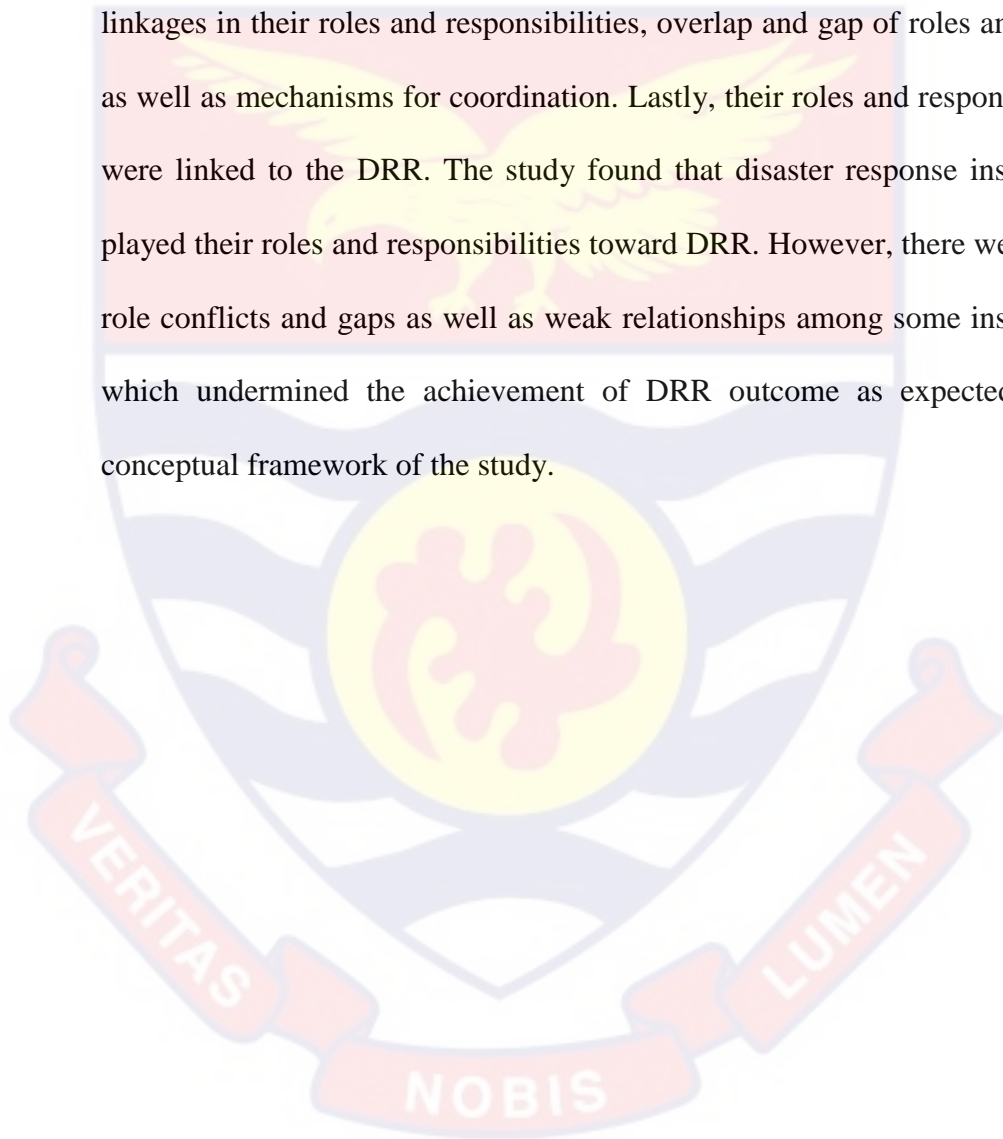
CHAPTER EIGHT

INSTITUTIONAL CAPACITY FOR DISASTER RISK REDUCTION

AND MANAGEMENT

Introduction

Capacity development is the process by which individuals, organisations, and society as a whole unleash, strengthen, create, adapt, and maintain the capacity to establish and attain their own development goals (OECD, 2006). Effective capacity development: (a) strengthens country ownership; (b) focuses on technical and functional capacities; and (c) enhances capacities interdependently across individual capacities (e.g., skills and knowledge), organisational capacities (e.g., coordination, mandates, multi-stakeholder processes), and an enabling environment (e.g., governance, policies and legal frameworks) based on jointly assessed needs, joint context-specific intervention identification, and joint implementation.

The institutional capacity assessment is shaped to gain a sound understanding of a country's needs to enhance their adaptive capacity through contextualised interventions such as targeted training or institutional strengthening for DRR, in particular at MMDA level. The institutional capacity assessment aims to identify the strengths and needs for DRR in order to design, implement and track results of contextualised interventions. The process is highly participatory and all key stakeholders inclusive to maximise sustainability (FAO, 2015a; Kalas & Benton, 2017).

The institutional capacity assessment methodology encompasses the five technical and functional capacities for adaptation planning outlined by GIZ (2016). To identify the strengths and limitations of individuals,

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organisations, and the enabling environment for national adaptation planning in the agriculture sectors, these technical and functional capacities should be evaluated across three dimensions. In accordance with FAO's guidelines for capacity development (FAO, 2015b), the evaluation would concentrate on three interdependent capacity dimensions:

At the individual level, awareness, knowledge, skills and competences were assessed. Regarding the level of organisation, performance, current roles and responsibilities for adaptation planning; mandate for adaptation in the disaster management; coordination among disaster responsive institutions and key stakeholders; national budget allocation to adaptation and capacity to mobilise resources, regional and MMDAs monitoring and evaluation (M&E) for adaptation and implementation of DRR activities. At the enabling environment level, alignment among sectoral policies with regard to adaptation; integration of adaptation into MMDAs MTDPs; institutional political economy; political commitment to address climate related challenges, as well as existing national adaptation planning processes.

On the other hand, institutional capacity of the various disaster responsive institutions was done based on three basic indicators; human resource, knowledge and skills, resources and logistics as well as training. Data were therefore, gathered from respective institutions regarding these indicators and the results are presented subsequently.

Human Resources

The performance of individuals in their functions is the basis for the success of any action or policy. Human capacity includes both the intellectual capacity (knowledge, skills) and the will (interest, patience, and persistence) to

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implement needed changes (McKinsey & Company, 2001). Therefore, data were gathered on human resource capacity of various disaster responsive institutions regarding their adequacy, skills and knowledge, competency among others. It was revealed that NADMO, other disaster responsive institutions and other key stakeholders indicated that there was inadequate human resource. Thus, there were inadequate NADMO personnel at all the MMDAs involved in this study. Some were even operating at the area council division or level whilst others operated at the main offices. On the other hand, other institutions including GNFS, GPS, GAS, MMDAs, among others, complained bitterly about inadequate staff which renders them incapacitated to execute their roles and functions effectively and efficiently.

> *"for when it comes to personnel, it is not enough; the staff present as at now is about 24." (IDI NADMO Officer, AMMA)*
>
> *"We don't have logistics, financially we are down, inadequate personnel too" ." (IDI NADMO Officer, KMA)*

This was corroborated by an officer that:

> *"Exactly, so there are problems centred left right. The resources are inadequate and the manpower is another problem. Somehow, we try to have it complimented by the existence of DVGs. Because of poor incentives also for them, that is a problem" (IDI NADMO Officer, BDA)*

On the contrary, a participant was satisfied with the human resource through other challenges such as inadequate logistics persisted. In an interview with a NADMO officer in BDA, this is what he had to say:

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> *"Yes, for when it comes to personnel, we have them, but the*
>
> *logistics such as office and vehicle to do regular monitoring*
>
> *and others is the problem."*

Resources and Logistics

Since our wants are insatiable and resources are always inadequate, especially in the developing countries such as Ghana, available resources and logistics should be managed properly to achieve intended purpose or goals. However, this was the outmost cry of all the institutions involved in this study. They indicated that though there were few personnel around, but could not do much because resources and logistics were adequately available. Most of these institutions had plans and proposed activities that would have contributed to DRR. However, they were left in books or on papers without any implementation due to this resource problem. Some institutions including Red Cross, EPA and GFS indicated that they did not have offices in all the MMDAs. Some of the institutions have offices only at the regional level which makes their operation difficult. In some cases, NADMO personnel have to share resources and logistics with the MMDAs in carrying out their roles and mandate. In an interview with a NADMO officer, this is what he had to say:

> *" yes, our major problem is cars. the other xxx so now we have*
>
> *many communities far from here like I was saying, when you*
>
> *want go to a place like Abono, you will get to Beposo before*
>
> *you get there. For those places, it is very difficult to get a car.*
>
> *And we do not have a car so sometimes we rely on public bus.*
>
> *So basically, car is our problem " [NADMO]*

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This was supported by an except from a NADMO officer:

> *"For resources and logistics, they are extremely inadequate. That is the truth, you realised there are no computers in the other office. Let us hold on with that so that I show you something. Before we even, go to the field to gather such formation there is nothing to identify you as a NADMO personnel. We do not have ID cards to inform that we work with NADMO. Also, none of the staff here has a vest. You only find us wearing some when there is an emergency, or we attended a training programme and had the opportunity to wear one. Usually, we rely on T-shirts printed for training programmes. What we do is to keep them properly so that during emergencies we can wear them for easy identification. The situation here is a complex one. As I speak to you, we do not have a vehicle for rapid responses but a team exists to that effect."* [NADMO, KMA].

An officer added his voice by saying that:

> *"The zonal is very proactive but the challenge here has to do with logistics. There are times they lose confidence and faith in what they do especially the PVGs because there are not given anything like an allowance"* (IDI NADMO Officer, BDA)

> *"as for logistics, we don't have anything. With that one, don't even go there because we do not have anything"* (IDI NADMO Officer, KMA).

Logistics is key when it comes to DRR. Therefore, institutions responsible for DRR were not able to execute their functions and responsibilities as expected due to the inadequate logistics. Vehicle, equipment and even just jacket for monitoring activities was a challenge. Even among the DVGs that were trained, there were no logistics for them to assist when disaster strikes.

Training and Education

Capacity building is a process by which individuals, groups, institutions, organisations and societies enhance their abilities to identify and meet development challenges sustainably (CIDA, 1996). To enhance abilities or skills, there should be a training or workshop. Therefore, data were gathered from participants regarding training opportunities or education for personnel of various disaster responsive institutions. The gap or difference between the skills, knowledge and attitudes possessed by the target group and those required to perform the expected activities, in other words between available and required competency levels in the DRR is the area to be considered for designing the appropriate training strategy and plan. Training, education and or workshop equip staff with the requisite knowledge and skills, enhance their understanding and skills regarding DRR activities. Due to its numerous benefits and its contributions to institutional capacity building for efficient and effective implementation and evaluation of DRR activities in the various MMDAs, data were gathered from participants on these indicators.

Data collected revealed that some institutions such as GAS, GNFS, and GPS have training schools where personnel were trained even before they were posted to the various MMDAs to work. Also, training opportunities,

workshop or education avenues were open to them always to update themselves. Continuous professional development was ensured in these disaster responsive institutions. Nevertheless, these trainings were sometimes not enough or adequate due to financial constraints and or sponsorship. In addition, only GAS and GNFS were mostly trained to respond to emergencies contributing to DRR activities or mostly response activities. Conversely, a NADMO officer voiced out that they did not have such trainings:

Yes, we learn on the job so when you are lazy person, you leave the job with no expertise. Also, the training of PVDs is contained in our action plans and Acts but we did not train them. The only motivation they receive is when we give them some bags of rice when the government supplies us with some" [NADMO officer, BDA].

On the other hand, the coordinating institution, NADMO, did not have a special training school or body where training or workshop sessions were conducted for them. Sometimes, NADMO collaborated with GPS, GNFS or GAS in organising trainings or workshops. However, they organised regional and district trainings and workshops for their staff. These trainings were mostly not adequate or enough for the staff. Mostly, these trainings sessions were cancelled due to lack of funds and or sponsorship.

"for training, we do it quarterly. We do it with the fire service, the Manhyia Fire Service. That is what we usually do. We collaborate with them to do some workshop with staff." All these come with the finances; if we are well resourced financially, we would even do it every month. Because of the

finances that is why we do it quarterly" [NADMO officer, AMMA].

This was corroborated by an officer that:

"We need funds for capacity building and in-service training because most of our staff are not trained in disaster management since they all come to learn on the job. We equally need funding to increase our buffer stalls. These have become highly political" [NADMO officer, BDA].

According to a NADMO officer from the region, the various MMDAs were selective when it comes to training and education of disaster response institutions such as NADMO. This is that he had to say:

"So you see training workshops like this, the assembly will not provide the needed funds for it because it is of a little interest to them. Therefore, we rely on the money that comes from government and we collaborate with Ghana National Fire Service and the Department of Geography and Planning at KNUST, Ghana Meteorological Agency. When they discover any activity of interest they go for it because it will make Kumasi Metro beautiful."

On education and skill development, a respondent echoed the need for the disaster response institutions, especially the NADMO, to have their training school to train their recruits, and DVGs among others. In an interview with a NADMO officer, this is that he had to say:

"Skill development and capacity building for staff is very important and it is not that organisations are reluctant to build

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the capacities of their staff but the resources to get that running is also the problem. Like the Fire Service, Police Service, these institutions have schools so I think in your recommendation especially for the organisation; I believe that having a school to build the capacities of not just their staff but also their DVGs and other stakeholders is very important" [IDI NADMO Officer, BDA].

On other hand, some participants indicated that disaster response institutions such as NADMO do have collaboration with some educational institutions such as GIMPA, Legon and UCC for some training and education a NADMO official at the region posited:

"On the issue of training and education, we have some of our staff being sent to GIMPA, Legon and UCC to receive some form of training and retraining. Others have also benefited from overseas training. I have also been fortunate to attend some seminars, trainings and workshops that has helped greatly sometimes not within the organisations that I have mentioned but among other stakeholders. For instance, veterinary have collaborated in our programmes, the Agric. services and have benefited. We have also benefited from UCC training programmes where we were sent abroad to China and other places. However, as one would have expected, it should be such that a large number at least once in a lifetime can be trained. Then may be some rare occasions you have these

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workshops also running to refresh our staff" [NADMO officer,

RCC].

This shows that few officials from some selected disaster response institutions have some opportunities to upgrade or enhance their knowledge regarding DRR and this rarely occurs. Knowledge is key, therefore, when officers are not trained or refreshed with current knowledge about how to do old things in a new way with speed and efficiency, they will not be able to execute their responsibilities as expected.

Funding

Funding is the act of providing resources to finance a need, program, or project. While this is usually in the form of money, it can also take the form of effort or time from an organisation or company. This is mainly the backbone of resources and logistics intended for DRR activities by each of the disaster responsive institution. It is believed that DRR activities are mostly expensive to execute, but its long run benefits outweigh its cost.

It was revealed that GoG was mainly the source of funding for the various DRR activities by the institutions. In addition, the various MMDAs provided support in the form of kind or cash to the various institutions to complement that of GoG for them to execute their roles and mandate regarding DRR. Also, sometimes, these institutions received some support from some companies in their various MMDAs. However, these funds were not enough or adequate to execute their activities, especially regarding DRR activities. All the institutions indicated that lack of funds was among the major challenges to the implementation of DRR. This was echoed in an interview with an officer:

"Yes, we have funding basically from the government. oh we use, sometimes, once a while, the small amount that comes from the government as you made mention of. It doesn't come all the time and if it comes, sometimes we rely on them." But as for NGO and other companies, we do not have any support or sponsorship from them for our activities" [NADMO officer].

This is supported by an exact from an officer:

"Yes, we have some sources of funding. The government is our source of funding and sometimes we have some NGOs who come to support us. We have the Norwegian Embassy that established for us the CREW station, GIZ and UNDP". However, for these international organisations, they normally first fall on our national headquarters before they provide us the funds or support that we received. Also, we have some individuals that support the work we do. Some local institutions also help a lot. For instance, when we want to conduct fumigation exercise, we write to agrochemical organisations for help and they do help a lot. Some individuals also support us with cash or money. However, the government is our main source of funding" [NADMO Officer].

An officer corroborates this:

"No, we do not have any NGO or individual who help us. That is why we solely depend on the assembly and they are not doing it.

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"We do not have logistics, financially we are down, inadequate personnel too. Sometimes we do sacrificial job on what we can do; what we are capable of doing; what we think we can do if they don't support us. By the new act the assembly allocate ...; we have 3% of the common fund allocated to NADMO. Ever since the act was passed we have never benefited anything from the 3% of the assembly. So we are just there. I don't know whether districts are benefiting from that one but we here and we have never anything of such. We have sent a lot of proposal but it wouldn't be approved" [NADMO officer, AMMA]

Regarding the adequacy of the funds allocated for DRR related activities

"No, they are not. The funds have never been adequate, when you look at our action plan and the number of actions that we are able to execute, you will be surprised" (IDI NADMO Officer).

"Before the creation of NADMO as said earlier there was a department called the disaster prevention department. With that said, a percentage of their funds was dedicated to disaster prevention so in the absence of NADMO this department existed to champion the course of disaster prevention. However, NADMO now exists so we were hoping that the percentage of money that was going to the MMDAs should be channelled to NADMO since that department no longer exists even though those funds keep coming and the assembly equally rely on NADMO. This explains why we fight for that money and

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the reason NADMO depends on the MMDAs because without NADMO the MMDAs must perform that function. There is money allocated for it which should be given to NADMO in their operations" [IDI NADMO officer].

This is supported by an exact from an officer:

"the funds are not adequate. So based on what the government gives us (funds), we assess the remaining eight activities and determine how many can be achieved using the available funds. When we realise that our funds are not enough then we are relying on the grants of our donor agencies. That is how we operate"[NADMO officer].

An officer corroborates this:

"We need funds for capacity building and in-service training because most of our staff are not trained in disaster management since they all come to learn on the job. We equally need funding to increase our buffer stalls. These have become highly political" [NADMO officer].

This means that the government solely funds DRR activities. And even in case where NGOs or private individuals support the various MMDAs in carrying out these activities, their support were not regular and adequate. Even with the government funding, the District Assembly Common Fund (3% of it is allocated to DRR) are not release timely for NADMO to execute their activities planned for their respective MMDAs.

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Discussions

The purpose of institutional capacity assessment is to identify the strengths and weaknesses as well as the needs for DRR to design, implement, monitor and evaluate interventions. Therefore, the study assessed institutional capacity of the various disaster response institutions on three basic indicators; human resource, knowledge and skills, resources and logistics as well as training. The study revealed that human resource was somehow adequate, however, knowledge, skills and training, resources and logistics were woefully inadequate.

A similar study was conducted in Jordan by CADRI (2018) on capacity assessment of the disaster risk management system revealed that there was lack of access to risk information across all levels and forms of governance including the MMDAs; no systematic data collection platforms; no legislation on availability of disaster risk information to all levels and forms of government and general public; weak coordination of climate information service; overlap and lack of clarity in the roles and responsibilities among institutions; inadequate logistics and resource for DRR; inadequate secretaries for officers; no dedicated national budget allocation for DRR among others.

However, capacity-building initiatives is to enhance officers' knowledge, skills, and decision-making abilities that are also essential for meaningful participation (Enarson & Fordham, 2021; Habib & Shaw, 2020). Therefore, the key disaster response institutions should be resourced in terms of logistics, resources, human skills and development as well as funding to deliver their mandate as expected.

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Chapter Summary

This section analysed the institutional capacity of the various disaster response institutions towards DRR. Institutional capacity of the various disaster response institutions was analysed based on three basic indicators; human resource, knowledge and skills, resources and logistics as well as training. The study revealed that human resource was somehow adequate, however, knowledge, skills and training, resources and logistics were woefully inadequate.
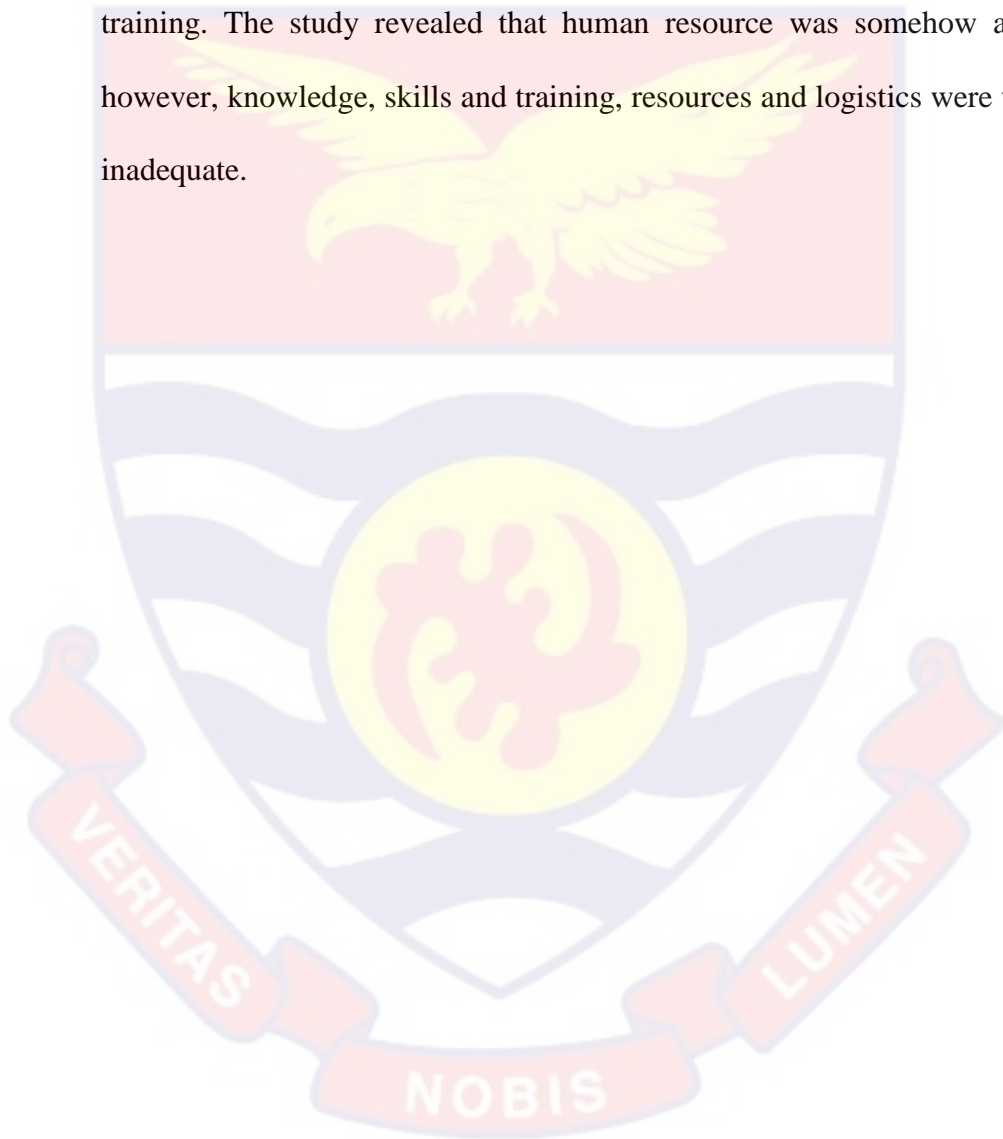
CHAPTER NINE

THE INTEGRATION OF DISASTER RISK INTO THE MTDPS OF

THE MMDAS

Introduction

The various MMDAs are responsible for social, economic, health, security, environmental developmental projects at the local level and the well-being of the community people. The MMDAs cannot overlooked at disaster risk due to the direct conflict developmental projects have with the environment. Therefore, harnessing DRR programmes and activities with the local plans of the various MMDAs is key to safeguard the community members from future unforeseen occurrences that rendered them vulnerable. Moreover, implementing the local plans of the various MMDAs vis-sa-vee that of DRR activities ensure the likelihood that planned risk reduction strategies are successfully implemented (Urban Governance and Community Resilience Guides, 2010).

The study's primary concerns are sustainable urban planning and community development, as well as the need for immediate action on climate change. In this section, the study looked at how the various MMDAs in the Greater Kumasi Area could benefit from adopting and implementing the principles of sustainable city and community development, climate action, and the Sendai framework.

In 2015, governments throughout the world voluntarily agreed to work together to reduce catastrophe risk under the Sendai Framework. The framework also stresses the importance of involving several parties, such as municipal authorities, the business community, and others. Comprised of

seven global goals and four areas of focus, this document aims to spur positive change around the world.

By 2030, the global disaster mortality rate is expected to be reduced by at least 75 percent, the number of people affected will be cut in half, the proportion of global GDP lost to disasters will be cut in half, and disaster damage to critical infrastructure and disruption of basic services, such as hospitals and schools, will be cut in half as well. Both initiatives share a common timeline, with the signing of the SDGs and the Sendai Framework occurring in 2015 and significant target years, thus, 2030. Reducing social and economic vulnerabilities and bolstering resilience in the face of a wide variety of natural and climate-induced catastrophes are two of the most prominent shared goals. Therefore, examining how these policies have been incorporated into the development planning process is necessary to harness them vis-sa-vee to reduce the vulnerability and ensure sustainable livelihoods.

Allocation of DRR in the MTDPs

Data gathered from the participants mainly confirm that there were allocation of DRR activities in the MTDPs. The NDPC guidelines for 2022-2025 framework stipulated categorically that there should be a portion for DRR activities and climate action in the MTDPs of the various MMDAs in Ghana. However, there was no percent of activities that could be incorporated in the various MMDAs plans.

This is supported by an exact from a NADMO officer:

> *Again, when it comes to certain aspects of your work that you*
> *feel I am needed or I need to make an input before then you are*
> *now running to me. However, by and large because there has*

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to be that integration of DRR activities into medium-term development plans of various assemblies they are able to find ways to engage our people for that to be done."

He continued by adding that:

"The system is centralised so at the lower levels; the regional and the district levels we are unable to see much. At the assemblies, there is an allocation from every assembly for disaster relief and that is where sometimes the district officers of NADMO also want to believe that the assemblies could do something to assist them in their various operations, which is sometimes also not forthcoming, and all manner of excuses provided."

This was corroborated by NADMO officer that:

"Every year, we do our action plan but we don't see anything from what we always send to them. For instance, if we send them about 10 activities, they will select about four out of them. Even with the four that you are talking about, even if they would pick, they will not take action on it. So I cannot tell you what happens with it. That is how it usually go" [NADMO officer, AMMA].

This shows that despite the fact that there is a guideline about the integration and harmonisation of all departments, units and agencies' plans together and the allocation to respective departments, units and agencies, some MMDAs did not adhere strictly to that.

DRR activities captured in the MTDPs

In the various MMDAs, District/Municipal/Metropolitan Planning Coordinating Unit (DPCU/MPCU/MPCU) are in charge of developing the Medium Term Development Plans, ensure its implementation as well as monitoring and evaluating these projects. The composition of the DPCU/MPCU/MPCU is complex with members from different departments and units including the NADMO coordinator, among others. After community engagement to collect data from the various communities within the district/municipal/metro, the DPCU/MPCU/MPCU meet to discuss and prioritise the developmental needs and challenges before drafting strategies to curb such menace or challenges.

It can be deduced from the data gathered that there were not effective DPCU/MPCU/MPCU in the various MMDAs. Therefore, power relied in the hands of the development planning officers to just pick and choose some activities from NADMO on DRR to be included in the action plans of the various MMDAs. However, if there were effective stakeholders engagements, NADMO coordinators and fire officers would have been involved in the processes and even assisted in prioritizing the need and challenges of the various communities in coming out with the MTDPs.

This was confirmed in an interview with a planning officer;

> *"The normal practice is that the planning officers with their go round to the various communities to gather data after community entry. Sometimes, they do this through the assembly members. The DPCU/MPCU/MPCU of various assemblies meets with key stakeholders to discuss them, rate or prioritise*

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the challenges and developmental needs. NADMO coordinators and fire officers are all involved in these processes so they help to identify the DRR activities that are most pressing the respective communities. So if the DPCU meet regularly as expected, all plans from various or different departments and units are harness or harmonise and therefore, integrated into the development plans after prioritisation of the problems or developmental needs."

Conversely, it was revealed that the DPCU/MPCU/MPCU was not active in all the MMDAs, therefore, proper consultation or engagement was not done. However, they found their way to involve some key officers or unit whose activities were mandated to be included in the Medium-Term Plans of the various MMDAs. This was revealed in an interview with a NADMO officer:

"If an institution or somebody feels so strong about a particular point and then may want to carry in very far, sometimes you will also be stubborn when it comes to because we are supposed to collaborate and at the end of the day you are even the biggest beneficiary and yet and then come and let us do things or try to reduce the disaster incidents within the area and then you are dragging your feet, you do not want to make available resources that you should and the end of the day you make the work so difficult. Again, when it comes to certain aspects of your work that you feel I am needed or I need to make an input before then you are now running to me.

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> *However, by and large because there has to be that integration of DRR activities into medium-term development plans of various assemblies they are able to find ways to engage our people for that to be done."*

This   shows that some disaster response institutions are only consulted to gather necessary data to meet the requirement about the MTDP and were not involved in the actual processes.

Incorporation of key stakeholders

For effective integration of Sendal Framework and SDG 11 into the development planning process, there is the need to consult or engage key stakeholders. Aside the DPCU/MPCU/MPCU which is in charge of the various development plans, implementation, monitoring and evaluation of these projects, the NADMO Act proposed that each assembly should have a district disaster management committee. This committee is to ensure effective engagement of key stakeholders. This committee is to prepare plans for the district to prevent and mitigate disasters in its area of authority and to maintain a close liaison with the Regional Disaster Management Committee in drawing up plans. However, this committee is not active.

DPCU/MPCU/MPCU is the technical wing of the assembly and therefore, bring together key technocrats and key stakeholders regarding developmental projects and environmental sustainability. It is responsible for performing the designated planning functions of the district assembly. Such responsibilities include the following: facilitate and coordinate the preparation development plans of the MMDAs; lead monitoring and evaluation activities of the MMDAs; coordinate implementation of development programmes,

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projects and activities in the MMDAs; coordinate and harmonise operations of Departments of the Assembly and other development partners; provide strategic advice to the MMDAs on matters relating development of the Assembly; provide operational support in the implementation of development policies and programmes; lead in strategic planning, efficient integration and implementation of the public policies and programmes to achieving sustainable economic growth and development; and ensure that field activities are efficiently performed to produce desired output.

Therefore, DPCU/MPCU/MPCU ensures that disaster risk reduction strategies from respective institutions or departments are integrated and harmonise in the development planning of the various MMDAs. This was echoed in an interview with a planning officer:

> *"The assemblies are just a coordinating unit that coordinate the activities of the various institutions or departments and or units in their respective localities for its development. Therefore, we bring institutions, departments, agencies or units together as at when they are needed and based on the situation at hand to ensure that development is done in our localities."*

In principle, the various units, departments and agencies as well as community and traditional representatives are supposed to work in harmony to ensure effective DRR activities implementation, monitoring and evaluation. However, due to some reasons including finances and logistics, only some selected few are involved fully in such processes.

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Evaluation of the Medium-Term Development Plans of the MMDAs Regarding Disaster Risk Reduction based on the development planning processes

The evaluation of the MMDAs MTDPs with regards to DRR was carried out successfully by considering three 3 successive MTDPs, thus, from 2014-2017, 2018-2021, and 2022-2025 period. The plans were evaluated based on six 6 main issues or themes (Disaster preparedness, Disaster response, Post-disaster recovery, Participatory planning/plan preparation/plan implementation/monitoring and evaluation, Institutional capacity, Integration of plans) that were further categorised into twenty-three 23 specific indicators. Moreso, these indicators were further grouped based on the five main targets of the Sendai framework. Therefore, the results of the data that were evaluated from the MTDPs of the various MMDAs are presented subsequently based on Table 20.

Regarding the scale been used, "Not Addressed (NA)" means no activity or issue was considered a particular indicator, "Partially Addressed (PA)" means only an activity was considered under such indicator, "Addressed (A)" means two or three activities or issues were considered while "Well Addressed (WA)" indicates that more than three (3) activities or issues were considered under such an indicator.

Table 19: Evaluation of the Medium-Term Development Plans of the MMDAs Regarding Disaster Risk Reduction

Main Issues	Specific	Planning period	KUMASI METROPOLITAN				ASOKORE MAMPONG MUNICIPAL				BOSOMTWE DISTRICT			
			NA	PA	A	WA	NA	PA	A	WA	NA	PA	A	WA
Disaster preparedness	MTDP/MTDP profile identifies past and present disaster prone areas/communities	2022-25				√			√					√
		2018-21			√				√					√
		2014-17		√					√					√
	MTDP takes care of information management (creating database, updating, storage and dissemination of information) regarding disaster risk reduction	2022-25				√			√					√
		2018-21			√			√					√	
		2014-17		√					√			√		
	MTDP considers early warning systems,	2022-25			√				√				√	
		2018-21			√		√						√	
		2014-17			√		√						√	
	MTDP considers risk and hazards mapping ana analysis	2022-25			√				√				√	
		2018-21	√						√				√	
		2014-17	√						√			√		
	MTDP ensures acquisition and storage of relief items	2022-25							√					√
		2018-21	√						√				√	
		2014-17	√				√						√	
	MTDP inculcates comprehensive disaster preparedness strategy/plans	2022-25		√					√				√	
		2018-21	√						√				√	

Table 19 Continued

		Period				
		2014-17	√		√	√	
	Education and sensitization of DRR	2022-25		√	√		√
		2018-21		√	√		√
		2014-17	√		√		√
Disaster response	MTDP makes room for emergency response services such as search and rescue operations, evacuation of victims to safe havens	2022-25		√	√		√
		2018-21	√		√		√
		2014-17	√		√	√	
	MTDP make room for assessment of disaster and registration of victims and provision of relief items	2022-25		√	√		√
		2018-21		√	√	√	
		2014-17	√	√		√	
	MTDP cater for the provision of medical services, coordination and communication, first aid and emergency medical care	2022-25		√	√	√	
		2018-21	√		√	√	
		2014-17	√		√	√	
	MTDP create and provide urgent aid in order to sustain life, improve wellbeing and build morale of the affected community.	2022-25		√	√	√	
		2018-21		√	√	√	
		2014-17		√	√	√	
Post-disaster recovery	MTDP makes room for critical infrastructure eg. Roads, telecom, electricity, water etc	2022-25		√	√		√
		2018-21	√		√	√	
		2014-17	√		√	√	
	MTDP indicates specific operational guidelines on how to take account of disaster occurrences	2022-25		√	√	√	
		2018-21		√	√	√	

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Table 19 Continued

Theme	Indicator	Period					
		2014-17	√	√		√	
	MTDP supports disaster resilient livelihoods	2022-25		√	√		√
		2018-21		√	√		√
		2014-17	√	√			√
	MTDP identifies and tackles infrastructural development with emphasis on households that are in more vulnerable locations	2022-25		√	√	√	
		2018-21		√	√	√	
		2014-17	√		√	√	
	MTDP incorporates climate resilient agricultural practices	2022-25	√			√	√
		2018-21	√		√	√	
		2014-17	√		√	√	
Participatory planning/plan preparation/plan implementation/monitoring & evaluation	Planning process is participatory	2022-25		√	√		√
		2018-21		√	√	√	
		2014-17		√	√		√
	Planning implementation is participatory	2022-25		√	√	√	
		2018-21		√	√	√	
		2014-17		√	√	√	
	Monitoring and evaluation of plans are participatory	2022-25		√	√	√	
		2018-21	√		√	√	
		2014-17	√		√	√	
Institutional capacity	MTDP makes room for the training of officials for disaster risk reduction management	2022-25		√	√	√	
		2018-21		√	√	√	

Table 19 Continued

		2014-17	√	√		√
	MTDP includes securing of resources and logistics for disaster reduction measures	2022-25		√	√		√
		2018-21	√		√	√	
		2014-17	√	√		√	
Integration of plans	MTDP develop data base on collaborating agencies, research and mobilisation of equipment for simulation.	2022-25	√		√	√	
		2018-21	√	√	√		
		2014-17	√	√		√	
	MDTP harness various departmental/unit plans on disaster reduction management	2022-25		√		√		√
		2018-21	√		√	√	
		2014-17	√		√	√	

*Not addressed =NA, Partially Addressed = PA,   Addressed = A,   Well Addressed = WA
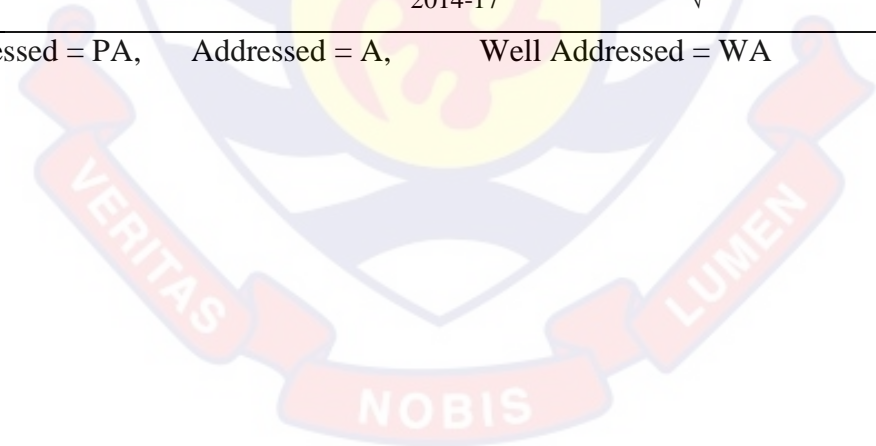
Disaster preparedness

The results show that MTDPs of 2014-2017 and 2018-2021 addressed the issue of identification of past and present disaster-prone areas or communities. All the MMDAs involved in the study were able to address this issue by considering it in their profile. However, this issue was well addressed by the MMDAs in the 2022-2025 MTDPs. For instance, KMA listed about 20 towns and prioritised their developmental challenges or needs of which disaster was among. However, the plans failed to identify the disaster related to vulnerable groups for necessary measures to be made to improve upon their resilience in disaster related issues.

On database management, this was not addressed in the 2014-2017, especially in the MTDP of KMA. It was partially addressed in the 2018-2021 MTDP of the various MMDAs. However, this was somehow addressed in the 2022-2025 MTDPs of the various MMDAs. The Community Resilience through Early Warning (CREW) Project was providing these services to some selected MMDAs in the Greater Kumasi Area of which KMA was part of the key focus. However, this project is not functioning currently so MMDAs such as KMA and BDA have addressed this issue well in their 2022-2025 MTDPs. Thus, provisions have been made to allow free flow of information and effective communication amongst disaster responsive institutions. Also, allocations have been made to procure logistics to ensure that proper database and information management relating to DRR is achieved.

Regarding early warning system, it was not addressed only in the MTDP of ASMA for 2014-2017 and 2018-2021. On the other hand, it was addressed in the MTDP of ASMA and BDA in 2018-2021 and 2022-2025 for

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BDA whilst it was well addressed in 2018-2021 MTDP of KMA. After the system of CREW project broke down, the early warning system of the various MMDAs in Greater Kumasi, especially those who were involved in that project found it difficult to restore this system or provide an alternative approach to disseminate information to community members on disaster related matters. At best, they used information vans to disseminate information to the community members whilst others adopted telephone or social media platforms such as whatsapp to disseminate urgent information regarding DRR. For instance, BDA had made provisions to undertake early warning programmes on disaster in 2024 and to equip DVGs in disaster prevention and management.

Risk and hazard mapping is key when it comes to disaster preparedness. Nevertheless, it was not addressed in the MTDP of the various MMDAs in 2014-2017, partially addressed in 2018-2021 while it is addressed in 2022-2025. For instance, in KMA and BDA, physical planning department and NADMO officials were charged to identify and map risk and hazard prone areas in the various communities and integrate those plans into the MTDPs. The BDA sought to undertake risk assessment and safety audit for hotels and institutions in 2022-2025 MTDP.

On relief items, it was partially addressed in the 2014-2017, not addressed in 2018-2021 and are well addressed in 2022-2025 MTDPs of ASMA and BDA. In the past, NAMDO officers of the various MMDAs used to store relief items for any contingencies, however, with time, it stopped coming from the headquarters and it became regional or national responsibilities and also provisions were supplied directly from region or

national as at when the need arose. However, with the rise of disaster related issues in Greater Kumasi, some MMDAs including BDA and ASMA have made some provisions to procure some relief items for future use. For instance, the action plan of BDA made provisions to provide relief items to disaster victims. Also, ASMA sought to enhance the relief operations and humanitarian welfare.

On comprehensive disaster preparedness strategies/plans, it was not addressed in the MTDPs in 2014-2017, partially addressed in 2018-2022 whilst it was addressed in 2022-2025. This shows that there was no comprehensive disaster preparedness plans for the MMDAs involved in this study. However, provisions have been made for developing disaster plans for the various MMDAs. This is not surprising since there was no disaster risk plan for the whole region. This was revealed in an interview with the Regional Economic Planning Officer of the Region:

> Currently, there is no risk or regional plan for the Ashanti Region. We are now working on one and I think is going to be the first regional plan that we will have for Ashanti region. We are relying on the various MTDPs of the various MMDAs as an input into the regional plan for proper plan to be made for the region.

On education and sensitisation, it was addressed in the 2014-2017 and 2018-2021 while it is well addressed in the 2022-2025 MTDPs of the various MMDAs. There were a lot of educational and sensitisation activities regarding DRR in the MTDPs of all the MMDAs involved. This was less expensive so all the MMDAs were well involved in these activities. For instance, KMA

made room for organising educational campaigns on fire and floods for all filling stations in Kumasi. ASMA conducted disaster management education monthly as captured in the MTDP of 2018-2021.

This was confirmed in an interview with a NADMO officer:

> *Our motto says it all, thus, prevention pays. So we are much interested in prevention rather than giving relief items. And this is what the people are not aware of. Therefore, we normally go to the schools, markets and churches to educate them on disaster risk reduction especially issues relating to fire outbreaks.*

Disaster Response

On the assessment of disaster and registration of victims and provision of relief items, it was not addressed in the 2014-2017 MTDPs of KMA, BDA and ASMA. In 2018-2021, it was partially addressed by ASMA and BDA whilst KMA did not address it. In 2022-2025 MTDP, it was addressed by KMA and ASMA while BDA well addressed it. Normally NADMO and other disaster response institutions are reactive rather than being proactive. Therefore, provisions are made for assessment and registration of victims as at when disaster occurs.

An interview with a NADMO officer revealed that "the normal practice was that they go and assess the damage of the disaster when it strikes, register the victims and then make provisions or provide them with relief items such as mattress, bucket and at times, rice and oil for their survival temporally. Now, food items and other relief items did not come as it used to be so people came here and they were highly disappointed in us when they visit for some

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times without anything." To improve upon this situation, the action plan of BDA made provisions to provide relief items to disaster victims. Also, ASMA sought to enhance the relief operations and humanitarian welfare.

For medical services, coordination and communication, first aid and emergency medical care, it was not addressed by the MTDP of BDA, ASMA and KMA in 2014-2017. In 2018-2021, it was partially addressed by KMA and ASMA whilst BDA addressed it. Currently, thus, 2022-2025, it is well addressed by ASMA and BDA whilst KMA addressed it. KMA was less concerned about rescue teams as well as DVGs due to the urbanised nature of the communities and the characteristics of the dwellers that did not permit the effectiveness of these teams. It was also indicated in the MTDP of KMA that fire outbreaks in the various market and warehouses were rampant as compared with the flooding issues.

On the other hand, there were individual volunteers as well as dormant DVGs in the various communities of BDA and ASMA that provided help as at when their services were needed. However, these people were not well trained but just volunteers in the communities that their people also recognised for such help. Such groups were recognised in Sawaba (ASMA) and Aputuogya (BDA).

Also, with the work of the Ghana Ambulance Service, victims of disasters were catered for and emergency medical care given to them. However, due to the absence and non-functioning of first aid teams in the various communities, GAS were left to carry out all these duties, thus, both first aid and emergency medical care to victims. This was due to poor communication and coordination of disaster responsive institutions.

Post-Disaster Recovery

This includes the provision of all types of help to victims of a disaster. It includes recovery/reconstruction among others. On critical infrastructure such as roads, telecommunication, electricity, water etc, they were addressed by all the MMDAs in the MTDP for 2014-2017, 2018-2021 and 2022-2025. These were well addressed in the MDTP for 2022-2025 for all the MMDAs. This was expected since the MMDAs are mandated to ensure development in their various localities. Therefore, developing especially disaster-prone areas or communities after a disaster strike is a must. However, this process normally takes long so many people in the community first develop these areas into slums before the actual infrastructure is taken care of by their respective MMDAs. To improve this situation, ASMA sought to design and implement post disaster social protection programmes in the 2022-2025 MTDP.

Per the observation of the researcher, especially in the ASMA, thus, Pelele area, in Aboabo, there was a slum along the stretch bridge and also along the Dagomba line after the fire outbreak. Mostly, the government delays in redeveloping affected areas after a disaster occurrence. Therefore, the settlers normally put up some temporal structure whilst waiting for the government project and thereby creating slums. This was also confirmed in an interview with a NADMO officer that:

> The people rebuild slums in replace of developed areas, for
>
> example, at Dagomba line in Asokore Mampong around 2021.
>
> NADMO was fighting to relocate that settlement.
>
> Unfortunately, there was a fire out break and we saw that as an

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opportunity to resettle the people since it had become difficult relocating them, however, before we could realise the then president loaded buses and trucks with food items, cements and iron rods to give to these people to rebuild. A similar thing happened at Santasi TUC.

On operational guidelines on how to take account of disaster occurrences, it was not addressed in the MTDP of ASMA and BDA in 2014-2017 whilst it was partially addressed in the MTDP of KMA. In 2018-2021, it was not addressed by the MTDP of BDA and ASMA whereas KMA addressed it. In addition, operational guidelines were taken into account by the MTDP of KMA, BDA and ASMA. The MMDAs have now officially made room for capacity building of NADMO officers which includes the operational guidelines on how to take account of disaster occurrences. Normally, officers learn on the job with few or no formal training on how to take account of disaster occurrences.

For support of disaster resilient livelihoods, it was not addressed by ASMA in 2014-2017 whilst it was partially addressed by KMA and BDA in 2014-2017 MTDPs. In 2018-2021, it was addressed by KMA and BDA, on the other hand, MTDP of ASMA partially addressed it. In 2022-2025 MTDPs, it was well addressed in BDA and KMA whilst ASMA addressed it.

On climate resilient agricultural practices, it was partially addressed by ASMA and addressed by BDA in 2014-2017 MTDPs. In addition, it was addressed by both ASMA and BDA in 2018-2021 MTDP and was well addressed by BDA in 2022-2025. On the other hand, it was not addressed by KMA in any of the MDTPs. This is due to the urbanised nature of KMA and

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scarcity of land for agricultural purposes. Comparatively, BDA is agrarian due to the fact that some large proportion of the people live in rural areas where agricultural serves as a major source of livelihood amongst the dwellers. Therefore, BDA sought to incorporate climate resilient agricultural practices in the MTDPs through education, sensitization and training of farmers on related matters.

Participatory planning/plan preparation/plan implementation/monitoring and evaluation

The results show that all the three 3 variables (Participatory planning/plan preparation/plan implementation/monitoring & evaluation) or indicators were addressed in the 2014-2017, 2018-2021 and 2022-2025 MTDPs of the various MMDAs. In addition, these indicators were well addressed in the 2022-2025 MTDPs. However, the evaluation of the implementation of 2014-2017 and 2018-2021 MTDPs revealed that there was weak community participation in plan preparation, plan implementation as well as monitoring and evaluation of plans in the various MMDAs. For instance, it was revealed in KMA that 'weak structures for effective participation of citizens especially vulnerable groups in decision making and policy implementation', and 'poor participation of community members in developmental issues' were among the major challenges encountered.

For ASMA, it was revealed that 'weak involvement and participation of citizenry in planning', 'weak collaboration between the Assembly and development authorities to ensure effective plan implementation, monitoring and evaluation'. With regards to BDA, 'weak involvement and participation of citizenry in planning and budgeting' and 'inadequate monitoring and

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evaluation activities conducted' were the key challenges to citizen participation in DRR activities. Therefore, it can be said that there was inadequate participation of development authorities, traditional authorities and community people in plan preparation, plan implementation as well as monitoring and evaluation.

Institutional Capacity

This focus on equipping the various institutions and individuals with the needed skills, resources and logistics to carry out their duties or responsibilities effectively and efficiently for development of the various MMDAs. Regarding training of officials, it was not addressed by ASMA in 2014-2017 whilst it was partially addressed in KMA and BDA in 2014-2017. In 2018-2021 MTDPs, it was well addressed only in KMA whereas it was addressed in ASMA and partially addressed in BDA. In 2022-2025, it is addressed in KMA and ASMA but partially addressed in BDA MTDP. This means that provisions were made to train staff regarding DRR in KMA and ASMA but not BDA. For instance, ASMA sought to strengthen the capacity of NADMO staff and other related institutions to perform functions more efficiently.

Also, KMA projected to build capacity of NADMO staff in disaster management' and 'organise capacity workshop on monitoring and evaluation' for staff and Assembly members. Despite this arrangements, evaluation of the implementation of 2014-2017 and 2018-2021 MTDPs revealed that there was inadequate training of staff on DRR. In addition, it was observed that four activities were allocated for disaster management and repeated for 2018-2022 and 2022-2025 MTDPs of KMA. This depicts that there was no improvement

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in their activities and were there just to beautify the plan and not for implementation purpose.

On resources and logistics for disaster reduction activities, it was not addressed by ASMA in 2014-2017, partially addressed by BDA and addressed by KMA. In 2018-2021, it was partially addressed by BDA whilst it was addressed by KMA and ASMA MTDPs. In 2022-2025 MTDPs, it was addressed by BDA and ASMA and well addressed by KMA. Nevertheless, evaluation of previous MTDPs, thus, 2014-2017 and 2018-2021, revealed that there was inadequate logistics or resources for disaster reduction strategies. For instance, evaluation of 2018-2021 MTDP of BDA revealed that there was inadequate financial, logistics and human resources for project implementation, monitoring and evaluation. The ASMA MTDP 2014-2017 and 2018-2021 capacity training focused mainly on revenue generation rather than disaster management.

This was corroborated in an interview with a NADMO officer who said that:

> *"We don't have logistics, financially we are down, inadequate personnel too. Sometimes we do sacrificial job on what we can do; what we are capable of doing; what we think we can do if they don't support us. By the new act the assembly allocate …; we have 3% of the common fund allocated to NADMO. Ever since the act was passed we have never benefited anything from the 3% of the Assembly Common Fund. So we are just there. I don't know whether districts are benefiting from that one but we have never seen anything of such. We have sent a lot of proposals but we do not get approval".*

This was supported by another NADMO officer that:

> *No, the funds are not adequate. funds have never been adequate, when you look at our action plan and the number of actions that we are able to execute, you will be surprised.*

On logistics, this is that NADMO officer lamented:

> *Before we even, go to the field to gather such formation there is nothing to identify you as a NADMO personnel. We do not have ID cards to inform that we work with NADMO. None of the staff here has a vest. You only find us wearing some when there is an emergency, or we attend a training programme and have the opportunity to wear one. Usually, we rely on T-shirts printed for training programmes. What we do is to keep them properly so that during emergencies we can wear them for easy identification. The situation here is a complex one. As I speak to you, we do not have a vehicle for rapid responses but a team exists to that effect.*

Integration of Plans

This focused on how various plans from various institutions were harnessed or synchronised for development with less disaster risk in the current and future. For the integration of various departments, units and disaster responsive institutions' plans on disaster risk reduction, the results showed that they were addressed in 2014-2017 and 2018-2021 whilst they were well addressed in 2022-2025 MTDPs of the various MMDAs. This is normally done by the DPCU/MPCU/MPCU together with key stakeholders and developmental authorities as well as community representatives.

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However, per the observation of the researcher, the number of disaster related activities were reduced after the prioritisation of the development challenges or needs based on the pressing needs of the people at that time or occurrences of that moment. Various MMDAs proposed effective and efficient integration of plans for 2022-2025 MTDPs. This is seen as indicated by the MTDP of BDA 2014-2017, that "local people, assembly members as well as area councils plans were integrated".

This was captured in the views of the REPO in an interview that:

> Normally when we are doing the action plan, we ask all departments to bring in their plans, so NADMO department will submit their pre-activities and we will integrate it into the action plan. We call something the disaster risk management plan, normally they do it and submit to the planner and we integrate it.

Evaluation of the Medium-Term Development Plans of the MMDAs Regarding Disaster Risk Reduction based on the priorities of Sendai framework

Measuring these indicators (twenty-three 23 specific indicators as shown in Table 20) against the priorities of Sendai framework revealed that the various MMDAs made strenuous efforts regarding the priority, thus, "understanding of disaster risk'. Provision of "understanding of disaster risk" was done through education and sensitisation campaigns through social media, markets, schools and churches, among others. Through this, people were enlightened on disaster risk, dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment.

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On "strengthening disaster risk governance to manage disaster risk", this was partially addressed by the various MMDAs. There are inadequate participation of key stakeholders and community members in plan preparation, plan monitoring and evaluation. There was no clear vision, comprehensive disaster risk plans, competence, guidance and coordination within and across sectors or departments for effective communication or information flow to achieve DRR activities.

With regard to "investing in disaster risk reduction for resilience", this was partially addressed. Especially with the governmental investment, the NADMO Act proposed three (3%) percent of the share of the District Assemblies Common Fund and advances from Contingency fund, however, this was irregular and some MMDAs even found it difficult to retrieve this money for their disaster related activities. Aside the government, private investment was low. However, some NGOs and international organisations such as UNDP amongst others supported the DRR activities.

"Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction" is the fourth priority of the Sendai framework. These include improving the knowledge, capacity of the people and organisations to anticipate, respond and recover from the effects of likely incidence of a disaster. This was partially addressed since the key component which is the early warning system was yet to be installed or function. There were inadequate relief items at the stores, safe havens aside schools, churches and mosques were not identified and prepared for such activities. Capacity of NADMO staff and assembly members were yet to be enhanced on disaster risk reduction and there were not enough funds

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allocated to redevelop communities that would be affected with any incidence of disaster. "Empowering women and persons with disabilities to publicly lead and promote gender equitable and universally accessible response, recovery, rehabilitation and reconstruction approaches is a challenge".

Challenges of integration of Disaster Risk Reduction into development planning processes of MMDAs

There can never be an implementation of policy without any challenges or hindrances, therefore, this chapter explore some major challenges regarding disaster management as well as the integration of DRR into development planning processes.

Challenges of disaster management organisations

Data gathered from disaster response institutions and key stakeholders revealed that there are a number of factors that hinder the effective and efficient delivery of their roles and responsibility in the quest to manage or prevent disaster in their respective location. However, the major factors included: inadequate resources and logistics, weak coordination and communication, overlap and role conflicts, temporal solutions to disaster, weak enforcement of the laws and acts, and politics.

Resources

Findings revealed that most organisations were challenged and lacked the proper logistics to deal with disaster situations in the country. Human resource also remained a challenge; institutions lacked the required human resource strength to deal with these issues. Financial commitments also remained a challenge as sometimes Government was unable to meet financial obligations of the institutions to properly deal with these situations. "*The*

private sector is not doing anything to help in disaster management'' A Red Cross official said. NADMO as a lead agency lacked the needed structures to accommodate staff with most zonal offices operating from uncomfortable structures and under resourced. NADMO officials emphasised this assertion during interview sessions with them. This situation affected staff morale, esteem and consequently reduced their output or productivity. A Key informant from NADMO noted:

> *"I have been working here for the past five years, and anytime we go out on field we have to use our monies for transportation. Providing a vehicle for field trips is a challenge and at the same time you should be seen to be working. We lack the resources to operate effectively and I wonder why an organisation like ours is not given the needed support."*

A Key informant from NADMO regional office noted:

> *"The challenges are numerous. The concept of disaster management on paper is appealing and effective but on the ground, it is the complete opposite. There are equally no training programmes on disaster management for staff and sometimes the people we employ also do not have any certification in disaster management. I remember we attended a training programme with some Americans and they assumed that we had a first degree in disaster management. We burst into laughter because none of us had the degree or was trained in disaster management."*

Weak Coordination

Coordination remains a challenge especially during preparedness phase of managing disaster due to differences in operating procedures and standards. Participants revealed that it was often a great challenge to achieve efficient communication across agencies. Trust issues hampered information flow and although multisectoral assessments were required, reports lacked uniformity. According to one of the interviewees, disaster management organisations demonstrate poor attitude towards meetings and representatives are unwillingly to give off information when asked probing questions due to the problem of power relations.

> "*I have a head, I am acting for someone and I do not need to contradict myself and look stupid" (*A Disaster Officer at Ghana Red Cross Society, 2019).

However, in the response phase some level of coordination was achieved in order save affected victims. This notwithstanding, coordination among organisations in the disaster management cycle is paramount to improving efficiency at disaster management.

> "*It appears departments in NADMO work in silos hence there is weak coordination amongst themselves which even affect coordination with other organisations"* (Programme Analyst, UNDP, 2019)**.**

With an interview with the ambulance service, an official said:

> *"Mostly, we don't call NADMO. My side, we don't call NADMO because in Ghana what NADMO have is, after flood or fire, they will come and donate beds or whatever, that their*

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mattress. But for us, we don't call NADMO; we either call police or fire or if extent then the military people to come inside"

Overlapping of Roles and Responsibilities

Functions and activities of most disaster management organisations seem to overlap which often results in conflict situations regarding appropriate organisation to handle specific issues. A NADMO officer complained, "*Environmental Health Officers accuse as us taking over their job, Fire service officers accuse us of taking over their jobs, Works department also accuse us of interfering with their jobs, this problem affects the effective discharge of our duties*". Most of these institutions above have overlapping roles in the different phases of disaster management. Findings revealed that the capacity of staff of civilian organisation is not sufficiently enhanced to enable them effectively handle crises in the country.

Solutions not lasting and sustainable

Disaster management organisations explained with frustration how government is unable to support them in providing lasting solutions to remedy disaster problems in the country. Officials from NADMO and other organisations explained that, due to lack of political will to make hard decisions, people continue to suffer the same effects of some disaster problems. For instance, perennial flooding in some parts of Kumasi required the demolition of buildings on water ways to make way for proper construction of drains, however this was not realised because politicians did not want to be unpopular. Moreover, citizens and community members in the bid to protect their interest resisted some of these moves by government

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leading to disruptive effects of flooding in Greater Kuamsi. According to the Programme Analyst with the UNDP, there were no sustainability measures and knowledge management to continue projects offered by development partners. He added, "*we expect to have sustainability measures to be put in place so if we are not there, the work can go on*".

NADMO deviating from its core mandate

Legally, NADMO is supposed to coordinate the activities of other organisations however, their focus has been geared towards management. Therefore, it was not surprising that the general public perceived the NADMO to be responsible for sharing of relief items and forgetting about their main responsibility, which is to coordinate.

A Red Cross official said:

> "*NADMO is to coordinate all of us. For instance, if there is any disaster, and NADMO does not call us to respond to, how do we know that? There is poor communication between NADMO and the other responsive institutions. But what do we see? They are always in a hurry to manage disasters by distributing relief items most often. He added, NADMO needs to assist Red Cross to establish first aid response team. We are there to provide the training to the people so NADMO has to call on us to do that. So that when there is any disaster in the community, immediately they call us, that something has happened to Asokwa, Red Cross will mobilise our response team there to respond to the situation*".

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An officer from information department of KMA said:

> "We do not have any link with the meteorological station or office. Our source of information is only with the NADMO through the Assembly. Basically, we are field officers, and we inform and educate the people on governmental projects and related activities. So when there is information or signal of danger or emergency ahead and the NADMO needs our service, they will inform us to sensitise the people about it. However, when there is a disaster incidence, we prepare situational report (this is the reality, what has really happened on grounds). Sometimes, you just have to be at the disaster scene so that the NADMO boss will know that at least you were around. But in reality, you have no role to play there. However, for humanity's sake and to show some care, you just have to be around. That is only if you have early information about such disaster occurrence".

An interview with a NADMO official at the region showed that they were really coordinating other organisations for effective disaster risk reduction, despite the challenges involved. This is what he had to say:

> "NADMO, as our motto goes "prevention pays" we considered everybody to be part of our stakeholders besides that we have our major stakeholders that we work with. When it comes to fire, we team up with the Ghana National Fire service, the Ghana Health Service, the Military, the Police to curb fire

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situations and because it is fire electrical may be involved so

we also team up with Electricity Company of Ghana [ECG]*".*

However, the data gathered revealed that some of the responsive and other organisations related to disaster management did not have strong relationships with NADMO. Some of the institutions saw NADMO as competing for attention as the 'overall robot' when it comes to disaster rather than coordinating the activities of others for effective disaster risk reduction.

Politics

Findings revealed that NADMO as a lead organisation in charge of coordinating the activities of other organisations regarding disaster management had been overly politicised which affected their ability to effectively operate with limited interference**.** The politics of competitive clientelism created an environment in which recruitments and appointments were based more on political rather than technical and professional considerations. This approach had been evident in the National Disaster Management Organisation in different regimes. An environmental health officer emphasised in an interview that key hindrance to the sustainability measures was change in political regimes. He added that change in management during regime changes affects continuity of projects and this constant political interference affected the performance of NADMO and consequently other collaborating organisations.

This emphasises the assertion by Meyer-Sahling et al (2008) that having political connections matter for civil service management. Often termed "Job for the boys" findings revealed the office or appointment of NADMO director was perceived publicly as just a reward for political

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patronage. Therefore, there was an issue of reduced quality of human resource recruited into the organisation. This was not surprising as it was revealed in the study that almost all the NADMO officials interviewed had inadequate knowledge about the various international guidelines or framework such as Hyogo framework and currently the Sendai framework, its targets and priorities. However, they had the main idea as stipulated by their motto as; "prevention pays." Respondents also cited a high level of political interference, unreliable political commitments as issues militating against Ghana's Disaster Risk Reduction Plan development as the government set committee but the committee had not yet delivered the policy document regarding DRR.

Discussion

The study found that disaster risk reduction issues were not well addressed in the three (3) MDTPs periods that were evaluated. There was inadequate integration of DRR activities in the various MTDPs of the various MMDAs (KMA, ASMA and BDA). Aside education, sensitisation campaigns, and capacity building of NADMO staff and Assembly members, little was done on early warning system, coordination of DRR activities amongst the disaster response institutions and departments, poor communication amongst disaster response institutions, no comprehensive disaster risk plans for the various MMDAs as well as inadequate monitoring and evaluation of DRR activities.

Also, with regard to the priorities of Sendai framework, only "understanding of disaster risk" was adequately addressed. Aside the 3 percent allocation of the District Assemblies Common Fund and advances from

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Contingency fund by the government being allocated for disaster risk reduction, there was inadequate finance and low private organisation or individuals' contributions to disaster risk reduction activities. There was poor community participation in the DRR activities as well as low institutional capacity to carry out DRR activities. Inadequate relief items, malfunctioning of early warning system, and poor disaster governance due to poor communication amongst the disaster response institutions.

Nevertheless, it is important to note that the specific outcomes and effectiveness of integration efforts can vary depending on the context, institutional capacities, and implementation approaches. In the case of Greater Kumasi Area, there was inadequate integration of DRR into the development planning process though some attempt and strategies were observed to do so. Therefore, the success stories of DRR were yet to be realised.

On challenges, the study found that there were some number of factors that hindered the effective and efficient delivery of the roles and responsibility of disaster response institutions in quest to manage or prevent disaster in their respective locality. These challenges included: inadequate resources and logistics, weak coordination and communication, overlap and role conflicts, temporal solutions to disaster, weak enforcement of the laws and acts, as well as politics.

Chapter Summary

This section evaluated the MTDPs of the various MMDAs in Greater Kumasi Area selected for the study based on the disaster risk reduction strategies as well as the priorities of the Sendai framework. Also, the allocation of DRR in the MTDPs; DRR activities captured in the MTDPs and

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the incorporation of key stakeholders were examined. The study revealed that there were some forms of DRR integration into the development planning processes, but not adequately done.

In addition, this section considered the challenges associated with the various disaster response institutions in the quest to integrate DRR into development planning processes. Data gathered from disaster management organisation and disaster response institutions and key stakeholders revealed that there are a number of factors that hinder their effective and efficient delivery of their roles and responsibilities. These major challenges included; inadequate resources, role conflicts, temporal solutions to disaster risk, weak enforcement of the laws and acts, and politics.
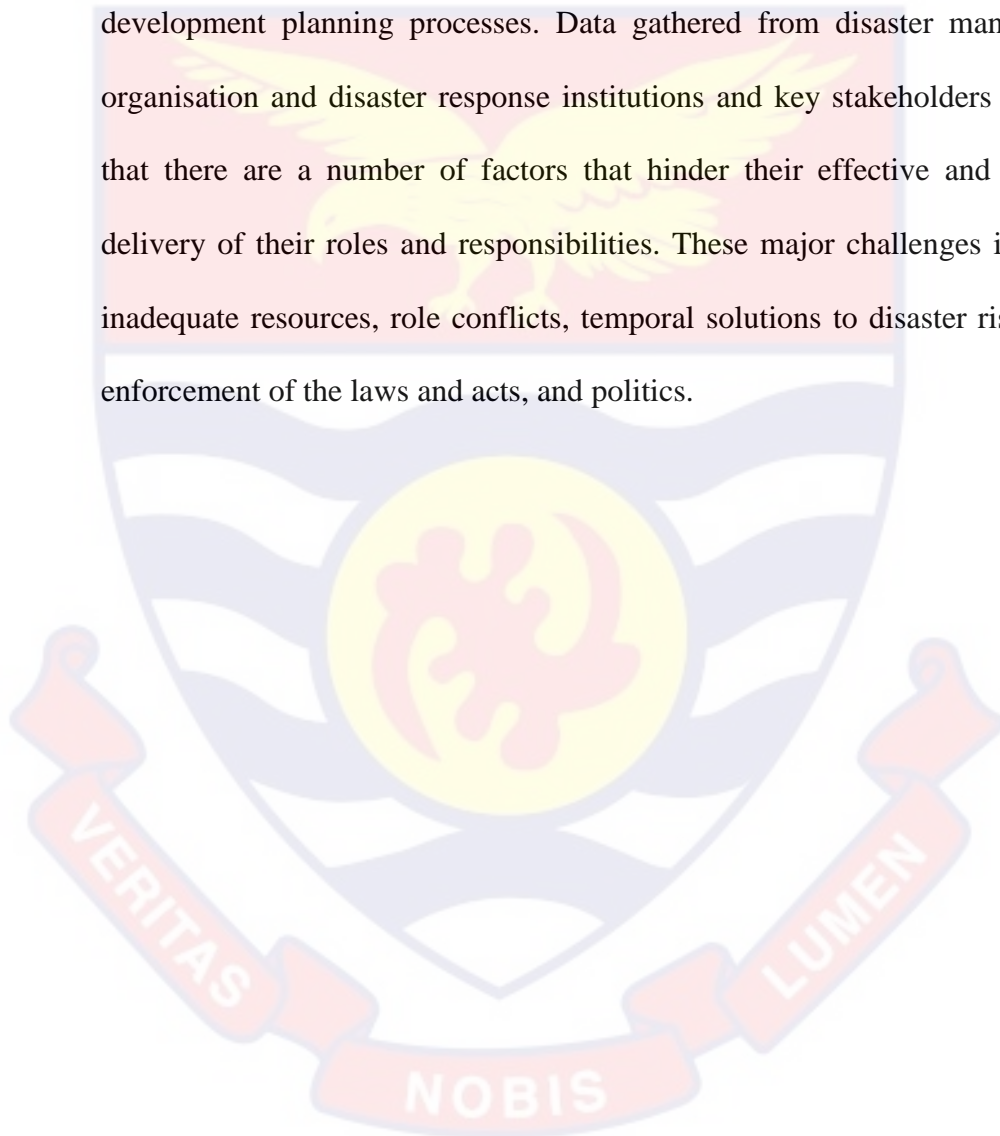
CHAPTER TEN

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This section provides the summary, conclusions, recommendations and suggestion for further studies. The summary gives a snapshot of the study focusing on the background, problem statement, objectives, methodology and key findings of the study. Based on the results of the study, conclusions made and recommendations for disaster risk planning in Greater Kumasi Area are ensured. Lastly, areas for further research are suggested based on the findings and weaknesses of the study.

Summary of Research Processes

The main purpose of the study was to examine the disaster risk planning of some selected MMDAs in the Greater Kumasi Area. The specific objectives were to:

1. Review the disaster risk reduction policies and acts and their contribution to disaster risk planning;

2. Examine community understanding of risk and participation in disaster risk reduction;

3. Analyse the roles and responsibilities of various response institutions in disaster risk reduction;

4. Assess the institutional capacity for disaster risk reduction and management and;

5. Evaluate the integration of disaster risk into the MTDPs of the MMDAs.

Pragmatism is a philosophy that advocates for a practical and pluralistic approach to research, combining multiple methods to shed light on human behaviour. This philosophy was adopted. The research approach used is a mixed method, combining both quantitative and qualitative approaches. The qualitative approach is inductive and explores meanings and insights in a natural setting, whilst the quantitative approach applies statistical techniques to establish relationships between variables and generalise findings to a population. The study employed a "quali-quanti" type of mixed approach, where the qualitative aspect was conducted first to gather information and provide insights for the quantitative aspect. The research design employed in the study is action research, which involves the researcher working directly with the people involved in the study to develop practical solutions and generate theoretical knowledge.

The study focused on the Greater Kumasi Sub-Region in Ghana and includes officials from various disaster response institutions and emergency services such as disaster management organisations, Ghana Fire Service, Ghana Police Service, Ghana Ambulance Service, Environmental Protection Agency, Metropolitan/Municipal/district assemblies, traditional authorities, Assembly members, community dwellers, and households as participants. In all, four-hundred and twenty-seven (427) respondents were involved in this study. The study included 399 households in the selected MMDAs and twenty-eight key informants.

The study utilised both primary and secondary sources of data. Primary data was collected through questionnaires, interviews, and focus group discussions, whilst secondary data was gathered from policy documents, laws,

and plans related to disaster management. Data collection instruments were validated through pre-testing, and data were collected using various procedures such as community entry, interviews, and self-administered questionnaires. Data analysis involved both quantitative and qualitative techniques. Quantitative data were processed using statistical software for descriptive and inferential analysis, whereas qualitative data were transcribed, coded, and analysed thematically.

Major Findings

Review the disaster risk reduction policies and acts and their contribution to disaster risk planning

It was found that equity levels were moderate, technical feasibility was moderate and ex-post was low. Political viability was high for EPA Act, GNFS Act, NAS Act, and NADMO Act whilst Land Policy and LUSPA Acts were moderate due to their inability to provide a platform to harness or integrate disaster risk reduction into development planning process. Administrative operability was low due to inefficiency of agencies and commissions responsible to ensure that the policy and acts' objectives were achieved. They were saddled with inadequate logistics, low staff capacity and cooperation challenges. Overall, Land policy was low while the various acts were moderately efficient in disaster risk reduction as well as integrating DRR into the development planning process.

Examine community understanding of risk and participation in disaster risk reduction

As part of the objective one, it sought to examine the understanding of households on disaster, disaster risk or vulnerability, awareness of risk factors

and potential causes of disasters. In addition, the section explored the community participation of the respondents regarding the various strategies and activities of disaster risk reduction. It was revealed that majority (98%) of the respondents have experienced a disaster (floods or fire outbreak) incidence before in their respective communities. For floods, it was normally experienced in the raining season whilst fire outbreak was rampant during the dry season in Ghana. Most of the households do not experience fire outbreak, however, the fire outbreak in Greater Kumasi normally occurred in the public places such as market centers, stores among others.

About 82 percent of the respondents perceived that they were at a higher risk or vulnerable to disaster whilst a few (18%) of the respondents perceived it to be low. About 80.2 percent of the respondents were very concerned about the disaster management and about 74 percent of the respondents were aware of the disaster risk factors in their respective communities whilst a few (26%) of the respondents were not aware. Moreover, 131 (36.6%) of the respondents indicated that chocked gutters/small gutters followed by heavy downpour/rainfall, indiscriminate waste disposal were the main causes of disaster in their communities. On the other hand, respondents indicated that unstable power supply and poor electrical wiring of houses were the major causes of fire outbreak.

The study examined community participation in Disaster Risk Reduction (DRR) strategies, focusing on different stages: prevention and mitigation, preparedness, response, and rehabilitation and recovery:

Prevention and Mitigation

Most respondents had not been trained for disaster preparedness, attended first aid training, participated in drills, or engaged in volunteer activities related to disaster prevention. Communities lacked emergency plans or flood insurance. Respondents were not involved in decision-making or activities regarding disaster prevention and mitigation.

Preparedness

Respondents disagreed that they were prepared to help their families during emergencies. Only 13.4% had emergency food supplies. Communities lacked early warning systems and communication with disaster management institutions, increasing vulnerability. Respondents disagreed about having an active community disaster response team. Where such teams existed, they were unreliable and unmotivated. Also, communities lacked evacuation routes and shelters. Only 12.3% had contacts of disaster response institutions. Respondents disagreed overall about community involvement in disaster preparedness (M=1.59, SD=0.99), making them vulnerable during disasters.

Response

Respondents strongly disagreed about their involvement in disaster response. Issues included inadequate search and rescue teams, slow response to disasters, poor disaster assessment, and politicised relief item distribution.

Rehabilitation and Recovery

Most respondents strongly disagreed that community members were involved in rehabilitation and recovery due to inadequate assistance and politicised relief distribution.

Risk Governance

Majority perceived neglect by community leaders in planning, monitoring, and evaluating DRR projects and activities, indicating a lack of governance involvement in all stages of disaster management.

In all, respondents were aware of disaster risk and were concerned about it. Also, the study revealed that community members were poorly involved in the DRR strategies. However, households were a little bit knowledgeable with regard to disaster prevention and mitigation as well as disaster preparedness due to the sensitisation and educational activities on DRR organised by the various MMDAs. Overall, the study reveals significant gaps in community participation across all stages of DRR, emphasizing the need for better training, involvement, and support systems to enhance community resilience.

Analyse the roles and responsibilities of various response institutions in disaster risk reduction

NADMO

NADMO was established to serve as a central point of contact for disaster and emergency management in the country. They prepare national disaster plans. It is mandated by the organisation's charter to provide relief aid in any place, and as a result, the organisation has regional, MMDAs, and zonal offices. NADMO as motto say "prevention pays" considered everybody to be part of the stakeholders besides the major stakeholders that they worked with. When it comes to fire outbreak, they teamed up with the GNFS, the GHS, the Military, the Police to curb fire situations and included the ECG if it was about fire electrical related fire outbreak.

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Ghana National Fire Service

They evaluate and assess the whole spectrum of anticipated fire and rescue-related dangers that confront societies. They perform prevention and protection activities such as fire education and simulation exercises and responds to incidents in a suitable manner. The study found that they advised prospective developers on fire safety measures they would require. Moreover, they provide technical advice for building plans

Ghana National Ambulance Service

The National Ambulance Service is a collaborating organisation in disaster management in Ghana. The "object of the service is to provide for the effective administration and management of emergency care services nationwide." The Service was established to offer proficient and timely pre-hospital emergency medical care to sick and injured persons and subsequently transports them safely to health centres. They ensure the provision of timely emergency care services for persons involved in accidents, disasters and any other related emergencies.

Ghana Metrological Agency

They offer valuable and consistent information by collecting, processing, storing, analysing and disseminating findings to end users such as the general public and other organisations concerning weather conditions or elements. It collaborates with NADMO in providing cost effective weather and climate services by disseminating information to support socioeconomic growth of the country with special regard to the protection of lives and property as well as the environment (Ghana Meteorological Agency Website,

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2016). Information dissemination is done through the local radio stations using local dialects to ensure target population receives the information.

Red Cross Society

The Ghana Red Cross Society (GRS) is a humanitarian organisation. If there is a humanitarian crisis, the Red Cross steps in to help the government. The Ghana Red Cross Society provides emergency first aid to those in need whilst they wait for more serious medical attention at the country's hospitals. "Our responsibility is to train local people in the various community how to give out first aid to victims when disaster occurs" (Red Cross Officer, Kumasi, Male).

Ghana Police Service

The GPS is a collaborating organisation of the NADMO. They cordon area off the disaster, control and direct traffic and sometimes set up safety zone around the disaster area to prevent pilfering and further damage to lives and property. They set up on-scene police command post, arrest and detain intruders and cope with proof until nicely relieved with the aid of forensic evidence control crew. Their service is explicitly observed during and after disaster occurrence especially fire outbreak. Moreover, they used to conduct investigation about the causes and related issues after the disaster strikes and make recommendations after the investigation.

Roles Gap and conflict among disaster response institutions

Relationship between the various MMDAs in Greater Kumasi Area and NADMO, EPA, TA and GNFS are expected to be strong. However, data gathered shows that there is poor relationship amongst organisations such as Red Cross, EPA, GAS, TA and GPS. There was no clear cut role between Red

Cross and National Ambulance Service. NADMO was not seen as a coordinator but rather a management body. There was a role gap between GMet, NADMO, GNFS, NAS and the Information department.

Assess the institutional capacity for disaster risk reduction and management

NADMO which is tasked by the NADMO Act in 2016 to coordinate the disaster response institutions and department in preventing, managing and reconstructing or redevelopment of community when disaster strikes had moderate influence on disaster risk reduction. This was due to the low administrative capacity as well as technical and financial support to implement its policies. It was revealed that various disaster response institutions have limited capacity to implement DRR due to: limited resources and logistics, inadequate staff and skills, and funds.

Evaluate the integration of disaster risk into the MTDPs of the MMDAs

A portion is given to DRR in the MTDPs of the MMDAs. There was ineffective functioning of DPCU/MPCU, DVGs, and MMDDC. There was inadequate integration of DRR activities in the various MTDPs of the various MMDAs (KMA, ASMA and BDA). Education, sensitisation campaigns, and capacity building of NADMO staff and Assembly members were addressed. Little was done on early warning system, coordination of DRR activities amongst the disaster response institutions and departments, poor communication amongst disaster response institutions, no comprehensive disaster risk plans for the various MMDAs and inadequate monitoring and evaluation of DRR activities.

Conclusion

Based on the specific research objectives and the major findings of the study, the following conclusions have been drawn;

- Policy and Acts moderately contribute to the disaster management and integration of DRR into development planning process. Thus, policies and acts by the government were not effective in fully integration of DRR into the development planning process;

- Households were aware of disaster risk. However, they were poorly involved in the development planning processes. Respondents were somehow sensitised and educated on disaster risk to ensure disaster preparedness and prevention;

- Despite the roles and responsibilities of disaster response institutions, there were still some role conflicts and gaps in them. The coordination role of NADMO was not explicitly demonstrated;

- The various disaster response institutions were inadequate capacity to implement DRR due to; limited resources and logistics, inadequate staff and skills, and funds; and

- There was inadequate integration of DRR activities in the various MTDPs of the various MMDAs (KMA, ASMA and BDA). Aside sensitisation and educational activities that were adequately done in the public places, community participation was very low, risk governance and financing, monitoring and evaluation of disaster risk reduction activities were poorly done.

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Recommendations

With regard to the conclusions drawn out of the study, the following suggestions are put forward for consideration;

- DPCU/MPCU of various MMDAs should ensure that development planning processes are participatory. Also, DVGs and disaster clubs should be revived in various disaster-prone communities and schools.

- NADMO should ensure proper coordination among the disaster responsive institutions. All disaster response institutions and related institutions concerning disaster management should be on board and their roles and responsibilities should be clearly stated to avoid overlapping and role gaps.

- NDPC should complete and issue the policy framework or disaster risk plan for the nation. This will serve as a guide for making regional and Metropolitan/Municipal/District disaster risk plan.

- The government as well as private entities or organisations should help provide adequate finance for implementation, monitoring and evaluation of DRR activities timely.

- The DPCU/MPCU in collaboration with the various MMDAs should ensure that there is adequate and proper integration of DRR activities into the development planning process.

Contribution to Knowledge

According to Silverman (2000), the impact of a study on knowledge can be evaluated in four key aspects: the development of a new concept or methodology, the expansion of previous research, and the alteration of existing

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knowledge. Consequently, the contributions of the study to knowledge encompass:

The study has built on existing studies that looked at the coordination among the disaster management institutions. This study examined the roles and responsibilities of disaster response institutions regarding disaster risk reduction. Also, role conflict, gap and role strain were examined among the disaster response institutions. Moreover, studies conducted so far focused on mainly on one disaster such as fire outbreak or floods, however, this study focus on both of the major disasters in Greater Kumasi Area. Furthermore, the study examined the integration of disaster risk reduction into the development planning process of the various MMDAs. The evaluation of MMDAs MTDPs from 2014 to 2025 against the disaster risk reduction strategies and the priorities of the Sendai framework as well as the collection of primary data from selected MMDAs in Greater Kumasi permitted a deeper analysis and understanding of disaster risk planning.

The contribution to the living with risk framework and the mainstreaming of climate change into the development planning process framework developed by UNISDR (2004) and Agyemang and Antwi (2016) respectively is another asset added to the literature by the study. The study introduced the disaster risk reduction activities and how their interplay with development planning processes, coupled with the structures (NDPC, RCC, MMDAs, NADMO etc) and processes (national policies, acts and customs) to ensure effective disaster risk planning in Greater Kumasi Area. The study confirmed the role gap and constrains amongst disaster response institutions

and the need for effective collaboration amongst key stakeholders in ensuring effective disaster risk planning.

Also, the desired outputs as listed in the model do not reflect some of the result of the study. For instance, enhanced disaster preparedness, improved resilience, improved emergency response and well-resourced disaster risk reduction team were not achieved. Though there were structures, institutions and integration of disaster risk reduction into the development planning process of the MMDAs, however, there was poor integration due to inadequate finance, poor monitoring and evaluation, low community participation. Also, the policies and acts governing disaster management do not adequately cover disaster risk reduction.

The contribution to knowledge is also based on the integration of disaster risk reduction into the medium-term development planning of the various MMDAs in Greater Kumasi Area. Most studies focus on the causes of flooding and fire outbreaks, effect of flooding and fire outbreak on households, business, coping strategies among others, however, how disaster risk reduction activities or strategies have been incorporated into the development planning processes were not considered. This was the focus of the study in order to ensure that the Sendai framework is adhered to and for the achievement of Sustainable Development Goal eleven (sustainable cities and communities).

The study's contribution to policy formulation represents an invaluable addition to existing knowledge. It emphasises the importance of conducting thorough research and engaging in meaningful consultations with relevant stakeholders when developing policies. Through extensive consultations,

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comprehensive data analysis, and the provision of various policy alternatives, the study has facilitated the creation of effective strategies for disaster risk planning. Also, it is recommended that the outcome of this study should be considered in the preparation of disaster risk reduction plan for the nation, Ghana.

Suggestions for further studies

Base on the findings of the study, it is proposed that some further researches can be carried out to fully examine the disaster risk planning in the Greater Kumasi Area. The following areas are therefore suggested;

1. How public and private partnership can help in financing disaster risk reduction activities. This has been informed by the fact that the 3 percent of the MMDAs Common Fund and contingency fund were not enough to finance DRR activities. Also, there is inadequate private sponsorship or support to DRR activities in the Greater Kumasi Area.

2. Examine community-based Disaster Management strategy in Greater Kumasi Area. The study found that there is less community participation in DRR. Therefore, the is the need to explore how Community-based Disaster Management strategy can help to bridge this gap knowing the essence and contribution of community members to DRR.

3. Explore factors that influence community participation in disaster risk reduction activities in Greater Kumasi Area. Despite the contribution of community members to DRR activities, they were less involved or neglected, it is therefore, recommended that a study is conducted to examine the factors that influence community participation in DRR activities.

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APPENDIX A

QUESTIONNAIRE FOR HOUSEHOLDS

UNIVERSITY OF CAPE COAST

DEPARTMENT OF GEOGRAPHY AND REGIONAL PLANNING

District:

Dear Sir/Madam

I am Oscar Opoku Agyemang, a PhD. candidate of the Department of Geography and Regional Planning from the University of Cape Coast. I am the principal investigator of this research and I humbly request you to participate in this PhD research which seeks to investigate '' An Evaluation of Disaster Risk Reduction Management in the Medium-Term Development Planning of Greater Kumasi". This research is purely for an academic exercise and all information given will be used solely for this purpose. The research is designed to elicit and gather data on the above topic that will contribute to the production of a PhD thesis as an exercise in partial fulfilment of the requirement for the award of a Doctorate. Therefore, your participation is fully voluntary. Your confidentiality is greatly assured. This will take about 15 minutes of your time. Thank you.

Please respond to the following questions by filling the blank spaces or ticking [√] where appropriate.

SECTION A: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

1. Sex: a. Male [   ]   b. Female [   ]

2   Age   a. below 20   [   ]   b. 20-29 [   ] c. 30-29 [   ]   d. 40-49   [   ]   e. 50-59 [   ] f. 60-69 [   ] e. 70 and above   [   ]

3. Marital status: a. Never married [   ]   b. Married [   ]   c. Divorced   [   ]
                d. Widowed   [   ]   e. Co-habiting   [   ] f. Separated [   ]

4. Religion: a. Christian [   ]   b. Moslem   [   ]
          c. Traditionalist   [   ]   d. Others (please specify)……………………

5. Educational level:

a. No formal education [   ]   b. basic education [   ] c. Secondary [   ]

 d. Tertiary   [   ]   e. Other (please specify)……………

6. Occupation:
……………………………………………………………………….

7. Number of persons in your household:
………………..……………………….

8. Average monthly income:

a. Less than 500 [   ]   b. 500-999 [   ]   c. 1000-1499 [   ]

d. 1500-1999 [   ] e. 2000-2499 [   ] f. 2500-2999 [   ]   g. 3000 and above [   ]

9. Name of community:……………………………….………………….………

10. How long have you been living in this community?.......................................

    a. less than 1 year [   ] b. 1 – 4 years [   ]   c. 5 – 9 years [   ] d.
        10 years and above   [   ]

11. Have you experience any disaster in your area? a. Yes [   ] b. No [   ]

12. If yes, what type of disaster?

 a. Fire [   ]   b. Floods [   ]   c. Other [   ] please explain…………

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SECTION B: COMMUNITY PARTICIPATION/INVOLVEMENT IN THE DISASTER RISK REDUCTION MANAGEMENT

13. This section contains community participation/involvement in the disaster risk reduction management of Greater Kumasi Area. Please tick as appropriate using a tick (√) or cross mark (x) the statement that describes your agreement or disagreement with each of the statements. In a 5-point Likert scale, where SD – Strongly Disagree, D – Disagree, Neutral – U, A – Agree, and SA – Strongly Agree, rate the following statements.

Statements	SD	D	N	A	SA
Disaster prevention and mitigation					
I have been trained on how to prepare for a disaster					
I have attended a first aid training					
I have participated in disaster or evacuation drill					
I have participated in a community or volunteer activity related to disaster preparedness or prevention					
I have been sensitised about disaster during its peak period					
I have emergency plans/flood insurance					
Disaster Preparedness					
Being prepared help my family and 1 during disaster or emergency					
I have suppliers/things in my home that help during a disaster or emergency					
Our community has an early warning system					
Our community has a disaster response or emergency plan					
Our community members have been trained to assist others during disaster or emergency					
Our community has a disaster response team that decides what to do during a disaster or emergency					
Our community has an evacuation routes					
Our community has shelter or open space identified where people can go to during a disaster or emergency					
Disaster Response					
Our community has a quick response team that come around when there is any disaster or emergency					
My family and I were attended to during disaster incidence					

There is search and rescue operations during disaster event					
Assessment of disaster, its intensity, damage and loss are done during disaster occurrence					
Registration of victims and provision of relief items are done during disaster occurrence					
Disaster Rehabilitation and Recovery					
Relief items are provided after a disaster occurrence					
Temporary shelter and rescue places are provided after a disaster incidence					
I have been involved in formulating disaster recovery plans					
Counseling sections are provided for victims after disaster occurrence					
I received assistance from authorities after disaster occurrence					
I received financial assistance after disaster occurrence					
Governance					
Our community members/unit committees are involved in planning or coordinating with MMDAs on disaster					
Our community has benefited from government previous programmes or activities related to reducing risk or vulnerability during disaster					
Our community members/unit committees are involved in implementation of disaster plans					
Our community members/unit committees are involved in Monitoring and evaluation of activities or projects related to disaster reduction management					

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APPENDIX B

UNIVERSITY OF CAPE COAST

DEPARTMENT OF GEOGRAPHY AND REGIONAL PLANNING

STRUCTURED INTERVIEW GUIDE FOR KEY

STAKEHOLDERS/OFFICERS

Topic: An Evaluation of Disaster Risk Reduction Management in the

Medium-Term Development Planning of Greater Kumasi, Ghana.

My name is Oscar Opoku Agyemang, a PhD. Candidate of the Department of Geography and Regional Planning from the University of Cape Coast. I am the principal investigator of this research and I humbly request you to participate in this PhD research which seeks aims at "An Evaluation of Disaster Risk Reduction Management in the Medium-Term Development Planning of Greater Kumasi". This research is purely for an academic exercise and all information given will be used solely for this purpose. The research is designed to elicit and gather data on the above topic that will contribute to the production of a PhD thesis as an exercise in partial fulfilment of the requirement for the award of a Doctorate. Therefore, your participation is fully voluntary. Your participation entails you being interviewed by the principal investigator or a research assistant, and whatever information you provide will be considered as confidential and will be treated as such. Please also note that your name or identity will not be mentioned in any part of the report. In addition, the information obtained from you will be used for its proposed purpose only. The principal investigator does not anticipate any risks or harm to you with respect to your involvement in this research project. The

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interaction is expected to last for about 45 minutes. Thank you in advance for

accepting to be part of this research project. Thank you once again.

Do you agree to participate in the study? Yes   No

If No, reason(s) for refusal:

……………………………………………………………………………………

……………………………………………………………………………………

Signature/Thumbprint of

Interviewee:_____
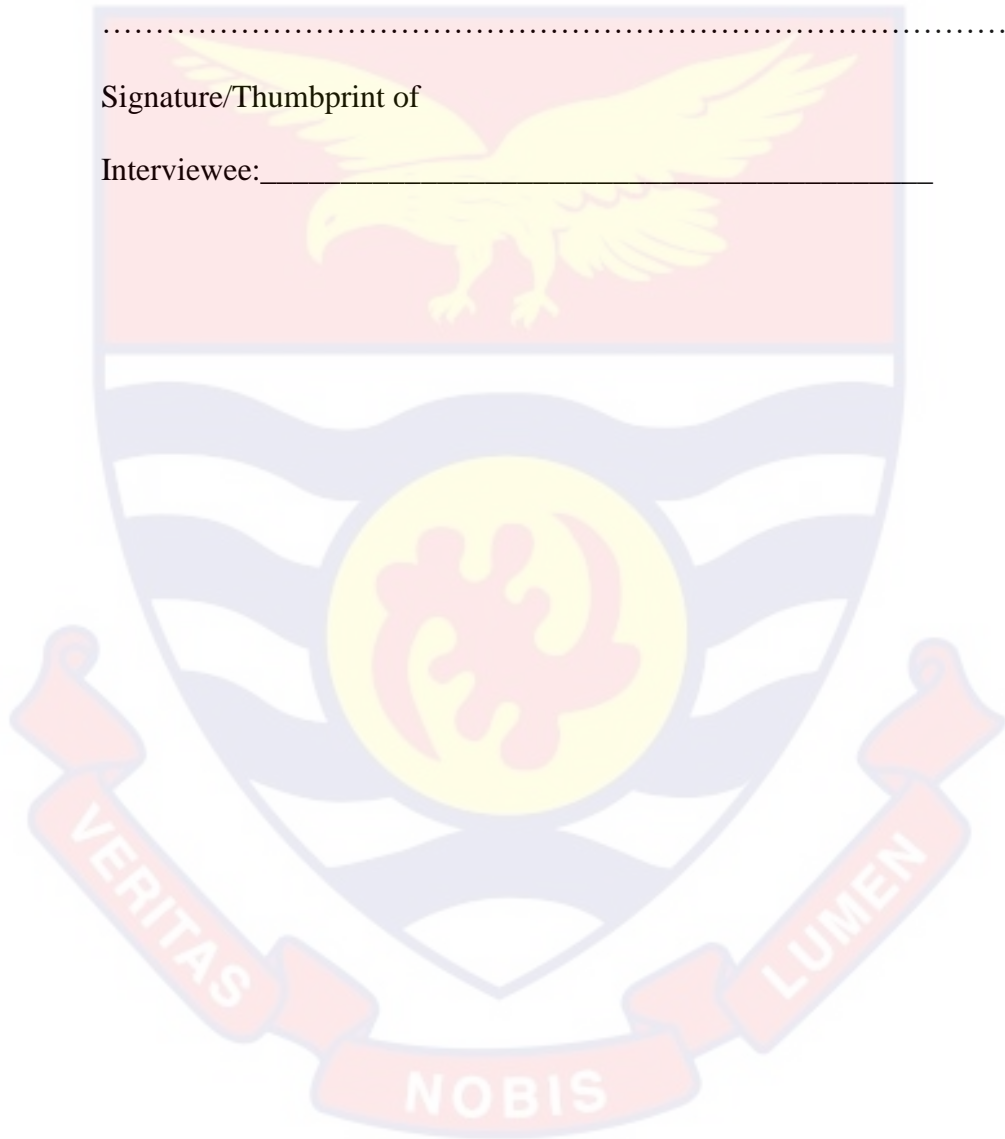
SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE PARTICIPANT

1. Sex: …………………………………………………………………
2. Age: …………………………………………………………………
3. Marital status: ………………….………………………………..
4. Institution: …………………….………………………………..
5. Designation: ……………………………………………………….
6. Educational level: ……………………………….…………………….
7. Religion: ……………………………….……………………………
8. Number of years worked: …………………………………………

SECTION B: THE ROLES AND RESPONSIBILITIES OF VARIOUS RESPONSE INSTITUTIONS IN DISASTER RISK REDUCTION

9. What are the roles/responsibilities of your institution regarding disaster risk reduction?
10. What is the role of your institution in the education/awareness creation/sensitisation on disaster?..
11. What is the role of your institution/office in the risk assessment and analysis of disaster? ....
12. What is the role of your institution/office in vulnerability and hazard analysis and monitoring? ....
13. How do you collaborate with other stakeholders in vulnerability and hazard analysis and monitoring? ....
14. Are there any policies, laws or legislative instrument that guide your institution with respect to disaster risk reduction management?..............

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15. If yes, please name them...

If no, why?

16. Are there bye laws on disaster risk reduction and management?

17. If yes to 16, how are bye laws enforced.

18. What is the role of your institution in early warning of community/households on disaster? ....

19. What is the role of your institution in disaster plan preparedness (contingency plan, early warning system, meetings)?...........

20. How does your institution respond to disaster occurrences? ....

21. What role does your institution play in rehabilitation and recovery activities after disaster occurrences? ....

22. Are there any missing functions to be performed by your organisation with respect to disaster risk reduction, planning and management?

23. Describe the nature of the competition or overlap with other institutions in the fulfilment of your responsibilities…………………..

24. Describe the nature of conflict with other allied institutions in the fulfilment of your responsibilities. ……………………………….

25. Has any of the responsibilities of your institution/outfit changed overtime?

Explain………………………………………………………….

26. What is your relationship with the following organisations: (please answer with VERY STRONG, STRONG, NEUTRAL, FAIR, WEAK, VERY WEAK)

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Relationship amongst Disaster Risk Reduction Institutions

 (please answer with VERY STRONG (VS), STRONG(S), NEUTRAL(N), FAIR(F), WEAK(W), VERY WEAK(VW))

	MMDAs	NADMO	GNFS	TA	GPS	GAS	GHS	DPO	PPD	DWD	ICS	DEHO	SOCIAL	NCCE
MMDAs														
NADMO														
GNFS														
Traditional Authorities (TA)														
GPS														
GAS														
GHS														
DPO														
PPD														
DWD														
Information														
DEHO														
SOCIAL WAREFARE/ COMMUNTIY DEV'T														
NCCE														

SECTION C: THE INSTITUTIONAL CAPACITY FOR DISASTER RISK REDUCTION AND MANAGEMENT

27. What has been the main source of funding of your organisation for disaster risk reduction and management?

28. How would you assess the adequacy of funding?

    i)   ADEQUATE   ii) INADEQUATE

    b) If inadequate suggest how this problem can be solved

29. How would you assess the adequacy of logistics?

    i) ADEQUATE   ii) INADEQUATE

30. LOGISTICS NEED ASSESSMENT

LOGISTIC TYPE	Current Number 2021	NUMBER REQUIRED				
		2022	2023	2024	2025	Remarks
1.						
2.						
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31.) How would you assess the adequacy of information for disaster risk reduction and management? i) ADEQUATE   ii) INADEQUATE

32. What are the constraints in the generation of information?.................

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33. How best can this problem be addressed?...

34. How often is data updated?...

35. In your assessment is current data up to date?.....................................

36. How will you assess the adequacy of the skills and knowledge to implement disaster risk reduction activities? i) ADEQUATE

ii) INADEQUATE

37. What are the constraints in the generation of the requisite skills?.................

38. How best can this problem be addressed?..

39. How often is your staff trained on disaster risk reduction management?

40. What are the reasons for your answer……………………………………..

SECTION D HOW DISASTER RISK REDUCTION MEASURES HAVE BEEN INCORPORATED INTO THE MTDPS OF THE MMDAS

41. Is there any allocation in the MTDPs meant for disaster risk reduction management?

Yes/No, explain ……………………………………………………………

42. Do you incorporate other key stakeholders plans regarding disaster risk reduction into the MTDPs? Yes/No explain.................................

43. Do the MTDPs capture the activities of the various key stakeholders regarding disaster risk reduction management? Yes/No, explain……

SECTION E IMPLEMENTATION OF DRR MEASURES IN MTDP IMPLEMENTATION OF THE MMDAS

44. What are the key stakeholders involved in the implementation of disaster risk reduction activities in the MMDAs?..

45. How are plans or activities of disaster risk reduction in the MTPs are implemented?.........

46. Do the key stakeholders collaborate in the implementation or is done individually?

Explain...

47. How are the activities of disaster risk reduction implemented monitored and evaluated?....

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48. Is there any collaboration between key stakeholders regarding the monitoring and evaluation of disaster risk reduction activities?..

SECTION F CHALLENGES OF MMDAS TO MANAGE/REDUCE DISASTER RISK

49. What are the key challenges of disaster risk reduction management of MMDAs with regards to the following:
a. Community engagement/vulnerability and risk identification
b. Plan preparation
c. Plan incorporation of various key stakeholders
d. Capacity of key stakeholders
e. Implementation of plans
f. Early warnings, response team, recovery programmes

50. In your view, what are some of the challenges your institution/office face in quest for effective disaster risk reduction management?

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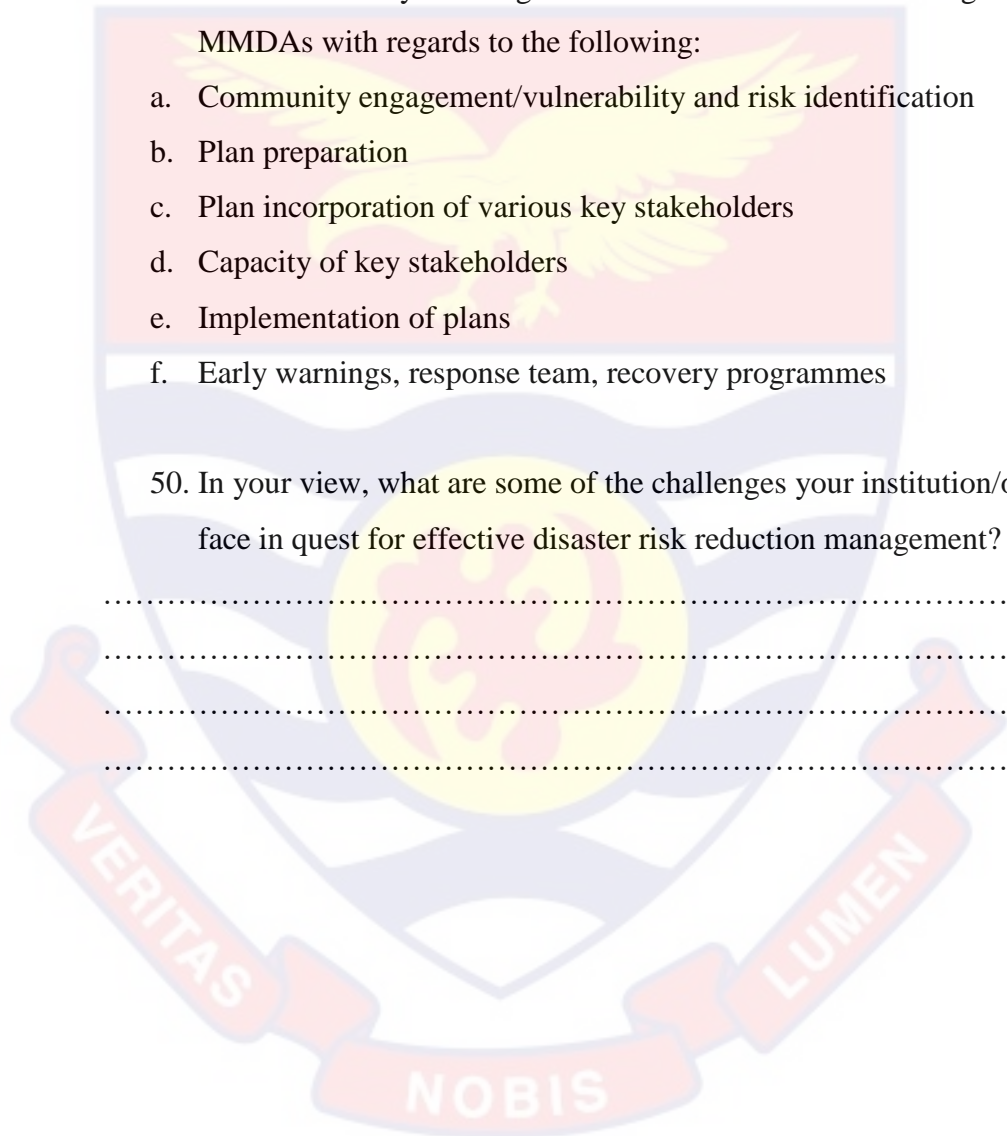
APPENDIX C

INDICATORS TO EVALUATE THE MEDIUM-TERM DEVELOPMENT PLANS OF THE

MMDAs REGARDING DISASTER RISK REDUCTION

Main Issues	Specific	Planning period	Not addressed	Partially Addressed	Addressed	Well Addressed
Identification of past and current disaster prone areas	MTDP identifies past and present disaster prone areas	2022-25				
		2018-21				
		2014-17				
	Profile of the MMDA identifies past and present disaster prone areas/communities	2022-25				
		2018-21				
		2014-17				
Disaster preparedness	MTDP takes care of information management (creating database, updating, storage and dissemination of information) regarding disaster risk reduction	2022-25				
		2018-21				
		2014-17				
	MTDP considers early warning systems,	2022-25				
		2018-21				
		2014-17				
	MTDP considers risk and hazards mapping ana analysis	2022-25				
		2018-21				
		2014-17				
	MTDP ensures acquisition and storage of relief items	2022-25				
		2018-21				
		2014-17				
	MTDP inculcates comprehensive disaster preparedness strategy/plans					
Disaster response	MTDP makes room for emergency response services such as search and rescue operations, evacuation of victims to safe havens	2022-25				
		2018-21				
		2014-17				
	MTDP make room for assessment of disaster and registration of victims and provision of relief items	2022-25				
		2018-21				
		2014-17				
	MTDP cater for the provision of medical services, coordination and communication, first aid and emergency medical care	2022-25				
		2018-21				
		2014-17				
	MTDP create and provide urgent aid in order to sustain life, improve wellbeing and build morale of the affected community.	2022-25				
		2018-21				
		2014-17				
Post-disaster recovery	MTDP makes room for critical infrastructure eg. Roads, telecom, electricity, water etc	2022-25				
		2018-21				
		2014-17				
	MTDP indicates specific	2022-25				

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	operational guidelines on how to take account of disaster occurrences	2018-21				
		2014-17				
	MTDP supports disaster resilient livelihoods	2022-25				
		2018-21				
		2014-17				
	MTDP identifies and tackles infrastructural development with emphasis on households that are in more vulnerable locations	2022-25				
	MTDP incorporates climate resilient agricultural practices	2018-21				
		2014-17				
		2022-25				
Participatory planning/plan preparation	Planning process is participatory	2022-25				
		2018-21				
		2014-17				
Plan implementation	Planning implementation is participatory	2022-25				
		2018-21				
		2014-17				
Monitoring & Evaluation	Monitoring and evaluation of plans are participatory	2022-25				
		2018-21				
		2014-17				
Institutional capacity	MTDP makes room for the training of officials for disaster risk reduction management	2022-25				
		2018-21				
		2014-17				
	MTDP includes securing of resources and logistics for disaster reduction measures	2022-25				
		2018-21				
		2014-17				
Integration of plans	MTDP develop data base on collaborating agencies, research and mobilization of equipment for simulation.	2022-25				
		2018-21				
		2014-17				
	MDTP harness various departmental/unit plans on disaster reduction management	2022-25				
		2018-21				
		2014-17				

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APPENDIX D

Ethical Clearance

UNIVERSITY OF CAPE COAST

INSTITUTIONAL REVIEW BOARD SECRETARIAT

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OUR REF: IRB/C3/Vol.1/0245
YOUR REF:
OMB NO: 0990-0279
IORG #: IORG0011497   13TH JULY, 2023

Mr Oscar Agyemang Opoku
Department of Geography and Regional Planning
University of Cape Coast

Dear Mr Opoku,

ETHICAL CLEARANCE – ID (UCCIRB/CHLS/2022/36)

The University of Cape Coast Institutional Review Board (UCCIRB) has granted Provisional Approval for the implementation of your research on **An Evaluation of the Integration of Disaster Risk Reduction into the Medium-Term Development Planning of the Greater Kumasi Area.** This approval is valid from **13th July, 2023** to **12th July, 2024**. You may apply for an extension of ethical approval if the study lasts for more than 12 months.

Please note that any modification to the project must first receive renewal clearance from the UCCIRB before its implementation. You are required to submit a periodic review of the protocol to the Board and a final full review to the UCCIRB on completion of the research. The UCCIRB may observe or cause to be observed procedures and records of the research during and after implementation.

You are also required to report all serious adverse events related to this study to the UCCIRB within seven days verbally and fourteen days in writing.

Always quote the protocol identification number in all future correspondence with us in relation to this protocol.

Yours faithfully,

Kofi F. Amuquandoh
Ag. Administrator

ADMINISTRATOR
INSTITUTIONAL REVIEW BOARD
UNIVERSITY OF CAPE COAST

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