Advocacy and Capacity Building for Disaster Risk Reduction and Preparedness in Ghana Project

Disaster Risk Management Training Manual

November 2016
THIS TRAINING MANUAL WAS PREPARED BY THE DIRECTORATE OF RESEARCH, INNOVATION AND CONSULTANCY (DRIC) OF THE UNIVERSITY OF CAPE COAST (UCC) ON BEHALF OF THE UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP), GHANA

Copyright © 2016 by the UNDP. All rights reserved. No part of this publication should be reproduced, stored in a database or retrieval system, or transmitted by any form or means, without the prior written permission of the publisher.
PREFACE

This manual is designed for Disaster Risk Reduction training programme for Government Cadres. It aims at assisting in training government departments and agencies at various administrative levels to enable them to prepare disaster management plans, generate risk maps using qualitative and quantitative methods, adequately prepare for and prevent or mitigate hazard impacts, develop and implement policies and effective corporate governance related to disaster. It also provides guidance on effective communication, coordination, collaboration and cooperation in performing roles and responsibilities in times of disaster in order to build community resilience and ensure that impacts are minimised by an efficient and effective disaster response.

The manual is organised into 10 modules. Module One is on the Meaning and Terminologies in Disaster Risk Management. This module defines and explains major concepts and terminologies in disaster risk management. The aim is to enable participants to understand the scope and dimensions of major terminologies in disaster, and implications of their measurements. The second module focuses on Hazard Mapping, Vulnerability and Risk Assessment. The module is designed to enable government cadres to identify and map out various hazards in their areas of jurisdiction, identify groups that are vulnerable to those hazards, and the potential danger posed by the hazard to the groups and area at large. Disaster Prevention, Mitigation and Preparedness is the third module. It explains the nexus among strategies for disaster prevention, preparedness and mitigation. It also describes the importance of pre-disaster activities on the occurrence, scope and impact of disaster. Module Four is on Disaster Response and Relief. This module is designed to enable government cadres to understand the timing and activities to be included in disaster response and relief programmes. The fifth module is on Stakeholder Analysis. The module identifies all the major stakeholders and their expected roles in disaster risk reduction.

Module Six focuses on Disaster Communication. It presents the importance of information sharing at the various stages in the disaster risk management process. The module also shows the various strategies and media for communicating disaster issues to the targeted audiences. Crises Counselling is the focus of Module Seven. The module is developed to enable government cadres to understand the importance and approaches to crises counselling. It aims to demonstrate to participants about the centrality of psychological recovery to other forms of recovery after disaster. The eighth module is on Common Disaster Types in Ghana and Areas of Development Usually Affected by Disasters in Ghana. The focus of this module is to enable participants familiarise themselves with past disasters, their levels of impact on development activities and efforts for controlling the disasters. Module Nine looks at Mainstreaming Disaster Risk Reduction into Development Efforts. This module explains how disaster risk management can be incorporated into mainstream development interventions and programmes. Finally, Module Ten covers Policies, Legislation, Regulations,
Mobilisation and Allocation of Resources. The module highlights the importance of regulations and resource mobilisation in Disaster Risk Reduction.

Each of the modules contains introduction, learning objectives, related units, summary and conclusions as well as references. Exercises/Activities, Stop and Reflect, and Suggested Questions on treated topics have been provided to guide users of the module to reflect and better understand key concepts and issues in Disaster Risk Reduction.

Icon Legend

<table>
<thead>
<tr>
<th>Icon</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>📖</td>
<td>Exercise or Activity</td>
</tr>
<tr>
<td>🧠</td>
<td>Stop and Reflect</td>
</tr>
<tr>
<td>🕵️</td>
<td>Questions</td>
</tr>
</tbody>
</table>
ACKNOWLEDGEMENTS

The contributions of individuals and teams have made this training manual possible. Accordingly, we are thankful to the UNDP for outsourcing the development and validation of this training manual to the Directorate of Research, Innovation and Consultancy (DRIC) of the University of Cape Coast (UCC). DRIC-UCC acknowledges the efforts of authors in developing the manual. We are also grateful to the reviewers for their useful suggestions that helped to shape the training manual. We say thank you to all those who have helped in various capacities to make this training manual complete.

DRIC-UCC, however, accepts full responsibility for any limitations or inadequacies in this training manual.

Authors:
Module 1: Meaning and terminologies in disaster risk management - Dr. David O. Yawson; Mr. Kweku Eshun & Mr. Emmanuel A. Mensah

Module 2: Hazard mapping, vulnerability and risk assessment - Dr. Benjamin K. Nyarko; Mr. Kingsley N. Osei & Mr. Emmanuel A. Mensah

Module 3: Disaster, prevention, mitigation and preparedness - Dr. Frederick A. Armah & Mr. Kingsley K. Asare-Pereko

Module 4: Disaster response and relief - Mr. Kingsley K. Asare-Pereko & Dr. Frederick A. Armah

Module 5: Stakeholder analysis - Prof. Kwabena Barima Antwi; Dr. Jones A. Danquah & Mr. Kingsley K. Agyemang

Module 6: Disaster communication - Dr. (Mrs.) Comfort I. Ogunleye-Adetona & Prof. Eric Nyarko-Sampson

Module 7: Crises counselling - Prof. Eric Nyarko-Sampson & Dr. (Mrs.) C. I. Ogunleye-Adetona

Module 8: Common disaster types in Ghana/Areas of development usually affected by disasters in Ghana - Dr. Collins Adjei Mensah; Dr. David O. Yawson & Mr. James Eshun

Module 9: Mainstreaming disaster risk reduction into development efforts - Mr. Kingsley K. Agyemang; Prof. Kwabena Barima Antwi & Mr. Kingsley N. Osei

Module 10: Policies, legislation, regulations, mobilisation and allocation of resources in disaster risk reduction - Dr. Jones A. Danquah & Dr. Collins Adjei Mensah

Reviewers:
- Prof. Albert M. Abane
- Prof. Stephen B. Kendie
- Prof. Samuel K. Annim
- Dr. Simon Mariwah
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Content</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREFACE</td>
<td>iii</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>v</td>
</tr>
<tr>
<td>LIST OF ACRONYM</td>
<td>ix</td>
</tr>
<tr>
<td>MODULE 1: MEANING OF TERMINOLOGIES IN DISASTER RISK REDUCTION AND MANAGEMENT</td>
<td>1</td>
</tr>
<tr>
<td>1.1 Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Learning Objectives</td>
<td>3</td>
</tr>
<tr>
<td>1.3 Definition of Key Terms in Disaster Risk Reduction and Management</td>
<td>3</td>
</tr>
<tr>
<td>1.4 Other Terms from the Relief Services Community</td>
<td>10</td>
</tr>
<tr>
<td>1.5 Summary and Conclusions</td>
<td>11</td>
</tr>
<tr>
<td>References</td>
<td>11</td>
</tr>
<tr>
<td>MODULE 2: HAZARD MAPPING, VULNERABILITY AND RISK ASSESSMENT</td>
<td>12</td>
</tr>
<tr>
<td>2.1 Introduction</td>
<td>12</td>
</tr>
<tr>
<td>2.2 Learning Objectives</td>
<td>12</td>
</tr>
<tr>
<td>2.3 Hazard Mapping</td>
<td>12</td>
</tr>
<tr>
<td>2.4 Vulnerability Assessment</td>
<td>23</td>
</tr>
<tr>
<td>2.5 Disaster Risk Assessment</td>
<td>29</td>
</tr>
<tr>
<td>2.6 Summary and Conclusions</td>
<td>42</td>
</tr>
<tr>
<td>References</td>
<td>42</td>
</tr>
<tr>
<td>MODULE 3: DISASTER PREVENTION, MITIGATION AND PREPAREDNESS</td>
<td>44</td>
</tr>
<tr>
<td>3.1 Introduction</td>
<td>44</td>
</tr>
<tr>
<td>3.2 Learning Objectives</td>
<td>44</td>
</tr>
<tr>
<td>3.3 Disaster Risk Management</td>
<td>44</td>
</tr>
<tr>
<td>3.4 Disaster Prevention</td>
<td>48</td>
</tr>
<tr>
<td>3.5 Disaster Mitigation</td>
<td>50</td>
</tr>
<tr>
<td>3.6 Disaster Preparedness</td>
<td>53</td>
</tr>
<tr>
<td>3.7 Summary and Conclusions</td>
<td>55</td>
</tr>
<tr>
<td>References</td>
<td>55</td>
</tr>
<tr>
<td>MODULE 4: DISASTER RESPONSE AND RELIEF</td>
<td>57</td>
</tr>
<tr>
<td>4.1 Introduction</td>
<td>57</td>
</tr>
<tr>
<td>4.2 Learning Objectives</td>
<td>57</td>
</tr>
<tr>
<td>4.3 Disaster Response</td>
<td>57</td>
</tr>
<tr>
<td>4.4 Relief</td>
<td>67</td>
</tr>
<tr>
<td>References</td>
<td>74</td>
</tr>
<tr>
<td>MODULE 5: PARTICIPATORY STAKEHOLDER ENGAGEMENT</td>
<td>75</td>
</tr>
<tr>
<td>5.1 Introduction</td>
<td>75</td>
</tr>
<tr>
<td>5.2 Learning Objectives</td>
<td>75</td>
</tr>
<tr>
<td>5.3 Defining Stakeholder Participation</td>
<td>75</td>
</tr>
<tr>
<td>5.4 Basic Steps in Participatory Stakeholder Engagement</td>
<td>81</td>
</tr>
<tr>
<td>5.6 Methods and Tools for Participatory Stakeholder Engagement</td>
<td>86</td>
</tr>
<tr>
<td>5.7 Summary and Conclusions</td>
<td>88</td>
</tr>
<tr>
<td>References</td>
<td>88</td>
</tr>
</tbody>
</table>
MODULE 10: POLICIES, LEGISLATION, REGULATIONS, MOBILISATION AND ALLOCATION OF RESOURCE IN DISASTER RISK REDUCTION

10.1 Introduction ......................................................................................................................... 132
10.2 Learning Objectives............................................................................................................. 132
10.3 The Role of Legislations and Regulations in Disaster Risk Reduction ......................... 132
10.4 Governance in Disaster Risk Reduction Management..................................................... 134
10.5 The Built Environment, Building Codes Regulation and Enforcement ......................... 139
10.6 Resource Mobilisation and Contingency for DRR............................................................. 142
10.7 Summary and Conclusions................................................................................................. 143
References................................................................................................................................... 144
**LIST OF ACCRONYMS**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>DGRP</td>
<td>Department of Geography and Regional Planning</td>
</tr>
<tr>
<td>DRIC</td>
<td>Directorate of Research, Innovation and Consultancy</td>
</tr>
<tr>
<td>DRM</td>
<td>Disaster Risk Management</td>
</tr>
<tr>
<td>DRR</td>
<td>Disaster Risk Reduction</td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Agency</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographic Information System</td>
</tr>
<tr>
<td>IFAD</td>
<td>International Fund for Agricultural Development</td>
</tr>
<tr>
<td>IFRC</td>
<td>International Federation of Red Cross and Red Crescent Societies</td>
</tr>
<tr>
<td>MMDAs</td>
<td>Metropolitan, Municipal and District Assemblies</td>
</tr>
<tr>
<td>MTDP</td>
<td>Medium-Term Development Plan</td>
</tr>
<tr>
<td>NADMO</td>
<td>National Disaster Management Organisation</td>
</tr>
<tr>
<td>NDPC</td>
<td>National Development Planning Commission</td>
</tr>
<tr>
<td>NGOs</td>
<td>Non-Governmental Organisations</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>PoA</td>
<td>Plan of Actions</td>
</tr>
<tr>
<td>PRA</td>
<td>Participatory Rural Appraisal</td>
</tr>
<tr>
<td>RCC</td>
<td>Regional Co-ordinating Councils</td>
</tr>
<tr>
<td>SOPs</td>
<td>Standard Operating Procedures</td>
</tr>
<tr>
<td>UCC</td>
<td>University of Cape Coast</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Programme</td>
</tr>
<tr>
<td>UNISDR</td>
<td>United Nations International Strategy for Disaster Reduction</td>
</tr>
<tr>
<td>UNOCHA</td>
<td>United Nations Office for the Coordination of Humanitarian Affairs</td>
</tr>
</tbody>
</table>
1.1 Introduction

This module introduces participants to the definitions and meanings of key terminologies or concepts in disaster risk reduction and management in order to strengthen the understanding of issues discussed here and elsewhere in the manual. Disaster is a word that is common on the lips of people. Perhaps, you have witnessed, watched, experienced, read or heard about a disaster event. Globally, the frequency of disaster events is increasing (see Figures 1.1.1 – 1.1.3) and so are the impacts.

Figure 1.1.1: Number of natural disasters reported from 1900 to 2011
Source: EM-DAT: The OFDA/CRED International Disaster Database (www.emdat.be), Université Catholique de Louvain, Belgium
Disaster and its related concepts can have different meanings for different stakeholders, a situation that can retard effective disaster management. Adopting common definitions of these terms and concepts would ensure common understanding, ease communication and help in coherent policy and operational actions for effective disaster management. This introductory module presents key terminologies compiled from the United Nations International Strategy for Disaster Reduction (UNISDR) (2009) and the relief community. Terms worth remembering are in bold and italics.
1.2 Learning Objectives
After completing this module, participants should be able to:

1. define basic terms in disaster risk reduction and management; and
2. organise each of these terms in relation to the disaster management cycle.

1.3 Definition of Key Terms in Disaster Risk Reduction and Management

**Disaster:** Once we are dealing with disasters, it is important that we first understand what disasters are and what they are not. The concept of disaster and its management have evolved over time. The UNISDR (2009) defines 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 own resources.*

The International Federation of the Red Cross and Red Crescent Societies (IFRC) define disaster as *a calamitous event resulting in loss of life, great human suffering and distress, and large-scale material damage.*

**Stop and Reflect 1.3.1**

- Is there a substantial difference between the two definitions? Which one do you prefer and why? Based on the definition you choose, would you consider a house burnt by fire as a disaster event? Explain.
- Are there any differences between disaster and accident?

Four characteristics of disasters that can be deduced from the definitions are:

(i) Disaster is an **outcome** of a hazard event
(ii) The disaster event has spatial boundaries (such as a community)
(iii) The event results in large human and material losses and damages
(iv) The affected community is unable to cope with its own resources

Does this suggest that if the affected community is able to cope, disaster cannot be considered to have occurred?

Disasters can happen on a large scale (such as mega-disasters or catastrophic disasters) and on a small scale. Whatever the situation, it can be deduced from the definitions that disasters result from the interaction between the coping capacity of a given community and a given hazard.

**Capacity** refers to the combination of all the strengths, attributes and resources available within a community, society or organisation that can be used to achieve agreed goals. **Coping capacity** is the ability of people, communities or organisations, using available resources and skills, to face and manage adverse conditions that potentially could lead to a disaster. That is, coping capacity is the ability of a given community to contain a given hazard event such that the normal functioning of the community is not disrupted.

---

**Exercise/Activity 1.3.2**

- Participants should identify five hazards and their sources in and around their homes. They should extend this to their communities. The identified community hazards are discussed in small groups.

- On May 9, 2001, Kotoko and Accra Hearts of Oak played a football match at the Ohene Gyan Sports Stadium in Accra. Confusion broke out among the spectators, resulting in 127 casualties. The groups should discuss and agree on at least three reasons why they consider this event as a disaster or not.

- The groups should identify the hazards and vulnerable conditions that caused the disaster event on June 3, 2015 in Accra.

---

*Plate 1.3.1: Images of the May 9 confusion at the Accra Sports Stadium*
Hazard is a phenomenon, condition, situation, event, human activity or substance that has the potential to cause injury to life or health, damage to property or the environment, or disruption of livelihoods and social services. An example of a hazard is earthquake. The potential to cause harm is the hazard. Hazards can be natural or human-induced. Hazards can originate from diverse sources, including geological, hydrometeorological, biological, technological or anthropogenic sources. Biological hazards arise from organic materials, living organisms (such as disease vectors), toxins and other bioactive substances. An example is epidemic diseases. Geological hazards originate from processes or phenomena internal to the Earth, such as volcanic eruption and earthquake. Hydrometeorological hazards result from atmospheric, hydrological and oceanic processes. Examples include hurricanes, drought, tornado, and floods. Technological hazards arise from technical or structural failures, industrial conditions and dangerous procedures. Note that combinations of these are possible.

Vulnerability is the degree to which a system, such as a community, is susceptible and exposed to the adverse effects of a given hazard. It is a condition that predisposes individuals, groups, communities or systems to hazard event. Vulnerability depends on the physical, socio-economic and environmental characteristics and circumstances that make the target system or community susceptible.

Exposure is the nearness of people, properties or communities to a hazard zone in space and time to suffer potential impacts. Houses and people close to an earthquake zone or at the epicentre are more exposed than those far away. However, a person living at the epicentre, but was away when an earthquake happened, would avoid personal injuries or death as opposed to a visitor who was at the premises.

Exercise/Activity 1.3.3
- Is there a natural disaster?
- Use three reasons to explain and defend your answer.

Risk is the probability that a hazard event will occur and cause damages or losses at a given place and time. It is a combination of the possibility of a hazard happening, the vulnerability of the target system to the hazard and the scale of damage that can occur. Disaster occurs when a hazardous event results in large scale or widespread damages or disruptions. Since risk is a probability, it can be calculated from past events. The relationship between hazard, vulnerability, risk and disaster is conceptualised in Figure 1.3.1.
We can infer from Figure 1.3.1 that disaster management will involve identification and prioritisation of hazards, reduction of vulnerability and management of risks in order to reduce or avoid the occurrence and or the effects of disasters. Remember that a disaster is the \textit{outcome} of poorly managed risks arising from the interaction of hazards and vulnerability. Thus, by properly managing risks, disasters can be prevented or reduced. Hazards are bound to exist, but vulnerability and risks can be reduced and managed.
Disaster risk refers to the scale of potential losses or damages that can affect a target community in the event of a disaster at a given time in the future. This can be quantified as the losses or damages in terms of lives, livelihoods, health, properties, facilities and services, among others. It is difficult to quantify all risks accurately, but it is important to identify and prioritise risks in disaster management. Disaster risks can be intensive or extensive. Intensive risk affects large concentration of people, property and activities exposed to intense hazard events as in cities. Extensive disaster risk is related to sparsely distributed people, properties or activities exposed to hazard events of low intensity but high frequency.

Risk assessment is a systematic approach to identify, quantify or simulate risks associated with hazards and existing conditions of vulnerability in order to reduce uncertainty. Risks can be identified and quantified as the product of hazard and vulnerability in a given context. Risks can be simulated by developing different scenarios of hazard-vulnerability interactions to assess potential damages. This can be done using simulation models.

Risk map identifies the places and structures in a community or geographical zone that might be adversely affected in the event of a hazard. Risk mapping is the process that leads to the production of a risk map.

Disaster risk reduction is a systematic and continuous analysis and redressing of the causal factors of disasters. It is the first step and key component of disaster (risk) management. It should be deliberate and proactive; not episodic (occasional or conveniently) and reactionary. Disaster risk reduction efforts and activities are normally specified in a formal document called disaster risk reduction plan prepared by an appropriate entity or authority. Disaster risk reduction involves structural and non-structural measures. Structural measures include the use of physical or engineering solutions (such as ocean wave barriers or earthquake resistant buildings) to avoid disaster or reduce its impacts. Non-structural measures involve the use of policies, laws, education and awareness creation, and practices to avoid or reduce the impacts of disaster.

Disaster risk management is a structured approach to manage uncertainty and potential adverse impacts from a natural hazard event, through a process of risk assessment and the development of strategies and specific actions to control and reduce risks. It is systematic, institutionalised, and covers both strategic and operational issues related to reducing vulnerability and exposure to hazards while increasing coping and response capacity. Risk management is about dealing with uncertainty. It is important, therefore, to emphasise the need for institutionalised approach so that the process of disaster risk management can be continuous, dynamic and responsive. The purpose of disaster risk management is to prevent, reduce or transfer the adverse effects of hazards. It comprises prevention, mitigation and preparedness. That is, disaster risk management comprises all measures and preparations done ahead of a hazardous event (or disaster).
It addresses both current and future risks (corrective and prospective risk management, respectively).

**Acceptable risk** is the level of loss a society or community considers acceptable given existing social, economic, political, cultural and technical conditions.

**Residual risk** is the fraction of risk that remains unmanaged even after installing effective disaster risk reduction measures and for which emergency response and recovery capacities should be maintained.

**Risk transfer** is the process of formally or informally shifting the financial consequences of particular risks from one party to another so that the former will obtain resources from the other party after a disaster occurs, in exchange for on-going or compensatory social or financial benefits provided to that other party.

**Critical facilities** refer to physical and technical infrastructure that are vital to the normal functioning of the target community, system or livelihoods and operational response to adverse circumstances such as disaster. Critical facilities underpin social services, socio-economic activities and the functioning of people, communities and organisations. Examples include communication system, transport system, health facilities, water and electricity supply systems. These facilities need to be protected against disasters and quickly recovered or restored during and after disasters.

---

**Early warning system** is a socio-technical system designed to generate and circulate meaningful warning information in a timely manner to enable a target system take a proactive response to a hazardous threat in order to avoid disaster or reduce its impacts. We emphasise “socio-technical” because an early warning system comprises all the steps from detection of the threat, through communication to target community or people, to the ability of the target to understand and respond appropriately to the warning.

**Emergency (crisis) management (or disaster management)** is a comprehensive approach to mobilising and managing resources, institutions and responsibilities in response to active emergencies (or disaster) to reduce impacts. It covers all the phases
of preparations for response, the response and initial recovery. A crisis is a threatening situation that requires immediate action. Effective crisis management can prevent a hazardous event from becoming a disaster or can stop further damages.

**Emergency services** are specialised agencies that have specific, unambiguous roles and responsibilities to secure and serve people and property during emergencies. Examples include the Fire Service, the Police Service, the National Ambulance Service and the National Disaster Management Organisation (NADMO), which plays a central role.

**Disaster preparedness** consists of the knowledge and capacities of institutions, communities and individuals to effectively anticipate, respond to, and recover from the impacts of likely, imminent or active hazard events or conditions. Thus, preparedness is incomplete if potentially affected people are not aware of the threat of a hazard. Preparedness is embedded in disaster risk management.

**Disaster prevention** is the elimination or reduction of the likelihood of occurrence of natural hazard event, or their adverse impacts. Do you think this is really feasible in all cases? Examples of disaster prevention actions include flood protection embankments.

**Disaster mitigation** refers to a set of measures to reduce or neutralise the impact of natural hazards by reducing social, functional, or physical vulnerability.

**Disaster response (relief)** is the provision of assistance or intervention through the emergency services during or immediately after a crisis in order to save lives, reduce further impacts on health and public safety and to meet the basic subsistence needs of affected populations.

**Recovery** refers to the decisions and actions taken to restore and or improve the pre-disaster functioning and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors. It is the ‘building back’ that starts just at the end of the emergency or crisis phase. It focuses not only on physical reconstruction, but also on the revitalisation of the economy, and the restoration of social and cultural life. Note, that recovery and reconstruction are conceptually separated in literature, but difficult to do so in practice. Reconstruction focuses primarily on the construction or replacement of damaged physical structures, and the restoration of local services and infrastructure.

**Resilience** is the ability of a community or system to resist, absorb, or recover from the effects of hazards in a timely and efficient manner, preserving or restoring its essential basic structures, functions and identity. It is the ability of the community to bounce back to normal functioning after suffering a distress from a hazard event.
1.4 Other Terms from the Relief Services Community

These terminologies have been compiled from the Preventionweb and Reliefweb (see links in the references list).

**Damage assessment** is the procedure for determining the magnitude of damage caused by a disaster or emergency event. Damages are normally classified as:

- Severe: the target facility or object cannot be used for its intended purpose. Complete reconstruction is required.
- Moderate: the target facility or object cannot be used effectively for its intended purpose unless major repairs are made.
- Light: the target facility or object can be used for its intended purpose but minor repairs would be necessary.

**Crisis counselling** is the process of alleviating the emotional and psychological disturbances of persons affected by disaster in order to restore a sense of control and mastery and to aid the process of recovery and reconstruction. Normally, disasters overwhelm the physical and psychological capacity of people to cope. This can lead to emotional and psychological disturbances which can affect a person’s ability to make right decisions or adopt reasonable responsive actions. Crisis counselling addresses these problems and is a crucial part of recovery and reconstruction.

**Early recovery** is a process which seeks to catalyse sustainable development opportunities by generating self-sustaining processes for post-crisis recovery. It encompasses livelihoods, shelter, governance, environment, and social dimensions, including the reintegration of displaced populations, and addresses underlying risks that contributed to the crisis.

**Needs assessment** is a process of estimating (usually based on a damage assessment) the financial, technical, and human resources needed to implement the agreed-upon programmes of recovery, reconstruction, and risk management. *Post-damage needs assessment* is normally a rapid, multi-sectoral assessment that measures the impact of disasters on the society, economy, and environment of the disaster-affected areas.

**Humanitarian assistance** refers to assistance provided by humanitarian organisation for humanitarian purposes (i.e., non-political, non-commercial, and non-military purposes). It is entirely on grounds of compassion and solidarity to support protection objectives.

**Population at risk** is a well-defined population whose lives, property, and livelihoods are threatened by given hazards.

---

**Exercise/Activity 1.4.1**

In small groups, participants should group the terminologies according to their relevance for the different parts of the disaster management cycle (see Table below).
1.5 Summary and Conclusions

Globally, the frequency and scale of impacts of disasters are increasing rapidly. This calls for coherent efforts to tackle disaster risks across varying administrative and temporal scales in the context of sustainable development. This module introduced the definitions and meaning of key terminologies in disaster risk reduction and management. Particularly, it introduced participants to the conceptual relationships between hazard, vulnerability and risk on one hand, and disaster on the other. This has given us the basis to think about what disasters are, how they occur and how they can be managed and communicated. It emphasised the need for adopting common definitions to promote common understanding among stakeholders and facilitate communication and coherent action for disaster management.

References


Web Resources


Table 1.4.1: Terminologies according to the disaster management cycle

<table>
<thead>
<tr>
<th>Risk Assessment</th>
<th>Prevention and Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparedness</td>
<td>Response and Recovery</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MODULE 2: HAZARD MAPPING, VULNERABILITY AND RISK ASSESSMENT

2.1 Introduction
This module aims at providing participants with generalised information on hazard mapping, vulnerability assessment and risk analysis as components of a risk assessments process. Participants would be made aware of various types of hazard and the approaches to hazard mapping as well as some techniques for physical and socio-economic vulnerability assessment. The module will also explore the link between hazard, vulnerability and risk analysis and will end with information on qualitative and quantitative methodologies for risk assessment.

2.2 Learning Objectives
On completion of this module, it is expected that participants should be able to:

1. distinguish between different types of hazard;
2. identify the data types for hazard mapping;
3. apply participatory mapping and GIS approaches to hazard mapping;
4. distinguish between different types of vulnerability;
5. identify the types of data needed for vulnerability assessment;
6. conduct physical and socio-economic vulnerability assessments;
7. identify the components of a risk assessment;
8. describe the processes used in risk assessment; and
9. apply appropriate methodologies to assess risk.

2.3 Hazard Mapping

Exercise/Activity 2.3.1

- With reference to module 1, what is your understanding of a hazard?
- Give 3 examples of hazard events that you have experienced?
- How would you categorise the examples mentioned?

Hazard mapping involves a graphical representation of the location, magnitude and temporal characteristics of hazards on 2 or 3 dimensional surfaces. The objective of this it to represent the spatial and temporal characteristics of the hazard as well as its magnitude using graphical symbols.
Hazard can be categorised based on their origin, that is, whether they are natural, human-induced or technological. Natural hazards are phenomena experienced in the physical environment which are harmful to humans and caused by forces for which there is no control. Examples of natural hazards are floods, earthquakes, volcanic eruptions and hurricanes. Figures 2.3.1 and 2.3.2 are examples of natural hazards.

Figure 2.3.1: A view of urban flood at Kaneshie Market Complex, Accra in 2014
Source: www.spyghan.com

Figure 2.3.2: Volcanic eruption of Mount Etna, Italy in 2013.
Source: www.telegraph.co.uk
Human-induced hazards are changes of natural processes within the earth’s system caused by human activities which accelerate or aggravate damaging events. Oil spills, atmospheric pollution, and major armed conflicts are some of such hazards. Figures 2.3.3 and 2.3.4 are examples of human-induced hazards.

Figure 2.3.3: Disabled oil vessel discharges oil into the Gulf of Mexico in 2005
Source: www.safety4sea.com

Figure 2.3.4: Map display of the frequency of conflict in the Northern region of Ghana (2007-2012)
Source: Osei-Kufour, Boakye and Mensah (2014)

Technological hazards are dangers caused by technological or industrial accidents, infrastructure failures or certain human activities. Nuclear activities and radioactivity, dam failures, transport, industrial or technological accidents (explosions, fires, spills)
are some of the technological hazards. Figures 2.3.5, 2.3.6 and 2.3.7 are examples of technological hazards.

![Figure 2.3.5: A collapsed building in Dkata, Bangladesh in 2013](source: archive.indianexpress.com)

![Figure 2.3.6: The scene after fire at a fuel filling station in Accra, 2015](source: www.enca.com)
Hazards can be single (such as volcanoes and earthquakes), sequential (such as flood) or combined (such as earthquake accompanied by tsunami) and, as a result, causing a flood or torrential rains leading to landslides in their origin.

Each hazard is categorised by its location, intensity, occurrence, probability, duration, distance, speed of onset, spatial dispersion and temporal spacing.

Exercise/Activity 2.3.2
In groups, participants discuss and report on the following:
- Major data requirements for hazard mapping
- How to acquire information for hazard mapping in Ghana

Data Requirements of Hazard Mapping
Spatial characteristics such as location, distribution and dimension; temporal (duration and speed of onset) and magnitude are the major data requirements for hazard mapping. Such information can be obtained through the following sources:

Base maps
Base maps represent topographic layers of data such as elevation, roads, water bodies, cultural features and utilities. Creation of a base map is a time-consuming activity. It is therefore desirable to use as a base, an existing map or orthophoto where possible. An adequate base map must be plan metric, that is, a representation of information on a plane in true geographic relationship and with measurable horizontal distances. It must also have sufficient geographic reference information to orient the user to the location of the hazard.
**Remotely sensed images**
Satellite images are increasingly becoming preferred sources of readily available information of locations or events on the earth’s surface compared to conventional ground survey methods of mapping that are labour intensive and time consuming. Depending on the sensor type or capabilities (spatial resolution, spectral resolution, radiometric resolution and temporal resolution), different images may be obtained from different service providers to feed into the information extraction process. RADARSAT, TerraSAR-X, ALOS and LIDAR, for instance, are some of the sensors that produce Digital Elevation Model (DEM) depicting topography. GeoEye, QuickBird and ALOS-PRISM are preferred sensors for visual mapping as they are of high spatial resolutions.

**Field data**
Through the advances of technology, ground surveying methods using electronic survey systems like Total Station, the global positioning systems (GPS) and Laser Scanners, have all greatly increased opportunities for data capture in the field.

**Cartographic Representation of Hazard**
Maps are the most operative way to convey actual and relative location. Maps can be simply defined as flat geographic portrayals of information through the use of symbols. Such approaches help hazard maps not to just convey the existence of natural hazards, but also to note their location, severity, and likelihood of occurrence in an accurate, clear, and convenient way. The application of cartography in hazard mapping will eventually lead to the creation of:

*Base map* which contains sufficient geographic reference information to orient the user to the location of the hazard.

*Scale and coverage* which draw the relationship between linear measurement on the map and the actual dimension on the ground. Small-scale maps show less detail for a large area and are applicable for regional development planning. Large-scale maps, on the other hand, reveal more detail for a small area and are more suitable for local or community level development planning. The scale used for a hazard map is dependent upon not only the hazard information to be shown, but also upon the scale of the base map. Therefore, the choice of scale for a hazard map may consider the following issues:

- Number of hazards to be displayed at a go;
- The hazard elements necessary to be displayed;
- Range of relative severity of hazards to be shown;
- The area of interest to cover;
- The use of the map with other planning documents and; and
- Function of the map, for example, whether it is to be an index or detail map.
Types of symbols
On a hazard map, symbols are used to represent reality. Symbols are selected for their legibility and clarity and/or map production characteristics. Location, for instance, can be depicted using one of these basic geometric symbols – point, line or an area. Points are more preferred for displaying volcanoes, while areas have been used for showing flooding.

Exercise/Activity 2.3.3
- If one needs to develop a hazard map, what approaches should one adopt?
- Discuss the issues to consider in developing a hazard map using GIS technology.
- Discuss the role of participatory mapping in hazard management.

Approaches to Hazard Mapping
Many approaches to hazard mapping have been developed. In all such approaches used, the key factors of consideration in the spatial analysis (valuation of likelihood losses of hazards) is appreciating that:

- all components of a hazard assessment vary in space and time; and
- as the consequences of hazards are usually large, it is prudent to include vulnerability and risk reduction strategies in the process.

In this module, Geographic Information System (GIS) mapping and Participatory mapping are the approaches discussed.

Hazard mapping using GIS
GIS is increasingly being utilised for hazard mapping and analysis, as well as for the application of disaster risk management measures. The nature and capability of GIS provides an excellent basis for processing and presenting hazard information in the form of maps. GIS is very useful in arranging a high volume of data necessary to produce a hazard map. The three-dimensional representation available in modern GIS offers opportunity to model hazard. GIS also provides various methodologies in creating and analysing hazards. The flowchart (Figure 2.3.8) represents the general procedure for the mapping of hazards in GIS.
Participatory mapping is a technique that allows for the integration of local level participation and knowledge in the map production and decision taken process. It is an interactive process that draws on local people’s knowledge and allows them to create visual and non-visual data to explore social problems, opportunities and questions.

In participatory mapping, the main objectives are to:
- collect evidence assets of the study area and issues during the mapping process;
- interpret the study area mapping experience and related experience to answer questions that have been developed about the study area; and
- develop a presentation that synthesises the participatory mapping experience and presents the conclusion and possible questions for further investigation.

How to Conduct Participatory Mapping
Whenever participatory mapping is to be conducted, the foremost issue of consideration is the ‘goal of the work’ which outlines the nature and essence of activities to be done. Once the goal has been decided, the next stage is the organisation of activities of participatory mapping in two blocks – preparation and implementation.

The preparation involves ‘scouting’ and ‘designing survey instrument, materials and directions’. The implementation may be organised into sessions (usually four) - preparation of participants or people involved in the participatory mapping activity;
undertake participatory mapping field trip; make presentations and carry out debriefing exercises.

**Utilisation of Participatory Mapping**
Participatory mapping is a powerful tool that increases stakeholder involvement and provides a means for participants to express their ideas in an easily understandable visual format. Participatory mapping is commonly used in the following ways:

- To create maps that represent resources, hazards, community values, usage (e.g., for recreation or other visitor use), perceptions, or alternative scenarios
- To gather traditional knowledge and practices and to collect information (hazards, environmental, socioeconomic, visitor use, etc.) for assessments or monitoring
- To identify data gaps.
- To inform other data collection methods (e.g., formal surveys, interviews, etc.)
- To evaluate existing programmes, plans and activities
- To facilitate the decision-making process
- To assist with data gathering for research
- To empower stakeholders
- To conduct trend analysis
- To educate stakeholders about issues and interrelationships of resources outside their immediate areas of concern

A participatory mapping method includes community mapping with paper maps and conversion of community paper maps into GIS maps.

![Figure 2.3.9: A scene of a participatory mapping activity](image)

**Applications of Hazard Maps**
Hazard maps have various applications that may be broadly captured as in spatial planning, risk reduction measures, instruments used in emergency planning and raising
awareness among the population as shown in Figures 2.3.10, 2.3.11, 2.3.12 and 2.3.13, respectively.

- **Spatial planning**: Hazard maps provide a basis for communal and district spatial planning processes (e.g. definition of hazard zones in development plans and formulation of building regulations).

![SHAMA DISTRICT LAND USE MAP](image)

Figure 2.3.10: Land use map of Shama district, Ghana
Source: Remote Sensing and Cartographic Unit, Department of Geography and Regional Planning (DGRP), UCC
• **Risk reduction measures**: Hazard maps assist in the localisation and dimensioning of hazard protection measures (e.g. flood protection structures, avalanche barriers, etc.)

![Flood Risk Areas Map](image)

**Figure 2.3.11**: Flood risk map of Inchaban and surrounding settlements  
Source: Remote Sensing and Cartographic Unit, DGRP, UCC

• **Instruments used in emergency planning**: Hazard maps indicate where the biggest risks arise and the events most likely to occur. This information can be used as a source of orientation in emergency planning.

![Emergency Planning Map](image)

**Figure 2.3.12**: A hazard map used for emergency planning  
Source: [https://www.co.pierce.wa.us/](https://www.co.pierce.wa.us/)
• **Raising awareness among the population**: Hazard maps help to demonstrate potential risks to the population and to increase awareness of eventual protective measures.

![Image: Flood warning time map of Inchaban and surrounding settlements](image)

**Figure 2.3.13**: Flood warning time map of Inchaban and surrounding settlements  
Source: Remote Sensing and Cartographic Unit, DGRP, UCC

### 2.4 Vulnerability Assessment

**Exercise/Activity 2.4.1**  
Break into groups and discuss the meaning and types of the term ‘vulnerability’.

In Module One, the concept of vulnerability was defined as the degree to which a system is exposed and susceptible to the adverse effects of a given hazard. Pelling (2003) in this wise defines vulnerability as “Exposure to risk and an inability to avoid or absorb potential harm”. Both vulnerability and its antithesis, resilience, are determined by physical, environmental, social, economic, political, cultural and institutional factors” (Provention Consortium, 2007).

- **Vulnerability** = (Exposure) + (Resistance) + Resilience

  Exposure: at risk property and population;  
  Resistance: Measures taken to prevent, avoid or reduce loss; and  
  Resilience: Ability to recover prior state or achieve desired post-disaster state.
Types of Vulnerability

- **Physical vulnerability**
  This refers to the potential losses to physical infrastructure such as roads, bridges, railways, radio and telecommunication mast and other features in the built environment. Physical vulnerability also includes impacts on the human population in terms of injuries or deaths. Vulnerability is analysed per group of constructions (i.e. structural types) having similar damage performance. It is an intrinsic quality of a structure and it does not depend on location.

- **Social vulnerability**
  Social vulnerability refers to losses as experienced by people and their social, economic, and political systems (Pelling, 2003 in Vilagrán de León, 2006). In this context, vulnerability refers to the extent to which elements of society such as children, the aged, pregnant and lactating women, single parents, physically and mentally challenged, the poor and destitute, social class, caste, ethnicity, gender, family systems, political systems, economic systems and cultural values degrade after being exposed to a hazardous condition.

  Levels of exposure to hazards, access to financial, social, natural, physical and human capital as well as policies, institutions and processes will influence the degree to which individuals, groups of persons or systems will degrade.

- **Economic vulnerability**
  This refers to the potential impacts of hazards on economic assets and processes (i.e. business interruption, loss of productive capacity, secondary effects such as increased poverty and job loss) and includes vulnerability of different economic sectors. Economic vulnerability is usually combined with social vulnerability during assessments.

- **Ecological/environmental vulnerability**
  This refers to the degree of loss that an ecosystem will sustain to its structure, function and composition as a result of exposure to a hazardous condition. This includes degradation, biodiversity loss and loss of productivity.

**Vulnerability Assessment**

This refers to the quantification of the degree of loss or susceptibility to an element at risk. The assessment is essential when conducting a risk assessment. Vulnerability assessments have not always been a part of risk assessment, but in recent times, they have become indispensable due to the recognition that disasters occur as a result of interactions between hazards and vulnerable elements. Variations exist in the method of quantification of vulnerability based on the following:
a. Type of vulnerability being measured, that is, it is physical, social, economic or ecological.
b. The scale at which vulnerability is being measured, whether at the individual, household or community level.
c. The type of hazard. Different hazard types call for different methods of quantification as not all methods of vulnerability quantification are used for the different hazard types.

**Data needed for vulnerability assessment and their usefulness**

- Historical data on the magnitude of a hazard and the level of damage it caused to specific elements such as buildings built from sandcrete or wood.
- Socio-economic data such as level of education, access to pipe borne water, access to secure shelter, social networks, sanitation, income level, access to credit, access to land, access to technology etc. The emphasis here is on the level of access that an individual, household or community has to various assets.
- Level of exposure to hazardous conditions
- Data on policies, institutions and processes which influence capacity of individuals, households and communities.

**Exercise/Activity 2.4.2**

Why is it important to collect historical data on the magnitude of a hazard and the damage that it caused to specific elements?

**Approaches to Physical Vulnerability Assessment**

There are a wide variety of ways to measure physical vulnerability. Two (2) main methods can be distinguished. These are the empirical and analytical methods as shown in Table 2.4.1. The analytical methods rely on the use of geotechnical engineering software and are often limited to individual structures, while the empirical methods can be applied to groups of related structures.

**Table 2.4.1 Methods of measuring physical vulnerability**

<table>
<thead>
<tr>
<th>Group</th>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Analysis of observed damage</td>
<td>Based on the collection and analysis of statistics of damage that occurred in recent and historic events. Relating vulnerability to different hazard intensities.</td>
</tr>
</tbody>
</table>
### Empirical methods

**Expert opinion**
Based on asking groups of experts on vulnerability to give their opinions, e.g. the percentage damage they expect for the different structural types having different intensities of hazard. This is meant to come to a good assessment of the vulnerability. Method is time consuming and subjective. Re-assessments of vulnerability after building upgrading or repair are difficult to accommodate.

**Score Assignment**
Method using a questionnaire with different parameters to assess the potential damages in relation to different hazard levels. The score assignment method is easier to update, e.g. if we think about earthquake vulnerability before and after application of retrofitting.

### Analytical models

**Simple Analytical models**
Studying the behaviour of buildings and structures based on engineering design criteria, analysing e.g. seismic load and to derive the likelihood of failure, using computer based methods from geotechnical engineering. Using, e.g. shake tables and wind tunnels, as well as computer simulation techniques.

**Detailed Analytical methods**
Using complex methods. It is time consuming, needs a lot of detailed data and will be used for assessment of individual structures.

### Methods of Measuring Socio-economic Vulnerability
Socio-economic vulnerability is indicator-based and can be assessed by analysing the level of exposure and coping mechanisms of individuals, households and communities.

Analysis of exposure and coping is done taking into consideration policies and processes and adaptation strategies of affected individuals, households and communities as shown in Figure 2.4.1.
Figure 2.4.1: Method for assessing socio-economic vulnerability
Source: Adapted from sustainable Livelihood Framework-DFID

Table 2.4.2 Socio-economic indicators (Adopted from DFID)

<table>
<thead>
<tr>
<th>Human Capital</th>
<th>Natural Capital</th>
<th>Social Capital</th>
<th>Physical Capital</th>
<th>Financial Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>Land and produce</td>
<td>Networks and connections</td>
<td>Infrastructure • Transport - roads, vehicles, etc. • Secure shelter &amp; buildings water supply &amp; sanitation</td>
<td>Savings</td>
</tr>
</tbody>
</table>
### Methods of Representing Vulnerability

- **Vulnerability indices**: Based on indicators of vulnerability; mostly no direct relation with the different hazard intensities. These are mostly used for expressing social, economic and environmental vulnerability.
- **Vulnerability table**: The relation between hazard intensity and degree of damage can also be given in a table.
- **Vulnerability curves**: These are constructed on the basis of the relation between hazard intensities and damage data
  - Relative curves: They show the percentage of property value as the damaged share of the total value to hazard intensity.
  - Absolute curves: Show the absolute amount of damage depending on the hazard intensity; i.e., the value of the asset is already integrated in the damage function;
  - Fragility curves: Provide the probability for a particular group of elements at risk to be in or exceeding a certain damage state under a given hazard intensity.
2.5 Disaster Risk Assessment

The Concept of Disaster Risk
In Module One, disaster risk was defined as the likelihood/probability of serious damage, deaths and injuries occurring as a result of a potentially damaging hazard interacting with vulnerable elements such as people and properties.

Thus, disaster risk arises out of an interaction between a hazardous condition and vulnerable elements. However, disasters only occur when the risk materialises (See Figure 2.5.1).

Disaster Risk Assessment
The Sendai framework for disaster risk reduction and its immediate predecessor, the Hyogo framework for action, both call for identification and assessment of disaster risk. Thus, risk assessments form an important aspect of risk reduction strategies.
In Module One, risk assessment was defined and regarded as a methodology to determine the likelihood and magnitude of damage or other consequences by analysing potential hazards and evaluating existing conditions of vulnerability that jointly could likely harm exposed people, properties, services, livelihoods and the environment they depend on.

### Stop and Reflect 2.5.1

#### Components of Risk Assessment

There are two (2) main components:

- **Risk analysis**: The use of available information to estimate the risk caused by hazards to individuals or populations, property or the environment. Risk analyses generally contain the following steps: Hazard identification, hazard assessment, elements at risk/exposure, vulnerability assessment and risk estimation.

- **Risk evaluation**: This is the stage at which values and judgement enter the decision process by including the importance of the risk and associated social, environmental, and economic consequences, in order to identify a range of alternatives for managing the risk.

From the Stop and Reflect 2.5.1, we realise that risk assessment involves the assessment of hazards and vulnerabilities. Thus, risk assessments are inextricably linked to and strongly influenced by the nature and likelihood of a hazard as well as the extent of loss that may occur due to the hazard.

### Contemporary approaches to risk assessments

- **Multi-hazard**: The same area may be threatened by different types of hazards. Each of these hazard types has different areas that might be impacted by hazard scenarios. Each of the hazard scenarios also might have different magnitudes. For instance, water depth and velocity in the case of flooding, acceleration and ground displacement in the case of earthquakes. These hazard magnitudes would also have different impacts on the various elements at risk, and therefore require different vulnerability curves.

- **Multi-sectoral**: Hazards will impact different types of elements at risk.

- **Multi-level**: Risk assessment can be carried out at different levels. Depending on the objectives of the risk study, it is possible to differentiate between national, regional, district and local policies, plans and activities to see how they have contributed to increased or reduced risk, their strengths and weaknesses in dealing with risks, and what resources are available at the different levels to reduce risks.

- **Multi-stakeholder**: Risk assessment should involve the relevant stakeholders, which can be individuals, businesses, organisations and authorities.

- **Multi-phase**: Risk assessment should consider actions for response, recovery, mitigation and preparedness.
Disaster risk Management: A Short Course for Practitioners in Ghana

- **Qualitative methods**: This involves qualitative descriptions or characterisation of risk in terms of high, moderate and low. These are used when the hazard information does not allow us to express the probability of occurrence, or it is not possible to estimate the magnitude. This approach has widespread application in the profiling of vulnerability using participatory methodologies (Garret, 1999). Risk matrices can be constructed to show qualitative risk. A risk matrix shows on its y-axis probability of an event occurring, while on the x-axis potential loss. The probability is described categorically as low, medium and high, while the potential loss is also described similarly as in Figure 2.5.2.

![Risk Matrix Diagram](image)

**Figure 2.5.2**: An example of a risk matrix used for assessing risk qualitatively

In Column A, enter all of those hazards from the list in Table 2.5.2 that may affect your community. You may need to research these with local disaster management authorities.

**Group Exercise 2.5.1**
- What risk assessment approaches are being applied by your organisation and why?
  Break into small groups and fill out Table 2.5.1 using the information provided below.
### Table 2.5.1: Risk assessment matrix

<table>
<thead>
<tr>
<th>A. Hazards</th>
<th>B. Hazard Likelihood</th>
<th>C. Impact Severity (Vulnerabilities/Resources)</th>
<th>D. Risk Score $B \times C$ E. Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 low – 5 is high</td>
<td>0 is low – 5 is high</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 2.5.2: Potential hazards

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Earthquake</th>
<th>Lightening</th>
<th>Debris Flow</th>
<th>Civil unrest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Flood</td>
<td>Heat Wave</td>
<td>Hazardous materials release</td>
<td>Terrorism</td>
</tr>
<tr>
<td></td>
<td>Fire</td>
<td>Drought</td>
<td>Transportation accident</td>
<td>Market fires</td>
</tr>
<tr>
<td></td>
<td>Storms</td>
<td>Pandemic (e.g., HIV/AIDS, flu)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fire</td>
<td></td>
<td>Water shortage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Food poisoning</td>
<td>Landslide</td>
<td>Power shortage</td>
<td></td>
</tr>
</tbody>
</table>
Semi-quantitative methods: These techniques express risk in terms of risk indices. These are numerical values, often ranging between 0 and 1. They do not have a direct meaning of expected losses; they are merely relative indications of risk. In this case, risk is expressed in a relative sense. The main difference between qualitative and semi-quantitative approaches is the assignment of weights under certain criteria which provide numbers as outcome instead of qualitative classes. The semi quantitative estimation for risk assessment is found useful in the following situations:

- As an initial screening process to identify hazards and risks
- When the level of risk (pre-assumed) does not justify the time and effort
- Where the possibility of obtaining numerical data is limited

Semi-quantitative approaches consider a number of factors that have an influence on the risk. A range of scores and settings for each factor may be used to assess the extent to which that factor is favourable or unfavourable to the occurrence of instability (hazard) and the occurrence of loss or damage (consequence). The matrix of hazards and consequences is used to obtain a ranked risk value. This is made by combining a set of hazard categories with a set of consequence categories. The final risk values can also be categorised and ranked with qualitative implications. The risk estimation can be done separately for loss of life and economic loss.
The semi-quantitative approach could be adapted to cover larger areas (spatial or GIS-based). This approach may be applicable at any scale or level of analysis, but more reasonably used in medium scales. Nowadays, such a semi-quantitative approach can efficiently use spatial multi-criteria techniques implemented in GIS that facilitate standardisation, weighting and data integration in a single set of tools. See Stop and Reflect 2.5.2.

**Stop and Reflect 5.2.2**

*Examples of a risk index used in the semi quantitative approach*


The **Disaster Deficit Index** measures country risk from a macroeconomic and financial perspective according to possible catastrophic events. It requires the estimation of critical impacts during a given period of exposure, as well as the country’s financial ability to cope with the situation.

\[
L_R = EV(I_RF_S)K
\]

\[
DDI = \frac{MCE\ loss}{Economic\ Resilience}
\]

The losses occurring in a **Maximum Considered Event (MCE)** represent the maximum direct economic impact in probabilistic terms on public and private stocks that are governments’ responsibility. This is a fraction of the total loss \(L_R\) which is estimated as:

where, \(E\) is the economic value of all the property exposed; \(V()\) is the vulnerability function, which relates the intensity of the event with the fraction of the value that is lost if an event of such intensity takes place; \(I_R\) is the intensity of the event associated to the selected return period; \(FS\) is a factor that corrects intensities to account for local site effects; and \(K\) is a factor that corrects for uncertainty in the vulnerability function.

Economic resilience is a composite index which is made by combining 5 indicators:
- Insurance and reassurance payments (F1p)
- Reserve funds for disasters (F2p)
- Aid and donations (F3p)
- New taxes (F4p)
- Budgetary reallocations (F5p)
- External credit (F6p)
- Internal credit (F7p)

A DDI greater than 1.0 reflects the country’s inability to cope with extreme disasters even by going into as much debt as possible. The greater the DDI, the greater the gap between losses and the country’s ability to face them.

Semi-quantitative risk can also be conceptualised as:
Although the equation is only conceptual, it allows incorporating the multi-dimensional aspects of vulnerability, and capacity. In this approach, indicators are used to characterise vulnerability and capacity, for instance, by relating it to population characteristics. These indicators are often integrated with hazard indicators using Spatial Multi-Criteria Evaluation.

The result of the equations will show risk only as relative qualitative classes, and allows for comparison of risk levels between different communities, neighbourhoods, cities or even countries.

Quantitative methods: This aims at estimating the spatial and temporal probability of risk and its magnitude. In this method, the combined effects, in terms of losses for all
possible scenarios that might occur, are calculated. There are several approaches; they express the risk in quantitative terms either as probabilities, or expected losses. In this approach, risk is perceived as follows:

Stop and Reflect 2.5.4
Risk = Hazard * Vulnerability * Amount of elements-at-risk

The equation given above is not only a conceptual one, but can also be actually calculated with spatial data in a GIS to quantify risk from hazards. The way in which the amount of elements-at-risk are characterised (e.g. as number of buildings, number of people, economic value or the area of qualitative classes of importance) also defines the way in which the risk is presented. The hazard component in the equation actually refers to the probability of occurrence of a hazardous phenomenon with a given intensity within a specified period of time (e.g. annual probability).

For calculating risk quantitatively using the equation in Stop and Reflect 2.5.4, the vulnerability is limited to physical vulnerability of the elements-at-risk considered, determined by the intensity of the hazard event and the characteristics of the elements-at-risk (e.g. building type).

In order to calculate specific risk, the equation in Stop and Reflect 2.5.4 will be modified as follows:

Stop and Reflect 2.5.5
RS = PT * PL * V * A

It is important to indicate here that the amount can be quantified in different ways, and that the way in which the amount is quantified shows the risk is also quantified. For instance, the amount can be given in numbers, such as the number of buildings (e.g. number of buildings that might suffer damage), number of people (e.g. injuries/casualties/affected), the number of pipeline breaks per kilometre network, etc. The elements at risk can also be quantified in economic terms. An example of a quantitative and probabilistic flood risk assessment is provided below.

Three (3) different scenarios, each with a different probability of occurrence (2 years, 10 years and 50 years), are provided. In this simple example, there are three (3) elements at risk only (buildings) that are of two (2) types. Type-1 buildings are weaker in construction than type-2 buildings. Based on past occurrences of flooding, a relation has been made between the water depth and the degree of damage using vulnerability curves explained in 2.4. This means that, with the same water depth type-1, buildings will suffer more damage than type-2 buildings.
The vulnerability curves presented in Figure 2.5.4 are hypothetical ones, but are the crucial component in the risk assessment. The three (3) hazard scenarios will affect the three (3) buildings in different ways. The small table in Figure 2.5.4 indicates the water depth that can be expected for the three houses related to the three (3) scenarios.

In the risk calculation presented in the lower table of Figure 2.5.4, the following types of information are determined for each element at risk:

- **PT** = annual probability of occurrence of the scenarios. The annual probability is calculated as the reciprocal of the return period.
- **A** = the quantification of the elements at risk. In this case the quantification is done in monetary values, including both the structure and the contents of the buildings.
- **V** = the vulnerability of the building for the specific flood scenario. This is done by relating the flood depth with the damage amount according to the vulnerability curve.
- **V * A** = the consequences. The expected losses per building for a given flood scenario is calculated by multiplying the vulnerability with the amount of elements at risk.
- **Σ V * A** = the total consequences of a flood scenario for all elements at risk exposed to the scenario.

The values of the total consequences per scenario (Σ V * A) are plotted against the temporal probability (PT) in a graph. Each scenario represents on point, and the location depends on the probability of occurrence and the total consequences. If you have at least three (3) scenarios, it is possible to plot a curve through the points, which is called the risk curve, or the Loss Exceedance Curve (LEC). The definition of an accurate Loss Exceedance Curve requires information on many hazard scenarios.
Figure 2.5.4: Example of risk estimation for a floodplain with 3 elements at risk for two different types of buildings
Table 2.5.3: Different ways of expressing risk

<table>
<thead>
<tr>
<th>General</th>
<th>Type</th>
<th>Principle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualitative</td>
<td>Qualitative</td>
<td>Based on relative risk classes categorised by expert judgment. Risk classes: High, Moderate and Low</td>
</tr>
<tr>
<td>Semi-Quantitative</td>
<td>Probability</td>
<td>Based on relative ranking and weights assignments by a given criteria. Risk index: Ranked values (0-1, 0-10 or 0-100). (dimensionless)</td>
</tr>
<tr>
<td>Quantitative</td>
<td>Economic risk</td>
<td>Probabilistic values (0-1) for having a predefined loss over a particular time period</td>
</tr>
<tr>
<td></td>
<td>Probable Maximum Loss (PML)</td>
<td>The largest loss believed to be possible in a defined return period, such as 1 in 100 years, or 1 in 250 years</td>
</tr>
<tr>
<td></td>
<td>Average Annual Loss (AAL)</td>
<td>Expected loss per year when averaged over a very long period (e.g., 1,000 years). Computationally, AAL is the summation of products of event losses and event occurrence probabilities for all stochastic events in a loss model.</td>
</tr>
<tr>
<td></td>
<td>Loss Exceedance Curve (LEC)</td>
<td>Risk curve plotting the consequences (losses) against the probability for many different events with different return periods.</td>
</tr>
<tr>
<td>Population risk</td>
<td>Population risk</td>
<td>Quantification of the risk to population</td>
</tr>
<tr>
<td></td>
<td>Individual risk</td>
<td>The risk of fatality or injury to any identifiable (named) individual who live within the zone impacted by a hazard; or follows a particular pattern of life that might subject him or her to the consequences of a hazard.</td>
</tr>
<tr>
<td></td>
<td>Societal risk</td>
<td>The risk of multiple fatalities or injuries in society as a whole: one where society would have to carry the burden of a hazard causing a number of deaths, injury, financial, environmental, and other losses.</td>
</tr>
</tbody>
</table>

Source: Westen et al. (2010)

**Population Risk**

Population risk can be expressed as individual risk or societal risk.

Individual risk is the risk of fatality or injury to any identifiable (named) individual who lives within the zone impacted by a hazard, or follows a particular pattern of life that might subject him or her to the consequences of a hazard.
Individual risk can be calculated as the total risk divided by the population at risk. For example, if a region with a population of one million people experiences on average 5 deaths from flooding per year, the individual risk of being killed by a flood in that region is 5/1,000,000, usually expressed in orders of magnitude as $5 \times 10^{-6}$.

Societal risk is the risk of multiple fatalities or injuries in the society as a whole, and where society would have to carry the burden of a hazard causing a number of deaths, injury, financial, environmental, and other losses.

**Stop and Reflect 2.5.6**

**Study this Example**

- What are the risks from driving an automobile?
- There are 15,000,000 accidents per year, 1 in 300 of which result in death, there are 250,000,000 people

\[
Societal\ Risk = 15,000,000 \text{ accidents/year} \times \frac{1}{300} \text{ accidents/year} = 50,000 \text{ deaths/year}
\]

\[
Individual\ Risk = \frac{50,000 \text{ deaths/year}}{250,000,000 \text{ people}} = 2 \times 10^{-4} \text{ deaths/person\cdot year}
\]

\[
Lifetime\ Risk = 2 \times 10^{-4} \text{ deaths/person\cdot year} \times 70 \text{ years} = 0.014 (1\ in\ 70)
\]

**QUESTIONS 2.5.1**

**Population Risk Calculation**

What is the risk of being killed by a rock fall while driving on the road from A to B?
- There are 500,000 cars driving on the road per year, there are 100 accidents due to rock fall on the road each year, 1 in 10 results in death, the average number of persons per car is 2.

- The number of deaths per year is:
- The individual risk of having an accident is:
- The individual risk of being killed is:
- The societal risk is:
- The life time risk is:
- The risk over 5 year period is:
Societal risk is generally expressed by f-N or F-N curves (See Figure 2.5.5).

- When the frequency of events which causes at least N fatalities is plotted against the number N on log scales, the result is called an F-N curve.
- FN-curves never rise from left to right, but are always falling or flat.
- The lower an FN-curve is located on the FN-graph, the safer is the system it represents, because lower FN-curves represent lower frequencies of fatal events than higher curves.
- F-N curves can be constructed based on historical data in the form of number of events (floods, landslides, etc.) and related fatalities.
- They can also be based on different future risk scenarios, in which for a number of events with different magnitudes the number of casualties is estimated.
- The curves can be constructed for different spatial units. These can be country, province, municipality, but also a community or even a building block within a neighbourhood.
- F-N curves are very important because they form the basis for developing societal acceptability and tolerability levels.

Figure 2.5.5: F-N curves showing the number of fatalities against annual frequency for natural and man-made hazards
2.6 Summary and Conclusions

Methods for assessing vulnerability are varied, but they all provide information on the extent to which elements at risk may degrade when exposed to a hazard of a given magnitude. The simplest techniques involve the use of indices to characterise the levels of vulnerability. Vulnerability curves provide for the relationship between hazard intensities and damage such that, at each hazard intensity, level of damage can be inferred.

The process of risk assessment entails assessment of the spatial and temporal probability of a hazard, the vulnerability of elements at risk and the estimation of the likelihood of losses.

It is a tedious but necessary step in the disaster risk reduction process. The approach to risk assessment may be qualitative or quantitative, but irrespective of the method that is chosen, information on the likelihood of losses will be generated if due process is followed. The output of a risk assessment may include risk matrices where the method is qualitative, risk maps where the method was spatial and F-N curves where the method is quantitative. These outputs will feed into a treatment.

References


EMA (2008). Disaster loss assessment guidelines. Emergency Management Australia. URL:


http://www.fema.gov/plan/mitplanning/planning_resources.shtm


Floods Hit Some Areas In Accra Again (2014). Retrieve May 12, 2016, from


NAHRIS (2006). Dealing with natural hazards and risks. Swiss Virtual Campus Project. URL:

http://www.nahris.ch.

NOAA report examines national oil pollution threat from shipwrecks. (2013). Retrieve May 22, 2016, from


Participatory mapping for decision making. (2009). Retrieve May 2, 2016, from


Scores killed in explosion at gas station in Ghana’s capital (2015, June 4),

http://www.enca.com/africa/scores-killed-explosion-gas-station-ghanas-capital

UN - ISDR (2004). Living with risk, UN.


http://www.telegraph.co.uk.


MODULE 3: DISASTER PREVENTION, MITIGATION AND PREPAREDNESS

3.1 Introduction
This module focuses on disaster prevention, mitigation and preparedness. These three elements together with risk assessment and recovery constitute Disaster Risk Management. Disaster risk management ultimately aims to decrease risk by reducing exposure to hazard, lessen vulnerabilities and increase capacity, and hence build resilience to disaster. When disaster risks are assessed, the next step is to consider a wide range of options available to prevent the disaster from occurring, protect people, their assets, and the environment, in the event that it occurs. The knowledge gained from the assessment allows individuals and communities to anticipate the types of disaster that are likely to affect them, and to think of ways to reduce the impact, or prevent it altogether. Although the sections under this module will be presented in order, in practice, the measures feed into each other and may be considered as a continuum or cycle.

3.2 Learning Objectives
Upon completion of this module participants should be able to:

1. distinguish between Disaster Risk Management (DRM) and Disaster Risk Reduction (DRR);
2. explain the core elements and phases of Disaster Risk Management;
3. describe various measures of DRR – prevention, mitigation, and preparedness;
4. explain the difference between disaster prevention, disaster preparedness and disaster mitigation; and
5. develop possible measures to reduce risks across sector and community.

3.3 Disaster Risk Management
This unit discusses the features of disaster risk management, frameworks to explain the process of disaster risk management and disaster risk reduction. Disaster risk management, which is operationalized at the community level, is briefly introduced.

Exercise/Activity 3.3.1
On 3rd June 2015, Ghana witnessed one of the worst disasters ever recorded in the country. The number of people who died was far higher than would be expected in a situation where the disaster emanated from a single hazard. Which aspect of the hazard that culminated in the disaster was technological (man-made) and which part was natural? How did these occur together in this disastrous form?
Disaster risk Management: A Short Course for Practitioners in Ghana

In the context of this unit, the term Disaster Risk Management refers to legal, institutional and policy frameworks and administrative mechanisms and procedures related to the control of both risk (ex ante) and disasters (ex post); therefore, it also includes the management elements.

Various frameworks have been proposed to understand the phases and process of disaster risk management. However, we will consider only two (2) of such frameworks in this unit.

Disaster Risk Management Framework

In this framework (Figure 3.3.1), the disaster risk management process (cycle) comprises the following main elements:

- **Risk identification and assessment**
  - Hazard analysis & monitoring
  - Vulnerability analysis
  - Determination of risk

- **Prevention and mitigation**
  - Land use planning
  - Land management
  - Non-structural measures

- **Preparedness**
  - Early warning
  - Evacuation
  - Emergency planning

- **Recovery**
  - Rehabilitation
  - Reconstruction
  - Rescue services

**Figure 3.3.1: A framework for disaster risk management**


- **Risk identification and assessment**: This involves determining and analysing the potential, origin, characteristics and behaviour of the hazard – e.g. frequency of occurrence/magnitude of consequences.
- Application of **risk reduction measures** in **mitigation**: Planning and implementation of structural interventions (e.g. dams, sea defence) or non-structural measures such as disaster legislation.
- **Disaster preparedness** and **emergency management**: Activities and measures taken in advance to ensure effective response to the impact of a hazard, including measures related to timely and effective warnings as well as evacuation and emergency planning.
- **Recovery/Reconstruction**: Decisions and actions taken in the post-disaster phase with a view to restoring the living conditions of the affected population.

Stop and Reflect 3.3.2

**Disaster Risk Management includes measures:**
- **Before** (risk analysis, prevention, preparedness),
- **During** (emergency aid), and
- **After** a disaster (reconstruction).

Sometimes disaster risk management includes only a part of disaster management, focusing on the before of the extreme natural event (GTZ, 2004, p. 18)

A holistic approach to disaster risk management is needed in order to enhance resilience and reduce vulnerability to disasters.

The Disaster Risk Management framework in Figure 3.3.1 has several alternatives, which differ from it depending on the level of detail it provides. In Figure 3.3.2, which is one of the alternatives to Figure 3.3.1, the disaster cycle is at the core and encompasses the usual elements of disaster risk management. However, each of the core elements has been expanded to show most of the factors that are not easily discernible at the macro-scale. For instance, risk assessment must take disaster history into account, analyse hazards and also analyse the vulnerability of the population to specific risks.
Figure 3.3.2: The “traditional” disaster cycle and the role of risk assessment
Source: Van Westen et al. (2013)

Exercise/Activity 3.3.2
- Compare the two frameworks and indicate in what way(s) the components of the two frameworks are similar and in what way(s) they are different.
- List some of the elements, which are only observed in Figure 3.3.2.

Stop and Reflect 3.3.3

Disaster Risk Reduction (DRR)
The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events. (UNISDR, 2009)

This means that DRR is limited in scope compared with DRM, which combines prevention, mitigation and preparedness with response.
Given the importance of DRR in the international policy arena, five (5) priority areas are underscored in the Hyogo Framework for Action (2005-2015):

1. Governance
2. Risk identification, assessment, monitoring and early warning
3. Knowledge management and education
4. Reducing underlying risk factors
5. Preparedness for effective response and recovery

The Hyogo framework for action was succeeded by the Sendai Framework for Disaster Risk Reduction 2015-2030 at the Third United Nations World Conference on DRR which took place in March 2015 in Sendai, Japan.

_The four (4) cornerstones of Disaster Risk Reduction_

Four parallel and complementary lines of actions can be considered to reduce exposure to disasters and achieve a more sustainable approach to development:

1. Community / stakeholder participation
2. Public policy actions
3. Safer construction and urban development
4. Development of a culture of prevention

---

**Exercise/Activity 3.3.3**

- Examine the four (4) cornerstones of Disaster Risk Reduction.

As individuals, categorise each of the pillars into technocratic, cultural, institutional, social or political factors.

In groups, compare your answers. Do you discern any overlaps in the categorisations you made? In other words, does a pillar fall within two categories or more simultaneously? Why is this so?

---

**Stop and Reflect 3.3.4**

Disasters are rooted in socio-political factors. Therefore, actions aimed at reducing risk should address the social factors that determine vulnerability as well as changes in the political environment that could increase the resilience of communities (UNISDR, 2009).

---

**3.4 Disaster Prevention**

This unit deals with the definition of disaster prevention, the foundations and the various types of disaster prevention.
For developing nations, including Ghana, prevention is perhaps the most critical component in managing disasters; however, it is clearly one of the most difficult to promote.

**The Basis of Disaster Prevention**

For disaster prevention to be successful, *a priori* planning is required. Planning of prevention hinges on two (2) issues:

- hazard identification (identifying the actual threats facing a community) and
- vulnerability assessment (evaluating the risk and capacity of a community to handle the consequences of the disaster).

Once these issues are put in order of priority, emergency managers can determine the appropriate prevention strategies.

While natural hazards cannot be prevented, human-made hazards such as those associated with industries, technological failures and pollution can be prevented. Although the literature sometimes uses prevention and mitigation synonymously, there is conceptual difference between the two terminologies. Prevention has more to do with **prohibiting man-made hazards** such as chemical accidents, household fires, etc., which are caused by human activities, errors or insufficient precautionary actions. However, mitigation and preparedness are considered as **key measures of risk reduction for natural hazards**.
Disaster risk Management: A Short Course for Practitioners in Ghana

3.5 Disaster Mitigation

This unit focuses on mitigation of disaster by individuals and institutions at various administrative levels. The fundamental objectives of disaster mitigation, types of mitigation measures and the role natural ecosystems in mitigating disasters are discussed.

Stop and Reflect 3.4.2

Types of Disaster Prevention

Disaster prevention may be considered as either primary or secondary.

- **Primary prevention** is to reduce, avert or avoid the risk of the event occurring, by getting rid of the hazard or vulnerability, e.g. to avoid overcrowding, deforestation, choked drainage and to provide services.

- **Secondary prevention** means to recognise promptly the event and to reduce its effects, e.g. by staying alert to possible displacements of population; by being ready to provide immunisation, food, clean water, sanitation and health care to the affected population.

Exercise/Activity 3.5.1

In 3.3, in small groups, you proposed preventive measures for the 3rd June 2015 twin disaster in Accra, Ghana. What mitigation measures can be implemented to forestall the re-occurrence of this disaster? What are the key differences between the preventive measures you proposed in Unit 1 and the mitigation measures you have now proposed? In small groups, classify these mitigation measures into structural and non-structural interventions.

Stop and Reflect 3.5.1

Definition of Disaster Mitigation

- Disaster mitigation refers to *the lessening or limitation of the adverse impacts of hazards and related disasters* (UNISDR, 2004).

- The adverse impacts of hazards often cannot be prevented fully, but their scale or severity can be substantially lessened by various strategies and actions. Mitigation measures encompass engineering techniques and hazard-resistant construction as well as improved environmental policies and public awareness.
Primary Objectives of Disaster Mitigation
The primary objectives of disaster mitigation are two (2) fold, namely hazard likelihood reduction and risk consequence reduction.

Hazard likelihood reduction
This objective is only appropriate for a few natural hazards, as it is not possible to reduce the occurrence of many hazards. However, the likelihood of floods occurrence can be reduced by mitigation measures such as sea defence walls.

Risk consequence reduction
This is a reduction in the impact of a hazard, via a reduction in exposure and/or vulnerability. It involves ensuring that the population, structures, or other systems are able to withstand such an event with as few negative consequences as possible. An example is the construction of the erosion-resistant sea defence wall in Keta, Volta Region of Ghana.

In reducing both hazard likelihood and risk consequence, the primary aim is to decrease risk of death and injury to the population. The secondary aims are to decrease damage and economic losses inflicted on public sector infrastructure and to reduce private sector losses.

Stop and Reflect 3.5.2

Types of Disaster Mitigation Measures
Broadly, disaster mitigation measures can be categorised into two:

- Structural Mitigation Measures
  This refers to any physical construction to reduce or avoid possible impacts of hazards, which includes engineering measures and construction of hazard-resistant and protective structures and infrastructure.

- Non-structural Mitigation Measures
  This refers to policies, awareness, knowledge development, public commitment, and methods and operating practices, including participatory mechanisms and the provision of information, which can reduce risk and related impacts.

Structural and non-structural disaster mitigation measures are mainly carried out by human beings. However, nature through ecosystem functions also provides several mitigation measures as shown in Table 3.5.1.

Table 3.5.1: Hazard and disaster mitigation functions of ecosystems

<table>
<thead>
<tr>
<th>Ecosystem</th>
<th>Hazard Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mountain forests, vegetation on hillsides</td>
<td>Vegetation cover and root structures protect against erosion and increase slope stability by binding soil</td>
</tr>
</tbody>
</table>
together, preventing landslides (Dolidon *et al.*, 2009; Peduzzi, 2010)

Catchment forests, especially primary forests, reduce risk of floods by increasing infiltration of rainfall and delaying peak floodwater flows, except when soils are fully saturated (Krysanova *et al.*, 2008)

Forests on watersheds are important for water recharge and purification, drought mitigation and safeguarding drinking water supply (see World Bank, 2010)

<table>
<thead>
<tr>
<th>Wetlands, floodplains</th>
<th>Wetlands and floodplains control floods in coastal areas (Campbell <em>et al.</em>, 2009)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Marshes, lakes and floodplains release wet season flows slowly during drought periods.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coastal ecosystems (mangroves, saltmarshes, coral reefs, sand dunes)</th>
<th>Coastal wetlands, tidal flats, deltas and estuaries reduce the height and speed of storm surges and tidal waves.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coastal ecosystems protect against storm surges, flooding and other coastal hazards – combined protection by coral reefs, seagrass beds and sand dunes/coastal wetlands/coastal forests is particularly effective (Batker <em>et al.</em>, 2010).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drylands</th>
<th>Natural vegetation management and restoration in drylands contributes to ameliorate the effects of drought and control desertification, as trees, grasses and shrubs conserve soil and retain moisture.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prescribed burning and creation of physical firebreaks in dry landscapes reduce fuel loads and the risk of unwanted large-scale fires (PEDRR, 2010).</td>
</tr>
</tbody>
</table>

---

**Exercise/Activity 3.5.2**

- What similarities and differences do you observe between ecosystem-based disaster mitigation and anthropogenic disaster mitigation?

- What human activities are likely to reinforce or antagonise disaster mitigation functions of ecosystems? Give specific examples.
3.6 Disaster Preparedness

This unit, which emphasises the need for preparedness, focuses on the key elements of preparedness strategies and the types of disaster preparedness.

**Exercise/Activity 3.6.1**

Divide participants into two groups, with one group focusing on floods and the other group on bush fire. Each of the two groups should devise a preparedness plan to address the specific hazard. Compare the two plans and highlight the key similarities and differences. What are the potential enabling and inhibiting factors to the implementation of both preparedness plans?

**Stop and Reflect 3.6.1**

**Definition of Disaster Preparedness**

Disaster preparedness encompasses the knowledge and capacities developed by governments, professional response and recovery organisations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions (UNISDR, 2007).

**Components of a Comprehensive Disaster Preparedness Strategy**

The essential elements include the following:

- Hazard, risk and vulnerability assessments
- Response mechanisms and strategies
- Preparedness plans
- Coordination
- Information management
- Early warning systems
- Resource mobilisation
- Public education, training & rehearsals
- Community-based disaster preparedness

Preparedness is based on a sound analysis of disaster risks and good linkages with early warning systems, and includes such activities as contingency planning, stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation and public information, and associated training and field exercises. For effective handling of hazards and disasters, a comprehensive disaster preparedness strategy is required.
Stop and Reflect 3.6.2

**Types of Disaster Preparedness**

Disaster preparedness can be studied under three specific categories:

- **Target-Oriented Preparedness**: Preparedness plans may be target specific, for instance, we may require different types of planning for the vulnerable groups of women, children, elderly and disabled.

- **Task-Oriented Preparedness**: Specific groups jointly develop activities based on one of the community’s plans to evaluate the community’s capability to activate the preparedness plan in a real emergency. Eventually, these tasks enable the development of plan revisions, employee training and material resources to support readiness.

- **Disaster-Oriented Preparedness**: This addresses the likelihood of occurrence of a specific disaster. Emphasis is placed on structural and non-structural mechanisms.

The effectiveness of the various types of preparedness depends on the availability of information on hazards, emergency risks and the countermeasures to be taken, and on the degree to which government agencies, non-governmental organisations and the general public are able to make use of this information.

In Ghana, the National Disaster Management Organisation (NADMO) has identified various levels at which disaster preparedness is required. These levels are shown in Figure 3.6.1 using flooding as illustration.

<table>
<thead>
<tr>
<th>Triggers</th>
<th>Early warning monitoring indicators</th>
<th>Responsible for early warning measures</th>
<th>Preventive and mitigating measures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2) Weather forecasts</td>
<td>1) Gmet</td>
<td>1) Use of media</td>
</tr>
<tr>
<td></td>
<td>2) Information flow on the rainy season</td>
<td>2) Ministry of Information</td>
<td>2) Designing of drainage systems</td>
</tr>
<tr>
<td></td>
<td>3) Observation of the rise of river level</td>
<td>3) NADMO</td>
<td>3) Clearing of waterways</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4) Timely evacuation of population</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5) Timely information flow on the rainy season</td>
</tr>
<tr>
<td>Opening of dams</td>
<td>1) Alert warning from Burkina Faso on the opening of dams</td>
<td>1) Volta River Authority</td>
<td>1) Timely flow of information on the opening of dams</td>
</tr>
<tr>
<td></td>
<td>2) Rise of the water level in Burkina Faso</td>
<td>2) Ministry of Information</td>
<td>2) Use of media</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3) Ministry of Foreign Affairs</td>
<td>3) Use of voluntary groups by NADMO and Red Cross</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4) Ministry of Interior</td>
<td>4) Evacuation plans and identification plans and identification of safer places</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5) NADMO</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6) District Municipal and Metropolitan Assemblies</td>
<td></td>
</tr>
<tr>
<td>Choked drainage systems</td>
<td>1) Increment in human activities due to population increase resulting in unplanned settlements</td>
<td>1) EPA</td>
<td>1) Establishment of an authority in charge of waste management</td>
</tr>
<tr>
<td></td>
<td>2) No existing waste disposal sites</td>
<td>2) District and Metropolitan Assemblies</td>
<td>2) Clean up of drainage systems by District Assemblies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3) Ministry of Works and Housing</td>
<td></td>
</tr>
</tbody>
</table>

Figure 3.6.1: Levels of disaster preparedness and relevant institutions in Ghana

Source: Dokurugu (2010)
Stop and Reflect 3.6.3

- Disaster preparedness provides a platform to design effective, realistic and coordinated planning, reduces duplication of efforts and increase the overall effectiveness of government, household and community members’ disaster preparedness efforts.

- Disaster preparedness activities embedded with risk reduction measures can prevent disaster situations and also result in saving lives and livelihoods during any disaster situation, enabling the affected population to get back to normalcy within a short time period.

- Disaster preparedness is a continuous and integrated process resulting from a wide range of risk reduction activities and resources rather than from a distinct sectoral activity by itself. It requires the contributions of many different areas – ranging from training and logistics, to health care, livelihood to institutional development.

3.7 Summary and Conclusions

In this module, you learned about concepts such as disaster prevention, preparedness, and mitigation. You were also introduced to definitions of disaster risk reduction and disaster risk management; the phases of emergency management; the responsibilities of individuals and local, regional, and national governments with regard to emergency management. The elements of a comprehensive disaster preparedness strategy were also covered. Furthermore, you learned that apart from mitigation measures by humans, nature also carries out hazard and disaster mitigation measures through ecosystem functions. The next module will address the response and relief phases of the disaster management cycle.

References


4.1 Introduction
This module builds on Module Three which discussed disaster preparedness planning issues. The module covers issues such as disaster response, characteristics of disaster response, and the key requirements for effective response. Also, covered are the types of responses, relief and the principles of relief, project management cycle governing relief, and the institutions for disaster response and relief.

4.2 Learning Objectives
At the end of this module, participants should be able to:
1. Describe and explain disaster response;
2. Identify factors that determine the nature of disaster response;
3. Discuss the key requirements for effective disaster response;
4. Explain disaster relief and principles of disaster relief;
5. Describe the project management cycle in relation to disaster relief; and
6. Identify institutions responsible for disaster response and relief in Ghana.

4.3 Disaster Response

Exercise/Activity 4.3.1
The aftermath of the twin disaster in Accra on June 3, 2015 raised many questions on the nation’s preparedness in responding to disasters. Many have argued that if responses had been timely, appropriate and adequate, the impact could have been averted or greatly minimised. Many others have also argued that the situation was just difficult to implement any response.
- How would you respond to these arguments and what could have been done differently?

Disasters manifest in many forms, and when they do, many lives are lost and properties damaged. Eventually, this situation disrupts various facets of life thus, the need for response. These responses may be directed at saving lives, reducing the health impact of the disaster, ensuring public safety, protecting and restoring properties damaged by the disaster and meeting the basic subsistence requirement of people affected. This unit outlines the rationale for disaster response, the activities entailed in the response process, characteristics of disaster response, determinants of response, and the stages of disaster response.
Disaster responses are the set of activities taken during a disaster or immediately following a disaster, directed towards saving life and protecting property (IFCR, 2008). The activities that deal with the effect of disaster may include medical care, evacuation, search and rescue, provision of emergency water, food and shelter, debris removal and stabilisation of unsafe buildings and landforms (Kumoi & Doss, 2000).

The Objectives of Disaster Response
Disaster response is aimed at providing immediate assistance to maintain life, improve health and support the morale of the affected population. It is focused at meeting the basic needs of the people until more permanent and sustainable solutions can be found. Disaster response depends on the adequacy of preparedness prior to the disaster, considering the scope of responses required. According to Carter (2008), response operations are often difficult to implement considering the disruptive and sometimes traumatic conditions disasters present. Thus, the success in responding appropriately depends on early planning, organisation and training. Disaster response preparedness are the pre-disaster activities that are undertaken to minimise loss of life, injury and property damage in a disaster, and to ensure that rescue, relief, rehabilitation and other services can be provided following a disaster. Preparedness for the first and immediate response is referred to as “emergency preparedness” (United Nations Office for the Coordination of Humanitarian Affairs [UNOCHA] guidelines for disaster management in Asia and the Pacific).

Factors that Determine the Nature of Disaster Response
Disaster response is determined by the nature of disaster event which is mostly characterised by:

- **The type of disaster**
  Disaster manifests in many forms, its onset may provide long warning, short warning, or no warning at all. The relative anticipation of the disaster event thus, would influence the effectiveness of activating preparedness plans, mobilisation, and application or response effort.

- **The ability to take pre-impact actions**
  Responses to disaster are operationalized in three main phases namely the “pre-, during and post-disaster” situation. Disaster early warning systems may provide timely warnings for anticipating impending disaster. Pre-impact responses (such as evacuation, shelter, and other protective measures) may be carried out if time and conditions are favourable.

- **The severity and magnitude of disaster**
  The severity and size of the problem determines the response required. Particular effects could be seen in the ability of responses to cope with the problem; the urgency of response action and the priorities which are applied in terms of the scale of potential effects of no appropriate response as well as the requirements for external assistance.
The capability of sustained operations
The capability of sustained operation is an essential ingredient of effective response. This is influenced by factors such as resource capability, management capability, community self-reliance, and availability of international assistance. It is important that these issues are clearly addressed in preparedness planning and response action plans.

Identification of likely response requirements
Knowing the likely response required to address specific disaster is important and ought to be identified in the preparedness planning stage of the disaster management cycle.

A clear understanding of the disaster treat is essential for determining the responses required. The characteristics of disaster events might result in some or all of the following:

- Many urgent and significant tasks involving injuries, deaths and/or property loss/damage
- Large numbers of personnel and agencies required
- High levels of public interest and/or controversy
- Many examples of information mishandling
- Potential for some key tasks to be overlooked or under-resourced
- Potential for some key tasks to be over-resourced
- Potential for some of the available key resources to not be used (Kumoi & Doss, 2000).

Exercise/Activity 4.3.2
Please divide the participants into four groups and let them:

- Identify the likely disasters Ghana could anticipate (such as flood, famine, fire, etc.)
- Taking one of the disasters identified, consider the factors that determine the nature of response and describe the responses required in addressing the impact of the disaster.
- Explain how the factors would determine the nature of responses identified.

Factors that determine the nature of disaster response
i. Type of disaster
ii. The ability to take pre-impact actions
iii. The severity and magnitude of disaster
iv. The capability for sustained operations

Requirement for Effective Response
Information and resources are two (2) essential requirements for effective response without which plans and efforts at responding will not yield the anticipated results.
**Information**

An early warning system provides vital information for effective response operation despite the unpredictability of some disaster events. An effective warning system must be robust to transmit warnings as early as practicable. Information gained from these systems could help in the planning and decision-making as well as inform the general public.

Resources form an essential component of disaster response. The need for disaster management organisations to be resource ready cannot be over emphasised considering the untimely occurrence of disasters, which most often is on short notice. The ability to mobilise the needed resources on short notice is most often hampered by many factors. Its effect on systems gives little room for procrastination of actions.

Disaster management requires a carefully drawn response plan which is often prepared in anticipation of emergency and activated in times of urgency. The response plan as a component of the disaster management plan includes ways of managing human and financial resources, response to supplies availability and communication procedures. This involves identifying, strengthening, and organising resources and capacities for timely and effective response to a potential disaster.

**Disaster Response Planning**

In disaster response planning, roles and responsibilities are defined, policies and procedures are developed and generic tools for responses are identified and developed. The response plan is developed based on assumptions of risks and hazards, and does not address specific disaster scenarios - as is the case for contingency plans.

Plans thus, must be monitored, evaluated and adapted to the specific situation in times of disaster.

---

**Exercise/Activity 4.3.3**

- Share samples of disaster preparedness plans, disaster response plans and contingency plans to the 4 groups and ask participants of the groups to:
  - a. Identify the key components of the three plans.
  - b. Discuss and present on the differences between the three plans.
  - c. Indicate when these plans should be developed and for what purpose.

- Based on your previous knowledge of the key components of a response plan, develop a response plan for your earlier chosen disaster considering:
  - a. Risk assumptions for the potential hazards
  - b. Roles and responsibilities
  - c. Policies and procedures
  - d. Response tools
Rationale for Disaster Response
Responses are mainly directed at:
- limiting casualties;
- alleviating hardship and suffering;
- restoring essential life support and community systems;
- mitigating further damage and loss; and
- providing the foundation for subsequent recovery.

The Humanitarian Charter
The Humanitarian Charter provided 4 (four) principles that must be followed in responding to emergencies based on the right to live in dignity, the right to receive humanitarian assistance, and the right to protection and security (The Sphere Project, 2011).

The principles are:
- avoid exposing people to further harm as a result of your actions;
- ensure people have access to impartial assistance;
- protect people from physical and psychological harm due to violence and coercion; and
- enable access to remedies and recovery from abuse (Sphere Handbook, 2012).

The Sphere Project aims to improve the quality of assistance provided to people affected by disasters, and to improve the accountability of humanitarian actors to their constituents, donors and affected people. This Project has suggested 4 (four) minimum standards that often need consideration during response to disasters. These are:
1. water supply, sanitation and hygiene promotion;
2. food security and nutrition; and
3. shelter, settlement and non-food items; and
4. health action.

Disaster Responses
Disaster responses include actions that embrace the following:
- Search and rescue
- First aid and emergency medical care
- Evacuation
- Evacuation centre management
- Development of Standard Operation Procedure (SOPs)
- Immediate repair of community facilities and services
- Relief delivery
- Coordination and Communication
- Psycho-social counselling and stress debriefing
- Medical services (Carte, 2008; Kumoi & Doss, 2000)
Search and rescue

This activity is usually conducted by well-trained volunteers in finding disaster victims, that is, lost, sick or injured persons in either a remote or difficult to access areas such as water bodies, desert, forest or probably in the course of mass population movement. The search and rescue operations are often directed at, locating endangered persons at an emergency incident, removing those persons from danger, treating the injured, and providing for transport to an appropriate health care facility.

Basic Key Steps of Search and Rescue

The basic steps as outlined by Kumoi and Doss (2000) are:

1. Size up - involves assessing the situation and determining what one is going to do and if yes, then how. The decision whether to attempt a rescue should be based on:
   a. The risks involved; and
   b. Achievement of the overall goal of doing the greatest good for the greatest number.

2. Search - involves locating victims and documenting their location.

3. Rescue - involves the procedures and methods of extricating and moving victims to safety.

To effectively conduct this exercise, a team with clear responsibilities of action needs to be in place during response.

First aid and emergency medical care

The need for first aid and emergency medical care arise in most disasters and response in this direction is of essence. First aid is the provision of initial care for an illness or injury. It is usually performed by non-expert, but trained personnel to a sick or injured person until definitive medical treatment can be accessed. Emergency medical care is immediate paramedic attention to severe wounds and the rapid transportation of the ill or injured to a health facility.
Evacuation
The evacuation of communities, groups or individuals is a frequent requirement during response operations but always needed. Evacuation is an organised movement of people from an area at risk to a safer place.

Types of Evacuation

Evacuations could be:
- Precautionary evacuation before disaster
- Protective evacuation after disaster
- Evacuations for reconstruction purposes

Services provided during evacuations include:
- Registration
- Assistance with financial and legal queries
- Water, food, clothing
- Rest areas
- Blankets and personal items
- Interpreter services
- Assistance in contacting family/friends
- Services for animals
- Emergency financial assistance
- First aid, medical and health
- Information

Standard Operating Procedures (SOPs)
In making disaster plans operational, there is the need to develop SOPs which could guide the team in effective operation. SOPs are the set of standard procedures that “operationalize” the disaster response and/or contingency/ plans. In other words, SOPs specify the way in which individuals or units will carry out their functions under the plan (such as, mobilisation of response team, deployment of assessment team process assessments, etc.) The SOPs set out what should be done, how it should be done, who is responsible for implementing what, and specifies available resources.

SOPs take cognisance of four stages of preparation and procedures:
- during normal times
- alert/warning and
- during disaster
- rehabilitation

During Normal Times

The state institution mandated to respond to disaster ought to:
Formulate and distribute disaster preparedness plans, and conduct drills in all areas;

 Produce maps of Wards/Village Tracts showing areas most vulnerable to storms, floods and other natural disasters;

 Make a list of vehicles and motor boats that can be used for emergency work;

 Compile a list of departments, non-governmental organisations (NGOs), and members of People’s Strength that will take part in relief operations in the pre-disaster, disaster and post-disaster periods and designate representatives for contact;

 Obtain beforehand the required relief and aid supplies;

 Form the necessary disaster preparedness committees and organisations;

 Create shelters and safe locations for use during disasters depending on local conditions;

 Conduct educational talks on natural disasters and rehearse periodically for the local community depending on local conditions; and

 Coordinate with departments concerned to form Security services, Auxiliary Fire Brigades, communication agencies and Red Cross Societies; and

 Provide organising and training activities.

Alert/Warning Stage

In the situation of impending danger, efficient warning systems would activate the needed alert. The following actions would be necessary in such stage of disaster.

 Emphasise the dissemination of news obtained through early warning systems to the community;

 Assign duties to administrative bodies and NGOs to fly warning flags as part of the disaster preparedness programme in the vulnerable areas of the Ward/Village Tract;

 Alert and mobilise members of the Security services, Auxiliary Fire Brigade, communication agencies, the Red Cross, Youth, members of People’s Strength and NGOs;

 Make the necessary arrangements to evacuate the public to safe locations (shelters) in a timely manner;

 Increase security sentries as required;

 Ensure that all levels of supervisors have all teams ready for assigned duties; and

 Keep the office operational 24 hours a day in the emergency period.

During Disaster Stage

In the event of a disaster, the issues to consider are:

 Alert the community in areas the natural disaster is likely to strike;

 Safeguard the road and water transport routes, keep relief and medical teams at the ready and arrange transport to affected areas at short notice;
Disaster risk Management: A Short Course for Practitioners in Ghana

- Evacuate the community from vulnerable areas to safe locations or designated shelters as quickly as possible;
- Operate relief camps and supervisory centres at designated shelters as quickly as possible;
- Ensure that administrative personnel and NGOs in areas vulnerable to storms give disaster warnings door to door as a matter of urgency;
- Keep available relief and aid supplies at the ready to launch relief operations quickly and effectively;
- Evacuate the public remaining in the area to designated safe locations;
- Make arrangements to evacuate movable property including cattle to designated locations; and
- Ensure the well-disciplined implementation of orders received from the coordinating agencies and sub-committees with the help of members of the Security services, Fire Brigade, Red Cross Youth members, and members of People's Strength, social organisations and NGOs.

Rehabilitation Stage

The rehabilitation stage is the post disaster phase where affected population restart their lives in a much difficult situation considering the impact of their losses. The SOPs for the rehabilitation stage are:

- Conduct field inspections in affected areas as soon as possible and provide the necessary assistance and support;
- Submit immediate preliminary reports with population figures, death and injury figures of cattle and animals, data on socio-economic losses, and carry out further systematic data collection;
- Make arrangements to provide health care and social protection to disaster victims;
- Clear collapsed buildings and trees as quickly as possible;
- Prioritise the restoration of transportation, electricity and water supply and telephone and telegraph services as soon as possible;
- Make arrangements as quickly as possible to reclaim contaminated wells and ponds for access to clean water and dig new wells for drinking water;
- Make arrangements to bury/cremate the remains of disaster casualties and animal carcasses;
- Manage and systematically utilise disaster funds and supplies, as well as cash and supplies donated by well-wishers, social organisations and NGOs; and
- Support the local population for the resumption and recovery of economic activities to previous conditions.

Relief Aid

This relates to any provision of assistance during an emergency that is meant to attend to a person’s immediate requirements for survival or recovery. It may include food, clothing, housing, medical care, necessary social services and security when a person
is faced with circumstances beyond her or his control. Relief aid must be targeted at the most vulnerable first: Vulnerable children or orphans, female or child headed households, pregnant or lactating women, sick or elderly populations.

**Coordination and Communication**

Coordination is key to successful disaster response, and is essential in ensuring timely and appropriate scaling-up of resources. Good coordination is crucial for combining resources effectively and efficiently, in order to reach the disaster-affected more rapidly. It contributes to better cooperation, reduces the level of duplication and helps to ensure a well-organised operation. Coordination activities can take place at different levels and in different forms.

The coordination activities include:

- **Meetings** - Plan to hold regular meetings with Movement partners to determine activities and roles;
- **Information management** - Information sharing on disaster impact, assessment and needs through input into DMIS (Disaster Management Information System);
- **Communication means** - Plan for continuous information and communication flow; Movement Coordination Framework - Plan for strategic and operational coordination; and
- **Partnership agreements** - Identify existing agreements and determine additional agreements needed to meet needs.

Communication, as with all aspects of disaster management, is essential for effective response. The need to consider efficient forms of communication is very relevant in response operations, especially during high impact disasters where communication systems are mostly affected.

Access to accurate and complete information following disaster impact is often a challenge due to the confusion that often characterises such circumstances. Accurate and comprehensive information is often a requisite without which response operations would be difficult. The setting of Emergency Operations Centres (EOC) is essential for the effective management of information. EOCs ensure that information is correctly processed according to the proven cycle of:

- acquisition of information;
- information assessment;
- decision-making; and
- dissemination of decisions and information.

**Psychosocial Support**

Disasters come with grieving moments as many may lose not only properties, but also dear ones with negative psychological outcomes. Impacts on psychosocial well-being can be both short term and long term. Psychological services play a crucial role in
responding to crises that involve large populations, as they cater for the needs of the majority of the affected population. They help in the recovery process and reduce the development of mental health problems. Psychosocial support activities include identifying and referring individuals requiring specialised support through professional mental health services.

**Public Health Services**

Public health services are required during disaster response. The relevance of medical services is most felt in disasters when there are:

- Deaths, injuries
- Loss of clean water
- Loss of shelter
- Loss of sanitation
- Loss of routine hygiene
- Disruption of solid waste management
- Public concern for safety
- Increased pests and vectors
- Damage to health care system
- Worsening of chronic illnesses
- Toxic/hazardous exposure
- Loss of food supply
- Standing surface water

The public health services required in responding to disasters include:

- Mass casualty management
- Mental health
- Environmental health
- Reproductive health
- Managing and continuation of existing health services
- Managing and continuation of medication on chronically affected diseases (HIV, TB, Leprosy, etc.)
- Management of the dead and missing
- Emergency feeding
- Communicable disease surveillance and response
- Sanitation

### 4.4 Relief

Disasters in most cases take away many essential subsistence needs and livelihood, making coping difficult for victims/communities affected. The victims end up needing help. Relief refers to the provision of essential, appropriate and timely humanitarian assistance to those affected by a disaster (International Federation of Red Cross and Red Crescent Societies [IFRC], 2008). It is defined as the provision of assistance or intervention during or immediately after a disaster to meet the life preservation and
basic subsistence needs of those people affected. Relief can be of an immediate, short-term, or protracted duration (United Nations, 2008).

Relief, as a disaster management process, provides timely essential needs such as basic household items, shelter, food, water and sanitation, or health items. Relief activities provide goods and services to disaster-affected populations in the form of supplies, vouchers or cash transfers, so as to enable those populations to cover their essential needs. Relief measures differ, depending upon the nature of disaster. At certain occasions, money may have no value, but certain articles like food, clothes, etc. may be more important (IFRC, 2008). The disasters that require relief may include fire, flood, lightening, earthquake landslides and sinking of land, snow avalanches, glaciers, drought, locusts, epidemics, land storms, excessive rains, cloud bursts and hailstorm. Other issues that may also require relief are accidents like motor vehicles accident, boat mishap, food poisoning and fall from tree or steep rock. Non-explosive burst and snakebite (Disaster Management Cell [DMC] Himachal Pradesh, 2012).

Relief, globally, is guided by fundamental principles which disaster organisations and NGOs engaging in disaster relief response ought to apply. The principles require that:

- Response to disasters must have humanitarian imperative
- Aid is provided based on needs alone and must be done without discrimination of any kind (race, creed or nationality of the recipients)
- Aid will not be used to further a particular political or religious standpoint
- Aid agencies do not to act as instruments of government foreign policy
- That culture and custom are respected in response and relief activities
- Disaster response is built on local capacities
- Ways be are developed to involve programme beneficiaries in the management of relief aid
- Relief aid would reduce future vulnerabilities to disaster as well as meeting basic needs
- Accountable to both those we seek to assist and those from who we accept resources
- Information, publicity and advertising activities shall recognise disaster victims as dignified human beings and not hopeless objects (SPHERE, 2011)

**Project Cycle Management Linked to Relief**

The project cycle management (PCM) is a conceptual tool used for the planning and management of programmes and projects leading to the improvement of programme effectiveness and outcome. In disaster response, the PCM provides five (5) main continuous components that guide disaster response. They are: assessment, planning and designing, implementation, monitoring, review and evaluation (IFRC, 2008).
Assessment
The first step after the onset of a disaster is to assess the origin, magnitude and effect of the disaster on the affected population so as to be able to identify humanitarian needs and plan possible interventions. The purpose of an assessment, therefore, is to ascertain the need for an intervention based on identified needs. This is done to identify the problem, its source and consequences. There are four (4) types of assessments that are usually conducted during disasters. These are immediate, rapid, detailed and continual assessments.

- **Immediate assessments** are conducted within 72 hours after the disaster. It is generally conducted by in country actors and involves the collection of basic disaster information.

- **Rapid assessments** are conducted immediately after the disaster and take up to a week. These involve gathering of information on the needs and existing capacities of the affected population. Possible areas of intervention and resource requirements are determined.

- **Detailed assessments** are conducted after rapid assessments to obtain further information on the affected population’s needs and capacities for programme planning. They can take up to a month to conduct, more or less depending on the area, the complexity of the issues and resources available.

- **Continual assessments** are conducted once the detailed assessment has been completed and relief programmes are running. They update information on the situation and involve beneficiaries for recovery programming. In addition, when contextual changes occur, continual assessments allow to initiate rapid or detailed assessments (IFRC, 2008)
**Planning/Design**

The planning and design process is critical to a relief operation as it helps to set out in clear stages what the operation will do. It also determines how progress and results will be monitored and defines the duration of relief activities. The planning process describes the steps and order to undertake when planning relief interventions. The design describes the selection of relief interventions that are best adapted to the needs of the context faced. This phase is aimed at defining the desired future situation of the affected population and to determining the objectives, strategies and activities needed to achieve it. It takes into account local capacities, the implementing agency’s mandate and capacities, and the constraints and risks. The outcome of the planning and design phase is project proposal/relief Plan of Actions (PoA).

The factors that must be considered when planning relief activities are:

- The needs identified during the assessment, presented by technical sector (shelter, NFIs, food, water and sanitation, health)
- The overall PoA for the operation
- The capacity and mandate of the disaster management organisation
- Programmes conducted/planned by other stakeholders (government, humanitarian organisations)
- The security and access to disaster-affected populations

**Implementation**

The implementation phase is when the activities are carried out to achieve the desired results. The implementation of relief activities is conducted once the assessment and the planning processes are completed. This may include the mobilisation and distribution activities. The key issues that would be considered are beneficiary targeting and identification and methods and tools for implementation.

**Beneficiary Targeting**

The relief intervention, depending on the nature and magnitude of the disaster and the capacity to respond, can aim to cover all the population (blanket distribution) or can be focused on the most vulnerable groups within the affected population (targeted distribution). The purpose of targeting is to provide relief to those who are least able to cover their essential needs. In slow onset emergencies and/or when relief is provided more than once to a population, targeting may be necessary. In rapid onset emergencies, relief is often provided to all of the population in the affected location, given the lack of time to conduct proper targeting (IFRC 2008).

Targeting follows strict criteria of selection. It is necessary that the criteria are drawn with community participation and approval. Regardless of the type of targeting system used it is important to maintain clear criteria that identify individuals and groups in a manner that is impartial and focuses on vulnerability.
Beneficiary Identification

Beneficiary identification is conducted prior to or during any relief operation in any disaster condition although very difficult to conduct in rapid disaster situations. In rapid disaster situations the minimal information on the number of persons requiring supply is enough to start the distribution process. However, in slow onset disasters that may require more than one relief operation, a detailed identification process would be required. Beneficiary identification serves two main purposes. Firstly, it helps to identify persons in need; secondly, it helps in ensuring accountability and judicious use of resources.

Generally, the identification process requires information such as:

- head of household’s given name and surname
- number of family members
- address or location of permanent and/or temporary residence (amount of detail to be determined according to context rural/urban/camp)

In situations that require long-term programmes where multiple distributions are planned, it may be advisable to collect supplementary information for family members such as:

- name
- gender
- age
- national identification number (or similar form of identification)
- date of identification and
- any other relevant information such as pregnant mothers, physically challenged, etc.

Monitoring

Monitoring, also known as process evaluation, is a continuous process of follow-up on all the activities throughout the disaster response and relief activities. Monitoring is done through the use of indicators which measure the extent to which an objective has been accomplished. These indicators measure changes in the lives of beneficiaries as a result of the relief they received. The resulting progress reports lead to decisions on whether or not an intervention needs to be changed or adapted as the situation evolves.

Review and Evaluation

Reviews and evaluations are the assessments carried out at a given point in the intervention. These involve analysis of the situation that produces intermediate/final reports that lead to recommendations for and adaptations to the intervention or to lessons learnt for the organisation.

The PCM steps need to be followed sequentially since each step builds on the previous one. In natural disasters, when time for response is short and teams want to provide relief to the affected populations in a timely manner, it is important to make sufficient
time to plan the intervention properly and to set up the necessary monitoring and evaluation steps. Reporting, in its most basic sense, is an integral part of all stages of the PCM, essential for proper internal and external communications, transparency and accountability. Examples of key reports done during the life-cycle of the project are assessment narrative reports and relief activity reports.

**Institutions for Disaster Relief and Response**

Many organisations respond to disasters both locally and internationally. In the local front, the leading government agency in disaster response is the National Disaster Management Organisation (NADMO). NADMO was established by act 517 of 1996 to manage disasters and similar emergencies in the country. Structured under the ministry of the interior, NADMO coordinate all the relevant civil authorities at the national, regional and district levels. The security agencies, such as the Police, Armed Forces, Navy, Air Force and the National Fire Service are also key in disaster response in the country. They are mostly responsible for the security issues in disaster response. Other governmental organisations such as the National Ambulance services provide health emergency services. Non-governmental organisations (NGOs) and civil society groups operating within the area of impact may also respond depending on their mandate and capacity. Other para-governmental organisations such as the Ghana Red Cross Society provide both health and relief services during disasters. On the international front, many organisations provide relief response.

**List of International Relief Organisations**

The list of international organisations providing response and relief are enormous. They however operate with specific mandate and in specific jurisdictions just as the localised organisations. Knowing these agencies by their mandate, core business and areas of operation could help raise the needed partners to addressing disasters in Ghana and beyond.

The list of international relief response organisations is as follows:

Exercise/Activity 4.4.1

Working in groups, ask participants to develop a matrix of organisations both locally and internationally that could provide response and relief to victims of a chosen disaster.

The issues that must be considered are:

- The name of institution
- Core mandate
- Area of operation
- Responsibility in disaster response and relief
References


Sphere Project (2011). *The Sphere project*.


5.1 Introduction

This module has been structured to cover four broad areas, namely defining stakeholder participation; basic steps in stakeholder analysis; methods and tools for stakeholder participation; and summary of the issues covered. Over the past several years, issues of ‘stakeholder participation’ have become increasingly important in development discourses. International development institutions and partners have recognised that ‘stakeholder participation’ is an essential process for the achievement of its overarching objectives of poverty reduction and sustainable development (UNDP, 2015). Stakeholder participation approaches have been shown to enhance project quality, ownership and sustainability. It is also a means to empower targeted beneficiaries (in particular, women and poor people) and to contribute to long-term capacity-building and self-sufficiency, hence its relevance in dealing with disaster risk reduction (DRR) education.

Many development partners refer to the importance of ‘stakeholder participation’ and encourage staff to utilise a ‘participatory approach’ in their day-to-day engagements with partners. The process of a bottom-up-participatory-approach and a client-responsive approach are to ensure stakeholder commitment and ownership of all interventions’, especially on issues related to DRR. Thus, this module seeks to emphasise the need for a shift to an approach where all stakeholders, including targeted beneficiaries of civil society, the donor community and agencies are involved from the outset of programme design through to implementation, monitoring and evaluation (Chambers, 2006).

5.2 Learning Objectives

After completing this module and its related activities, participants should be able to:

1. define stakeholder participation within the context of DRR efforts;
2. describe the forms, benefits and cost of stakeholder participation;
3. list and explain the basic steps in stakeholder analysis;
4. identify and explain the methods and tools for stakeholder analysis; and
5. Engage key stakeholders in any DRR activity.

5.3 Defining Stakeholder Participation

Stakeholder ‘participation’, stakeholder ‘engagement’ and stakeholder ‘involvement’ are often used interchangeably in relation to the interactions between two or more stakeholders in policy making, development projects, organisational
management and decision making in disaster risk reduction (DRR) education. In brief, ‘stakeholder participation’ is the involvement of interest groups (i.e. representatives of locally affected communities, national or local government authorities, politicians, civil society based organisations and businesses) in a planning or decision-making process as further explained in Stop and Reflect 5.3.1.

**Stop and Reflect 5.3.1**

**Meaning of Stakeholder Participation**

- In the operational context of this module, ‘stakeholder participation’ is the process through which people with common interest (stakeholders) influence and share control over development initiatives, decisions and resources that affect them; and

- Participatory development is defined as a process in which people are proactively and significantly involved in all decision-making processes that affect their lives (BMZ Participation Concept, 1999).

**Models of Stakeholder Participation**

Figure 5.3.1 shows Arnstein’s ladder of citizen participation framework. Arnstein’s ladder of citizen participation is an example that depicts the linkages between the various schemes, types and methods of stakeholder participation.

<table>
<thead>
<tr>
<th>SN</th>
<th>Rungs</th>
<th>Level of Power</th>
<th>Type of Participation</th>
<th>Suitable Method of participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Citizen Control</td>
<td>Citizen Power</td>
<td>Functional participation</td>
<td>Project group/team work</td>
</tr>
<tr>
<td>7</td>
<td>Delegated Power</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Partnership</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Placation</td>
<td>Tokenism</td>
<td>Interactive Participation</td>
<td>Citizens’ jury, focus group discussion</td>
</tr>
<tr>
<td>4</td>
<td>Consultation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Informing</td>
<td>Non-participation</td>
<td>Passive/Pseudo-participation</td>
<td>Community forum, media</td>
</tr>
<tr>
<td>2</td>
<td>Therapy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Manipulation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 5.3.1: Ladder of citizen participation**

Source: Bahli and Bujukkurt (2005); Koningsveld (2005)
In Figure 5.3.1, columns 2 and 3 explain the interaction between power structures in society which makes participants who have power to influence change do so through processes of known decision making. It consists of eight (8) stairs. The first and second stairs correspond to non-participation as the degree of participation or power to influence the basis of participation is weak. This is because mere education through manipulation or curing participants of a misconception does not enlist them into the power structure that has direct bearing on change. The third, fourth and fifth stairs deal with opportunities for citizens to hear and be heard; engage in consultative bargaining; and to be appeased of a grievance. These correspond to the degree of tokenism as the level of influence.

The sixth, seventh and eighth stairs border on partnership; delegated power and citizen control. Partnership formation formalises the participatory process between ordinary citizens and the power holders through enhanced negotiation and engagement in trade-offs. Delegated power entails citizens being given greater autonomy to manage a particular aspect of a programme or intervention. At the rung of citizen control, the minorities seek to minimise the extent to which the majority of outsiders could interfere with their delegated power and so aim at retaining full control over what they govern.

Meaning and Forms of Stakeholder Participation

Stakeholders are people/communities who may be directly or indirectly, positively or negatively affected by the outcome of projects, programmes or new initiatives such as DRR education. The three basic forms of stakeholders are:

**Primary stakeholders:** They are the beneficiaries of a development intervention or those directly affected (positively or negatively) by it. They include local populations (individuals and community-based organisations) in the project/programme area, in particular, as well as poor and marginalised groups who have traditionally been excluded from participating in development efforts. In disaster risk reduction, these stakeholders include: homeowners, renters, homeless persons and community-based small-scale businesses.

**Secondary stakeholders:** These refer to those who influence a development intervention or are indirectly affected by it. They include the government, line ministry and project staff, implementing agencies, local governments, civil society based organisations, private sector firms, and other development agencies. The Ghana Police Service, National Fire Service, National Disaster Management Organisation (NADMO), Ghana Education Service (GES), Ministry of Local Government and Rural Development (MLGRD), Non-Governmental Organisations (NGOs), etc. are all part of this group.

**Key stakeholders:** This group can significantly influence, or are important to the success of the project through financial resources or power. In the context of DRR in the local, regional or national scale, key stakeholders could include National Disaster Management Organisation (NADMO), NGOs, etc.
Management Organisation (NADMO), Ministry of Local Government and Rural Development (MLGRD), Metropolitan, Municipal and District Assemblies (MMDAs), etc. and they could be financiers of DRR efforts. A key element in stakeholder participation is the ability to identify stakeholders, their needs, interests, relative power and potential impact on the intended endeavour in a people-centred fashion as illustrated in Stop and Reflect 5.3.2 and 5.3.3.

**Stop and Reflect 5.3.2**

**Forms of Stakeholder Participation**

Disaster preparedness can be studied under various categories:

- **Focusing on people** - recognising that people are at the centre of development;
- **Being humble** - realising that ‘local’ knowledge is as valid as ‘expert’ knowledge;
- **Learning to listen** - accepting that stakeholders have wisdom and a right to be heard;
- **Sharing control** - sharing influence and control with project stakeholders;
- **Empowering others** - focusing on building the capacity of marginalised stakeholders to find their own solutions to development problems, enabling beneficiaries to become active owners rather than passive recipients of development; and
- **Valuing process** - understanding development as a ‘process’, not just a ‘product’

Source: Adapted from Inter-American Development Bank (2000)

**Stop and Reflect 5.3.3**

**Stakeholder Participation as a Crosscutting Issue**

Stakeholder participation transcends all areas and can be found in the following areas:

- Gender equity
- Good governance
- Expanded partnership with civil society organisations (CSOs)
- Sustainable poverty reduction
- Enhancing Sustainable development goals
- Disaster risk reduction

**Effective Ways of Promoting Stakeholder Participation in DRR**

In stakeholder participation initiatives some groups - such as the very poor, women, nomadic groups or ethnic minorities – may lack the organisational, social or financial means to make their voices heard and participate effectively. These are often the exact stakeholders whose needs and interests are critical to the success and sustainability of development interventions. Special efforts are needed to address the disequilibrium of
power, knowledge and influence among stakeholder groups and to allow weaker, less organised groups to interact effectively with stronger, more established stakeholders. These include:

- **Capacity building** – Providing training, coaching, funds or other resources to marginalised groups to assist them in organising, mobilising support, identifying and articulating their interests;
- **Mandated representation** – Where there is a danger of exclusion, it may be useful to establish targets of representation, for example, agreeing that all village committees will include an established number of women or that all ethnic groups in a given community will be represented on a decision-making body;
- **Separate events** – In some cases, it may be valuable to meet with specific population groups separately, for example, to hold a separate women’s meeting to discuss their particular concerns;
- **Levelling techniques** – Power differentials between stakeholders can be reduced through the use of participatory methods. A skilled facilitator can use a number of techniques to ensure that all participants have equal opportunity to make their voices heard. Negotiating systems may need to be developed for handling conflicting interests between different groups of local stakeholders; and
- **Use of intermediaries** – In circumstances where the direct participation of marginalised individuals themselves is not feasible, intermediaries or surrogates may be identified to represent their views and defend their interests. For example, if it is not possible for women farmers from isolated areas to participate directly in a national forum on agricultural development, female extension workers might be selected to represent their interests (Adopted from World Bank, 2000).

**Exercise/Activity 5.3.1**

Before attempting to engage participants on section 5.1.3, divide participants into two groups. Ask one group to discuss the benefits of stakeholder participation in DRR, while the other group examine the costs of stakeholder participation in DRR and present the outcome in a plenary session for class engagement in relation to urban market fire disaster in any locality of the group’s choice or convenience.

**Benefits and Cost of Stakeholder Participation in DRR**

**Benefits TO DRR**

The potential benefits of increased stakeholder participation include the following:

- Improved programme/project design by drawing on local knowledge and expertise to ensure that designs accurately reflect stakeholder priorities and needs;
- Improved means of verifying the relevance and appropriateness of proposed interventions;
Strengthened stakeholder commitment to, and ownership of, policies and projects, leading to increased uptake of project services and greater willingness to share costs;
Enhanced sustainability as a result of increased stakeholder ownership;
Opportunity to foresee and/or resolve potential obstacles, constraints and conflicts;
Emphasised means to identify and address potential negative social and environmental impacts;
Opportunity to generate social learning and innovations based on field experience;
Capacity-building of stakeholders and local institutions (including their capacity to analyse problems and initiate other development activities);
Improved means of ensuring that project benefits are distributed equitably; and
Strengthened working relations between stakeholders, government and civil society organisations and development partners.

Costs and Risks to DRR
Each progressive level of stakeholder participation brings with it different costs and risks. The principal cost is the absence of stakeholder participation in programmes and projects. Lack of stakeholder participation can lead to:

- A sense of indifference, resentment, or deliberate obstruction on the part of intended beneficiaries;
- Higher up-front costs in terms of time and resources;
- Danger of undertaking poorly planned or merely token participatory activities due to limited time, capacity, commitment or resources;
- Lack of political will on the part of governments to allow wide stakeholder participation because they fear loss of power or influence;
- Difficulty in reaching out to marginalised groups and ensuring that the true priorities and needs of poor and vulnerable groups are represented;
- Difficulty in identifying genuine representative non-governmental organisations (NGOs) and civil society organisations (CSOs);
- Co-optation of the stakeholder participation process by more powerful or articulate stakeholders, and the exclusion of the poor and disadvantaged;
- Creation of unrealistic expectations;
- Aggravating conflicts between stakeholder groups with different priorities/interests;
- Weak capacity of beneficiary and intermediary organisations; and
- Challenge of coordinating efforts with other on-going consultation/participation processes in order to avoid ‘consultation fatigue’.
5.4 Basic Steps in Participatory Stakeholder Engagement

The concept of Participatory stakeholder engagement: Stakeholder engagement is the identification of a project's key stakeholders, an assessment of their interests, and the ways in which these interests affect project riskiness and viability (Clayton, 1997). According to Oakley (1995), stakeholder analysis is a methodology for identifying and analysing the key stakeholders in a project and planning for their participation. It is, therefore, the starting point of most participatory processes and provides the foundation for the design of subsequent stakeholder activities throughout the project cycle. A thorough stakeholder analysis should be carried out in the early planning stages of all endeavours such as DRR, and reviewed and refined from time to time as the details of programme or project design become more detailed and definite.

Exercise/Activity 5.4.1

A coal-fired plant is to be established in a coastal community in the central region of Ghana. Divide the participants into four groups and ask each group to develop an integrated participatory stakeholder plan and present the results for a discussion.

Probing Questions 5.4.1

Stakeholder Engagement

- Who are the key stakeholders (primary/secondary) of the proposed project?
- What are the interests of these stakeholders?
- How will they be affected (positively/negatively) by the project?
- Which stakeholders are most important for the success of the project?
- How will various stakeholder groups participate throughout the life of the project?
- Whose capacity needs to be built to enable them to participate?

Generally, the most fundamental steps in stakeholder analysis can be enumerated as follows:

Step 1: Identify key stakeholders;
Step 2: Assess stakeholder interest and the potential impact of the new initiative or subject of interests;
Step 3: Assess stakeholder influences and importance; and
Step 4: Outline a stakeholder participation strategy.

Step 1: Key Stakeholders Identification

The first step of stakeholder analysis is to identify relevant stakeholder groups. Key questions to ask in addressing this issue are:

- Who are the programme or project targeted beneficiaries?
Who might be adversely impacted?
Will the project impact (positively or negatively) on any vulnerable groups?
Who are the projects main supporters and opponents?
Who is responsible for carrying out planned activities?
Who can contribute financial and technical resources?
Whose behaviour has to change for the intervention to succeed?

An initial list of stakeholders can be drawn up on the basis of a desk review of secondary data (publications and documents) and existing staff knowledge of the project, sector and country. This preliminary list must then be verified, modified and enhanced through the use of the questions discussed above.

**Step 2: Analysis of Stakeholder Interests and Programme/Project Impacts**
Once relevant stakeholder groups have been identified, the next step is to analyse their interests (overt and hidden) and to assess the potential impact of the proposed project on their interests.

Key questions for participants to answer include:
- How does each group of stakeholders perceive the problem at hand and proposed solutions?
- What are their key concerns and interests with respect to the project?
- What are stakeholders’ expectations of the project?
- What does each group of stakeholders stand to gain/lose as a result of the project?
- What conflicts might a group of stakeholders have with a particular project strategy?
- How do different groups of stakeholders relate to each other?
- Is there convergence/divergence between their interests and expectations?

These questions are best answered by stakeholders themselves in the context of a stakeholder workshop. Such a workshop requires careful preparation and could require a full day (depending on the complexity of the subject or project and stakeholder interests).

**Step 3: Stakeholder Prioritisation**
The analysis of stakeholder interests and project impacts should allow the project team to categorise different groups of stakeholders and to determine the relative priority that the project should give to each stakeholder group’s interest.

Key questions to engage the attention of participants are:
- Who are the project’s targeted primary beneficiaries?
- What is the importance of each stakeholder group to the success of the project?
- What is the degree of influence of each stakeholder group over the project?
Are special measures needed to protect the interests of primary stakeholder groups that are weak or vulnerable?

The results of the first three steps of stakeholder analysis can be represented in table form to provide a clear and comprehensive picture of stakeholder interests, importance and influence.

**Stakeholder Analysis Matrices**

The following three tables represent a framework for recording and organising the information generated by a stakeholder analysis in the context of DRR. An example of an uncompleted set of matrices for a hypothetical activity or project is provided in the techniques section of this module.

To review, the three variables used to construct the matrices are listed below:

- **Interests**: the priority concerns of the stakeholder group (or what is ‘at stake’ for them);
- **Influence**: the degree to which the stakeholder group has power and control over the endeavour and can thus facilitate or hinder its implementation; and
- **Importance**: the degree to which the achievement of programme or project objectives depends on the active involvement of a given stakeholder group.

These variables are presented in Tables 5.4.1, 5.4.2 and 5.4.3. The first three columns can, ideally, be completed during the first stakeholder workshop. An assessment and comparison of the importance and influence of various stakeholders can be done during the workshop or completed later by the team.

**Exercise/Activity 5.4.2**

You have been tasked by the Metropolitan/Municipal/District/Municipal Chief Executive (MMDCE) or the Regional Minister to recommend strategies for ensuring that a localised DRR proposal against market fires is adopted and successfully implemented. As a member of the technical implementation team, how will you carry out a participatory stakeholder plan to ensure inclusiveness in the plan?

**Exercise/Activity 5.4.3**

Elect a rapporteur to record a summary of the group’s discussion on the hypothetical market fire disaster above, fill in the matrices, and briefly present the results in plenary. Select a facilitator within the group who will help you to accomplish the following tasks. Discuss the range of stakeholders likely to be involved in the prevention, reduction or response action and select six key stakeholder groups for the purposes of the exercise.
In Table 5.4.1, identify for each stakeholder group:

- What interests they are likely to have in the market fire prevention, reduction or response action;
- What effect the market fire prevention, reduction or response action will probably have on these interests (positive, negative, or neutral);
- The level of importance of the stakeholder for the market fire prevention, reduction or response action (in other words, to what extent the project focuses on meeting the needs of the stakeholder); and
- The level of influence that the stakeholder is likely to have over the market fire prevention, reduction or response action (the extent to which the stakeholders has some control over how the activities are operationalized).

Using the information in Table 5.4.1, map the relative importance and influence of the stakeholder groups in Table 5.4.2. Discuss how the stakeholder groups compare to each other and consider how, if at all, the market fire prevention, reduction or response action should involve the different groups in each stage of the project cycle. In Table 5.4.3, insert some examples of how some of the stakeholder groups can be involved in each stage of the market fire prevention, reduction or response action proposal implementation.

### Table 5.4.1: Identification of stakeholder groups and their interest, importance and influence

<table>
<thead>
<tr>
<th>Stakeholder groups</th>
<th>Interest(s) at stake in relation to program</th>
<th>Effect of project on interest(s)</th>
<th>Degree of influence of stakeholder over project</th>
<th>Importance of stakeholder for success of project</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ (positive)</td>
<td>U= unknown 0 = neutral  - = (negative)</td>
<td>U= unknown 1= little/no importance 2= some importance 3= moderate importance 4= very important 5= critical importance</td>
<td>1= little influence 2= some influence 3= moderate influence 4= significant influence 5= very influential</td>
<td></td>
</tr>
</tbody>
</table>

Using Table 5.4.1 on the stakeholder information generated, participants should map their interest in Table 5.4.2. This part does not provide new information but is a helpful way to prioritise the influences/interest of stakeholders.
Table 5.4.2: Mapping key stakeholders’ relative influence

Importance of Activity to Stakeholder

<table>
<thead>
<tr>
<th>Influence of stakeholder</th>
<th>Unknown</th>
<th>Little/no influence</th>
<th>Some influence</th>
<th>Moderate influence</th>
<th>Very influential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Little/no influence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some influence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate influence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very influential</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The final table uses either of the two tables above as the basis of outlining ideas about how and when to engage the various stakeholders. Participants should insert specific participation strategies for key stakeholders as in Table 5.4.3.

Table 5.4.3: Formulation of stakeholder participation strategy

<table>
<thead>
<tr>
<th>Stages in project process</th>
<th>Information sharing (one-way-flow)</th>
<th>Consultation (one-way-flow)</th>
<th>Collaboration (increasing control over decision making)</th>
<th>Empowerment (transfer of control over decisions and resources)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification of common disasters in the locality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prioritisation of disaster types and preventive/reduction/response initiative</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implementation supervision and monitoring of accepted initiative</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluation of programme initiative or measure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Step 4: Stakeholder Action Planning**

The ultimate goal of stakeholder analysis is the definition and development of a stakeholder action plan that outlines the specific activities to be carried out by each stakeholder group (including agreed timelines, inputs and resources, progress indicators, etc.). Some stakeholder groups will have active and continuous roles to play, while others may only need to be kept informed of progress or be involved at certain key moments of planning or implementation.

A stakeholder action plan is best drawn up in direct collaboration with those concerned and a participatory workshop (or series of workshops) is often the best way to proceed.
5.5 Methods and Tools for Participatory Stakeholder Engagement

Exercise/Activity 5.5.1
Participants use participatory stakeholder engagement methods/techniques to develop profile and assess priorities/needs of households affected by fire disaster at a market. Divide participants into four groups and ask each group to carry out a rapid stakeholder analysis to identify the vulnerable groups, examine the socio-economic impacts, and propose mitigation measures or strategies.

Suggested Questions 5.5.1
The list of questions and issues that must be addressed in the selection of an appropriate participatory stakeholder analysis methods and techniques includes:

- What is the nature of the program/project being contemplated?
- What goal does the proposed program/project hope to achieve?
- Who and what kinds of stakeholders are expected to be involved in the intervention?
- Where in the socioeconomic and political hierarchy are these stakeholders placed?
- What kind of social relationships exist, including latent and active conflicts?
- What is the capacity stakeholders to effectively participate and benefit from it?
- Are there institutions and instruments to organise, and facilitate participation?

An attempt to answer the suggested questions would require the following commonly used methods and techniques.

Participatory Meetings and Workshops
The following are a number of session formats, but the list is by no means exhaustive. Remember, you can use more than one idea in a session, and you should always leave time in the schedule to include participatory approaches and techniques to stimulate thinking, reflecting, discussing, and engaging:

Panel Discussions
Panellists build off each other’s answers to elicit different opinions and deepen the discussion. The discussion can start with an overview presentation and brief comments from each panellist to frame the discussion and provide the audience with an understanding of the experience and viewpoint each panellist brings. The majority of the session time can then be spent in a question and answer (Question and Answers) format with questions from both the moderator and participants.
Discussion is richest when the panel members represent different key constituencies, expertise or points of view related to the topic and when advanced preparation clarifies each panel member’s role and how one relates to the other panel. Presentations can be effective when the goal is to make guidance, concepts, viewpoints or specific experience clear. When working with a presenter, be sure to provide clear guidance on the points you would like the presenter to focus on so he or she can minimise the time spent on project overview and maximise the time spent delving deeper into the key lessons learned or implications for others. It is important, however, that presentations and the one-way communication they foster be seen as one part of a larger session that will then seek, through additional activities, to engage directly with participants.

**Pyramid Schemes**

Participants are given a question or problem to think through on their own for a few minutes. They are then asked to join with a neighbour to discuss the topic in twos, then in a subsequent round in groups of four or six, then in groups of eight or twelve. Not only is this effective in requiring engagement and participation by everyone, it also creates a safe zone early on in the smallest groups for tentative and exploratory answers that could serve as the seed for creative but credible responses. Growing the groups larger provides the opportunity for friendly challenging of ideas and cross-fertilising the best of answers across groups.

**Debates**

Speakers present opposing sides of an issue. This format can liven up a discussion topic that lends itself to debating pros and cons, multiple views, or conflicting opinions around an issue. As a variation, groups of participants can be assigned opposing sides of an issue and asked to formulate the key debate points as a group.

**Round Table**

Participants form groups around a specific topic area in order to share experiences and discuss ideas. This format provides an informal setting for starting dialogue, sharing and discussion. Depending on the purpose, formal questions could be posed to the group to guide their discussion or the topic could remain open for the group to determine the direction of their conversation. Roundtables are similar to working sessions but generally are not as formal and may be used to simply start the discussion without the time allotted to work toward completing a joint project.

**Participatory Research/Data Collection**

Participatory Rural Appraisal (PRA) is one participatory research approach that offers a ‘basket of techniques’ from which those most appropriate for the project context can be selected. The basic principles of PRA tools are:

- Participation: local people serve as partners in data collection and analysis;
- Flexibility: not a standardised methodology, depends on purpose, resources, skills, and time;
- Teamwork: outsiders and insiders, men and women, mix of disciplines, etc.;
- Optimisation: optimal cost and time efficient, but ample opportunity for ignorance, analysis and planning, etc.; and
- Systematic: for validity and reliability, partly stratified sampling, cross-checking.

The central part of any PRA tools includes:

**Semi-Structured Interviewing:**
This is interviewing based not on a questionnaire but on a checklist of issues that the PRA team adapts according to the interview situation. These interviews are, therefore, more like conversations guided informally by the interviewers. While sensitive topics are often better addressed in interviews with individuals, other topics of more general concern are amenable to focus group discussions and community meetings.

**Mapping:** Creating or drawing community maps, personal maps, institutional maps, etc.

**Ranking:** Problem ranking, preference ranking, wealth ranking etc.

**Trend and Time Analysis:** Historical diagramming, seasonal calendars, daily activity charts, etc.

### 5.6 Summary and Conclusions
The presentation underscores the fact that effective stakeholder participation is a well-planned, managed, and focused process engaging a widely representative group of stakeholders particularly the poor, and not the most number of people. For this reason, the work on mainstreaming participation has to be guided by sustainable impact on the ground, and judged against its value-added in the way programmes and projects are designed and implemented. The reality that participation cannot be realised by the action of one actor alone is used to underscore the imperative partnership, while the fact that not all activities are auspicious to participation highlights the need for informed selectivity. Mainstreaming participatory practices is not a static undertaking. It is, instead, a work in progress. Likewise, the methods and tools presented are subject to on-going revision and updating as best practices are distilled, and lessons are drawn from experience on the ground.

### References


6.1 Introduction
The role of communication particularly, communication disaster risk in reducing risks of disaster reduction cannot be over emphasised. This is because communicating disaster risk provides the public with information about the effects of disaster, and how actions may affect the outcome of the disasters. This training programme is therefore timely, especially so because of the continuous disasters bedevilling Ghana.

The module introduces participants to disaster communication as a tool for effective disaster risk communication in Ghana. At all the stages of a disaster cycle (Mitigation and prevention, preparedness, response, and recovery), communication between the government and the people/victims is very important. This is because it’s a valuable way of avoiding and reducing the negative impact of disasters. Hence, efforts will be made to look at the definition of communication, different component of a good communication (the intention, medium and the receiver of the message), effective communication and communication, disaster and risk and crises communication.

6.2 Learning Objectives
At the end of this exercise, participants are expected to successfully:

1. explain the concept of risk communication in disaster management;
2. describe best practices of disaster in disaster management;
3. communicate to the specific needs of the public by utilising different forms of media/tools, one of the principles of crises communication; and
4. understand the need to build trust and rapport with the stake holders and the target group by giving timely and correct information to the public.

Stop and Reflect 6.2.1

Definition of Communication

- Communication is an act, instance of transmitting, information transmitted or conveyed, a verbal or none-verbal (written message)
- Communication is more than exchanging information; it’s about understanding the emotions and intentions behind information (Jackson, 2013).

6.3 Basic Steps in Communication
- Forming of communicative intent
- Message composition
- Message encoding
- Transmission of signals
- Reception of signals
- Message decoding
- Interpretation

### 6.4 Importance of Communication in Disaster Risk Reducing

- Communication promote preparedness for disasters
- Communications provide early warnings signals of disasters
- Communication facilitates proper response to disasters

---

**Exercise/Activity 6.4.1**

Participants will divided into groups each group will identify a types of disaster common ones in Ghana particularly the types that are experienced in their places of residence/work location and do a short drama on how they will communicate to victims of disaster or sensitise people on how to mitigate against the avoidable disasters.

---

**Stop and Reflect 6.4.1**

**Effective Communication**

Effective communication includes non-verbal communication, engaged listening, managing stress in the moment, the ability to communicate assertively, and the capacity to recognise and understand your own emotions and those of the person you are communicating with. It enhances the provision of difficult messaging without creating conflict (Zaballar, 2013).

---

### 6.5 Steps to Effective Communication

- Use standard terminologies when communicating-risks, disaster, coping, resilience, vulnerable, etc.
- Request and provide clarifications when needed- allow/encourage the beneficiaries to respond to issues they are not sure of.
- The communicator should also be well informed about the situation of things within the community where the information is to be disseminated.
- Ensure statements are direct and unambiguous.
- Inform appropriate individuals when the mission or the plan changes.
- Communicate all information needed by those individual or teams external to the team.
- Use non-verbal communication appropriately.
6.6 Barriers to Effective Communication

- Non-focus on the issue at hand, not being attentive
- Avoid interruption, show interest in what is being said
- Avoid being judgemental but make provision for feedbacks
- Pay attention to non-verbal communication
- Be conscious of individual differences
- Keep stress in check but be assertive

6.7 Disaster Risk Communication

Disaster risk communication helps to provide the public with information about the effects of disaster, and how actions may affect the outcome of the disaster. In other words, it helps to inform the public about a potential disaster situation to enable people make informed choices. Disaster risk communication may take place through many different channels, including face-to-face conversations, telephone calls, group meetings, mass media such as television, radio, Internet and interactive social media such as Twitter and Facebook.

6.8 Effective Disaster Communication

Effective risk communication requires the alignment of complex factors, including trust between the communicator and the audience(s), audience involvement, and emotional responses to risk. Trust in institutions and organisations should be considered in developing disaster risk communication messages and the need to reach out effectively to special needs of the target groups is necessary to provide insight on crafting messages for and understanding the behaviour of children, the elderly and disabled, those with literacy difficulties, activists, and minority racial and ethnic groups.

Some specific principles related to effective risk communication include:

- An understanding of the characteristics of an audience is essential to developing effective risk communication efforts;
- The how, when, and by whom a message is delivered impacts its effectiveness;
- Communicators must continually adapt to changing situations;
- Using the preparedness approach like games, interactive discussion groups or teaching make a proposal of how you can effectively increase knowledge or preparedness behaviour of the target group on disaster management; and
- Promotion of discussion group approach to general disaster preparedness is more effective than the simple provision of written information.
Stop and Reflect 6.8.1

**Risk and Crisis Communication**

- Risk communication is often defined as a process of exchanging information among interested parties about the nature, magnitude, significance, or control of a risk (Covello, 1992). According to Heath (2010), crisis is a risk manifested. Therefore, risk communication often focuses on developing and conveying messages prior to and during an event, and crisis communication focuses on doing so post event.
- A crisis is a specific incident with a short time frame, while a risk is often more nebulous and evolves over time. The principles for crises communication include, being there first, giving right information, being credible, express empathy, promote action to calm the victims and show respect (Reynolds, 2012).
- Risk communication tends to utilise messages from experts and scientists while crisis communication typically utilises messages from authoritative sources. The distinction between these two terms allows for a specific focus and understanding of the types of information and considerations that should be made available at different stages and for different events. Risk communication interventions enhance better response to disaster and helps to improve disaster recovery (Aberque, 2002).

Exercise/Activity 6.8.1

- Describe the role of disaster communication in each stage of the Disaster Cycle (Risk assessment, mitigation and prevention), preparedness and warning, response and recovery.
- For each stage of the disaster cycle, identify the most effective disaster communication technologies to use.

![Diagram](image_url)

**Figure: 6.8.1: Review flowchart of the role of communication using GIS in disaster risk reduction**

Source: Adapted from Jackson (2006)
6.9 Stages of Disasters and Disaster Communication

Natural disaster preparedness interventions targeted at a whole population through interpersonal communication is quite resource-intensive but effective, especially so because during disasters, there is the need to communicate quickly by all available methods. In order to plan, the communicators should have information on disaster cycle phase - mitigation, preparedness, response or recovery, disaster types, natural or man-made, geographical setting as well as population characteristics and numbers. Details of intervention will depend on obtaining all relevant knowledge, behaviour and incidence outcomes. For instance, relevant knowledge about the setting and behaviour of beneficiaries will help arrive at a detailed description/response of interventions or strategies for recovery (either rehabilitation and/ reconstruction). The messages must promote preventive behaviours (normal productive routine, social and physical activity and working to resolve conflicts). Information about an existing telephone help line, GIS, radio and mobile telephones also provides opportunity for referrals and crisis intervention. Figure 6.8.1 shows the interconnectedness of the various stages of disasters and disaster communication.

6.10 Summary and Conclusions

Effective risk communication is vital in all phases of a crisis. Therefore, participants of this training workshop have been empowered to:

- Allow emergency managers and local leaders to conduct effective risk communication;
- Design and develop a disaster information system through the use of GIS and as well create a centre with communication tools and updates;
- Identify potential network centres and provide infrastructures like telephone network, cellular network and Internet. This will facilitate an effective risk reduction communication and potentially reduce the occurrence of disasters in Ghana.

References


MODULE 7: CRISIS COUNSELLING

7.1 Introduction
The vast majority of people prefer to have stable, happy lives rather than to have a life full of problems. However, even the most stable individuals encounter problematic situations in life that cause major disturbances. People can often cope with the daily stresses and problems that arise. However, when a problem occurs that is temporarily beyond a person’s ability to cope and he or she is “thrown off balance by the ensuing event”, then the person experiences a crisis. To regain stability, there is the need to offer assistance in the form of counselling.

This module discusses crisis counselling; that is, the type of counselling offered the individual in distress to stabilise. Topics discussed here include what constitutes a crisis, types of crisis, features of a crisis, counselling, and crisis counselling. Other topics include goals of crisis counselling, characteristics of an effective crisis counsellor, strengths and limitations of crisis, and crisis interventions (counselling process).

7.2 Learning Objectives
By the end of this module, participants should be able to:

1. define crisis;
2. explain counselling;
3. explain crisis counselling;
4. identify and discuss the goals of crisis counselling;
5. list the characteristics of an effective crisis counsellor;
6. distinguish between the strengths and limitations of crisis counselling; and
7. discuss the processes involved in crisis counselling.

7.3 Crisis
Definition of Crisis
In this unit, we discuss what crisis is, and the various explanations given for a crisis. “What is a crisis? or What is the meaning of crisis?” you may ask.

Exercise/Activity 7.3.1
How would you define a crisis in your own words?
Consider what we have in Stop and Reflect 7.3.1.

Stop and Reflect 7.3.1

Definition of Crisis

- A crisis is an acute disruption of psychological homeostasis in which one’s usual coping mechanisms fail and there exists evidence of distress and functional impairment (Robert, 2005).
- Any serious interruption in the steady state or equilibrium of a person, family, or group. A temporary disruption of psychological balance wherein usual coping mechanisms fail.

How do you understand the definitions above? How do they reflect the explanation(s) you have?

We can refer to crisis as any situation in which the individual perceives a sudden loss in his/her ability to solve a particular problem, and to cope with the situation. Crisis is how an individual reacts to a stressful life experience that affects his/her stability and ability to cope or function. It is a period of transition in the life of an individual, family or group, which serves as a turning point in their lives, and which may be seen as a challenge or a threat, a "make or break" new possibility or risk, a gain or a loss, or both simultaneously.

What are Instances of Crises?

Most crises are part of the normal range of life experiences that most people can expect, and most people will recover from crisis without professional intervention. However, there are crises outside the bounds of a person’s everyday experience or coping resources which may require experts’ help to achieve recovery. What are examples of some of these experiences?

Stop and Reflect 7.3.2

Instances of Crisis

- Instances of crisis may include natural disasters, sexual assault, criminal victimisation, mental illness, suicidal thoughts, homicide, a drastic change in relationships and so on.
- Most severe outcomes of a crisis are suicide, homicide, running away, physical harm, psychosis or a family breaking apart.

How does what you have correspond with what is in the box above?
Stages of Crisis

Exercise/Activity 7.3.2

- How does a person react to a crisis situation?
- Are there any stages involved in reacting to a crisis?
- What are your ideas about these? What stages does a person in crisis go through?

A crisis makes a tacit assumption that a person can be assisted to reverse any emotional difficulties he/she may go through. The main cause of a crisis is an intensely stressful, traumatic, or hazardous event, but two other conditions are also necessary: (1) the individual’s perception of the event as the cause of considerable upset and/or disruption; and (2) the individual’s inability to resolve the disruption by previously used coping mechanisms.

Gerald Caplan (1961, 1964), a psychiatry professor at Massachusetts General Hospital, was the first clinician to describe and document the four stages of a crisis reaction: (a) initial rise of tension from the emotionally hazardous crisis precipitating event, (b) increased disruption of daily living because the individual is restricted and cannot resolve the crisis quickly, (c) tension rapidly increases as the individual fails to resolve the crisis through emergency problem-solving methods, and (d) the person goes into depression or mental collapse or may partially resolve the crisis by using new coping methods.

Types of Crisis

After discussing the definitions of crisis, it is important for us to know whether there are types of crisis, and if so what they are. Compare what you have with what is box below.

Exercise/Activity 7.3.3

Do you know of any types of crisis? What are these?

Stop and Reflect 7.3.3

Types of Crisis

- According to Stone (1993), the two basic kinds of crisis are developmental and situational.
- Other types of crises include Existential, and Ecosystemtic.
Let us now discuss the components of each of the types of crisis listed in Stop and Reflect 7.3.3.

**Defining Features of a Crisis**
What are the characteristics or defining features of a crisis? How do we know that one is in a crisis? These are given below. Discuss them thoroughly indicating how each one of them defines a crisis.

- A triggering event or long term stress
- The individual experiences distress
- There is loss, danger, and/or humiliation
- There is a sense of uncontrollability
- The events feel unexpected
- There is disruption of routine
- The distress continues over time (from about 2 – 6 weeks)

### 7.4 Counselling

**Defining Counselling**

How do you explain counselling: giving advice, giving direction, providing help or offering assistance to another person? How about giving suggestions and giving information for decision-making? These are the various explanations or meanings to which people give to counselling. Are these definitions of counselling exact and exhaustive? Let us look at this definition:

---

**Stop and Reflect 7.4.1**

Counselling is a personal, face to face, relationship between two people in which the counsellor, by means of the relationship and his special competencies, provides a learning situation in which the counselee, a normal sort of person, is helped to know himself and his present and possible future situations so that he can make use of characteristics and potentialities in a way that is both satisfying to himself and beneficial to society, and further, can learn how to solve future problems and meet future needs (Tolbert, 1972).

---

How does your explanation/understanding compare to what is in Stop and Reflect 7.4.1? Let us spend a little time to discuss the definition by Tolbert (1972) in depth.

1. What does it mean for counselling to be a personal relationship?
2. Who is the counsellor?
3. What is the relationship meant to result in?
4. Would we say counselling has not taken place if the individual does not exhaust the different aspects of counselling as defined by Tolbert?

For counselling to be effective, the relationship should be permissive to allow the client to gain an understanding of him/herself to a degree which enables him/her to take positive steps in the light of new orientation.
7.5 Crisis Counselling
What is Crisis Counselling?
We have defined “crisis” and “counselling” in our earlier discussions. What, in your view, is crisis counselling? Let’s put the two concepts together and explain what crisis counselling means. What did you get?

Let’s compare with what is in Stop and Reflect 7.5.1.

Stop and Reflect 7.5.1
Crisis counselling occurs when a client who is destabilised engages the services of a counsellor. The person is unable to cope with events in his/her life and, consequently, may be wracked by destructive feelings of self-doubt, anxiety, or guilt and may be engaging in hurtful behaviours. This crisis needs immediate attention otherwise there is the risk of further personality or behavioural deterioration.

How did the definition in Stop and Reflect 7.5.1 compares to your view of crisis counselling? What are characteristics of a person in crisis?
Is Crisis counselling different from crisis intervention?
How do you explain crisis intervention?

Let’s see what we have here in Stop and Reflect 7.5.2.

Stop and Reflect 7.5.2
Crisis Intervention is the emergency and temporary care given an individual who, because of unusual stress in his or her life that renders them unable to function as they normally would, in order to interrupt the downward spiral of maladaptive behaviour and return the individual to their usual level of pre-crisis functioning (Greenstone & Leviton, 2011).

Discuss any similarities as well as differences between these explanations.

Goals of Crisis Counselling

Exercise/Activity 7.5.1
- What does crisis counselling seek to achieve?
- What important role does it play in the lives of persons in disaster?
- What is/are the goal(s) of crisis counselling from your layman point of view?

The primary goal of crisis counselling is to attain the quickest possible relief of the internal and external symptoms of the crisis and a return to that particular person’s usual level of functioning. Thus, getting help to those that are suffering. This Unit of the
module would provide you with the basic aim and a summary of what the counselling relationship works towards. This summary is provided in Stop and Reflect 7.5.3.

Stop and Reflect 7.5.3

Summary of Goals of Counselling

The goals of crisis counselling can be summarised as, to:
- help the person return to his usual level of functioning;
- decrease anxiety; help people who are in crisis recognise and correct behaviours and cognitive distortions.
- teach crisis-solving techniques; and,
- give more assistance after immediate help is received.
- safety: ensures the individual is safe, any risk has been reduced and resources, if available, have been provided.
- stability: ensures the individual is stable and has a short-term plan which includes mastery of self and the emergency or disaster situation.
- connection: helps connect the individual to formal and informal resources and support. If resources are supports are not readily available, crisis counselling helps the individual pursue potential natural supports/resources.

7.6 Characteristics of an Effective Crisis Counsellor

How, in your view, should a person who counsels others during crisis periods be? Have you thought about any special skills or abilities for people who want to be crisis counsellors? What abilities or special skills (characteristics) should such counsellors have?

Alright, let’s discuss some of the characteristics of effective crisis counsellors.

Crisis counsellors work with people who are in distress and often in need of psychological intervention. It takes a steady disposition and a calm demeanour to talk with people in crisis who may be very emotionally charged. To do this effectively requires special characteristics, abilities and skills. Some characteristics that an effective crisis counsellor should possess are presented in Stop and Reflect 7.6.1.
Stop and Reflect 7.6.1

Some Characteristics of Effective Crisis Counsellors
Effective crisis counsellors should possess characteristics such as:

- **Self-Awareness**: knows him/her self and empathise with clients without becoming personally involved or emotional when people who have gone personal experiences come to them.
- **Non-judgemental**: willing to listen all through to the client without casting judgement on those in crisis.
- **Non-Reactive**: does not react to client’s outbursts or threats but be completely supportive when client shows strong emotions.
- **High Tolerance**: remain calm when placed in tense and stressful situations.
- **Specific Training**: receive specific skills and techniques in crisis counselling that are quite different from normal counselling.

Should anyone at all undertake crisis counselling? Why?
How do you think the absence of any of the characteristics in the box above would affect crisis counselling?

Strengths and Limitations of Crisis Counselling
Crisis counselling has its strengths (advantages, importance) and limitations (disadvantages and set-backs). Discuss the points on strengths and limitations of crisis counselling in Stop and Reflect 7.6.2 in detail.

Stop and Reflect 7.6.2

Strengths of Crisis Counselling
- It is brief and direct
- It has modest and objective goals
- It is more intense than regular counselling
- It is transitional in nature

Limitations of Crisis Counselling
- It is used immediate in situations only
- It does not go very deep with resolution
- It is time-limited

Are there any more points you would want to add to the strengths and limitations of crisis counselling? Bring them out for discussion.
7.7 The Crisis Counselling Process

Crisis Counselling in Ghana

Do you know of any way(s) or process(es) by which an individual in crisis can be assisted through counselling? How have we offered crisis counselling to victims of disasters in Ghana?

Let us consider the following disasters, and see how we fared by way of offering crisis counselling in recent incidents of disaster:

- May 9, 2001 Accra Sports Stadium (Baba Yara) disaster, which resulted in 127 deaths.
- The 2\textsuperscript{nd} northern floods in 2007 which swept through Upper West, Upper East and Northern Regions affected over three hundred thousand (307,127) persons, resulting in 41 deaths.
- On 7 November 2012, Melcom’s five-storey shopping mall at Achimota near Accra collapsed, trapping many people inside. A rescue mission saw 82 people in all, including 14 dead, pulled out of the rubble.
- On December 22, 2012, Melcom suffered another major accident when its mall in Agona Swedru was totally burnt down by fire.
- Fire outbreaks in major markets in Accra, Kumasi, Takoradi and Cape Coast.
- Gas station explosions in major cities as Accra and Kumasi.

Do you recall any counselling offered when these disasters occurred? Could you recall the process or procedure of counselling?

Alright, let us compare how this was done with what we would discuss here.

Crisis Counselling Processes

The crisis counselling process indicates a step-by-step procedure of how to assist a person experiencing a crisis to achieve stability. We will discuss two types of process: a generally simple one, and a model referred to as SAFER-R.

Let us discuss the steps for crisis counselling process in the case of the generally simple one:

General Steps in Crisis Counselling

First Contact

In the first contact, it is useful to get personal information of the client and not be subjected to a lengthy intake evaluation. The counsellor should try to set the person at ease, clarify the task and invite him/her to talk. A good crisis counsellor is a good listener and more active. The crisis counsellor clarifies, reassures, educates, and offers advice on anxiety, depression, agitation or sleeplessness since they are at levels that severely impair functioning or make the crisis intervention impossible.
Long and Short Term Goals
In the midst of a crisis, people lose perspective. They are flooded with thoughts and feelings. Such persons have difficulty setting priorities and as a result they tend to get very concerned about things they cannot deal with and tend to avoid or ignore the more immediate concerns of the moment that they can deal with. For this reason, it is often useful to help them to organise their thoughts into two sets of goals - a set of short-term goals and a set of long-term goals.

Short Term Goals include calming down, trying to come to terms with their intense fear, talking about what has just happened to them, getting shelter for the night, having something to eat, etc.

Long Term Goals include getting into a long-term and normal counselling, looking for a job, finding permanent housing, etc. The crisis counsellor needs to be very active and directive in helping the person sort out these two types of goals and then in attending, in a very practical way, to achieving the short term goals and making a plan to attend to the long-term goals.

Making a Plan
People in crisis have trouble concentrating, thinking straight, using good judgment, and setting priorities. It is often helpful for the counsellor to take notes while talking to the client to keep track of all the information and to have a list of topics to remind him/her (counsellor) to cover during the interview.

At the end of the session, it is often very useful to actually write up a plan for the person to follow and send him/her away with the plan in their hand. It is best to prepare the plan with the person’s collaboration to number each of the points and to format it so that it is easy to read.

Termination
Crisis counselling is, by its nature, very brief. Many interventions take place entirely in one session. It is important to conduct the session as a single session treatment.

The crisis intervention should end with a concrete plan for the person to follow. The plan should be written and given to the person. The counsellor should make any and all referrals that might be necessary.

SAFER-R Model
The SAFER-R Model is a much-used model of intervention. The model approaches crisis intervention as an instrument to help the client to achieve his or her baseline level of functioning from the state of crisis. This intervention model for responding to individuals in crisis consists of 5+1 stages. This model is presented in format as follows:
Let us discuss each step of the process in groups.

| Stabilise | Acknowledge | Facilitate understanding | Encourage adaptive coping | Restore functioning or | Refer |

Exercise/Activity 7.7.1
Break class into groups of 5, and let each group brainstorm on the components of each step of the intervention model. After 20 minutes, the leader and secretary of each group take turns to present to the whole class what the group came out with.

7.8 Summary and Conclusions
It is clear from the discussions that crisis is around everyone, and every one of us can be a victim. Counselling is assistance offered to an individual to help him or her stabilise in times of crisis. We have discussed types of crisis, characteristics of an effective crisis counsellor, and the crisis counselling process. Counselling sought during crisis greatly assists the individual or a group of persons to cope with the situation.

References


8.1 Introduction
This module is designed to enhance participants’ knowledge on the nature and types of disaster in Ghana, their effects on national development and efforts made to control them. Globally, the earth is now experiencing different kinds of disasters which have resulted in loss of many lives and properties. Studies show that in the 1980s the world was witnessing about 120 natural disasters per year but now this has increased to approximately 500. This is as a result of accumulation of different disasters taking place in different parts of the world including Ghana. Hence, having adequate knowledge of the nature and types of these disasters is important for necessary precautionary measures to be put in place to avoid them. In the context of this module, “common disaster” refers to a disaster that occurs frequently in a particular area within a given period of time.

8.2 Learning Objectives
After completing this module and its related activities, participants should be able to:
1. Classify the various types of disaster in Ghana and provide examples;
2. Explain the causes of at least three (3) common disasters in Ghana;
3. Explain the ways through which disasters affect national development; and
4. Explain progress made by Ghana on disaster management.

8.3 Types of Disaster in Ghana

Exercise/Activity 8.3.1
With the aid of examples, the participants should discuss the types of disasters in Ghana.

The National Disaster Management Organisation (NADMO), the official government agency responsible for managing disasters in Ghana has broadly categorised disasters in the country into six (6) main types (Table 8.3.1).
Table 8.3.1: Types of disasters in Ghana

<table>
<thead>
<tr>
<th>TYPES OF HAZARDS/DISASTERS</th>
<th>EXAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro-meteorological Disasters</td>
<td>Flood, Windstorm, Rainstorm, Drought and Tidal waves</td>
</tr>
<tr>
<td>Pest and Insect Infestation Disasters</td>
<td>Armyworm, Anthrax, Blackfly, Locust, Larger Grain Borer etc.</td>
</tr>
<tr>
<td>Geological/ Nuclear Radiological Disasters</td>
<td>Earth Tremor, Gas Emission and Landslide</td>
</tr>
<tr>
<td>Fires and Lightning Disasters</td>
<td>Bush/Wild fires, Domestic and Industrial fires and Lightening</td>
</tr>
<tr>
<td>Disease Epidemics Disasters</td>
<td>Cholera, Yellow Fever, Cerebro-Spinal Meningitis (CSM), and Pandemic Influenza</td>
</tr>
<tr>
<td>Man-Made Disasters</td>
<td>Social conflicts, Collapse of Building, Vehicular and Aviation Accidents, Lake/ Boat Accidents, Marine and Railway Disasters</td>
</tr>
</tbody>
</table>

Source: NADMO (2016)

This classification was done to suit the nature of disasters that occur in Ghana, and also draw response plans and training programmes (hazard maps, emergency preparedness) to easily control disasters that affect the country.

8.4 Common Disasters in Ghana and their Causes

Building on the previous unit which highlighted the broad types of disasters in Ghana, this unit goes a step further to discuss common disasters in Ghana and their underlying causes. This is to provide insight into some of the major disasters having a great toll on the development of Ghana. The frequency and the cost of these disasters in terms of loss of lives and properties were used as basis for their inclusion in this unit. The disasters covered here are transport accidents, floods, fire outbreaks, and disease epidemics.

Exercise/Activity 8.4.1
Reflecting on the types of disasters in Ghana discussed above, participants should break themselves into groups and try their hands on the following questions:
- Identify the common disasters in Ghana.
- Discuss some of the factors that, in your estimation, accounted for those disasters.

Transport Accidents

Vehicular accidents and lake/boat accidents are major transport disasters that every year destroys many lives and property in Ghana. For example, a report on vehicular accidents in Ghana by National Road Safety Commission from January to November 2015 indicated that the country recorded 9,904 cases of road traffic crashes. These
crashes involved 15,505 vehicles and caused 1,474 deaths and 8,448 injuries. In 2011, vehicular accident alone caused the country $145 million representing 1.4 per cent of Ghana’s GDP. Factors such as over-loading, over speeding, wrong overtaking, drink driving, bad road network, fatigue driving, poor maintenance of vehicles, have been attributed as some of the causes of these road accidents. Figure 8.4.1 shows an example of road accident in Ghana that occurred on 16th February 2016 at Kintampo.

![Kintampo road accident in 2016](image)

**Figure 8.4.1: Kintampo road accident in 2016**

Source: GRAPHIC.COM.GH (2016)

**Flooding**

Flooding serves as one of the common disasters that affect the country. The 1999 Northern floods swept through the Upper West, Upper East, Northern and the Northern parts of the Brong Ahafo and Volta Regions. It affected over three hundred thousand (300,000) persons. In 2009, floods in the Northern part of Ghana again claimed eight (8) lives and displaced about 121,000 people. A total of about 30,000 hectares of farmlands were destroyed. The June flood disaster that occurred in 2015 at Accra claimed over 150 lives. Most of the floods in Ghana are caused by factors such as poor planning of towns, laxity in the enforcement of laws on building construction, silting and choking of drains, and improper disposal of waste. Others are poor drainage systems which obstruct easy flow of running water, and low level nature of lands which make some communities submerged under water anytime there is a heavy rain. Figure 8.4.2 shows an example of flooding in Ghana.
Fire Outbreaks

Exercise/Activity 8.4.2

Focusing on the table below, discuss the trends of fire outbreaks, causes of these fires, what NADMO and Fire Service are doing about fires, and effects of fire on national development.

Table 8.3.3: Sources of fire outbreaks in Ghana

<table>
<thead>
<tr>
<th>Source</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013 Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic</td>
<td>1354</td>
<td>1267</td>
<td>1241</td>
<td>1075</td>
<td>1315</td>
<td>2040</td>
<td>2063</td>
</tr>
<tr>
<td>Industrial</td>
<td>130</td>
<td>128</td>
<td>91</td>
<td>84</td>
<td>123</td>
<td>153</td>
<td>161</td>
</tr>
<tr>
<td>Vehicular</td>
<td>271</td>
<td>323</td>
<td>361</td>
<td>367</td>
<td>415</td>
<td>662</td>
<td>757</td>
</tr>
<tr>
<td>Institutional</td>
<td>52</td>
<td>66</td>
<td>64</td>
<td>87</td>
<td>95</td>
<td>113</td>
<td>94</td>
</tr>
<tr>
<td>Commercial</td>
<td>277</td>
<td>277</td>
<td>283</td>
<td>270</td>
<td>327</td>
<td>454</td>
<td>534</td>
</tr>
<tr>
<td>Bush</td>
<td>370</td>
<td>463</td>
<td>355</td>
<td>229</td>
<td>238</td>
<td>559</td>
<td>653</td>
</tr>
</tbody>
</table>

Source: Addei (2016)

Statistics by Ghana National Fire Service (GNFS) show that between January 2008 and June 2010 a total of 7,670 fire outbreaks occurred in Ghana which resulted in 102 deaths, 119 injuries and damages worth GH¢23,964,380. Dominant among these fires were domestic, commercial, vehicular and industrial. In 2012, a total of 4,577 fire outbreaks were recorded in the country causing an estimated damage cost of GH¢10.3 million compared to 5,489 fire outbreaks in 2013 with an estimated damage cost of GH¢ 25.08 million (Ghana News Agency, 2016). Major causes of these fires include illegal electrical connections, frequent power outages, sub-standard electrical materials in buildings, gas leakages, faulty electrical appliances, overloading of electrical metres and improper use of candles and generators. An example of fire outbreaks in Ghana is illustrated in Figure 8.4.3.
Disease Epidemics
Information from NADMO shows that Ghana experienced an outbreak of Cerebro-Spinal Menigitis (CSM) disease in 1997. This concentrated in the northern part of the country affecting the Upper East, Upper West and Northern Regions. In all, 1356 lives were lost and this included 852 people from Upper East Region, 431 from Northern Region and 73 from Upper East Region. Apart from CSM, Cholera has been a particular infectious disease that frequently affects Ghana. In 2014, there was an outbreak of cholera which affected all the 10 regions of Ghana. A situation report by WHO in 2015 indicated that at the end of 2014 (week 52), a total of 28,975 cholera cases were recorded in Ghana with 243 deaths. The report further shows that there was another cholera outbreak in 2015 and by April 2015, 566 cholera cases were recorded across 7 regions of Ghana killing 5 people. The cholera outbreaks have been associated with poor sanitation conditions in the country resulting from poor waste management practices from individuals and inadequate waste management facilities.

The discussed common disasters in Ghana apart from taking away the lives and property of individuals and bringing hardships to families affected, they also have consequences on the overall development of Ghana. The various areas of Ghana’s development affected by disasters are discussed in the next unit.

8.5 Disasters and National Development of Ghana

The occurrence of different disasters in Ghana affects various aspects or sectors of the country. This slows down the overall development efforts of Ghana since the disasters lead to low productivity and poor performances of some sectors that are critical to the
country’s development. Specific areas or sectors often affected by disasters in Ghana include the agricultural, education, commercial, industrial, and health, each of which is discussed below.

**Agricultural Sector**

This is one of the main sectors that support the development of Ghana. Often referred to as the backbone of the country’s economy, the agricultural sector provides employment opportunities to the majority of Ghanaians, raw materials to feed many agro-based industries, cash crops to earn Ghana some foreign exchange and food to satisfy the nutritional needs of Ghanaians. However, disasters such as floods and bushfires often disrupt the activities of this sector by destroying several farmlands. The 2007 flood in the Northern Region of Ghana destroyed about 70,500 hectares of farmland and an estimated production loss of 144,000 Metric Tonnes (MTs) of food crops including maize, sorghum, millet, ground nuts, yam, cassava and rice. The floods also made many farming areas and communities inaccessible due to breakdown of key infrastructure such as bridges and roads.

Apart from floods, the sector is also affected by incidence of bushfires. The 2014 annual progress report by the Ministry of Food and Agriculture indicated that at the end of the 3rd quarter of 2014, about 64 agricultural related fires were recorded across the country, affecting about 497 hectares of farmland. The report further revealed that in the Builsa South District in the Upper East Region of Ghana bushfires destroyed about 144 hectares of rice farms and a combine harvester belonging to the Ministry (Figure 8.5.1). All these developments affect food production which in turn has corresponding consequences on prices of food and food security in the country.

![Figure 8.5.1: A rice field destroyed by bushfire at the Builsa South District](image)

Source: Ministry of Food and Agriculture (2015)
Educational Sector
The educational sector in Ghana has witnessed several disasters which have caused damages to school buildings and many educational materials including books. In 2007, about 210 schools were affected by floods in which over 190 classrooms collapsed in the Northern Region. In the Greater Accra Region, the 2011 floods affected many basic and secondary schools in the region and this influenced the Ministry of Education to order the closure of the affected schools to save students and teachers from any flood-related casualties. Furthermore, a situational report on the June 3rd flood disaster in 2015 found facilities of most schools damaged by floods at Nima, Aworshie, Aladjo, Adabraka and Low McCarty hill communities in Accra.

Apart from school buildings and educational materials which are often damaged through floods, other essential infrastructure such as local transport and energy are also temporarily disrupted by floods which affect school attendance, and teaching and learning activities. These devastations in the educational sector negatively affect the delivery of education services in the country.

Commercial and Industrial Sector
Over the last decade, the country has experienced frequent fire outbreaks at several market centres. Markets which have suffered from these fire outbreaks include Kantamanto, Agbogbloshie and Makola markets at Accra, and Asafo and Kumasi central markets in Kumasi. The fires destroyed the wares of many traders and rendered them jobless. In addition to this, many private and public businesses or institutions have suffered different forms of disasters either through floods or fire outbreaks reducing their level of productivity. For example, in 2011, Vista 2000 Limited which deals in newsprints and other paper products was hit by floods and this damaged several properties of the company which worth about GH¢6 million.

Health Sector
In the health sector, poor waste management practices in some areas of Ghana together with insanitary conditions that follow disasters like floods lead to the spread of diseases like cholera and malaria. In addition to this, the victims (either the injured or the dead) of various types of disasters in Ghana such as vehicular accidents, fire outbreaks, floods, collapse of buildings and gas explosions are sent to health centres in the country for treatments which put much strain on the health facilities in the country. At times when there are major disasters involving a large number of people, the health facilities are over-stretched to the extent that some patients are not able to get hospital beds to receive healthcare and others too do not receive treatment of time due to limited facilities and health personnel. For example, the 37 Military Hospital and Korle-Bu Teaching hospital were under much pressure to attend to hundreds of victims of June 3rd disaster in 2015 that occurred in Accra.

The resultant effect of disasters on the four sectors discussed above is that it forces government to increase its expenditure on these sectors in order to restore the damages
caused by disasters. It also resulted in diverting the country’s resources into providing relief aids to support the livelihood of disaster victims. All these expenses could have been used to enhance the country’s development efforts especially in areas where the country fall short but they end up being channelled into disaster management issues.

8.6 Progress on Disaster Management in Ghana

Ghana has made some efforts to enhance the management of disasters. This unit highlights the progress made by Ghana in managing disasters to create much awareness on the country’s achievements in the area of disaster risk management. The unit gives much attention to the country’s progress report on international disaster management strategies such as the Yokohama Strategy for a Safer World in 1994, and the Hyogo Framework for Action (2005) which were blueprints that came out from the first and second world conferences on disaster reduction respectively. Below are examples of the progress made by Ghana on disaster management which is discussed under four broad themes.

Establishment of National Disaster Management Organisation (NADMO)
In line with the Yokohama Strategy for a Safer World and its plan actions which emphasise the need for countries to establish a permanent disaster management organisation to control all disaster related matters, NADMO was established in Ghana. It was established by Act 517 of 1996 with a responsibility of managing all disasters in Ghana and similar emergencies. To enable NADMO go about its activities well and work with relevant civil authorities at the national, regional and district levels, it was placed under the Ministry of Interior which has an oversight responsibility of ensuring internal security and maintenance of law and order in Ghana. At the moment, NADMO has a National secretariat in Accra, ten (10) Regional secretariats in all the ten regions of Ghana, two hundred and forty-three (243) Metropolitan, Municipal and District secretariats and over nine hundred (900) zonal offices throughout the country.

Integration of Disaster Risk Considerations into Sustainable Development Policies

- Improvements have been made on Disaster Risk Reduction (DRR) activities in Ghana. Every organisation in the country has been directed to establish DRR
desk as a means to control disasters at the organisational level. Guinness Ghana, Cocoa Processing Company, Vodafone Ghana are examples of organisations that have established DRR Desks in their outfits.

- At the district level, DRR strategies have been integrated into planning agendas. As at 2015, 14 out of 26 districts in the Eastern Region of Ghana were assisted by the Regional Platform Committee on DRR in the area to draw up disaster management plans.

- Anti-terrorism bill which was drafted in 2013 was officially passed into law in March 2014. This law protects the country’s borders from the activities of terrorists and man-made disasters caused through the activities of terrorism.

- Environmental and sanitation improvement strategies have been strengthened in the countries development agendas. The First Saturday of every month is celebrated as National Sanitation Day across Ghana. This occasion is used to keep the environment, drains, market centres and communities clean to control floods and the spread of infectious diseases.

- Importation of used refrigerators, freezers and air conditioners has been banned. The ban took effect from January 2013 under the legislative instrument (LI) 1932 (2008). In line with this initiative over 2400 old and inefficient refrigerators have been replaced with new ones, and more than 5000 banned refrigerators destroyed in a bid to reduce their impact on the ozone layer depletion and climate change related disasters.

- Many School Disaster Prevention Clubs have been formed at second cycle and tertiary institutions. Members of these clubs are given periodic training on Disaster Risk Reduction activities. This contributes in building strong capacities for managing disasters at the grassroots level.

**Building Resilience against Hazards**

- In collaboration with international stakeholders such as Bournemouth University, and North Dakota National Guard, NADMO has over the years organised disaster management courses such as International Disaster Management and Incidence Command Systems courses to upgrade the skills and capacities of emergency agencies to better manage disasters in Ghana. More than 90 participants selected from Ghana Police Service, National Fire Service, Immigration Service, Armed Forces and the National Ambulance Service benefited from these courses in 2014.

- Drainage expansion and dredging works have been embarked upon at the community level to build resilience against flood disasters. In June 2013, dredging works was undertaken by the Cape Coast Metropolitan Assembly on the Kakum River in the Central Region to reduce the perennial flooding of surrounding communities during raining seasons. Similar dredging works have been embarked upon by the Accra Metropolitan Assembly on drains in Old Fadama, Nima, Kotobabi and Odaw River as part of measures to control floods in the capital city.
- National Relief and Reconstruction Management Plan (NRRMP) handbook has been prepared by NADMO as an effort to enhance emergency preparedness, response and recovery programmes to disasters at the community level.
- Ghana Meteorological Agency (GMet) has received technological upgradement to enhance their capacity on flood and drought detention. A major example of this is Automatic Weather Stations (AWS) donated by the Japanese International Cooperation Agency (JICA) to GMet in Bole, Salaga and Yendi all in the Northern Region. The facilities have boosted meteorological services and research in terms of weather predictions and climate information to build resilience to climate and ecosystem changes.
- To deliver prompt services in the event disasters, a 24-hour Operations Room of NADMO has been upgraded with well-connected links at regional and districts levels to disseminate information on the occurrence of any disaster for immediate actions to be undertaken.
- A project dubbed “Expanding Climate Change Resilience” has been completed in the Northern Region of Ghana. It commenced on January 2013 and ended on March 2014. The project was able to empower 18 communities to establish wood logs and access weather information through mobile phones for rainfall and drought updates.
- A 3-year project (2013 – 2015) entitled Community Resilience through Early Warning (CREW) has been completed across the ten regions of Ghana. The project under the initiative of NADMO and supported by the Norwegian government and UNDP has helped to build the capacities of communities for better preparedness and mitigation of the impact of flood and drought disasters.

Disaster Risk Reduction Approaches, Emergency Preparedness and Recovery Programmes

- Phase-3 of the Ada Sea Defence Project is underway. The project worth €60 million and feasibility studies started in March 2012 after large stretches of land in Ada were lost to sea tidal waves. The project after completion is expected to protect 400 villages in the area against tidal wave erosion.
- Works are on-going on the second-phase of the Atorkor-Dzita-Anyanui Sea Defence Project in the Keta Municipality of the Volta Region which is worth $11 million. The project is being undertaken under the supervision of the Ministry of Water Resources, Works and Housing. As part of the project, new computer laboratory costing $150,000 has been constructed and rehabilitation works undertaken on schools destroyed by tidal wave erosion by the project contractors (Amandi Company Limited) as part of their social responsibility to the Ada community.
- NADMO in conjunction with UNDP under the Africa Adaptation Programme has conducted hazard mapping, and vulnerability and risk assessment throughout the country to provide a strong database for effective mitigation strategies against disasters.
A national Web Emergency Operation Centre (Web EOC) is nearing completion at the NADMO head office to effectively monitor and respond to potential disasters across the country.

Recommendations have been for the establishment of a specialised hospital facility to manage Disease Epidemics Disasters. This facility is to help prevent the spread and treatment of infectious diseases such as pandemic influenza, Severe Acute Respiratory Syndrome (SARS) and Lassa fever in Ghana.

A series of public educational campaign has been organised by the Ministry of Health and NADMO on diseases like Malaria, Ibola and other epidemics to create awareness and build capacity towards mitigating such diseases.

Ghana Health Service has implemented a malaria control programme to reduce death and illness caused by malaria diseases. As at 2015, about 12,000,000 Long Lasting Insecticide Treated Mosquito Nets (LLITMN) had been distributed to households in Ghana through the programme.

8.7 Summary and Conclusions
This module has exposed you to the broad types of disasters in Ghana. Apart from this, common disasters that affect the Ghanaian economy were discussed with much emphasis giving to floods, fire outbreaks, transport accidents and the disease epidemics. The causes of these common disasters were also highlighted. Furthermore, areas or sectors often affected by disasters in Ghana were treated and sectors such as the agricultural, educational, commercial and health sectors received much attention. Lastly, the module discussed the progress made by Ghana on disaster management to uncover the country’s achievements in that area.

References


9.1 Introduction
This module discusses the delicate relationship between Disaster Risk Reduction (DRR) and development at various administrative levels. It considers disaster risk reduction as very important in the quest to achieve sustainable development and poverty reduction. The module emphasises on the need to mainstream DRR into the development process which requires the establishment of the necessary legal and regulatory framework. As a process activity, mainstreaming DRR into the development agenda is made practical using the planning process.

9.2 Learning Objectives
It is expected that at the end of the unit, trainees would be able to:
1. Explain the relationship between DRR and development;
2. Discuss the need for mainstreaming DRR into the development process;
3. Identify the various levels of mainstreaming; and
4. Explain the process of mainstreaming DRR into the development planning.

9.3 Disaster Risk Reduction and Development

Exercise/Activity 9.3.1
- Discuss the relationship between disaster and development.
- Explain four reasons why disasters should be of concern to us.

Disaster and Development
There is a relationship between disaster and development. Disaster erodes the gains of development and hence the need to plan development so that development activities would be resilient to the effects of disaster. Development has been defined variously by different authors.

Stop and Reflect 9.3.1
This module would explains development to mean a comprehensive and multidimensional process that aims at ensuring changes in attitudes and social systems, institutions, environmental management and solving problems that are associated with equity, inequality, gender, governance, boosting economic growth and poverty eradication.
The definition in Stop and Reflect 9.3.1 highlights a number of issues about development:

- Development is seen from a multi-dimensional perspective and not only from the perspective of economic indicators such as the Gross National Product (GNP) per capita;
- Development should not be only about growth but also the distribution of growth and solving inequality;
- Changes in attitude, social structures and institutional capacity building are necessary for systems to work effectively;
- Development should lead to an improvement in the standard of living of the people and reduction or eradication of poverty;
- Environmental management and disaster risk reduction should form part of the discussion on development;
- Gender issues should be mainstreamed into the development agenda; and
- Good governance including environmental governance should be given the desired attention.

Why should we be Concerned about Disaster?

Disaster can undermine national development effort especially in developing countries such as Ghana. The delicate relationship between disaster and development could be explain as follows:

- Disaster has the ability to erode the gains of development and poverty reduction interventions.
- In the event of disaster, resources periodically allocated to other sectors are channelled into emergency relief services and disaster management and this stifles development in other sectors of the economy.
- Disasters increase the vulnerability of households and individuals to poverty. In most cases disasters worsen the plight of the poor and further deepens their level of poverty.
- Disaster risk reduction will potentially build the resilience of the poor to vulnerability.
- Disaster risk reduction further ensures the protection of infrastructure, property and life and guarantees a sustained standard of living.

Exercise/Activity 9.3.2

- Discuss how to importance of mainstream DRR into the development plan of your district.

Levels of Mainstreaming

What is Mainstreaming?

The term ‘mainstream’ literally means the deepest part of the steam where most fishes would gather. The word is hence used as a derivative to mean the dominant form,
especially pertaining to culture, religion or politics (e.g. mainstream culture). Mainstreaming has been used since the nineties in international development in reference to very important but neglected crosscutting issues that need uplift to the fore of development policy and planning. Popular examples including mainstreaming gender, environment and climate change adaptation in development.

Stop and Reflect 9.3.2

“Mainstreaming risk reduction’ describes a process to fully incorporate disaster risk reduction into relief and development policy and practice. It means radically expanding and enhancing disaster risk reduction so that it becomes normal practice, fully institutionalised within an agency’s relief and development agenda” (Trobe & Davis, 2005, p.16).

Mainstreaming Disaster Risk Reduction encompasses the need to:

- Integrate DRR in the formulation and implementation of policy on national development issues;
- Consider disaster risk reduction in the preparation of Medium Term Development Plans for countries and their meso-level and micro-level decentralised administrative units;
- Integrate DRR in sector development plans of Ministries/Departments/Agencies (MDAs) of countries;
- Constantly monitor and ensure documentation on a programme or project that is under implementation to identify potential disaster risk issues and taking the necessary steps to address these issues;
- Incorporate DRR into the development of spatial development plans of communities to ensure sustainable land use and land management;
- Integrate DRR into disaster relief effort to avoid the creation of other potential disaster and environmental degradation issues; and
- Incorporate DRR into Environmental Assessment of projects, programmes and plans.

The Need for Mainstreaming

There are a number of reasons to support the need to mainstream DRR in the development process. The reasons centre on the impact of DRR on poverty reduction, economic development, urban development and climate change adaptation among others as explained below:

- The poor are disproportionately affected by disasters especially women, children and the elderly and people recovering from previous disasters and conflicts. Living on marginal lands and fragile environments increases the vulnerability of the poor to disasters. By increasing the plight of the poor, disasters exacerbate inequality in the system and reduces the coping capability of the poor.
Disasters are associated with a lot of economic cost to the state, industry and individuals. The cost of the earthquake and tsunami in Japan were estimated to be about 4 per cent of the country’s gross domestic product (GDP), whereas the economic cost of the Haiti earthquake in 2010 was estimated at 120 per cent (120%) of GDP. The cost of the twin disaster in Accra in June 3, 2015 is estimated at about Gh¢1,658,847.00 (myjoyonline, 2016).

The impact of disasters is likely to increase with unplanned urban growth, poor resources management, increasing urban populations and with the new challenges posed by climate change.

Mainstreaming Disaster Risk Management (DRM) into policies and planning can reduce the rise in the cost associated with the impacts of disasters. If countries build their capacity in the requisite tools, expertise and strategies to factor DRM into development planning, a significant progress would be made in the reduction of the cost associated with disasters (The International Bank for Reconstruction and Development/The World Bank, 2012).

Stop and Reflect 9.3.3
Reasons for mainstreaming DRR into development issues include:
- To ensure the reduction of potential disaster by considering disaster risk reduction issues at the project/programme/plan formulation and designing stage;
- To ensure that disaster relief effort and services are carried out sustainably without the creation of other potential disasters and environmental degradation;
- To avoid the creation of other potential disasters through the implementation of development projects, plans and programmes.
- To reduce the economic cost that would be associated with disaster and relief effort by the consideration of potential disasters and mitigation and adaptation effort during the planning stage.

What are the Outcomes of Disaster Risk Reduction Mainstreaming Measures?
- Disaster risk reduction incorporated into the national policy for various sectors of the economy.
- Disaster risk reduction incorporated into the guidelines for the preparation of medium term development plans (in the Ghanaian context by the National Development Planning Commission).
- Disaster risk reduction considerations incorporated in the medium term development plans of MMDAs and MDAs in the country.
- Economic cost of dealing with disasters that are associated with the implementation of development projects and programmes reduced as a result of the consideration of DRR in the project/programme design.
- Disasters that are associated with projects/programmes implementation reduced as a result of the introduction of DRR measures.
9.4 Levels of Mainstreaming

Levels of Mainstreaming DRR in Ghana

Mainstreaming DRR into development planning can occur at various administrative levels. In Ghana, three administrative levels could be identified being:

- The national level;
- The Regional Co-ordinating Council level; and
- The Metropolitan/Municipal/District Assemblies and the sectoral level.

Mainstreaming Disaster Risk Reduction at the National Level

At the national level of development planning in Ghana, the National Development Planning Commission is the main institution for the development of national planning policy and strategy. The National Development Planning Commission Act 1994, Act 479, session 2 (1) defines the prime duty of the commission as to “advise the President on development planning policy and strategy”. The commission therefore defines the policy direction of the government for MMDAs and sector institutions for the preparation of the medium-term development plans.

With respect to environmental management and disaster risk reduction, Act 479, session 2.2(c) enjoins the commission to “make proposals for the protection of the natural and physical environment with a view to ensuring that development strategies and programmes are in conformity with sound environmental principles”.

To assist the commission in carrying out this mandate, the commission incorporates environmental management principles and disaster risk protection measures into the commission’s guidelines for the preparation of medium-term development plans by MMDAs and sectors. The commission also provides guidelines for the preparation of Spatial Development Framework at the national level and by Regional Co-ordinating Councils and MMDAs. The commission through the co-ordination of the Regional Co-ordination Councils monitors the preparation of the medium-term development plans to ensure that the guidelines are fully complied with.

Regional Co-ordinating Council (RCC)

The role of the Regional Co-ordinating Councils in the development planning process in Ghana is that of a co-ordinating role. The National Development Planning System Act 1994, (Act 480) defines the planning functions of the Regional Co-ordinating Councils to include provision of data and necessary information to the District Planning Authorities for the preparation of development plans; co-ordinating the plans and

Exercise/Activity 9.3.3

- Identify the main stakeholders that would be involved in mainstreaming DRR at the Metropolitan/Municipal/District Assembly level.
- What will be the role of each major stakeholder?
programmes of the District Planning Authorities; and monitor and evaluate the implementation programmes and the projects of the District Planning Authorities.

The role of the RCC in the mainstreaming of DRR into the planning process will therefore include:

- The provision of the necessary information on Disaster Risk Reduction for planning purposes to the MMDAs;
- Incorporating DRR measures into the preparation of Regional Spatial Development Framework.
- Co-ordinating to ensure that DRR measures have been incorporated into the Medium-Term Development Plans (MTDP) and Spatial Development Framework (SDF) of MMDAs as stated in the guidelines of the National Development Planning Commission;
- Monitor and evaluate the implementation of Disaster Risk Reduction measures.

**Metropolitan/Municipal/District Assemblies**

Local governments play a key role in disaster risk reduction mainstreaming. As the main stakeholders in the preparation, implementation, monitoring and evaluation of Metropolitan/Municipal/District Assemblies (MMDAs) Medium Term Development Plans and Spatial Development Framework at the district level, they have a key role in mainstreaming DRR into the planning process. The MMDAs deal with different stakeholders in the management and preparation of District Medium Development Plans and Spatial Development Framework and therefore are well placed to co-ordinate and incorporate disaster risk reduction measures in development/spatial plans. The role of the MMDAs in DRR reduction mainstreaming include the following among others:

- Bringing all the necessary stakeholders together for the preparation of district medium term development plans/spatial development framework;
- Collection of data for development planning, including data on disaster and risk related issues for mainstreaming DRR into the planning process;
- Co-ordinating the development planning and spatial development framework process with focus on mainstreaming DRR into the process;
- Enforcement of bye-laws on disaster risk reduction and enforcement of spatial planning laws to ensure reduction of flooding and other disasters;
- In collaboration with relevant sectors build the local capacity for DRR management and planning to ensure mainstreaming of disaster risk measures at the local level and for sustainable climate change adaptation measures; and
- Collaborate with neighbouring MMDAs when necessary for a joint disaster and risk management plan.

**Sectors**

Planning activities are also carried out by sector Ministries/Department/Agencies (MDAS) in Ghana. The MDAs also follow the guidelines of the National Development Planning Commission (NDPC) in the preparation of the development plans. The guidelines from the NDPC contains includes instructions on mainstreaming DRR into
the planning process. The MDAs therefore have an important role to play in mainstreaming DRR into the development process. In the main, the following could be associated with the role of the MDAs in mainstreaming DRR into the planning process:

- MDAs collect data on sector specific disaster risk assessment issues to assist in mainstreaming DRR into the development of sector specific development plans;
- Collaborate with MMDAs and other relevant stake holders in disaster management and mainstreaming DRR into the development plans and spatial development framework of MMDAs;
- Provide the NDPC with sector specific data and information to assist the development of national development policy framework;
- Monitor the implementation of programmes and projects that are related the DRR to ensure successful plan execution; and
- Provide the necessary technical support where necessary to MMDAs in DRR management planning and the implementation of projects on disaster risk reduction measures.

9.5 Legal and Institutional Framework for DRR Mainstreaming in Ghana

Mainstreaming disaster risk reduction into the development process would require the necessary institutional capacity. It will require the organisations with the requisite technical knowledge for disaster management and planning. It would also require the organisations with the necessary resources and structures to operate, as well as effective collaboration with other allied institutions for effective delivery. The legal and regulatory framework for disaster risk reduction also becomes very critical.

A number of laws and legislative instruments help in explaining and guiding Disaster Risk Reduction and Management in Ghana being:

- Environmental Protection Agency Act 1994, Act 490
- The Ghana National Fire Service Act, 1997 (Act 537)
- Land use and Spatial Planning Act 2016

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

The Act establishes the National Disaster Management Organisation (NADMO) as the co-ordinating organisation for disaster management in the country. Session 1(2) a. enjoins the organisation to “prepare national disaster plans for the preventing and mitigating the consequences of disasters”. With regard to Disaster Risk Reduction, the Act calls for the establishment of District Disaster Committees with functions including the preparation of plans for the prevention and mitigation of disasters in their areas of authority.
Environmental Protection Agency Act 1994, Act 490
The Environmental Protection Agency (EPA) Act 1994, Act 490 other legislative instruments on Environmental Assessment also assist in providing the legal basis for disaster reduction and hence disaster risk reduction mainstreaming. The EPA Act 1994, Act 490, Session 2 (h) empowers the Environmental Protection Agency “to prescribe standards and guidelines relating to the pollution of air, water, land and any other forms of environmental pollution including the discharge of waste and the control of toxic substances”. The EPA Act further enjoins the Agency to regulate the conduct of Environmental Impact Assessment by proponents of projects and programmes. This, in a way ensures proper accounting for disaster related issues to be addressed by proposed programmes and projects.

The Ghana National Fire Service Act, 1997 (Act 537)
The Ghana National Fire Service [GNFS] Act, 1997 (Act 537) makes provision for the organisation to advise prospective developers of fire safety measures they would require. Session 4(b) of the Act enjoins the GNFS to “provide technical advice for building plans in respect of machinery and structural layouts to facilitate escape from fire, rescue operations and fire management”. The functions and services provided by the GNFS are very important in DRR.

Land use and Spatial Planning Act, 2016
The Act establishes the Town and Country Planning Authority (previously, Town and Country Planning Department) with the necessary mandate to ensure sustainable spatial development planning in the country. Session 4 (i) of the Act makes provision for the Authority to “ensure the control of physical development in uncontrolled or less controlled but sensitive areas such as forest reserves, nature reserves, wildlife sanctuaries, green belts, coastal wetlands, water bodies, water catchment areas, mining areas, open spaces and public parks”. The Act further mandates the Authority to ensure that the exploitation and use of natural resources would not adversely affect human settlements and the environment. Ensuring of development control further strengthens the mandate of the Authority to assist in DRR.

9.6 Mainstreaming DRR into the Development Planning Process

Exercise/Activity 9.6.1
- Describe the processes and activities you would recommend to help mainstream DRR into the preparation of a district Medium-Term Development Plan (MTDP).

- What challenges do you envisage to encounter in mainstreaming DRR into the MTDP.
The suggested activities and processes for the mainstreaming of DRR into the planning process are based on a generic planning process. The activities involved could be varied or adapted to suit local circumstances.

### Table 9.6.1: Activities to help mainstream DRR in the planning process

<table>
<thead>
<tr>
<th>Stages in the Planning Process</th>
<th>Suggested Activities to Assist in DRR Mainstreaming</th>
</tr>
</thead>
</table>
| Stage 1: Identification of District Problems, Potentials and Constraints | - Review the previous Medium-Term Development Plan (MTDP) to identify DRR projects and the extent of implementation  
  - Data gathering on recorded disaster cases during the previous years (medium-term planning period)  
  - GIS Mapping to link disaster occurrence to their respective spatial locations  
  - Estimated cost of disasters over the previous MDTP planning period under review  
  - Data and Maps on potential disaster zones and areas e.g. flood modelling maps  
  - Data on gender/children related disaster issues.  
  - Data on institutional capacity for DRR,  
    - e.g. Numbers and categorisation of NADMO, Fire Service and other allied disaster organisation officers in the MMDA  
    - Data on disaster related Non-Governmental Organisations (NGOs), Community Based Organisation in the MMDA  
  - Information on institutional challenges for disaster risk reduction  
  - Identification of disaster zones for spatial planning purposes |
| Stage 2: Formulation of Goals and Objectives | - Gather information from National Development Planning Commission Guidelines for the preparation of Medium-Term Development Plans on disaster risk reduction  
  - Gather information of sector specific goals on disaster reduction (from Ministries, Departments and Agencies [MDAs])  
  - Gather information from the National Spatial Development Framework for your planning area.  
  - Goal formulation should be based on the analysis of problems, constraints, challenges, potentials and disaster and risk modelling at stage one. |
### Stage 3: Generation of Alternative Scenario

- The planner should be able to guide politicians and decision makers in the formulation of goals and objectives and targets for the plans gestation period.
- The goals and objectives identified should be classified according to the development themes in the NDPC guidelines for the preparation of MTDPs.

- This stage calls for assessing the opportunity cost for disaster risk reduction measures.
- There will be the need to initially assess the cost of maintaining the status quo –the ‘No Action’ scenario and implications or consequences of taking desired action- the ‘Action Scenario’.
- The selected path or action should be assessed in terms of issues such as:
  - Encouraging local participation
  - Sustainability
  - Encouraging local adaptation to the impacts of climate change
  - Available institutional capacity to implement measures identified
  - Conformity with national policy as dictated by the NDPC National Development Policy Framework and Guidelines for the preparation of MTDP
  - Conformity with National Spatial Development Framework
  - Cost of action within the budget of MMDA or ability of the project to attract national funding

### Stage 4: Preparation of a Development Framework

- This the stage for standardisation
- Gather information on national and international standards on disaster risk reduction and climate change adaptation issues
- Gather information on the relevant sector specific guidelines on DRR e.g. (Ghana National Fire Service safety guidelines, Environmental Protection Agency [EPA] sector specific guidelines)
- Information should also be gathered on national goals and targets
- Identify, assess, and analyse the risk of disaster that may be associated with programmes and projects
- Assess the cost of disaster risk in identified projects and programmes
| Stage 5: Plan Preparation | • Discuss the inclusion of the DRR programmes and projects identified with the Metro/Municipal/District Planning and Co-ordinating Unit (MMDPCU) for inclusion in the medium term plan  
• Discuss the inclusion of strategies for the development Spatial Development Framework taking into consideration the National Spatial Development Framework  
• Liaise with the relevant technical heads in providing budget estimates for the programmes and projects identified  
• Assist in the preparation of risk management plan for some specific projects with some substantial identified risk  
• Provide technical guidance for the presentation of the final document  
• Prepare for explanation of issues at the validation workshops for the draft plan |
| --- | --- |
| Stage 6: Monitoring and Evaluation | • Facilitate the formation of project monitoring teams with relevant stakeholders  
• Furnish key agencies and stakeholders involved in the implementation of projects with key agreed targets and indicators  
• Regularly monitoring to ensure the protection of reserved and protected areas  
• Plan and arrange for routine monitoring of projects to monitor implementation of disaster risk management plan  
• Organise regular review meetings on projects to assess performance on disaster risk reduction measures  
• Organise regular field visits to project sites  
• Ensure regular documentation on all projects  
• Ensure timely delivery of project reports |
9.7 Summary and Conclusions

- The module has established the important relationship between Disaster Risk Reduction and Development. Disaster has the capacity to erode the gains of development and hence the need to take due consideration of issues that are related to disaster risk reduction in the development planning process.

- Mainstreaming DRR into the development planning process enables due consideration to be made to programmes and projects that would increase the resilience of communities to the impact of disasters.

- There are levels of mainstreaming DRR into development issues in Ghana. At the national level, the NDPC ensures that policy formulation takes care of disaster risk reduction issues. The commission also ensures the inclusion of DRR in the guidelines for the preparation of medium-term development plans by MMDAs and sectors. The Regional Co-ordinating Councils play a co-ordinating role in the preparation of development plans by MMDAs. The Metropolitan/Municipal/District Assemblies and sectors prepare medium term development plans with guidelines from the NDPC that incorporate DRR.

- The planning process is participatory, inter-disciplinary and ensures that all stakeholders participate in the development of DRR measures. The process also ensures due consideration of proposed measures to avoid the creation of potential disaster avenues. There is the need for regular monitoring of the implementation of the measures proposed in the development plans to ensure efficient implementation for sustainable development.

References


10.1 Introduction
This module is designed to deepen participants understanding of the link between DDR and legislations. In addition, it will highlight on the importance of regulations and resource mobilisation in DDR. The interaction of anthropogenic perturbations with natural hazards usually exacerbates the impacts of natural disasters when they do occur, particularly in developing countries. These call for policies that address the way humankind manages the natural environment and in built ecosystems to reduce risk of disasters. History has shown that policy could be used to modify human behaviour. In Ghana, most disaster incidences notably, periodic floods, are purely due to policy, governance and institutional failure. The increasing exposure of rural communities and urban dwellers to floods and other geo-hazards is primarily due to lack of enforcement of environmental laws, inadequate institutional capacity and systematic policy failure.

10.2 Learning Objectives
At the end of the module, the participants would be able to:
1. explain the link between legislation, regulation and DRR;
2. enumerate the major national legislations in DRR;
3. explain the principles of good governance in DRR management;
4. explain the link between building codes regulation and urban planning policy in disaster risk management; and
5. enumerate different types of DRR financing schemes.

10.3 The Role of Legislations and Regulations in Disaster Risk Reduction
The essence of legislation and regulation in DRR is to reduce human vulnerability to disaster. Legislation and regulation fundamentally modify individual behaviour and in the process reduce exposure to hazards (See Table 10.3.1).

Exercise/Activity 10.3.1
In groups of five (5), participants should discuss the following:
- Major legislative instruments and regulations expected reduce risk of exposure to hazards in Ghana.
Table 10.3.1 Legislation in Ghana that are related to DRR

<table>
<thead>
<tr>
<th>Name of legislation and year of assent into law</th>
<th>Act number</th>
<th>Relevance to DRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Powers Act, 1994</td>
<td>Act 472</td>
<td>This Act gives conditions for Declaration of Disaster in Ghana</td>
</tr>
<tr>
<td>National Disaster Management Organisation Act, 1996</td>
<td>Act 517</td>
<td>This law led to the establishment of NADMO, it also defines the functions</td>
</tr>
<tr>
<td>National Buildings Regulations, 1996</td>
<td>LI 1630</td>
<td>Building codes and town country planning legal framework, with emphasis on zonation.</td>
</tr>
<tr>
<td>Local Government Act, 1993</td>
<td>Act 462</td>
<td>Act 462 contains important community based disaster and emergency reduction strategies. Section 1 (10:3), (13:e, g)</td>
</tr>
<tr>
<td>Environmental Protection Act, 1994</td>
<td>Act 490</td>
<td>This law is fundamental to environmental prohibition and mechanisms for enforcement.</td>
</tr>
<tr>
<td>Ghana Meteorological Agency Act, 2004</td>
<td>Act 682</td>
<td>This law highlight on early warning systems</td>
</tr>
<tr>
<td>National Fire Prevention Law, 2003</td>
<td>LI 1724</td>
<td>This gives framework for fire regulation and its related punitive measures</td>
</tr>
<tr>
<td>Ghana National Petroleum Corporation Law</td>
<td>PNDCL 64</td>
<td>This law has provision to prevent adverse effects of petroleum operation on the environment, resources and people of Ghana.</td>
</tr>
</tbody>
</table>

Source: Norman and Binka (2015)

National Development Planning Commission (NDPC) (see Stop and Reflect 10.3.1), NADMO and Environmental Protection Agency (EPA) are the main focal point institutions overseeing DRR in the country. The other supporting institutions are the security services. They coordinate development plans and projects of MMDAs. Environmental impact assessments are being seriously enforced by EPA in collaboration with other agencies. Ghana is signatory to many international environmental laws and protocols (e.g. Kyoto Protocol on climate change, Cartagena Protocol on Biosafety, etc.).
Stop and Reflect 10.3.1

**Functions of NDPC related to DRR**

- NDPC shall at the request of the President, Parliament, or on its own initiative make proposals for the protection of the natural and physical environment with a view to ensuring that development strategies and programmes are in conformity with environmental standards.

- NDPC gives policy direction on DRR for it inclusion in medium to short-term development plan of MMDAs (Metropolitan, Municipal and District Assemblies) and MDAs (Ministries, Departments and other Agencies).

Exercise/Activity 10.3.2

In groups of five (5), participants should discuss the following:

- Difference(s) between regulation and legislative instrument.

- Views about siting of fuel and gas filling stations in densely populated areas.

10.4 Governance in Disaster Risk Reduction Management

The DRR approach requires redefining the role of government in disaster reduction. It is generally agreed that national governments should be the main actors in DRR. They have a duty to ensure the safety of citizens, the resources and capacity to implement large-scale DRR, a mandate to direct or co-ordinate the work of others, and they create the necessary policy and legislative frameworks. These policies and programmes have to be coherent. Governance in DRR reflects in the way central government (national), and other arms of government (sub-national actors) and civil societies are able to mobilise their effort in unison to coordinate, manage and mitigate or reduce disaster-related risk and emergencies.
Stop and Reflect 10.4.1

Definition of Governance in the Context of DRR

- **What is Governance?**
  Governance, as defined by UNDP, is the exercise of political, economic and administrative authority in the management of a country’s affairs at all levels. It comprises mechanisms, processes and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences. Governance encompasses, but also transcends, government. It encompasses all relevant groups, including the private sector and civil society organisations.

- **Disaster risk governance** refers to the way in which the public authorities, civil servants, media, private sector and civil society coordinate at the community, national and regional levels in order to manage and reduce disaster and climate related risks. This requires that sufficient levels of capacity and resources are made available to prevent, prepare for, manage and recover from disasters. It also entails mechanisms, institutions and processes for citizens to articulate their interests, exercise their legal rights and obligations, and mediate their differences (IFRC & UNDP, 2014).

Exercise/Activity 10.4.1

In groups, participants should discuss the following:
- Why good governance is necessary for DRR.
- Elements of good governance.
Elements of Good Governance

![Diagram of Good Governance Elements]

**Figure 10.4.1. Elements of good governance**

**Accountability**: Accountability in DRR is the central premise of the Sendai DRR framework. The institutions mandated to carry out DRR activities should be accountable to the target group or community that they serve. Accountability also implies the institutions involved in DRR should have to be responsible for their actions or inactions.

**Transparency**: Full disclosure of financial commitment from international donors and local organisations for disaster relief and reconstruction. Good governance demands that the distribution of relief items to victims of disaster should be devoid of corruption, ethnic and political bias. Transparency in the operations of DRR institutions is paramount to ensure adequate support from the international community. There is the need to establish reporting mechanisms as well as disclosure of sources of data,
information and expert opinion (Organisation for Economic Cooperation and Development [OECD], 2012).

**Democratic:** Decision making process in DDR management should be more or less decentralised and at best devoid of command-and-control systems. To have strong legitimacy and support for DRR operations, the involvement and devolution of powers to local communities through districts assemblies should be encouraged. The voices of vulnerable groups, women, children, peoples with disabilities and poor in the society should be heard. These social groups are affected the most in the event of disasters. They have high exposure to risk of natural hazards in urban and rural communities due to the fact that they settle in the fragile environments (e.g. marsh land, waste land, refuse dump, etc.) of built ecosystems that have high potential to natural hazards such as floods and landslides. “Natural hazards on their own do not result in disaster. Rather, it is the vulnerability of populations in countries that has a direct bearing on levels of disaster. Supportive governance is necessary to ensure coping capacities in societies” (UNDP, 2010, p.1).

**Participation:** The involvement of local communities, voluntary individuals, private sector and NGOs in operations, structures and activities for DRR initiatives is paramount for good governance and it needs to be given impetus. Seek the inputs of stakeholders in the formulations of DRR policies. In the absence of strong collaboration, and the event of disasters or emergencies the mobilisation and distribution of relief items and logistics becomes problematic. DRR activities have to be multi-sectoral and all-inclusive as well as accessible in order to be efficient and effective.

**Inclusiveness:** Inclusive DRR management and policies in line with good governance should focus on equality of rights and opportunities, dignity of the individual, acknowledging diversity, and contributing to resilience for everyone, not leaving aside members of a community based on age, gender, disability or other (Sharma *et al.*, 2014). Invariably, exclusion increases the vulnerability of segments of the society and throw off the objectives DRR out of gear.

**Responsiveness:** Institutional structures need to metamorphose in consonant with modern trends. Good governance is apt to changes and responsive to the needs of the people. Society evolves over time and comes in its wake with different anthropogenic problems that will have implication on DRR. In this regard, DRR policies have to be modified or changed periodically to meet the needs and demands of the people at each point in time if necessary.

**Gender Sensitivity:** The Hyogo and Sendai framework for action both reorganise gender as one of the core principles of DRR. Gender describes social roles in a particular cultural context. It also involves interpersonal relationship between men and women. It defines roles, responsibilities and privileges of belonging to particular sex. In sub-Saharan Africa including Ghana and other parts of Asia, gender issues have profound effect on socioeconomic development; hence the need not to be neglected in the policy formulation. In these societies women and children are usually marginalised and have limited access to environmental resource. This hinders their capacity to
engage in DRR related activities and increase their vulnerability to hazards. For the purposes of good governance the role of gender in DRR should have maximum priority. **Awareness creation:** The use of media (both print and electronic) in dissemination of information to the populace is paramount in DRR management. The creation of public awareness through education as to how people should organise and mobilise themselves in the event of disaster or emergencies is crucial. History has taught us that with all the sophisticated early warning systems in place; without proper awareness creation and education in the event of disaster, there will be huge social and economic cost to the society. Hence, governance in DRR should stress on education and flow of information to vulnerable communities to adequately prepare them at the individual household level. Simulations and training sessions need to be conducted to equip the populace as to how to organise themselves in the event of disaster. **Chieftaincy institution:** In Ghana one of the strong institutions often neglected when it comes to national policies and legislations is the traditional chieftaincy institutions. Chiefs and overlords wield much power and authority over their area of jurisdiction traditionally; they can latently mark or mar any policy directives, ironically the constitution of the republic of Ghana prohibits their ability to function effectively and is silent on their role in current democratic dispensation. For good governance of DRR management, the role of chieftaincy institutions must be explicitly defined to ensure stronger grass-root participation. **Transboundary cooperation:** Out-of-state cooperation in DRR management is necessary to strengthen the capacity of national institutions. Technical and financial assistance as well as technology transfer from other countries within sub-region and other parts of the world should be encouraged. Some form of disasters (tremor, the management of transboundary river basin to reduce impact of floods, e.g. periodic spills from Bagre Dam on White Volta) need international collaboration to handle them. **Empowerment:** Good governance empowers individuals and communities. Empowerment through good governance will make individuals and communities active participants in DRR management. The populace can be empowered through education and awareness creation. A community that is aware of its vulnerability to disasters is more likely to take action.
The Built Environment, Building Codes Regulation and Enforcement

Human settlement planning and management is one particular area that has received much attention in disaster management issues worldwide. This is due to the important role that it has been recognised to play in addressing problems caused by disasters such as displacement of people, destruction of buildings and breakdown of essential services such as water, transport and electricity networks. This unit discusses policies and regulations covering settlement planning in Ghana and disaster management to the extent to which these regulations and policies cater for disasters in the country. Emphasis is given to the 1996 Building Regulations of Ghana (LI 1630), National Housing Policy and the National Urban Policy.

Exercise/Activity 10.5.1

In groups, participants should discuss the following:

- Is waste management important in reducing floods in Accra?
- Is demolition of buildings on waterways and wetlands solution to floods in Accra?
- Whose responsibility is it to enforce and persecute offenders of Building Regulations in Ghana?
- What can be done to reduce floods in Accra and other part of the country?

The 1996 Building Regulations and Disaster Management

The Building Regulations of Ghana LI1630 came into force on 27th September, 1996 to provide building standards to enhance the health and safety of the citizenry. It is
structured into 19 parts and has some aspects that focus on disaster management which are highlighted in Table 10.5.1.

### Table 10.5.1. Aspects of Ghana’s Building Regulation on disaster management

<table>
<thead>
<tr>
<th>Section or Part of building regulation</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Part 2: Plot Development</strong></td>
<td>▪ No site liable to flooding shall be built upon.</td>
</tr>
<tr>
<td></td>
<td>▪ No building shall be erected over a drain, culvert, watercourse, high-tension cable or sewer except approved by a District Planning Authority.</td>
</tr>
<tr>
<td></td>
<td>▪ Any site for the erection of a building for human habitation shall be adequately protected against dampness unless the building is intended to be used solely for storage or the accommodation.</td>
</tr>
<tr>
<td><strong>Part 6: Structural fire precaution</strong></td>
<td>▪ Buildings for public entertainment shall have comprehensive fire escape systems.</td>
</tr>
<tr>
<td></td>
<td>▪ Fuel-fired appliances shall not be installed in an exit or corridor serving as an access to exit.</td>
</tr>
<tr>
<td></td>
<td>▪ Service rooms containing equipment subject to possible explosion and refrigerating, and transformer equipment shall not be located near or under any means of escape from a building.</td>
</tr>
<tr>
<td></td>
<td>▪ Exit direction signs shall be placed in corridors and passageways where necessary to indicate the direction of exit travel.</td>
</tr>
</tbody>
</table>

Source: Building Regulations of Ghana (1996)

These aspects of the building regulations on disaster management are to ensure good structural works of buildings to resist disasters, enhance the safety of occupants of various building and their vulnerability to health related disasters associated with poor sanitation conditions.

In case of disasters, they are also to provide easy means of escape from buildings to avoid casualties and openings to which disaster management personals and other security agencies can use to bring disasters in buildings under control.

However, the enforcement of the building regulations has been of concern in Ghana since disasters in the country such as collapse of buildings, domestic fire outbreaks and floods that have been linked to poor enforcement nature of these regulations.

**National Housing Policy**

The National Housing Policy which aims at providing adequate, decent and affordable housing in Ghana came into being in March 2015 after it was officially launched by the Ministry of Water Resources, Works and Housing. Issues on disaster management and
risk reduction were given attention in the eight broad objectives of the policy (Ministry of Water Resources, Works and Housing, 2015). Objectives 4 and 5, for example, were much emphatic on disaster management. Objective 4 centred on accelerating home improvement (upgrading and transformation) of the existing housing stock. To achieve this, the National Housing Policy, among other things, recommends the following:

- Incentives for effective maintenance of family housing and introduce penalties in case of poor maintenance including fines and demolition for endangerment to life and property.
- Enforce building code and regulations in respect of fire risks and hazards, structural integrity, water and sanitation, electricity supply, ventilation and all other facilities that will ensure safe habitation.
- Conduct periodic reviews of national building code and regulations to ensure their responsiveness to standards of structural integrity, service conditions and functional utility within the context of low-income affordability.

The fifth **Objective of the policy focuses** on promoting orderly human settlement growth with physical and social infrastructure. Measures to achieve this objective recommended by the policy include:

- Reinforce the coastal sensitivity mapping and management initiative by the EPA to improve information on flood risk and land use zoning.
- Mainstream and scale-up the on-going flood disaster mitigation measures by removing properties situated in flood plains and obstructing water courses to minimise the frequency of disasters arising from such illegal blockages.
- Promote the reduction of storm water run-off in communities through storm water management (collection, recycling and reuse) for irrigation, watering of lawns, and flushing of toilets leading to minimization of perennial flood among other things.
- Develop engineered landfill sites in major urban and metropolitan areas with adequate equipment and operational funds to support waste management activities.

The above measures on disaster management and risk reduction inculcated in the National Housing Policy framework to enhance durability of buildings, avoid building on water ways, improve information of floods, and enhance the management of waste to reduce risks to disasters such as collapse of buildings, floods, fire outbreaks and the outbreak of infectious diseases.

**National Urban Policy**

The overall goal of the National Urban Policy is to promote a sustainable, spatially integrated and orderly development of urban settlements which will lead to a sound living and working environment for all people to support the rapid socioeconomic development of Ghana. This goal is supported by 12 objectives of which matters on disaster management are covered.
Objectives 4, 8 and 10 placed much emphasis on disaster management issues. Below are their underlying initiatives which focused on some aspects of disaster management problems in urban areas as stipulated in the National Urban Policy.

**Objective 4:** improving environmental quality of urban life

**Objective 8:** Promoting urban safety and security

**Objective 10:** Promoting climate change adaptation and mitigation mechanisms

All these initiatives all to make urban centres of Ghana safer, convenient, healthier and free from common disasters such as floods, fire outbreaks, and spread of infectious diseases like cholera.

### 10.6 Resource Mobilisation and Contingency for DRR

**Resource Mobilisation**

Disasters cause damage to physical infrastructure and important economic facilities, resulting in human, financial and environmental losses. The suffering and hardship cannot be quantified in monetary terms. The post-disaster recovery and reconstruction efforts require huge financial commitment. Often disaster occurs at the point in time that there is no budgetary allocation for it. This slows down economic growth and destroys years of developmental gains. The financial aspect of disaster can be mitigated through prudent fiscal policies and many risk financing instruments. These instruments include risk transfer tools and compensation arrangements provided by the private sector or government, as a complement to physical risk reduction measures (OECD, 2012).

**Exercise/Activity 10.6.1**

Into group of 5 or 6,

- Identify and discuss possible disaster risk financing schemes for Ghana.
- Discuss possible sources of internal funding for establishment disaster management fund.

**Disaster Risk Financing Schemes**

**Table 10.6.1. Disaster risk financing schemes**

- **Risk financing:** This involves making adequate provision of funds purposefully to meet financial obligations in the event of disaster. These funds can be obtained or generated internally from the consolidated funds and is set aside for future utilisation or externally through the banking sector, capital markets and international lending institutions.

- **Risk transfer:** This is insurance **mechanism of shifting** risks to financial institutions through payment of a premium. Compensation is paid to the insured in the event of disaster. Risk transfer may be obtained through insurance policies or capital market instruments such as catastrophe bonds.
The insurance and reinsurance sectors are the main sources of risk transfer, although capital markets are also involved.

- **Pool of savings or reserves**: Risk financing fund is set up from internally generated funds and invested in other derivatives to cushion against depreciation and only made available or drawn only in the event of a disaster.

- **Contingent credit facilities**: This involves provision of some form of loan package to the affected populace for recovery activities in the event of disaster. Under this mechanism, funds meant for disaster relief and reconstruction efforts are usually invested and are made available in the event of disaster.

- **Insurance**: This involves payment of premiums such that financial risk from disaster is transferred to second party. Insurance schemes facilitate transfer of risk to undertakers such as insurers and reinsurers financial institutions.

- **Catastrophe-linked securities (Catastrophe bonds)**: Here, risk emanating from disasters is financed through capital markets. The investor purchases the bond with a principal payment and then receives regular periodic payments. However, the payment of interest and/or principal is cancelled in the event of a specified catastrophe (e.g. floods or earthquake.)

- **Social Safety net**: Here, members of a community pooled their resources together to cushion them against adverse effect of disaster.

Source: OECD (2012) and Cummins and Mahul (2009)

**Role of Institutions in Disaster Risk Financing**

Disaster risk financing can be effectively addressed support from the government and non-governmental organisations through appropriate policies, regulatory framework and the enabling institutional arrangements. The institutional regulatory framework should address the following concerns (OECD, 2012):

- To ensure the general availability or affordability of financial tools to strengthen DRR.
- Provide adequate compensation to vulnerable segments of the economy.
- Ensure prompt compensation in the event of a disaster and promote confidence in disaster response.
- Provide greater certainty regarding the allocation of disaster risks within the economy.

**10.7 Summary and Conclusions**

One of the essential components of DRR management is enactment of legislative and regulatory instruments to empower institutions to perform their functions. The essence of laws and regulations are to minimize exposure of vulnerable groups to disasters and hazard. Natural disasters are themselves not a problem but interaction with man-degraded environment leads to disaster. Thus, this calls for policies, legal and regulatory instruments to modify behaviour. Losses emanating from disaster events can set back developmental gains. Financial risk products need to be developed to mitigate
the financial cost of disaster on the society, particularly in Ghana. An appropriate contingency plan supported by contingency funds will minimize the economic impact of natural disasters. One of the core components of DRR is good governance coupled with well-functioning strong institutions. For the purposes of strengthening and legitimising local DRR institutions in the communities of their areas of operation, the chieftaincy institution should not be relegated to the background. Ghana has lots of stylistic legal instruments in the statutory books on disaster management, but some have outlived their importance in modern times. The laws and regulations on the land should be backed by enforcement and any infraction should attract stiffer penalty than is currently the case.

References


