DISASTER MANAGEMENT

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Abstract

The impact of disaster on people, property and environment has compelled researchers, academic institutions, and organizations to focus on disaster risk management with intention of reducing its vulnerability from those who are exposed to such hazardous situations, and educate the local community to become resilient when a disaster strikes at any time. Such educational and awareness process include; mitigation, preparedness, response and co-ordination at the times of disaster. However, disaster requires intervention at all levels international, national and local, to prevent people and property from its risk. In this book the author discusses nature and types of hazards, vulnerability capacity assessment, role of community in disaster management, risk assessment methods, information technology on disaster management, development co-operation for disaster managers, psychological intervention in disasters, gender and natural disasters. This will help scholars, and humanitarian agencies to enhance their work in terms of collaboration at the times of risk.

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Dedication

This book is dedicated to my parents father Mohamed Harun, mother Hawa Mula and my children: Emad Salih, Muhsin Salih, Sead Salih and Mubarak Salih. Hoping that one day they will realize that my absence from them was important and necessary for their good future. It is also dedicated to all the victims of disasters in the World at large and South Sudan in particular.

Introduction

It gives me great pleasure to write this introduction not only to a book but to a great future educational project of a new university in South Sudan. The book is the first one of many that will be written by South Sudanese for use in teaching at the new university. We have a lot of hope and are very optimistic about the future when we shall teach using material we have authored. Such material is anchored in our world-view and our experiences and will be more relevant to our situation.

Dr Salih Mohamed writing from real life experience of disasters had provided a concise but comprehensive review of the disaster cycle that covers risk factors, mitigation, management, and effects short-term a long term. He has described very well the physical and human aspects of disasters. The book is a challenge to researchers and disaster relief workers to come forth and write more books on each of the specific aspects that the author has mentioned. It is always preferable to undertake field research and analyze the results within an integrated framework of ethical and moral values relating to disasters. Such research can also stimulate more original thinking about wider concepts about the causes of disasters many of which arise from human violations of the rights of the environment or the rights of other humans.

I wish to thank the author, Dr Salih Mohamed, and the reviewer, Professor Hamza Njozi, for a job well done.

Professor Omar Hasan Kasule Sr.

Chapter one

Introduction

The occurrence and impacts of disasters on the vulnerable people, properties and environment has motivated researchers, intellectuals and organizations to focus on disaster risk management which involves mitigation, preparedness and response in terms of emergency assistance.

The world is increasingly becoming vulnerable to both, natural and man-made disasters, such as earthquakes, floods, famine and war. This is a multi-faceted global problem which requires joint efforts to mitigate its effects.

In addition, the upsurge in social violence, such as high-jacking, terrorism, civil unrest, and conventional armed conflicts has drastically affected many nations and communities.

These have often wreaked intolerable burdens on government and societies whose resources are already precarious because of poor economic and social conditions. This, in turn, has produced additional strains on international assistance sources, thus weakening global counter-disaster efforts and capabilities**.**

Objective of the book

The core objective of this book is to provide an introduction to learners and anybody who is interested in the field of disaster management to enable them understand various concepts of disaster management, and to identify the effective means of lessening its impact from the vulnerable people, property and environment.

Definition of concept

As per the *Oxford Dictionary* a disaster is a sudden accident or a natural devastation that causes great damage or loss of life.

A Disaster is an event or series of events, which gives rise to casualties and damage or loss of properties, infrastructure, environment, essential services or means of livelihood on such a scale that it is beyond the normal capacity of the affected community to cope with. Disaster is also sometimes described as a disastrous situation in which the normal pattern of life or eco- system has been disrupted and extra-ordinary emergency interventions are required to save and preserve lives and or the environment.

THE NATURE AND TYPES OF HAZARDS

A natural hazard can cause loss of life, damage of property and economic ruin damage in its action resulting from natural calamities such as floods, volcanoes, earthquakes and other geological processes. The event will not be considered a disaster if it occurs in an unpopulated area. However, in a vulnerable area an earthquake can have disastrous consequences and leave lasting damage which can require years to repair. Therefore, there are both natural and man-made disasters.

- **Natural Hazards**

  Natural hazards are physical phenomenona that are either caused by rapid or slow onset of events which can be geological (earthquakes, landslides and volcanic activity); hydrological (floods) climatological (extreme temperatures) meteorological (waves and storms) and biological diseases such as epidemics and insect/animal plagues. (Transmitted by the bites that derive from rats)

- **Man-made/Technological, Hazards**

  These are the events that are caused by humans and occur in or close to human settlements such as conflict, famine, displaced populations,

industrial accidents environment pollution and transport accidents. Also there is a wide range of challenges, such as unplanned urbanization, poverty as well as threats of pandemics. In summary, types of hazards include:

- **Earthquake**
  Earthquake is the result of a sudden release of energy in the earth's crust that creates waves at the earth surface, earthquakes manifest themselves by vibration, shaking and sometimes displacement of the ground. They are caused by slippage within geological faults.

An earthquake can cause serious damage to infrastructure on the ground pipes, plants will be destroyed by high- magnitude earthquake and communication systems such as road and rail network become non-functional, cutting off, or making the delivery of emergency supplies difficult.

Destruction during an earthquake can also lead to chemical leakage at manufacturing plants and storerooms which can eventually lead to widespread chemical contamination of drinking water.
Earthquakes and floods may affect people anywhere and at any time, but the situation of the poor and the vulnerable will always be more precarious. In many cases such people end up becoming internally displaced people and refugees.

The scourge of war often impels people to escape and move out in large numbers away from the conflict area, to places with no infrastructures or at best with very limited resources.

So the internally displaced persons (IDPs) are those who are forced to flee their homes due to circumstances such as internal disasters or war, but remain within their own Country.

For example, in 2013, the internal war and conflict caused thousands of people in South Sudan to flee their homes and move elsewhere in the Country. Such events usually call for fast coordinated efforts to provide basic services such as shelter, food, water, latrines and hand washing facilities.

When providing shelter, the choice of location is often dependent on the availability of water. Conflicts of this kind can also result in people taking refuge outside their Country. For example, in 2013 approximately about 5,000 South Sudanese took refuge in both Uganda and Sudan.

- **Volcano**

  Volcanoes can cause widespread destruction and consequent disasters in several ways. Their effects include volcanic eruption itself that may cause harm following the explosion of the volcano or falling rocks.

  Secondly, lava may be produced during the eruption of volcano then the lava destroys many buildings, plants and animals due to its extreme heat.

  Thirdly, volcanic ash, which is the cooled ash forming thick clouds in the nearby location, may cause roofs to collapse under its weight and the small quantities of that ash are harmful to humans.

- **Floods**

  A flood is an overflow of water that submerges land. It temporarily covers the dry land with water. Flooding results from the volume of water within a body of water, such as rivers or lakes which overflows causing some water to escape the usual boundaries.

  Flooding is defined as an abnormal rise in the water level that results in overflowing of streams or rivers. Flood water can destroy infrastructure, houses, roads and water supply systems, as well as agricultural crops

which ultimately causes a shortage of flood supplies in the Country. Besides the destruction of people, animals also perish when flashfloods occur.

A flashflood happens when rain falls so fast that the underground cannot drain the water away faster. Roads become like rivers and if there is a lot of water floods can carry away buildings, cars and other essential human belongings.

Floods can also cause widespread bacterial contamination of wells and surface water sources with waste products washed from the ground surface or from flooded latrines and sewers resulting in the outbreak of disease. For example, cholera commonly occurs after flooding.

- **Drought**

Drought is the unusual dryness of soil caused by levels of rainfall that are significantly below average over a prolonged period. Also hot dry winds, shortage of water, high temperatures and consequent evaporation of moisture from the ground contribute to conditions of drought. It results in crop failure and shortage of water.

Drought occurs when there is no deficiency in precipitation over an extended period of time, resulting in a water shortage. The lack of rain means that the water flow in the river is reduced, lakes, pools dry up, and ground water and soil moisture are depleted, and crops are damaged.

Drought can lead to national and regional food insecurity crises, domestic animals can die as well, and this means droughts can cause loss of life and livelihood.

- **Wildfires**

Wildfires are large fires which often start in wild land areas. Their common causes include lightning and drought but wildfires may also

be started by human negligence. It can spread to populated areas and thus be a threat to human and property as well as wildlife.[1]

- **Epidemic and Endemic Morbidity.**
  A disease may be epidemic or endemic where there is rapid increase incidence within the community, because of a new disease or seasonal transmission of disease. For example malaria may be endemic in an area and becomes an epidemic among un-immune community arriving from another area, or may cause seasonal epidemic in an agricultural population as the number of mosquitoes increase. Another epidemic risk posed by the occurrence of certain number of cases is cholera in crowded refugee camps, Ebola in a region or district. The best example of Ebola threats is in the neighboring Congo which boarders South Sudan and caused Panic to most South Sudanese where the Ministry of Health took serious measures to prevent it from entering to the Country.

Disaster Affected Persons

The persons affected by disasters provide their own preliminary source of assistance and the contribution from other partners are complementary to their efforts.

The affected persons may be refugees who have crossed to an international border seeking for refuge in a host country. Such persons have special rights and status. At times such persons are a displaced group who fled a conflict or local disaster, so the two categories mentioned above will not get similar assistance and protection, because the **IDPS** condition may be worse than the refugees.

Especially if their own government is hostile to them. In such cases both the refugees and **IDPS** may remain in need of outside assistance for many years in case they are not able to return to their countries due to prevailing conflicts.

1. Eng. Mohamed Zees au Ahad , construction Project management. UK. Dr. Richard Laku, Director for Ebola Management , Ministry of Health, South Sudan, Juba

However, those who are affected by acute natural disasters such as floods, volcanic eruption are less likely to move far from their homes and depend sometimes on outside assistance. [2]

2 Author's contribution based on experience in the areas of conflict and refuges situations, South Sudan

Chapter two

Disaster management
Concepts of disaster management

The concept of disaster according to this book is as follows:

- Disruption to normal patterns of life which is usually severe and may also be sudden, unexpected, and widespread.
- Human effects such as loss of life, injury, hardship, and adverse effects on health.
- Effects on social structure such as destruction or damage complete government systems, buildings, communications, and essential services.
- Community needs such as shelter, food, clothing, medical assistance, and social care.

The Determination of Disaster Planning

The purpose of planning is to anticipate future situations and requirements, thus ensuring the application of effective and coordinated countermeasures. It is suggested that this is a useful definition for disaster management officials because it indicates the wide nature and requirements for counter-disaster planning. In other words, planning should not be confined merely to preparedness for and response to specific disaster events; it should cater, as far as possible, for the whole scope of the disaster management cycle.

However, the definition used in this book is:

An event, natural or man-made, sudden or progressive, which impacts with exceptional measures to prevent it such severity that the affected community has to respond by taking serious steps to overcome the risk, in relation to the definition of disaster, it has also been taken into account that disaster management is essentially a dynamic process. It encompasses the

classical management functions of planning, organizing, staffing, leading, and controlling, that involves many organizations working together to prevent, mitigate, prepare for, respond to, and recover from the effects of disaster.

Disaster management is defined as:
An applied science which seeks systematic observation and analysis of disasters to improve measures relating to prevention, mitigation, preparedness, emergency response and recovery-disaster management can be defined as the organization and management of resources and responsibilities for dealing with all humanitarian aspects of management, in particular, preparedness, response and recovery in order to lessen the impact of disasters.

Disaster management refers to the conservation of lives and property during a natural or man-made disaster.

Mitigation, Disaster Risk Reduction
Mitigation is the effort to reduce loss of life and property by lessening the impact of disaster, in order for mitigation to be effective there is need to take action before the next disaster occurs; the purpose is to reduce human and financial losses.

It is important to know that disasters can happen at any time and any place and if we are not prepared the consequences can be fatal.

Therefore, effective mitigation requires that we all understand local risks and address the hard choices and invest in long term community well-being. Without mitigation actions we jeopardize our safety, financial security and self-reliance. When a disaster happens in a place its financial consequences are hard to predict.

Disaster Mitigation Refers to plans, strategies and actions taken to reduce a population's vulnerability to future disaster threat. Disaster mitigation

measures are those that eliminate or reduce the impact and risk of hazards through proactive measures taken before an emergency or disaster occurs.

Disaster mitigation measures may be structural (e.g. flood dikes) or non-structural(e.g. Land use zoning), so there is usual need for effective actions to be taken before the next disaster strikes, the purpose of doing this is to reduce human and financial consequences. However, it is important to know that disasters can happen at any time and in any place and if we are not prepared the consequence will be great in terms of assets and fatal in terms of life.

Therefore, mitigation activities should incorporate the measurement and assessment of the risk, environment, and such activities may include the creation of comprehensive pro-active tools that help decide where to focus funding and efforts in risk reduction while other examples of mitigation measures include:

Enforcement of building codes, land use regulations, safety regulation relating to high rise building, control of hazardous substances, safety codes governing land, river/sea and air transport systems, agricultural programs aimed at reducing the effects of hazards on crops, systems to protect key installations such as power supplies and vital communications, hazard mapping, Adoption and enforcement of land use and zoning practices, implementation and reducing the risk of disasters involves activities, which either reduce or modify the scale and intensity of the threat faced or by improving the conditions of elements at risk.

Although the term "prevention" is often used to embrace the wide diversity of measures to protect persons and property, its use is not recommended since it is misleading in its implicit suggestion that natural disasters are preventable. The use of the term reduction to describe protective or preventive actions that lessen the scale of impact is therefore preferred.

Mitigation embraces all measures taken to reduce both the effects of the hazard itself and the vulnerable conditions to it in order to reduce the scale of a future disaster .In addition to these physical measures, mitigation should also be aimed at reducing the physical ,economic and social vulnerability to threats and the underlying causes for this vulnerability.

Therefore, mitigation may incorporate addressing issues such as land ownership, tenancy rights, wealth distribution, implementation of earthquake resistant building codes, etc.

Preparedness

This brings us to the all-important issue of disaster preparedness. The process embraces measures that enable governments, communities and individuals to respond rapidly to disasters and cope with them effectively. Preparedness includes for example, the formulation of viable emergency plans, the development of warning systems, the maintenance of inventories, public awareness and education and the training of personnel.

It may also embrace search and rescue measures as well as evacuation plans for areas that may be "at risk" from a recurring disaster.

All preparedness planning needs to be supported by appropriate rules and regulations with clear allocation of responsibilities and budgetary provisions.

Early Warning

This is the process of monitoring the situation in communities or areas known to be vulnerable to slow onset hazards, and passing the knowledge of the pending hazard to people who are likely to be affected.

To be effective, warnings must be related to mass education and training of the population who should know what actions to take when warned. Building codes, flood plan mapping, building of homes in flood – prone

areas, disaster mitigation public awareness programs, and insurance programs.

Disaster Risk Reduction

Disaster risk reduction aims at reducing the damage caused by natural hazards like earthquakes, floods, drought and cyclones, through an ethic of prevention.

Disaster risk reduction is a systematic approach to identify and assess and reduce the risk of disaster. It aims at reducing socio-economic vulnerabilities of disasters as well as dealing with the environmental and other hazards that trigger them.

Reducing risk can only be achieved by decreasing the contribution from one or more of the three following components:-

- **Hazards**: Building of flood level to alter the cause of flood events.
- **Exposes**: Land use planning decisions to ensure that new development is not exposed to hazard events, or influencing the type of development. Vulnerability retrofitting older buildings that were built following lower building codes was enforced.

Hazard Modeling:

Hazard modeling helps us to understand a hazard intensity (magnitude) frequencies and source. It is typically underpinned by mathematical models that describe the propagation of the hazard across the landscape without knowledge of the past it will be difficult to predict what might happen in the future. Historical catalogues are used to understand the frequency of hazard event.

Exposure:

Exposure refers to the elements at risk from natural or man-made hazard event. This includes individuals, households and communities, buildings and structures, public facilities and infrastructure assets, agricultural commodities environmental assets and business activities.

Exposure information is about the location and characteristics of each of the elements and is therefore, about what is at risk.

This information feeds into natural hazard risk analysis to identify what elements are at risk in the location, enough information about each of the elements help to understand how they are likely to behave when subjected to natural or artificial hazard. It also helps as evidence-based division to prepare, respond and recover from any event.

Vulnerability:
Vulnerability refers to the impact of a hazard has on people, infrastructure and the economy. Vulnerability is divided into four main areas, physical, social, economic and systemic depending on class of elements at risk.

Chapter three

Planning Disaster Preparedness

Disaster preparedness refers to plans, procedures, and actions taken to ensure an effective response to a future disaster strike.

Disaster preparedness refers to measures taken to prepare and reduce the effects of disasters, mitigate its impact on vulnerable populations and respond effectively to cope with consequences of such hazards at local, national and international levels.

United Nations defined disaster preparedness as involving forecasting and taking precautionary measures prior to an imminent threat when advanced warnings are possible. Therefore, disaster preparedness (DP) provides an opportunity to design effective realistic and coordinated planning to reduce duplication of efforts and increase the overall effectiveness of disaster preparedness activities by society, households and community members.

These efforts help to minimize the impact of disaster on communities and result in saving more lives and safeguard livelihood during disaster situation. Preparedness includes the formulation of viable emergency plans and the development of the warning system, maintaining public awareness, education and training of personnel. It also embraces search and rescue measures as well evacuation plans for areas that may be at risk plans that need to be supported by appropriate rules and regulations and budgetary provisions.[3]

Both Red cross and Red crescent societies work to develop essential means to reduce vulnerability of households and communities in disaster

3. https://www.ifrc.org/en/what-we-do/disaster-management/about-disaster management

to cope with the effects of disasters, strengthen the capacity of national societies in disaster preparedness and post disaster response, determining national society role and mandate in disaster plans to establish regional networks that will strengthen collective impacts in disaster preparedness and response at international level.

Planning and practicing for disaster events is a key factor for a favorable response. Preparedness and recognition of the importance of the importance of including public health and health care in the planning process. Disasters can take many forms and require health care leadership to take early hazards approach.

Hence, good planning produces effective emergency operations and improves overall preparedness. The following are the basic disaster planning for comprehensive emergency management:-

1. Mitigation:

Mitigation involves preventive measures to reduce vulnerability. These are actions taken to prevent harmful effects on the communities, or in the key installations. However, other preventive measures include; construction of a dam or levee to control flood water so that it cannot adversely affect people, buildings, livestock, means of production, and subsistence. Some simple examples of mitigation measures are:

- Strengthening buildings to render them more resistant to cyclones, floods, or earthquakes.
- The incorporation of hazard resistance in structures or procedures to be followed in new development projects.
- Planting certain kinds of varieties of crops that are less affected by specific kinds of disaster.
- Changing crop cycles so that crops mature and are harvested before the onset of the flood or cyclone season.
- The adoption of land-use planning and controls to restrict activities in high-risk areas.

- Economic diversification to allow losses in one sector to be offset by increased output in other sectors.

Controlled Burning in a Bushfire:
This action can remove potential fuel and prevent the start of fire in case it starts, as well as preventing it from reaching threatening proportions. Some form of legislations can be regarded as preventive measures for example, land use regulations which ensure that communities are not allowed to develop anything on vulnerable sites, such as disaster prone areas of flood plain. It is worth mentioning here that some countries use the term prevention / mitigation while others apply it separately.

2. Preparedness.
Measures include formulation and maintaining of valid and updated counter-disaster plans which can be brought into effect whenever required. Special provisions for emergency actions, such as evacuating populations or moving them temporarily to safe areas. Providing warning systems, emergency communications, public education and awareness, training programs including exercises and tests, building capabilities to manage the impact of hazards collectively.

3. A response
Is an action to reduce a diverse action during the disaster such as treatment and management of the flow or movement of patients.

4. Recovery
Involves actions to restore areas affected by the disaster to pre-disaster operation such as normal surgical schedules and billing procedures. The comprehensive plan involves also the planning staff, tasked to collect and organize information and resources and is responsible for creating the incident action plan. The logistic staff is in charge of tactical objectives and responds to the incidents.

The finance staff track expenditures and provide funds for costs and claims.

Under each section there is a manager and a unit leader who is responsible for carrying out functions which require establishment of an emergency management program as here under:

- A hazard vulnerability analysis identifies potential emergency operations plans and drives the planning process.
- The emergency operation plan provides a framework for organizations' strategies to respond to the emergency and covers all roles, authorities and responses to all hazards.

Once a plan is developed, it becomes a document to be applied for threats, goals and priorities including training and updating of information obtained. States have the primary responsibility of implementing measures to reduce disaster risks.

Disaster risk reduction needs to be an essential part of a state's investment in sustainable development. States have the power as well as the responsibility to protect their citizens and their national assets by reducing the losses from disasters. States however cannot do the job alone.

Effective disaster risk reduction relies on the efforts of many different stakeholders, including regional and international organizations, civil society, including volunteers, the private sector, the media and scientific community.

Problems in Mitigations

From a practical disaster management viewpoint, certain problem areas can apply to mitigation. Some of these are given below.

- There may be long-standing acceptance of disaster risks by governments and communities, who may feel that traditional measures (taken over many years) are adequate. Such measures may include the positioning of population sites and traditional building practices. There may therefore

be some built-in reluctance to accept new methods of mitigation.

- Some mitigation measures may be costly, for example, enforcement of building codes is likely to increase the cost of buildings. This in turn may reflect, in various ways, on costs and prices, and may therefore be opposed within the community.
- Higher priorities given to other major national programs (health, education, etc.) may make it financially difficult to implement mitigation programs.
- Political considerations may rule out or restrict mitigation programs .If such programs are extensive and (through land-use restrictions and enforcement of building codes, etc.) undue interference with living conditions and standards, government may become unpopular. Thus, governments may not enforce mitigation programs adequately, in the interest of retaining political power.
- Aspects of modern progress and development may affect mitigation programs. For instance, international standards in various fields may dictate that governments undertake mitigation measures (mainly perhaps in the form of safety measures). In such cases, governments may have little or no choice. This may therefore mean that other desirable mitigation programs will have to take lower priority.
- Lack of insufficient appropriate mitigation measures may have an adverse effect on the ability to cope with disaster situations. For instance, inadequate mitigation measures may cause a significant overload on response operations and result in the latter being only partially effective.
- If counter-disaster planning is inadequate, the effectiveness of mitigation may be seriously reduced. For example, it may be possible to mitigate the effects of a disaster situation by undertaking precautionary evacuation of people before the disaster strikes. However, if evacuation plans and other counter-disaster arrangements are not already in place, such an evacuation may not be possible. Even worse, if such an evacuation is attempted without adequate plans, the risks to the people concerned may even be increased. Similarly, if planning is inadequate, large numbers of people may, as a mitigation measure, be housed in unsafe communal

buildings (schools, churches, etc.) In the past, in some countries, this has led to considerable loss of life because of buildings collapsing during disaster impact.

- In post-disaster analysis and review, insufficient attention may be given to mitigation measures. This can have severe repercussions in future disasters.
- Inadequate standards of community self-reliance and self-help may adversely affect successful mitigation because even elementary precautions (such as such as ensuring an emergency food supply or being prepared for evacuation) will not be taken.

Requirements for effective mitigation may include some or all of the following:

- A clear and comprehensive national disaster policy which addresses all aspects of disaster management and ensures that mitigation is given proper consideration and priority.
- Adequate assessment and monitoring of disaster hazards and vulnerabilities, so that the need for mitigation measures is accurately identified and defined. Indeed, effective vulnerability analysis is a primary prerequisite for mitigation programs and Annex A deals with this subject in detail.
- Adequate and accurate analysis of all reasonable mitigation projects. In this regard, it is especially important to achieve sensible gain/loss comparisons; for instance, whether by instituting mitigation programs the nation and community are going to gain more (bearing in mind the costs and restrictions involved), as against the losses which might arise if nothing is done.
- Readiness on the part of governments to institute and carry through appropriate mitigation programs.
- Appropriate consideration of mitigation measures in national development plans, including the immediate and long-term cost benefit implications of taking or not taking mitigation action.
- A basis of organization and planning centered on a permanent disaster management center or section. The existence of such a section is vitally

important in the overall disaster management sense because, on behalf of government, the center/section should keep a constant watch on disaster management. Thus, in coordination with other agencies, it is able to identify the need for various mitigation measures as they may arise. It is then the responsibility of the center/section to advise government on needs for mitigation programs, and the priorities which should apply.

- Insistence by the disaster management center/section (on behalf of government) that an effective post-disaster review is under taken after all major disaster events. This review must include advice to government on whether, as a result of a particular disaster, mitigation measures are adequate or whether additional measures are needed.
- Recognition that mitigation measures may originate from all levels of government, not only from the national level. This is important because, for instance, the "disaster front" is usually at the local government (or community) level. Thus, from this level, the need for mitigation measures may be more obvious than from higher levels.
- Specialist programs which may assist in the development of large-scale mitigation measures; for instance, agricultural programs which assist farmers and others in mitigation of crop losses.
- Adequate public awareness and education programs, in order to assist communities in playing their appropriate part in mitigation measures.
- Support for traditional measures of mitigation, where these may be used in the overall disaster management sense.
- Support, also for the development of self-reliance and self-help at the community level because these aspects can often provide useful support for mitigation concepts.

Vulnerability Capacity Assessment

Vulnerability capacity assessment is a method of investigation and data gathering that uses various participatory tools in order to understand the following:

- The natural hazards people face in their locality.

- Their vulnerability to hazards and to other threats stressors and shocks.
- Their capacity to cope with and recover from disasters.

It is also a process that allows people to identify, analyze priorities and designed actions that contribute to disaster risk reduction.
It also helps to mobilize communities and raise awareness of the risk they face which in turn results to the support of efforts for resource mobilization.

VCA builds on existing capacities skills, knowledge and resources which communities process. As a result the actions taken to reduce disaster become more embedded in the local reality which contributes to their effectiveness and sustainability.

VCA is a part of a process of working with communities to reduce their vulnerability to disasters and other threats.[4]

The important factor of success is the ability to critically analyze the qualitative data collected and use the information designed for the implementation of community risk reduction activities.
The role the community plays in this analysis is crucial

- Always be transparent from the start on what the exact purpose of the assessment.
- Avoid approaching communities with pre-conceived ideas with regard to the problems that need to be addressed.
- Trust building is important and requires time.
- Avoid raising expectations which cannot be met (allocate possible resources for implementation)
- The assessment should not be a goal by itself but needs to be followed by action planning and implementation aiming at strong participation, taking into account traditional knowledge sharing and discussing with the community the out-come of the assessment and analysis.

4. Shephard B. Rubin J, Health Policy 2006 – 2019

The assessment of vulnerability situations is the most important tool in supporting capacities and measures of disaster. Preparedness for emergency programs, rehabilitation and development, the process needs building of information gathered with explanation of vulnerability and the hazardous situation to the local citizens. Institutions and civil community organizations should also prepare volunteers in information gathering which helps greatly in the assessment needed for the situation of vulnerability.

Chapter four

Disaster response

Disaster response refers to actual operations and actions taken immediately after a disaster has struck to provide assistance and support to the stricken population and area. This stage of response include setting up control rooms, putting the contingency plan (possible) in action, issue warning action for evacuation, taking people to safer areas and render medical aid to the needy.

Simultaneously, render relief to the homeless, food, drinking water, clothing as well as restoration of communication and disbursement of (payment) assistance in cash or in-kind. Usually, immediate emergency relief activities and rescue are to take place with full assessment of the damage needs. It also refers to operations and actions taken immediately after a disaster.

Disaster response is sometimes called emergency response because it is usually applied for short period 2 – 3 weeks after the impact. And emergency measures are necessary to deal with the immediate effects of disaster. A state of emergency is declared by the government of the vulnerable country in the prone areas or counties.

The best example for that is the recent state of emergency declared by the President of the Republic of South Sudan in the prone flood States.

Risk Assessment Method

Risk assessment is a process to determine the probability of losses by analyzing potential hazards and evaluating existing conditions of vulnerability that could pose a threat or harm to property, people, livelihoods and the environment on which they depend. Risk Assessment

Northern **Bahr el Gazal** is among the states in South Sudan that is prone to recurrent seasonal floods, mostly in the months of July-October. For example, the year 2019 witnessed early flood incidents, which intensified between July-October. Those floods posed much life-threatening situations, including destruction of houses, crops, livestock, and road networks as well water and sanitation facilities. Furthermore, during the flood season, there were increases in cholera and livestock diseases thereby increasing the vulnerability of the agro-pastoralist communities to infections, food insecurity and malnutrition, mostly among lactating women, children and the elderly.

The initial rapid Needs Assessment carried out by SSRC indicated that the reported number of people affected by the flood disaster was still increasing as some areas were being assessed. Those affected were in dire need of access to basic life-saving services including food, shelter, and water and sanitation services needed to sustain their lives.

At this stage, the identified priorities were provision of shelter and essential households' items to severely affected households, direct cash assistances to ensure immediate access to food consumption for severely affected households, installation of Surface Water Treatment system to supply clean water coupled with hygiene promotion interlinking with psychosocial support. Risk assessment is made up of the three following processes:

1. Risk identification

Risk identification is the process that is used to find, recognize and describe the risks that could affect the achievement of objectives.

2. Risk Analysis

Risk analysis is the process that is used to understand the nature of sources and causes of the risks that have been identified and to estimate the level of risk. It is also used to study the impacts consequences and examine the controls that currently exist.

3. Risk Evaluation

Risk evaluation is the process that is used to compare risk analysis results with risk criteria in order to determine whether or not a specified level of risk is acceptable or tolerable.[5]

Information Technology in Disaster management

Disaster in every country is managed by the government at central level, state level, and district level, which have various roles to play during the breakout of disasters.

However, the voluntary sectors like non-governmental organizations are also becoming increasingly important for the various functions they perform. Therefore, effective and reliable communication is vital for disaster reduction. Communication technology skills and media are essential for the roles performed in disaster management.

Information technology is changing every aspect of human life; it enhances the quality and effectiveness of services in other human aspects such as education, research, culture, communication and security.

Hence, disaster management needs drastic improvements in its sources to decrease damage and save the life of people.

To achieve this main objective, disaster management has to face challenges for data collection, data management, translation integration and communication which is a crucial role in this respect. The advanced techniques of information technology such as remote sensing satellite communication help in planning and implementing disaster management which in turn enhances the perception towards promoting a culture of prevention in the disaster management. Here below are the information and communication technology [ICT] tools:

5. Van Emmoik A. KamphuisJHulsosch A. 2002

• **Internet:**

In the present era of electronic communication, internet provides a useful platform for disaster mitigation communications. The role of internet is becoming increasingly important due to the following reasons:-

- It facilitates opportunity to enhance the capabilities of addressing hazard awareness and risk management. Practices before, during and following emergency events.

- Internet sites provide increasing information related to various hazards. It also provides more information about the growing number or organizations and professional disciplines addressing them.

- Network provides the means of access to more reference and resources material to more people in many ways.

- **GIS and Remote Sensing**

  Graphic information system and remote sensing are used in drought relief management such as early warning of drought conditions and helps to plan out the strategies to organize relief work. Satellite data may be used for target potential ground water sites for taking up well-digging programs.

- **Satellite Radio Application**

  Satellite radio plays a key role during the disaster warning and disaster recovery phases. Its key advantage is the ability to work even outside areas not covered by normal radio channels. Satellite radio can also be of help when the transmission tower of the normal radio channels is damaged in disaster.

Development Cooperation for Disaster Management

Development relates to the overall objectives of poverty alleviation, economic growth, establishment of social justice and economic independence, and development processes are central for the disaster managers.

Disaster management is a development activity that aims to protect development process to ensure reduction in vulnerability cases. The policy of disaster management is that no one should be considered more important than others. However, it should seek to ensure for development projects and assess disaster impacts aiming at reducing vulnerability of the population bearing in mind that disasters will still occur and the focus should be on disaster preparedness to ensure that structures and mechanisms are in place to allow emergency response and recovery at times of disaster.

Assessing Recovery Needs and managing projects

Recovery is used to describe the activities that encompass the phases of emergency relief rehabilitation and reconstruction.

Rehabilitation

Rehabilitation includes the provision of temporary public utilities and housing as interim measures to assist in long term recovery.

Reconstruction

Reconstruction includes the replacement of building, infrastructure and life line facilities so that long-term development projects are enhanced rather than reproducing the same conditions which made an area or population vulnerable in the first place.

The long-term prevention or disaster reduction measures for example construction of embankment against flooding, irrigation facilities as drought proofing measures, increasing plant cover to reduce the occurrence of landslides land use planning construction of houses capable of withstanding the heavy rain wind speed and shocks of earthquakes are some of the activities that can be taken as parts of development plans.

Disaster recovery is fundamental in returning the community to a state of normality in as short a time as possible. However, it must be recognized that recovery starts while response is underway and will extend well beyond the disaster response.

It is important to note that there are often multiple stages of recovery. At times there may be an early or short term recovery that is focused on rapid damage assessments and restoration of infrastructure and services.

A later stage of recovery involves repairs and constructions of fewer infrastructures. Follow-up phase of recovery affords the opportunity to incorporate disaster mitigation or resilience features.

The lesson learned from this process is that establishing the recovery project (program) office helps to focus on the recovery while response efforts are under way. Care needs are to be taken to avoid collision with disaster response efforts and this is achieved by viewing recovery as a parallel and complementary effort to response.

The program office functions as a bridge from disaster response to recovery. The program office begins to facilitate achieving recovery objectives and manage risks. Therefore, every organization needs to have a plan to ensure that the organization is prepared to deliver services in the event of disruption. Local authorities should also have continuity plans and employ emergency response in place to deal with disasters or other emergency situations.

Chapter five

PSYCHOLOGICAL INTERVENTION IN DISASTERS

From professional experience there is no justification for mental health responses to be delayed until weeks after a disaster has happened. There is always hope that better system for knowledge gathering will improve both the short and long-term responses to disasters to reduce distress and prevent mental health problems.

However, experience from disasters stresses the need for each country to develop a plan to screen for adverse reactions after a disaster and then provide effective treatment.

There is also a strong belief that those who are exposed to disasters and other traumatic events should be provided with psychological debriefing or immediate trauma counseling, critical incident stress debriefing, therapeutic intervention are used with emergency responders. The intent of this intervention and other forms of psychological debriefing is to prevent the onset of post-traumatic stress disorder.

Evidence suggests strongly that individuals provided with psychological debriefing approaches have poor long-term mental health, than those who are not debriefed at all.

Another approach used is to routinely screen those staff deployed to high threat environment. For example, the military emergency service men and women are to be screened immediately after their return from such duties. The screening aims to identify the presence of the early symptoms and signs of post traumatic mental health difficulties in order to advise individuals who exhibit these signs to seek professional help.

Screening of these kinds is used by US, Canadian and Australian military

with the intent of protecting the mental health of troops returning from operational deployment. Such screenings are not easy or cheap to administer. Therefore, science has confirmed that it is better to rely on supporting the bonds between people within communities and trauma exposed organizations to mitigate the psychological impact of disasters than fly in experts who neither understand the situation which people have been exposed to.

The Need for Optimum Use of Resources

One hard fact of life that emerges from analyses of disasters is that available resources are seldom adequate to cope with requirements. Moreover, the pattern of shortfall or discrepancy is subject to considerable variation, as the following examples indicate:

- Disasters can make very heavy demands on some resources but not necessarily on others. For instance, response to an earth quake situation places high priority on heavy earth-moving equipment, search and rescue, and special medical skills to the extent that these resources are nearly always overburdened.

- In some disaster situations, adequacy of one resource capability maybe reduced or offset by limitations in other resources. For instance, in a situation where there are heavy requirements for emergency feeding, food resources may be adequate but distribution capability is not.

- Shortfalls (deficits) in resources may sometimes be self-imposed. For example if planning has been inadequate, the full range of communications resources may not be available when urgently required.

  In addition to the foregoing considerations, it is necessary to bear in mind that:

- Under most circumstances, the possible scope of disaster management activity is wide and varied; therefore, the participation of many organizations, facilities, and personnel is required. This can pose numerous problems in management and use.

- The impacts of major disasters impose severe demands across a wide part, if not all of the national structure.

- Recovery from disaster places is a considerable overload on many national resources, often over a prolonged period.

There is nothing new, therefore, in situations where individual countries around the world may find themselves pinched for adequate resource capability.

Use of Resources

Moreover, it is widely accepted internationally that it is neither practicable nor cost-effective to have special services as separate from standard emergency services standing by just in case a disaster occurs. The alternative, therefore, must be to use existing capabilities. However, when the requirements of preparedness for response to and recovery from disaster are considered and assessed, it becomes quite clear that these capabilities have to be optimized. In other words, there is little point in expecting disaster-relevant resources to be effective in their normal role, plus a disaster role, without enhancing their performance to a required level.

However, the nature of most counter-disaster resource organizations is such that it is not easy for them to achieve and maintain highest dual-role performance by their own means. For example, most governments (which constitute primary counter-disaster resources) are rigidly tasked and staffed.

Moreover, they tend to be under the continuing pressure of establishment cuts and other forms of economies. Generally speaking, therefore, these kinds of resources will not achieve high levels of effectiveness in their disaster roles if they are left entirely to their own devices. This, obviously, is where disaster management assistance comes in.

Given that disaster management assistance has a viable role here, certain

other issues need to be borne in mind. These issues relate to the fact that resource organizations tend to vary in regard to compatibility between their normal role and their disaster role. For instance:

- Some organizations are closely oriented toward disaster tasks. As an example, a public work sector has the equipment for and day-to-day experience in clearing remains and cutting access roads, which is a primary disaster task. Similarly, much of a telecommunications agency's daily task is concerned with maintaining communications systems; in times of disaster that task may increase considerably but, in essence, it does not change.
- Other organizations, however, may have to make significant adjustments when extending into their disaster roles. A community services sector, which is heavily desk-oriented normally, may have to switch a proportion (amount) of its personnel into active field roles for emergency feeding and welfare center purposes.
- Some resource organizations may have difficulty in extending satisfactorily into their disaster role because of the need to keep their primary role functioning at near-normal level.
- With NGOs, the assumption of disaster roles is often easier than is the case with government organizations. Most NGOs are normally concerned with various aspects of community care and assistance.

GENDER AND NATURAL DISASTER

It is found that natural disasters affect women more adversely than men in terms of the effect of disasters on the life expectancy at birth. This means that natural disasters kill more women than men, or kill women at younger age than men. The extent to which women are more likely to die than men or to die at a younger age from the immediate disaster impact or from post-disaster events depends not only on disaster strength itself, but also on the socioeconomic status of women in the affected country.

The higher women status, the smaller is the differential negative effect of natural disasters on female relative to male life expectancy. This means that where the socioeconomic status of women is high, men and women

will die in roughly equal numbers during and after natural disasters.
Whereas the socio-economic status of women is low, more women die than men or die at younger age. There is physiological and biological differences in disaster response capacity that can lead to differential mortality rates for the three main reasons:-

o Men can be physiologically better equipped to withstand a disaster physical impact.

For instance, if a woman is less strong than male counterparts she will be more easily swept away by wind or water. This disadvantage is severe for women in the final stages of pregnancy who are less able to self-rescue of their decreased mobility.

Also women can run less quickly and climb trees and water rescue points with greater difficulty and lower speed.

o Men and women have different propensities to die from various diseases, but the implications for gender – specific disaster mortality are ambiguous with the possible exception of measles for which some evidence suggest that women might be more susceptible to die.

Generally, men are more prone to acquire and die from parasitic and infectious diseases. In principle, women are at advantage of famines and droughts unless they are pregnant or lactating, they can better cope with food shortages due to their lower nutritional requirements and high body fat.

o Large-scale natural disasters can have severe detrimental effects on the social infrastructures, reducing access to food, hygiene, health services and clean water when the basic health care infrastructure is severely damaged or health expenditures are reduced to reallocate public funds for immediate disaster response purposes.[6]

6 https://www.ifrc.org/en/what-wedo/disaster-management/about-disaster-management/

Water Supply in the Emergency Response

Water is one of the most essential elements for sustaining life. National, Regional and Local authorities throughout the world are responsible to maintain necessary infrastructure and to safeguard resources for uninterrupted supply of good quality, health and safe water for every day needs of all the population.

These needs keep growing with economic, development, laundry, sanitation, recreation and other domestic uses an adequate supply of water resources should be safeguarded for all sectors of the economy and including agriculture.

Drinking water has become a global problem from different perspectives. For instance, there are parts of the World that lack necessary water resources for their basic needs in terms of quality and quantity.

Emergency water is an event that disrupts the normal supply of water; it can occurs due to natural causes or when there is damage to the key infrastructures of the treatment base or water storage system. Untreated or partly treated water may be unintentionally distributed in emergency situation. Another case of emergency water is contamination of water supply, for example by a chemical leakage.

The purpose of treatment of water in emergency situation is to remove all sorts of poisons present in the water and to improve the quality to safer human consumption.

In acute emergency situations where speed of water provision is crucial, the major options for water supply are distribution of safe water to people through the use of water tankers, and plastic bottles. The other option is to give the consumers the means of treating water for themselves to render it safe.

As for refugees and displaced persons the long-term need should be located in an area where there is adequate water. This type of water

requires treatment before consumption, in order to maintain the water safe from contamination.

EFFECTIVE COORDINATION PROCEDURE

Coordination is the unification, integration, and synchronization of efforts of group members so as to provide unity of action in the pursuit of common goals.

It is a hidden force which binds all the other functions of management. According to Mooney and Reelay coordination is orderly arrangement of group efforts to provide unity of action in the pursuit of common goals. [7] According to Charles Worth, coordination is the integration of several parts into an orderly whole to achieve the purpose of understanding.

Management seeks to achieve coordination through its basic functions of planning, organizing, staffing, diverting and controlling. That is why coordination is not a separate function of management because achieving harmony between individuals towards achievement of group goals is a key to success. Coordination is the essence (spirit) of management and is understood and is inherent in all functions of management.

A manager can be compared to an orchestra conductor since both of them have to create rhythm and unity in the activities of group members. Coordination is an integral element or ingredient of all the managerial functions as discussed below:-

- Coordination through planning. Planning facilitates co-ordination by integrating the various plans through manual discussion, and exchange of ideas, like co-ordination between finance budget and purchases budget.

- Co-ordination through organizing – Mooney considers co-ordination as the very essence of organizing in fact when a manager group assigns

7. http/unisdr.files/7817-UNISDRT erminology English.pdf

various activities to subordinates and when he creates departments co-ordination is uppermost in his mind.

- Co-ordination through staffing. A manager should bear in mind that the right number of personnel in various positions with right type of education and skills are taken into consideration to ensure right men are on the right job.

- Co-ordination through directing. The purpose of giving orders, instructions and guidance to the subordinates is served only when there is harmony between superiors and subordinates.

- Co-ordination through controlling. Managers ensure that there should be co-ordination between actual performance and standard performance to achieve organizational goals. From the above, we can very much affirm that co-ordination is the very essence of management. It is required in each and every function and at each and every stage; therefore, it cannot be separated.

Effective disaster risk reduction requires community participation. The involvement of communities in the design and implementation of activities helps to ensure that they are well tailored to the actual vulnerabilities and to the needs of the affected people. This informed engagement helps to avoid problems and secondary effects when hazard events occur. Participatory approaches can more effectively capitalize on existing indigenous capacities.

They are usually also more sensitive to gender, cultural and other context-specific issues that can undermine or empower particular groups and individuals to take locally based action. The incorporation of local perspectives into decision-making and activities also helps to ensure that changes in vulnerability and perception of risk are recognized and factored into institutional processes, risk assessments, and other programmes and policies.

Problem Parts in Prevention

Traditional Attitudes

There may be long-standing acceptance of hazards by governments. For instance, a state may have lived for periods with a recurring major flood problem. Therefore, the need for preventive measures is not recognized.

Price

The price of some preventive measures can be very high; for instance, large public works of similar engineering projects; thus, they tend to be ruled out, perhaps without a detailed analysis of cost–benefit and other factors.

Other State Priorities

Higher priorities given to other major state programs sometimes totally preclude(prevent) consideration of preventive measures. For example, nations usually prioritize programs such as medical and health, education, economic development, and so on. In addition, considerations affecting disaster may be omitted altogether from such plans.

Thus, measures of prevention do not receive adequate or appropriate attention in national planning. In fact, some national development projects may actually increase disaster risks, rather than help prevent them.

Political Aspects

Political motives may sometimes have an adverse effect on disaster prevention. For instance, measures of prevention may upset the interests of sections of the public by encroaching on land, property, or other aspects. The possible political risk to a particular government or political party may not, therefore, be acceptable. Also, the spread and increase of population may expose more people to disaster risks because they may be obliged to live in, say, flood-prone areas on low-lying islands. However, to compel such people to move, as a measure of disaster prevention, may not be feasible for political and/or practical reasons.

Development Problems

Normal development may cause problems related to prevention. For example, the safety considerations which apply to an airport may be affected by a number of issues. Possibilities are:

Prevention

- The surrounding population may increase significantly, putting more people at risk in the event of a major air accident.

- The operating characteristics of new generations of aircraft may increase the real or perceived risks to the surrounding communities. Pressure for preventive measures in these cases (e.g., for the closure of a particular airport) may well come from action groups or whole communities. However, such preventive measures may not be economically possible and could, therefore, be ruled out or indefinitely postponed. Other aspects of development may produce the need for measures of disaster prevention. For instance, a large-scale release of hazardous chemicals may constitute grave risks to large numbers of people, livestock, and the environment. Similarly, a fire in a major multistory building may threaten the lives of hundreds of people. In both these cases, strict safety measures are needed and form the basis of disaster prevention.[8]

It must be remembered, however, that high standards of training for staff are usually vitally important and that public awareness and common sense are necessary to support preventive plans and procedures. Thus, it may be difficult, in any case, to guarantee required standards of disaster prevention.

Stability in Disaster Management

Lack of proper preventive measures may often throw heavier loads on other aspects of disaster management when disaster occurs. This may especially apply to response operations and recovery action. Also in post-

8. Capacity building in Asia using information technology applications- Asian disaster preparedness center, Bangkok.

disaster review or analysis, high priorities tend to be given to restoration of infrastructure and to aspects such as rehousing programs. Consideration of future disaster prevention usually comes as a lower priority if, indeed, any consideration is given to it at all. There is also the relevant point that over many years, priorities in international disaster assistance tended to be given to relief and recovery measures, rather than preparedness, mitigation, and prevention.[9]

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