COURSE MANUAL

Introduction to Disaster Management

Virtual University for Small States of the Commonwealth (VUSSC)
Disaster Management
Version 1.0

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Acknowledgements

What is the Virtual University for Small States of the Commonwealth (VUSSC)? VUSSC provides some of the smallest countries with stronger economic opportunities through improved access to quality education. Through the VUSSC, learners from island nations in the Caribbean, Pacific, Mediterranean and the Indian Ocean, as well as small countries in Africa, gain online access to open educational resources (OERS) designed to meet the development needs of participating countries. These non-proprietary course materials are used in the offering of credit-bearing qualifications at post-secondary institutions in the participating countries, strengthening their educational capacity and outreach. The courses will eventually be made more widely available for adaptation and use.

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About this course manual

Introduction to Disaster Management has been produced by the Virtual University for the Small States of the Commonwealth (VUSSC) team. All course manuals produced by the VUSSC team are structured in the same way, as outlined below.

How this course manual is structured

The course overview

The course overview gives you a general introduction to the course. Information contained in the course overview will help you determine:

- If the course is suitable for you.
- What you will already need to know.
- What you can expect from the course.
- How much time you will need to invest to complete the course.

The overview also provides guidance on:

- Study skills.
- Where to get help.
- Course assignments and assessments.
- Activity icons.
- Units.

We strongly recommend that you read the overview *carefully* before starting your study.

The course content

The course is broken down into units. Each unit comprises:

- An introduction to the unit content.
- Unit outcomes.

- New terminology.
- Core content of the unit with a variety of learning activities.
- A unit summary.
- Assignments and/or assessments, as applicable.

Resources

For those interested in learning more on this subject, we provide you with a list of additional resources at the end of each module; these may be books, articles or web sites.

Your comments

After completing Introduction to Disaster Management we would appreciate it if you would take a few moments to give us your feedback on any aspect of this course. Your feedback might include comments on:

- Course content and structure.
- Course reading materials and resources.
- Course assignments.
- Course assessments.
- Course duration.
- Course support (assigned tutors, technical help, etc.)

Your constructive feedback will help us to improve and enhance this course.

Course overview

Welcome to Introduction to Disaster Management

All communities are vulnerable to disasters, both natural and man-made. This first-year University level course was designed by experts from throughout the world to increase knowledge of disaster management, with the aim of reducing this vulnerability and improving disaster responsiveness. We hope that you will find these learning materials stimulating, enjoyable and useful.

Introduction to Disaster Management—is this course for you?

This course is intended for people who require an introductory-level understanding of the concepts underpinning, and practical processes involved in, the management of disasters.

You do not need any prior knowledge of the topic, although your own personal experiences or those of other people in your community will be very valuable in your learning.

Course outcomes

Outcomes

Upon completion of Introduction to Disaster Management you will be able to:

- *Define and describe* disaster management, hazard, emergency, disaster, vulnerability, and risk;
- *Identify and describe* the types of natural and non-natural disasters and the implications of disasters on your region and environment;
- *List and describe* the main hazards to which your region is, or may be, vulnerable;
- *Define* the various phases of the disaster management cycle;

- *Explain* the importance of disaster mitigation and disaster preparedness;
- *Describe* how disaster management can be integrated into public policy and how planning and design of infrastructure should take into account the vulnerability of communities;
- *Develop and write* an emergency operations plan (EOP);
- *State and explain* the importance of the Community-Based Approach to education and public awareness;
- *Describe* how a community-based action plan for disaster management can be actively implemented;
- *Describe* how and why training personnel to acquire skills and knowledge are essential in mitigating the impact of disasters;
- *Recognise* the contribution and participation of volunteer agencies;
- *Define* the contents of a school-based programme on disaster management;
- *Define and explain* how culture contributes to people's response to education and public awareness programmes;
- *Compare* the importance of indigenous knowledge in education and public awareness on disaster management;
- *Define* Emergency Management Systems (EMS);
- *Identity* how the EMS assists in hazardous material management, emergency medical services, and response and recovery operations;
- *Explain* how Global Information Systems (GIS) Global Positioning Systems (GPS) technology are utilised within all phases of the disaster management cycle;
- *State* the advantages and disadvantages of using Remote Sensing Systems (RSS) in disaster management;
- *Explain* the role of the media in disaster management;
- *State* the advantages and disadvantages of using Remote Sensing Systems (RSS) in disaster management;
- *Identify* the components involved in emergency medicine;
- *Describe* a suitable infrastructure and procedures in accessing emergency medicine services;
- *Identify* the main communicable diseases common in disaster situations; the risk factors that increase the likelihood of an outbreak and ways of preventing/minimising such outbreaks;

- *Explain* the importance of water sources and the minimum standards for water quality and quantity;
- *Describe* processes to monitor and evaluate vector control measures and environmental health programmes in emergency situations;
- *State* the impacts of a disaster on society;
- *Develop* contingency plans to minimise food distribution problems in the post-disaster period;
- *Assess* the impacts of disaster on people's income, earning capacity and overall social welfare;
- *Identify* the stages of disaster recovery and associated problems;
- *Identify and list* the most vulnerable groups in disaster and post-disaster times;
- *Describe* briefly how we can reduce the effects of disasters on vulnerable groups.

Timeframe

How long?

The expected total learning time for this course is 90 hours, over one semester, although the duration could be extended depending on the requirements of your institution.

Formal study time would be expected to be about 4 hours per module, or 56 hours in total.

Another 34 hours of self-study time is recommended.

Study skills

As an adult learner your approach to learning will be different to that from your school days: you will choose what you want to study, you will have professional and/or personal motivation for doing so and you will most likely be fitting your study activities around other professional or domestic responsibilities.

Essentially you will be taking control of your learning environment. As a

consequence, you will need to consider performance issues related to time management, goal setting, stress management, etc. Perhaps you will also need to reacquaint yourself in areas such as essay planning, coping with exams and using the web as a learning resource.

Your most significant considerations will be *time* and *space* i.e. the time you dedicate to your learning and the environment in which you engage in that learning.

We recommend that you take time now—before starting your self-study—to familiarize yourself with these issues. There are a number of excellent resources on the web. A few suggested links are:

- http://www.how-to-study.com/

  The "How to study" web site is dedicated to study skills resources. You will find links to study preparation (a list of nine essentials for a good study place), taking notes, strategies for reading text books, using reference sources, test anxiety.

- http://www.ucc.vt.edu/stdysk/stdyhlp.html

  This is the web site of the Virginia Tech, Division of Student Affairs. You will find links to time scheduling (including a "where does time go?" link), a study skill checklist, basic concentration techniques, control of the study environment, note taking, how to read essays for analysis, memory skills ("remembering").

- http://www.howtostudy.org/resources.php

  Another "How to study" web site with useful links to time management, efficient reading, questioning/listening/observing skills, getting the most out of doing ("hands-on" learning), memory building, tips for staying motivated, developing a learning plan.

The above links are our suggestions to start you on your way. At the time of writing these web links were active. If you want to look for more go to www.google.com and type "self-study basics", "self-study tips", "self-study skills" or similar.

Need help?

Help

Is there a course web site address?

What is the course instructor's name? Where can s/he be located (office location and hours, telephone/fax number, e-mail address)?

Is there a teaching assistant for routine enquiries? Where can s/he be located (office location and hours, telephone/fax number, e-mail address)?

Is there a librarian/research assistant available? Where can s/he be located (office location and hours, telephone/fax number, e-mail address)?

Is there a learners' resource centre? Where is it located? What are the opening hours, telephone number, who is the resource centre manager, what is the manager's e-mail address)?

Who do learners contact for technical issues (computer problems, website access, etc.)

Assignments

Assignments

There are seven assignments set for modules 2-7 and module 9 of this course. You will need to spend about two hours on each of these assignments.

[How are the assignments are to be submitted?]

[To whom should the assignments be submitted?]

[What is the schedule for submitting assignments? End of each unit? Specific dates?]

[What is the order of the assignments? Must they be completed in the order in which they are set?]

Self-Assessments

Assessments

There is a self-assessment exercise for each of the 14 modules in this course which you can use to make sure that you have understood the key concepts in this course. You should spend about one hour on each self-assessment exercise.

Are they self-assessments or teacher-marked assessments?

When will the assessments take place?

How long will the assessments be?

How long will learners be allowed to complete the assessment(s)?

How long will it take a teacher to mark the assessment(s)?

Getting around this course manual

Margin icons

While working through this course manual you will notice the frequent use of margin icons. These icons serve to "signpost" a particular piece of text, a new task or change in activity; they have been included to help you to find your way around this course manual.

A complete icon set is shown below. We suggest that you familiarize yourself with the icons and their meaning before starting your study.

Activity	Self-Assessment	Assignment	Case study
Discussion	Group activity	Help	Note it!
Outcomes	Reading	Reflection	Study skills
Summary	Terminology	Time	Tip

Unit 1

Overview of Disaster Management

Introduction

This unit looks at definitions, terminologies, and types of potential hazards (including natural and non-natural disasters); understanding disasters, their causes and implications; and the contents of an effective disaster management plan.

Outcomes

Upon completion of this unit you will be able to:

- *Define and describe* disaster management, hazard, emergency, disaster, vulnerability, and risk.
- *Distinguish* between an emergency and a disaster situation.
- *Identify and describe* the types of natural and non-natural disasters.
- *List and describe* the main hazards to which your region is, or may be, vulnerable.
- *Identify and briefly discuss* implications of disasters on your region and environment.

Terminology

Disaster Management:

Is more than just response and relief (i.e., it assumes a more proactive approach)

Is a systematic process (i.e., is based on the key management principles of *planning*, *organising,* and *leading* which includes *coordinating* and *controlling*)

Aims to reduce the negative impact or consequences of adverse events (i.e., disasters cannot always be prevented, but the adverse effects can be minimised)

Is a system with many components *(these components will be discussed in the other units)*

Hazard:	"Is the potential for a natural or human-caused event to occur with negative consequences" (key words) A hazard can become an emergency; when the emergency moves beyond the control of the population, it becomes a disaster.
Emergency:	"Is a situation generated by the real or imminent occurrence of an event that requires immediate attention" (key words) Paying immediate attention to an event or situation as described above is important as the event/situation can generate negative consequences and escalate into an emergency. The purpose of planning is to minimize those consequences.
Disaster:	"Is a natural or human-caused event which causes intensive negative impacts on people, goods, services and/or the environment, exceeding the affected community's capability to respond" (key words)
Risk:	"Is the probability that loss will occur as the result of an adverse event, given the hazard and the vulnerability" (key words) Risk (R) can be determined as a product of hazard (H) and vulnerability (V). i.e. R = H x V
Vulnerability:	"Is the extent to which a community's structure, services or environment is likely to be damaged or disrupted by the impact of a hazard" (key words)

Types of Vulnerability	Characteristics
Tangible/Material (easy to see; value easily determined)	People – lives, health, security, living conditions Property – services, physical property loss, loss of use Economy – loss of products and production, income Environment – water, soil, air, vegetation, wildlife
Intangible/Abstract (difficult to see; value difficult to determine)	Social structures – family and community relationships Cultural practices – religious and agricultural Cohesion – disruption of normal life Motivation – will to recover; government response

Figure 1: Types of Vulnerability

Vulnerability	Contributing Factors
Poverty	People who are already in a depressed state are less able to recover. Some people are even more vulnerable – pregnant women, children and the disabled.
Population growth	Population has grown dramatically over the past decade
Rapid urbanisation	Growing concentration around the capital. For example, two-thirds of the Samoan population lives in Apia.
Transition in cultural practices	Increase in sub-standard housing in more heavily populated urban areas. Changes in traditional coping mechanisms – declines in self-reliance, food conservation and preservation, warning systems etc.
Environmental degradation	As resources are consumed, vegetation cover removed, water polluted and air fouled, a country is more vulnerable to a disaster.
Lack of awareness and information	When people and government officials are unaware or lack information about disaster management, they fail to take appropriate actions.
Civil Strife and unrest	Resources are consumed, people are in a stressed situation, and transportation is restricted.
Geographical isolation	Island countries are disadvantaged by their relative remoteness, particular their limited access to schools, health and cash.
High disaster impact	Limited economies (tourism, agriculture). Disaster impact can affect an entire economy.
Political uncertainties/instability	Changing government policies, changing personnel in the national focal point, economic weakness all can contribute to an effective national disaster management programme.

Figure 2: Contributing Factors to Vulnerability

Distinguishing between an emergency and a disaster situation

An emergency and a disaster are two different situations:

- An ***emergency*** is a situation in which the community is capable of coping. It is a situation generated by the real or imminent occurrence of an event that requires immediate attention and that requires immediate attention of emergency resources.

- A ***disaster*** is a situation in which the community is incapable of coping. It is a natural or human-caused event which causes intense negative impacts on people, goods, services and/or the environment, exceeding the affected community's capability to respond; therefore the community seeks the assistance of government and international agencies.

Types of natural and non-natural disasters

Disasters are often classified according to their:

a causes – natural vs. human

b speed of onset – sudden vs. slow

An excellent summary of frequently asked questions can be found at the Global Development Research Centre's website (Srinivas, 2005).

A. CAUSES

1 Natural Disasters

These types of disaster naturally occur in proximity to, and pose a threat to, people, structures or economic assets. They are caused by biological, geological, seismic, hydrologic, or meteorological conditions or processes in the natural environment (e.g., cyclones, earthquakes, tsunami, floods, landslides, and volcanic eruptions).

a Cyclones, Hurricanes or Typhoons

Cyclones develop when a warm ocean gives rise to hot air, which in turn creates convectional air currents. Cyclones occur when these conventional air currents are being displaced. The term hurricane/typhoon is a regionally specific name for a "tropical cyclone". In Asia they are called 'typhoons'; in the Indian and Pacific Oceans they are called 'cyclones'; and over the North Atlantic and Caribbean Basin, they are called 'hurricanes'.

Tropical warning procedures:

i Small crafts and fishing boats: approx 25-35mph winds.

ii Wind advisory for the public: approx. 25-35mph winds.

iii *Gale watch:* when a mature tropical cyclone has a significant probability to threaten a part of the country within 48 hours.

iv *Gale force warning:* issued when wind speeds are expected to reach gale force intensity of (34-47knots) within the next 24 hours.

v *Storm watch*: if a post tropical cyclone disturbance is a notable to threat to an area or the entire country within a 24 to 48 hour timeframe, a storm watch statement would be included with the gale warning.

vi *Storm warning:* issued every three (3) hours when the average wind speeds are expected to reach storm force intensity of 48-63 knots within the next 12 to 24 hours.

vii *Cyclone watch:* issued when tropical cyclone winds is expected to reach cyclone force winds of above 63 knots (or 70 mph) in 24 to 48 hours.

viii *Cyclone warning:* issued every three (3) hours, when wind speeds are expected to exceed 63 knots within the next 12 to 24 hours.

b Earthquakes

An earthquake is a trembling or shaking movement of the earth's surface, resulting from plate movements along a fault-plane or as a result of volcanic activity. Earthquakes can strike suddenly, violently, and without warning at any time of the day or night. The following terminologies are associated with earthquakes: *epicentre, fault, magnitude* and *seismic waves*.

For practical purposes, earthquakes are usually defined by their magnitude (or quantitative energy released) which is measured using a logarithm scale of 1 – 10. This logarithm scale is referred to as the *Richter scale*. The magnitude is determined by analysing seismic data obtained from seismometers.

The intensity of an earthquake is measured using the *Modified Mercalli Intensity (MMI) Scale*, which is determined qualitatively by physical observations of the earthquake's impact.

c Tsunami

A tsunami is an ocean wave generated by a submarine earthquake, volcano or landslide. It is also known as a seismic sea wave, and incorrectly as a tidal wave. Storm surges (or *Galu Lolo*) are waves caused by strong winds[1].

The largest earthquake event recorded in Samoa was on 26 June 1917, measuring 8.3 on the Richter scale. The event originated in Tonga (approximately 200km south of Apia) and it triggered a tsunami of four to eight (4-8) metre run-ups in Satupaitea, Savaii. The tsunami arrived less than ten (10) minutes from its point of origin, meaning it travelled at

[1] Tsunami was known in Samoa as a *Galu Afi* but the National Disaster Advisory Committee (DAC) has now adopted SŪNAMI as its Samoan translation.

a speed of more than 1,000km/hr. Hence, when an earthquake occurs, you must heed the tsunami warning, for example, people living in low-lying coastal areas must relocate to higher and safer grounds immediately.

d Floods

This phenomenon occurs when water covers previously dry areas, i.e., when large amounts of water flow from a source such as a river or a broken pipe onto a previously dry area, or when water overflows banks or barriers.

Floods can be environmentally important to local ecosystems. For example, some river floods bring nutrients to soil such as in Egypt where the annual flooding of the Nile River carries nutrients to otherwise dry land. Floods can also have an economic and emotional impact on people, particularly if their property is directly affected. Having a better understanding of what causes flooding can help people to be better prepared and to perhaps minimize or prevent flood damage.

e Landslides

The term landslide refers to the downward movement of masses of rock and soil. Landslides are caused by one or a combination of the following factors: change in slope gradient, increasing the load the land must bear, shocks and vibrations, change in water content, ground water movement, frost action, weathering of shocks, removal or, or changing the type of vegetation covering slopes.

Landslide hazard areas occur where the land has certain characteristics which contribute to the risk of the downhill movement of material. These characteristics include:

i A slope greater than 15 percent.

ii Landslide activity or movement occurred during the last 10,000 years.

iii Stream or wave activity which has caused erosion, undercut a bank or cut into a bank to cause the surrounding land to be unstable.

iv The presence or potential for snow avalanches.

v The presence of an alluvial fan which indicates vulnerability to the flow of debris or sediments.

vi The presence of impermeable soils, such as silt or clay, which are mixed with granular soils such as sand and gravel.

Landslides can also be triggered by other natural hazards such as rains, floods, earthquakes, as well as human-made causes, such as grading, terrain cutting and filling, excessive development, etc. Because the factors affecting landslides can be geophysical or human-made, they can occur in developed areas, undeveloped areas, or any area where the terrain has been altered for roads, houses, utilities, buildings, etc.

2 Human-Made Disasters

These are disasters or emergency situations of which the principal, direct causes are identifiable human actions, deliberate or otherwise. Apart from "technological disasters" this mainly involves situations in which civilian populations suffer casualties, losses of property, basic services and means of livelihood as a result of war, civil strife or other conflicts, or policy implementation. In many cases, people are forced to leave their homes, giving rise to congregations of refugees or externally and/or internally displaced persons as a result of civil strife, an airplane crash, a major fire, oil spill, epidemic, terrorism, etc.

B. SPEED OF ONSET

1 *Sudden onset:* little or no warning, minimal time to prepare. For example, an earthquake, tsunami, cyclone, volcano, etc.

2 *Slow onset:* adverse event slow to develop; first the situation develops; the second level is an emergency; the third level is a disaster. For example, drought, civil strife, epidemic, etc.

The main hazards a region is, or may be vulnerable to, will depend on the geographic location of the country. In Samoa, for example, the main hazards which may turn into disasters are:

- Cyclones
- Earthquakes
- Tsunami
- Flooding
- Landslides
- Epidemics

Implications of disasters on your region and environment

Cyclones have been a frequently occurring disaster in Samoa for the past decade; the impact of each occurrence has been devastating. The following list identifies a few of the unpleasant impacts:

- Infrastructure damage
- Telecommunication loss
- Flooding
- Landslides
- Power disruption

- Water problems
- Agricultural damage
- Loss/damage to housing
- Damage to inland and coastal environments
- Disruption of standard of living, lifestyle, etc.

Unit summary

Summary

This unit sets the scope for what disaster management entails. As an introductory course, the content focuses on definitions and descriptions of terminologies; articulating the concept of disaster management; distinguishing between emergency and disaster situations; identifying and describing the types of natural and human-caused disasters; listing and describing the main hazards your country is vulnerable to; and identifying and briefly describing the implications disasters can have on people and the environment.

Self-Assessment

Self-Assessment

1 Define the following:
   - *i* (a) Disaster management;
   - *ii* (b) Hazard;
   - *iii* (c) Emergency;
   - *iv* (d) Disaster;
   - *v* e) Vulnerability; and
   - *vi* (f) Risk
2 Differentiate between an emergency and a disaster situation
3 Identify and describe three natural disasters which you are familiar with; identify and describe three man-made disasters you have learnt about.
4 List and describe one main hazard to which your country is vulnerable to.
5 Identify and briefly discuss one adverse impact that a particular disaster has left behind on your lifestyle and environment

References

Srinivas, H. (2005) *Disasters: a quick FAQ.* Accessed on 24/01/08 at: http://www.gdrc.org/uem/disasters/1-what_is.html

Unit 2

Disaster Management Cycle – Phase I: Mitigation

Introduction

Disaster management is an enormous task. They are not confined to any particular location, neither do they disappear as quickly as they appear. Therefore, it is imperative that there is proper management to optimize efficiency of planning and response. Due to limited resources, collaborative efforts at the governmental, private and community levels are necessary. This level of collaboration requires a coordinated and organized effort to mitigate against, prepare for, respond to, and recover from emergencies and their effects in the shortest possible time.

Outcomes

Upon completion of this unit you will be able to:

- *Define* the various phases of the disaster management cycle.
- *Explain* the importance of disaster mitigation.
- *Describe* how disaster management can be integrated into public policy.
- *Explain* how planning and design of infrastructure should take into account the vulnerability of the communities.

Terminology

Disaster management cycle:	A cycle with phases that reduce or prevent disasters
Mitigation:	Reducing or minimizing an impact of a hazard or disaster.
Risk management:	Consists of identifying threats (hazards likely to occur), determining their probability of occurrence, estimating what the impact of the threat might be to the communities at risk, determining measures that can reduce the risk, and taking action to reduce the threat.
Vulnerability:	A condition wherein human settlements, buildings, agriculture, or human health are exposed to a

disaster by virtue of their construction or proximity to hazardous terrain.

Disaster Management Cycle

Disaster management is a cyclical process; the end of one phase is the beginning of another (see diagram below), although one phase of the cycle does not necessarily have to be completed in order for the next to take place. Often several phases are taking place concurrently. Timely decision making during each phase results in greater preparedness, better warnings, reduced vulnerability and/or the prevention of future disasters. The complete disaster management cycle includes the shaping of public policies and plans that either addresses the causes of disasters or mitigates their effects on people, property, and infrastructure.

The mitigation and preparedness phases occur as improvements are made in anticipation of an event. By embracing development, a community's ability to mitigate against and prepare for a disaster is improved. As the event unfolds, disaster managers become involved in the immediate response and long-term recovery phases.

The diagram below shows the Disaster Management Cycle.

Figure 3: Disaster Management Cycle

Mitigation: Measures put in place to minimize the results from a disaster. Examples: building codes and zoning; vulnerability analyses; public education.

Preparedness: Planning how to respond. Examples: preparedness plans; emergency exercises/training; warning systems.

Response: Initial actions taken as the event takes place. It involves efforts to minimize the hazards created by a disaster. Examples: evacuation; search and rescue; emergency relief.

Recovery: Returning the community to normal. Ideally, the affected area should be put in a condition equal to or better than it was before the disaster took place. Examples: temporary housing; grants; medical care.

An excellent source of more information can be found in the Global Development Research Centre's article, "The Disaster Management Cycle" (Warfield, 2005)

Disaster Mitigation

Mitigation refers to all actions taken before a disaster to reduce its impacts, including preparedness and long-term risk reduction measures. Mitigation activities fall broadly into two categories:

1 Structural mitigation – construction projects which reduce economic and social impacts

2 Non-structural activities – policies and practices which raise awareness of hazards or encourage developments to reduce the impact of disasters.

Mitigation includes reviewing building codes; vulnerability analysis updates; zoning and land-use management and planning; reviewing of building use regulations and safety codes; and implementing preventative health measures. (World Development Report, 1998) Mitigation can also involve educating businesses and the public on simple measures they can take to reduce loss or injury, for instance fastening bookshelves, water heaters, and filing cabinets to walls to keep them from falling during earthquakes. Ideally, these preventative measures and public education programmes will occur before the disaster.

From time to time some mitigation requirements may be outside of the scope of the disaster manager, however, this does not lessen the role to be played by mitigation. On the contrary, it is the responsibility of the emergency manager to avail him or herself with the requisite information to engage community involvement.

The primary focus of disaster management is to prevent disasters wherever possible or to mitigate those which are inevitable. Four sets of tools that could be used to prevent or mitigate disasters include:

a Hazard management and vulnerability reduction

b Economic diversification

c Political intervention and commitment

d Public awareness

The first two apply exclusively to disasters caused by natural phenomena while the latter are used to mitigate any other hazards.

Mitigation strategies

Two aspects of mitigation include:

1 Hazard identification and vulnerability analysis and

2 Various mitigation strategies or measures.

These are discussed in greater detail below.

Hazard identification and vulnerability analysis

A hazard can cause the full range of natural disasters, major man-made incidents, and resource crises that become the concern of the entire community, not just emergency management personnel. The ideal is for communities to be prepared at all times for all types of hazards. In practical terms however, this is not possible. Preparedness for one hazard or disaster may increase your risk to another. For example, structures designed to withstand hurricane force winds may incur or cause greater damage if there is an earthquake. The more logical solution would be to adapt best practices as much as possible for the most likely scenario.

But what about the hazards associated with our 21st-century lifestyle such as chemical spills, ecological disasters, explosions, major transportation accidents? Mitigation involves addressing both natural and man-made hazards, different as they are in many respects. A crucial first step in mitigation is deciding which hazards have the greatest potential to affect your jurisdiction.

The most critical part of implementing a mitigation strategy is a full understanding of the nature of the threat as the hazards faced vary between locations and from hazard to hazard. Some countries are prone to floods and drought; others have histories of tropical storm damage; and others are at risk from earthquakes. Most countries are prone to at least some combination of hazards and all face the possibility of technological disasters as industrial development progresses. The effects these hazards are likely to have and their potential damage is dependent on the risks, the people, their livelihoods and the existing infrastructure. For any particular location, therefore, it is critical to know which hazards are the most likely.

Furthermore, targeting mitigation efforts relies heavily on correctly assessing vulnerability – see tables in Unit 1. Vulnerability assessment can also be extended to social groups or economic sectors: People who rent houses rely on a landlord to repair any damage and are more likely to be rendered homeless in the event of a disaster. Correctly identifying the groups of tenants and establishing rights of tenure and landlords' obligations to repair may reduce the number of people rendered homeless in the event of a disaster. Similarly, food growers sending their produce to market through a single mountain pass will be unable to sell their

produce if the pass is blocked. Developing an alternative route to market will reduce disruption of the agricultural sector. Thus, building or constructing a number of routes is very important because in a time of disaster it will be easier for the affected group or community to employ alternatives.

Mitigation strategies or measures

- Adjusting normal development programmes to reduce losses. For instance, varieties of crops that are more wind, flood or drought resistant can often be introduced in areas prone to floods, drought and cyclones.

- Economic diversification. In areas where the principal or sole source of the income may be threatened, attempts should be made to diversify the economy and introduce the economic activities that are less vulnerable. Diversification is extremely important where economies are dependent on a single cash crop.

- Developing disaster resistant economic activities. Some economic activities are relatively unaffected by disasters. For instance, situating warehouses in flood plains may be more appropriate than manufacturing plants in the same location. Coconut palms could be more suitable than other fruit trees in cyclone-prone coastal areas. Efforts should be made to identify and encourage the development of enterprises that are less vulnerable to the hazards.

An excellent overview on disaster mitigation can be found in one of the FEMA emergency management training modules – see the Reference List at the end of this unit.

Disaster Mitigation and Infrastructure

Investment in infrastructure for the management of hydrological hazards – such as cyclones and floods – has significantly reduced the loss of life from an annual average of 100,000 persons during the past 50 years to 41,000 persons during the past 15 years. Investment in disaster management infrastructure falls into two categories:

1 Investment in infrastructure to support sustainable socioeconomic development; and

2 Investment in infrastructure for reconstruction and recovery.

Source: ESCAP, 1995. Asian and the Pacific Report on Natural Hazards and Natural Disaster Reduction.

Considerations

a Operations

To maintain operations during a disaster, ensure that a backup generator is available in case of power failure and that a battery-operated radio is at hand as well as a back-up supply of critical goods/needs – a continuous supply if at all possible.

b Critical Information and Communication

Ensure that there is a backup copy of all critical information – namely employee data, customer list, production formulas, a list of software and hardware and logon and passwords – in an accessible yet safe place; regularly update the backup copy of all files.

c Insurance

Ensure that all critical assets, including business interruption are insured and be aware of the content of the insurance policy.

d Infrastructure planning

For most infrastructure projects, natural hazard mitigation should be addressed during the conceptual development of the project. The preliminary design should take into consideration the prevalent hazards and methods to avoid or to minimize the effects of the extreme natural events. These factors include:

- Situating the facility to avoid flooding, soil erosion, exposure to high winds and unstable soils, and to minimize exposure to storm surge and high waves for harbours, docking facilities and coastal buildings;

- Designing the shape of the buildings and structural systems to minimize effects of high winds and earthquake effects, tornados, and, in the case of protection works, to avoid unwanted effects such as beach erosion, accretion, or negative impact on coral reefs and wetlands;

- Construction materials that are corrosion resistant and of appropriate durability and strength.

Furthermore, targeting mitigation efforts relies heavily on correctly assessing vulnerability. Vulnerability assessment can also be extended to social groups or economic sectors: People who rent houses rely on a landlord to repair any damage and are more likely to be rendered homeless in the event of a disaster. Correctly identifying the groups of tenants and establishing rights of tenure and landlords' obligations to repair may reduce the number of people rendered homeless in the event of a disaster. Similarly, food growers sending their produce to market through a single mountain pass will be unable to sell their produce if the pass is blocked. Developing an alternative route to market will reduce disruption of the agricultural sector. Thus, building or constructing number of routes is very important because in a time of disaster it will be easier for the effected group or community to employ alternatives.

e Mitigation Activities at Home

Homes can be destroyed by high winds. Flying debris can break windows and doors, allowing high winds and rain into your house. High winds can also cause weaker places in your home to crumble. Strengthening vulnerable areas such as roofs, exterior doors, windows, and garage doors; clearing debris from possibly affected areas; and building a safe room in your home can all contribute to personal mitigation strategies. It is also very important to encourage people to learn more about other protective measures that fall within the purview of their local building code.

Additionally, in areas that are prone to strong winds, there is a need for a number of other measures to be considered such as engineering structures to withstand wind forces; including wind load requirements in building codes; planting windbreaks; planning forestry areas upwind of towns; and the provision of wind-safety buildings, for example providing strong village halls for community shelter in vulnerable settlements.

Disaster and Development

Disasters and development are closely linked in that disasters can both destroy development initiatives and create development opportunities and that development schemes can both increase and decrease vulnerability.

The prevailing attitude has been that disasters, especially natural ones, were an act of nature and as such were beyond human control; accepting death and damage to property was part of the costs. With such an attitude, most development plans were designed without consideration for the effect disasters would have on community plans and vice versa. When a disaster did occur, the response was directed at meeting emergency needs and cleaning up. Now it is realized that much more can and need to be done to reduce the severity of hazards and disasters.

A growing body of knowledge on the relationships between disasters and development indicates four basic themes as follows:

3 Disasters set back development programming, destroying years of development initiatives.

4 Rebuilding after a disaster provides significant opportunities to initiate development programmes.

5 Development programmes can increase an area's susceptibility to disasters.

6 Development programmes can be designed to decrease the susceptibility to disasters and their negative consequences.

Decision-makers who ignore these relationships between disasters and development do a disservice to their people, who place their trust in them. Increasingly forward-thinking Ministries of Planning and Finance, with

support from the United Nations and other non-governmental officials, are assessing development projects in the context of disaster mitigation. Projects are thus being designed to include disaster recovery programmes and with long term development needs in mind.

Development requires institutional and structural transformations of societies to speed up economic growth, reduce levels of inequality, and eradicate absolute poverty. Over time, the effects of disasters can seriously degrade a country's long-term potential for sustained development and cause governments to substantially modify their economic development priorities and programmes.

At the same time, disasters often provide opportunities for development. They can improve the atmosphere in favour of change and create a rationale to establish development programmes such as job training, housing construction and land reform. However, poor management of the relief and rehabilitation responses may have severe negative implications for development for years to come, and may even increase vulnerability to future hazards.

The impact of disasters on development programmes

Disasters can significantly impede the effectiveness of development resource allocation. The damage is done in many ways and the impacts can be as complex as the economy itself. It is for specific reasons that practitioners explore the issues of lost resources to determine what will no longer be available to the country after a disaster such as assessing the effects of programme interruptions and the switching of crucial resources to other, shorter-term needs as disasters often change the political, economic and social conditions within a country. There will also be a need to consider the negative impacts on investment climates (of the now declared disaster zone) to determine what opportunities will be left to attract local and international investment capital to the area or country that has been devastated by the disaster. And lastly, in what state will the disruption of the non-formal sector leave the disaster area in terms of citizens proceeding with their lives in ways closest to conditions before the disaster. This non-formal sector may involve the way private citizens conduct business in their lives after the disaster.

Vulnerabilities caused by development

Lack of access to education and information often has wider implications and local people may be simply unaware of the options open to them in reducing their vulnerability. Poor people, for example, have fewer assets to invest in resources which may reduce their vulnerability; they may also be unwilling to make any significant investment without clear and obvious benefits. Poor people are also less likely to be in a position to organize collectively to reduce common risks, partially because these groups are usually have a higher proportion of women, young children, elderly people, the sick and disabled. Furthermore, after a disaster, the

effects of malnutrition and chronic illness put people at additional risk. Although in aggregate terms development will usually contribute to a reduction in vulnerability to natural disasters, any development activity may substantially increase particular types of vulnerability. Illustrations of such development activities are as follows:

- Urban development often leads to an influx of low-income groups such as large-scale settlements on marginal land or in high densities with poor quality housing. Buildings may be situated on earthquake faults, in flash-flood zones, or on slopes prone to landslides.

- Marine and coastal zone development leads to concentrations of populations exposed to possible storm-surges, high winds, flash floods, and landslide risks. Tourist development can increase potential vulnerability substantially when low-lying beach areas are targets for infrastructure and capital investments. Tsunamis and tropical storms can quickly destroy these improvements as well as placing tourists and workers at substantial risk to death and injury.

- Construction of transportation lines and poorly managed forestry programmes will often lead to deforestation and increased risks of landslides.

- Water resource management projects, including dams and irrigation schemes, potentially increase risks to large populations, either by displacing natural habitats, increasing risks of severe flooding, or by increasing the risk of dam failure.

- Investment in poorly controlled hazardous industries may lead to concentrations of population around the plant; increases in air and water pollution; and exposure to hazards from both chronic and catastrophic release of toxic materials.

- Livestock development projects can lead to severe loss of vegetation cover and conditions of near-desertification around specific natural points such as wells.

- Agricultural projects promoting cash crops may reduce the production of staple foods.

Each of these examples illustrates the importance of including risk assessment as an integral part of programme planning and evaluation, and highlights the critical importance of training and education in these areas.

Development programmes can decrease vulnerability

The term mitigation is increasingly applied to measures which reduce economic losses, as well as those which reduce death and injury. The distinction between the two types of mitigation is as follows:

Structural mitigation includes measures to reduce the economic and social impact of hazardous agents and involve construction programmes, especially dams, windbreaks, terracing and hazard resistant buildings.

Non-structural mitigation is most commonly used to refer to policies and practices, including land-use policies, zoning, crop diversification, building codes, and procedures for forecasting and warning. In a broader context, non-structural mitigation can also include education, awareness, environmental understanding, community organization, and empowerment strategies.

Mitigation is most effective as part of a medium- to long-term development programme which incorporates hazard-reduction measures into regular investment projects. Under these conditions risks can be assessed analytically and explicitly in the context of national planning and investment programme reviews. The cost effectiveness of specific emergency preparedness measures and hazard reduction activities can be assessed. There are opportunities to build links between government and international organizations involved in relief and recovery and to provide opportunities for investment institutions to help governments gain access to new developments in hazard-reduction technologies. In regular investment project design and sector loans, attention can be given to early warning systems and other elements of emergency preparedness through financial or technical assistance.

Using development programmes to decrease vulnerability should increasingly be incorporated into every level of programme and project preparation and review within UNDP country programming as well as other financial and technical assistance projects. Structured review procedures should require that the disaster implications of new projects be explicitly taken into consideration.

There is a wide range of options for incorporating mitigation measures into regular development programmes. Each of the following examples suggests ways of protecting populations and critical economic assets against hazards and of reducing the overall impact of a disaster.

1 Strengthening urban utility systems and industrial support infrastructures is a common aim of development projects. This is achieved through a variety of external inputs including loans, technical assistance, and support for institutional development. "Lifeline systems" – such as water, electric power, transportation links and communications – can be made more effective as well as more selectively resistant to particular hazards.

2 Many other opportunities exist to incorporate hazard resistant building techniques in housing and other construction programmes. These opportunities are usually specific to the type of housing used in the region and the nature of local hazards. Such measures can substantially reduce injuries and deaths from earthquakes and tropical storms. Additionally, these programmes can protect high value economic resources, reducing the total costs of damage and improving the chances of more rapid recovery. On a wider scale, the application of building codes, associated training programmes, and more extensive use of zoning regulations in urban development reduce the risk for the local population, and the likelihood of damage to industrial facilities. Improved drainage systems and flood protection measures can further protect people and facilities in hazardous areas.

3 Investments in improving administration and strengthening the resource-base of public institutions will have a general positive impact on the effectiveness of preparedness arrangements, emergency responses and the quality of longer-term recovery planning. Training programmes in general, and especially those with a management or technical focus, can be expected to improve the implementation of mitigation and response measures.

4 Agricultural and forestry programmes provide a range of opportunities for mitigation. Reforestation programmes reduce risks of erosion, landslides and flash flooding. Changes in cropping patterns can also ameliorate erosion problems and losses due to floods and drought. The introduction of pest-resistant crops can reduce the economic and other impacts of infestations. Programmes for soil conservation, water harvesting and improving on-farm storage can mitigate the effects of drought.

Each of these examples represents an opportunity for mitigation. Each also requires investment of scarce resources.

According to USAID***:***

- The operation must be directed at restoring assets or productivity in a long-term development perspective - not relief.
- The prospective economic returns should be high.
- The effects of the emergency should be significant.
- The event triggering the emergency should have a low probability of happening again soon.
- The need for an urgent response should be evident.
- Emergency lending is limited to cases where effective action can be felt in two to three years.
- There should be some prospect for future reduction in the hazard.

Developing a draft country-level disaster and development policy

Outlined below is a policy framework for bilateral foreign aid based on an example from USAID. The framework highlights three areas of concern for development initiatives for countries faced with disasters. These areas are as follows:

a *Partnership:*

Development cannot be unilaterally mandated and implemented. The success, or lack thereof, of development initiatives requires close collaboration among donors, governments, communities, nongovernmental organizations, the private sector, and universities. Partnerships build ownership and capacity and achieve significant results

through joint efforts, based on comparative advantage and common objectives.

b Flexibility:

Local conditions for development vary widely and can change rapidly – for better or worse. Development agencies must be efficient and flexible; adaptable to local environments and capable of adjusting to changing conditions and seizing opportunities when they arise.

c Selectivity:

Development resources are limited relative to the world's needs. They are a public asset that must be invested prudently to achieve maximum impact. Assistance allocations among countries should be based on three criteria: need; the foreign policy interests of the country supplying the aid (e.g., the United States); and the commitment of a country and its leadership to reform. At the country level, resources should be invested where they have maximum impact in achieving priority strategic objectives.

Given the scope of the degradation to infrastructures, human and social systems, political and economical that a country can suffer from disasters to its development, no private individual or company will have the resources to take disaster preventative steps to manage its developmental growth. Therefore, the government of a country is to develop policies that will steer disaster prevention that will lead to sustainable development in the long term. Experts in the field of disaster and development policy recommend that the following action must be taken by government at the national, regional and local levels. The effect of disasters should be counteracted using policies aimed at sustaining development. If development polices are developed adequately, they can achieve the following:

- Permit governments to define rehabilitation and reconstruction methods in response and recovery in the disaster management cycle.
- Set standards to manage public and private resources and their distribution for recovery by disaster victims
- Back local laws and regulations, interagency cooperation and collaboration to benefits sustain the development.
- Provide for local communities to access resources for recovery that sustains development.
- Design risk reduction strategies for communities such as early warning measures.
- Allow government officials to use of hazard vulnerability mapping information to control relocation.
- Enforce land elevation and set procedures for compliance with zoning laws and regulations.

- Provide for the development of land preservation in danger zones.

- Establish the framework for disaster assistance in the form of loans and public assistance for immediate recovery.

- Set out procedures for land use including maintaining natural mangrove for storm surge protection.

Quarantelli (1997) claimed that "policies can be established and steps can be taken that will reduce and weaken some negative effects of the probable catastrophic disasters of the future." The policies mentioned above can reduce the catastrophic impact that disasters place on development initiatives, particularly in very poor countries.

Unit summary

Summary

The disaster management cycle – a continuous process – includes mitigation, preparedness, response, and recovery.

Mitigation refers to those measures and policies put in place to reduce the impacts of a disaster. The process involves hazard identification, vulnerability analysis, putting in place the right infrastructure and ensuring up-to-date logistics. Proper education and public awareness are useful tools to engage community involvement.

Disasters and developments are closely related. Disaster can both destroy development initiatives and create development opportunities. Development schemes can both increase and decrease vulnerability. Thus, links between disaster and development must be taken into account for sustainable socio-economic development.

Effective mitigation programmes incorporate risk reduction measures in regular investment projects. Financial institutions require that foreign aid be approved on the basis of appropriate risk reduction and mitigation policies at the national, regional and local scale developments.

Assignment

Assignment

Are there any official policy measures or a legal framework to mitigate disaster in your country?

Self-Assessment

Assessment

1 With the help of a diagram, explain the disaster management cycle.

2 Define mitigation?

3 List some of the practical things that you would do to secure your house against the threat of hurricane/ tornados.

4 Development can either increase or decrease the vulnerability of the community. True or False?

References

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Unit 3

Disaster Management Cycle – Phase II: Preparedness

Introduction

The goal of emergency preparedness programmes is to achieve a satisfactory level of readiness to respond to any emergency situation through programmes that strengthen the technical and managerial capacity of governments, organizations, and communities. These measures can be described as logistical readiness to deal with disasters and can be enhanced by having response mechanisms and procedures, rehearsals, developing long-term and short-term strategies, public education and building early warning systems. Preparedness can also take the form of ensuring that strategic reserves of food, equipment, water, medicines and other essentials are maintained in cases of national or local catastrophes.

During the preparedness phase, governments, organizations, and individuals develop plans to save lives, minimize disaster damage, and enhance disaster response operations. Preparedness measures include:

- Preparedness plans
- Emergency exercises/training
- Warning systems
- Emergency communications systems
- Evacuations plans and training
- Resource inventories
- Emergency personnel/contact lists
- Mutual aid agreements
- Public information/education

As with mitigation efforts, preparedness actions depend on the incorporation of appropriate measures in national and regional development plans.

Outcomes

Upon completion of this unit you will be able to:

- *Describe* disaster preparedness.
- *Explain* the importance of preparedness in disaster management.
- *List* the four important levels at which all disaster preparedness activities must take place.
- *Explain* the importance of disaster risk reduction.
- *Develop and write* an emergency operations plan (EOP).

Terminology

Emergency preparedness:	Actions taken before the onset of a disaster so that a government can successfully discharge its emergency management responsibilities, such as establishing authorities and responsibilities for emergency actions and garnering the resources to support them.
Logistical readiness:	A satisfactory state of readiness to mobilize resources in the most efficient and effective manner in order to minimize losses as a result of a disaster.
Memorandum of Understanding:	A legal document outlining the terms and details of an agreement between parties, including each party's requirements and responsibilities
Response mechanism:	The means by which disaster relief is coordinated and mobilized from governmental and non-governmental organisations to helpless victims of a disaster.

Disaster Preparedness

Disaster preparedness is defined as a continuous and integrated process involving a wide range of activities and resources from multi-sectoral sources. *(Disaster Preparedness Training Programme; International Federation of Red Cross and Red Crescent Societies, IFRCRCS, 2005)*. In order that disaster preparedness is undertaken with rewarding outcomes, those involved in the process must approach it from a mitigative, response, recovery and business continuity perspective. That is, when considering disaster preparedness the phases of emergency management must be looked at carefully.

Disaster mitigation policies and measures will not stop a disaster especially a natural one from occurring and persisting. What mitigation policies and measures seek to do is reduce vulnerability to, or increase resilience to, the effects of the inevitable disasters to which a country is prone.

Basically disaster mitigation and preparedness go hand in hand. Disaster preparedness for example includes implementation of mitigation measures to ensure that existing infrastructure can withstand the forces of disasters or that people can respond in their communities and at the same time protect themselves. The collective capabilities of the country, people, and the government to deal with extreme hazards or adversities when they occur are measures of their cumulative preparedness. In local circumstances and because of historical proneness to disasters, mitigation is important, but preparedness is doubly important.

Disaster preparedness involves the preparation of people and essential service providers in their communities for the actions that they will take in case of disasters. If this is the case, consideration must be given to the manner in which the formal responders (Police and Fire Services, Emergency Medical Services personnel and the Military) prepare to respond to disasters. For example, the personnel in these response agencies may have to learn the use of new equipment, treatment methods for diseases or providing services to prevent the escalation of the effects of disasters that will further destroy lives and devastate property.

The International Federation of Red Cross and Red Crescent Societies (IFRCRCS, 2005) states that disaster preparedness requires global, national, community and individual inputs. Disaster preparedness incorporates all activities that will enhance the efficiency, effectiveness and impact of disaster emergency response mechanisms in the local community and throughout the country. The following are of particular importance:

- Develop and test warning systems regularly and plan measures to be taken during a disaster alert period to minimize potential loss of life and physical damage.
- Educate and train officials and the population at risk to respond to the disaster.
- Train first-aid and emergency response teams.
- Establish emergency response policies, standards, organizational arrangements and operational plans to be followed by emergency workers and other response entities after a disaster.

Others feel that disaster preparedness should be one that is particularly “community-based” through national or international efforts that will provide for strengthening community-based disaster preparedness through educating, preparing and supporting local populations and communities in their everyday efforts to reduce risks and prepare their own local response mechanisms to address disaster emergency situations.

Disaster Risk Reduction (DRR)

Natural hazards need not be natural disasters. Preventive action is possible, especially when advance knowledge of the nature and occurrence of such hazards are available to the general public.

Human vulnerability is the relative lack of capacity of a person or community to anticipate, cope with, resist and recover from the impact of a hazard. Factors that increase human vulnerability to disasters include rapid urbanization, population growth, and lack of knowledge about how to effectively resist the effects of disasters and poverty. Of all the factors, poverty is perhaps at the root of what makes most people vulnerable to the impact of most hazards. An understanding of human vulnerability provides us with an understanding of the significance of what physical measures should be naturally favoured in the various circumstances. Disaster Risk Reduction (DRR) forms the pillar of disaster preparedness, that is, it forms the action plan to be implemented before, during and after disasters. So, what is risk reduction? The IFRCRCS defines risk reduction as physical measures to reduce the vulnerability and exposure of infrastructure to natural hazards as well and to provide coping and adaptive infrastructure in case of a disaster event.

Some DRR recommendations for countries which do not have a robust disaster preparedness plan are:

- Policy, planning and capacity building in disaster management
- Physical prevention; example, building sea-walls against storm surge or flood shelters during flood events
- Capacity building at institutional and systemic level in disaster preparedness

The above policy and planning of physical measures designed to reduce risks will have far reaching socio-economic and environmental benefits that will keep the country functioning at all levels; for example the continued provision of food, potable water and health care and at the same time there will be less damage to infrastructure.

Examples of DRR measures that countries can adopt into their planning and policy are listed below:

- Proper planning to mitigate flooding in flood prone areas and alternate infrastructure for the provision of food and potable water.
- Provision of raised flood shelters as those constructed in Bangladesh.
- The improvement of water supply systems in rural areas to provide sufficient potable water supply during floods or droughts.
- The construction and use of drainage pumps as an example of strengthening the capacity to cope with floods.

- Enhance community-based disaster preparedness by focusing more on the roles of women.
- Improve wireless communication that is robust and integrated with both electronic and manual system.
- Train farmers to diversify food crops as a strategy to survive in the event of disaster.
- Set up a Memorandum of Understanding (MOU) locally and internationally to provide for the acquisition of resources which can be depleted by disaster and or become scarce.

Further information can be found in the UN Disaster Management Training Programme's publication, "Building Capacity for Risk Reduction" (1997).

The Emergency Operation Plan (EOP)

At the national level, an Emergency Operation Plan (EOP) needs to be established to set out the scope of activities required for community preparedness and response. It must declare what the community can realistically do. The EOP allows the community to respond to threats and engages responders in the short-term recovery and must be flexible to be valuable in real and potential emergencies. EOPs are general and do not include the administrative plan, the mitigation strategy, the long term recovery or the Standard Operational procedures. Those areas of disaster management are contained in separate documents.

Developing and Writing the EOP

Within existing organizational structures the EOP works to ensure things are done systematically. Existing legislation and other memorandum of agreement forms the backbone of what the EOP aims to do. Basically, the EOP consists of a promulgation/broadcast statement signed by the Chief Executive Officer authorizing the Plan; description of the planning process, abstract of contents, implementation; table of contents; instructions about the use of the Plan; purpose of its sections, and its distribution.

For more information on EOPs, see "FEMA Document, Unit 4 -- Preparedness". Some organisations call this a "Preparedness Plan" – see the excellent "UN Disaster Management Training Programme".

1 Structure of the EOP

The EOP is specific in its layout as follows:

i Statement of Purpose – This is what the Plan seeks to achieve for citizens.

ii Situation and assumptions – Statements of the emergency events, actual and potential, and describe the warning methods and any situations that may be peculiar/unusual to the community.

iii Organization and assignment of responsibilities – Dealing specifically with how the jurisdiction will assign the emergency functions to carry out the Plan by roles of local officials in the emergency management structure.

iv Concept of operations – This section describes the roles and relationships of government agencies, the private sector and how they interact with each other.

v Administration and logistics – The management of resources, general support requirements, and availability of services and support for all phases of emergency management and the policies set up to make these activities occur.

vi Plan development and maintenance – This involve activities to keep the plan current and reflect changes that result from actual experiences in emergency management, changing emergency situations and assumptions, and modifications in the community's profile.

vii Authorities and references – These authorities and references apply to those statutes, executive orders, regulations, and formal agreements that pertain to any type of emergency.

viii Definition of terms – This provides for a common understanding of the terms that will use in communication, directing and control in disasters.

2 Functional Annexes

An EOP is incomplete if it does not contain functional annexes that provide specific information and direction on operations and the roles and responsibilities to be performed by responders. General terminologies are included in the annexes along with the identification of actions that not only ensure effective response, but also aid in preparing responders for emergencies and disasters.

EOPs address matters such as direction and control (who is in charge); communications (information exchange); early warning (warning to the public); public information (orders of evacuation, mass care, health and medical services and resource management). The EOP includes considerations for other functions to be performed such as damage assessment, search and rescue, emergency services, aviation operations, transportation and other miscellaneous services that are necessary to manage a disaster.

3 Exercising the EOP

EOPs are tested by having response agencies exercise them. The exercises carried out involve preparatory training that helps orient staff to the procedures that they may be required to know, to function during a disaster. Another way of testing an EOP is a table-top exercise that mainly focuses on responders' familiarization with their roles and responsibilities in the emergency management system. In the tabletops

responders sit around a table and talk their way through scenarios to complete exercises.

As familiarity is gained with contents of the EOP, more involved exercises are conducted such as functional drills which take place in an enclosed setting arranged to look like an Emergency Operations Centre (EOC). They involve complex simulations using verbal and written communication, telephone and radio messaging. Scenarios for the exercises comprise messages like real events to which the players respond. Near-to-real exercises called field drill are conducted where players perform the work order in some of the specialized facilities present, such as the EOC and the communications centre. Finally, there is the full-scale exercise which combines a functional exercise with a field drill. In such an exercise, all players respond to the emergency with equipment and support as in a real situation. Civilian participation is sometimes used to simulate injured victims.

4 Publicizing the Plan

Completed EOPs are published and made public to communities and through the use of public awareness programmes. In this case they serve to increase awareness of citizens to emergencies or disasters. Information about the EOP can be obtained from the local news media, government offices, community talk groups and hand outs and brochures.

5 Resource inventories

The EOP requires considerable resources such as people, equipment, systems and supplies to use in its operations. These resources are needed for emergency response and at the same time, the social comfort of personnel working there for long hours during disasters. Allocation of resources needed to deploy the Plan come from the government, the community and the private sector. Resource assessments are frequently needed to identify weaknesses, strengths and needs.

Mainstreaming Child Protection and Gender in Emergency Planning

It is high time that women take an active role when designing mitigating plans and activities so that appropriate gender issues are mainstreamed. Women are not always well-represented in decision-making. Experts agree that involving women broadens the range of ideas proposed for and incorporated into disaster planning initiatives and results in plans that are more disaster-resilient.

Gender mainstreaming in disaster preparedness, relief and construction include mapping of existing forms and sources of gender discrimination in each context while making disaster preparedness plans. It is also necessary to involve community based women's organizations of marginalized groups in preparedness, relief and reconstruction planning and pressing for accountability in implementation.

Besides, by offering children the opportunity to participate more fully in disaster situations, we cease to be interpreters of their needs and thoughts,

and instead begin to accompany them in the design of actions and adequate strategies that strengthen their capacity to reflect, contribute, and lead their own development processes. This in turn increases the possibilities of sustainable educational processes on disasters and their prevention. It also contributes to the democratization process through the formation of young leaders with a vision and knowledge of development.

Further information can be found in "Children in Disasters, A report for Plan UK, 2002".

This sub topic is addressed in more detail in *Unit 14 – Vulnerable Groups in Disasters.*

Unit summary

Summary

This unit looks at emergency preparedness as part of disaster mitigation. History has shown that hazards, especially natural ones, cannot be stopped but what history has also shown is that the more prepared people are to a hazard, the more likely that the hazard does not become a disaster. Preparedness is defined and activities to achieve this are outlined. The unit also provides recommendations for disaster risk reduction (DRR) in countries where disaster management is deficient. The Emergency Operation Plan (EOP) and its importance are discussed and issues relevant to child protection and gender are mentioned.

Assignment

Assignment

Write a two (2) page report on the disaster preparedness process/plan in your country, if any. If none exists, discuss the need for one and how it could be developed.

Self-Assessment

Assessment

1 What are the four levels of input needed for disaster preparedness?

2 Why is crop diversification recommended as a disaster preparedness method?

3 Why are gender issues important in the disaster preparedness plans?

4 What is the relationship between preparedness and mitigation?

5 List one DRR measure which would be appropriate for your region in each of the three categories recommended for countries which are developing their disaster preparedness plans.

Solutions:

1 Global, national, community and individual levels.

2 Different crops possess varying degrees of resistance to damage from different disasters. By diversifying crops instead of relying on just one, a farmer will have the resistant crops to depend on despite the destruction of the susceptible ones. For example, taro *(Colocasia esculenta var. esculenta)* is more resistant to floods while yam *(Discorea spp.)* is more resistant to cyclones.

3 Gender issues are important and must be included in all plans of the disaster management cycle to make it more effective and efficient. For instance, the inclusion of women in the formulation of plans may result in more relevant and speedier delivery of relief responses to affected children given their natural proximity to them.

4 Mitigation and preparedness work together. Mitigation aims to reduce vulnerability to disasters such as building cyclone resistant houses. Preparedness is the whole country's readiness to deal with a disaster, including the implementation of mitigation measures. Preparedness is broader and includes issues such as the training and management of people and stockpiling food at strategic locations.

5 The three categories referred to are: Policies and planning, physical prevention projects, and capability building.

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Unit 4

Disaster Management Cycle – Phases III and IV: Response and Recovery

Introduction

Disaster response is the sum total of actions taken by people and institutions in the face of disaster. These actions commence with the warning of an oncoming threatening event or with the event itself if it occurs without warning. The focus in the response and recovery phases of the disaster management cycle is on meeting the basic needs of the people until more permanent and sustainable solutions can be found.

Developmental considerations contribute to all aspects of the disaster management cycle. One of the main goals of disaster management, and one of its strongest links with development, is the promotion of sustainable livelihoods and their protection and recovery during disasters and emergencies. Where this goal is achieved, people have a greater capacity to deal with disasters and their recovery is more rapid and long lasting. In a development oriented disaster management approach, the objectives are to reduce hazards, prevent disasters, and prepare for emergencies.

Outcomes

Upon completion of this unit you will be able to:

- *Define* disaster response and recovery.
- *State* the aims of disaster response.
- *Explain* typical disaster response activities.
- *Explain* the difference between modern and traditional response.
- *Give* examples of modern methods.
- *Explain* activities of disaster recovery.

Terminology

Development:	A step or stage in growth or advancement in society, economics or in politics for a better lifestyle.
Evacuation:	Removal from hazardous place to another that is safe.
Humanitarian	The act of promoting the welfare of humanity, especially through the elimination of pain and suffering.
Logistics	The branch of civil defence or agency that have to do with procuring, maintaining, and transporting materiel, personnel, and facilities
Recovery:	The return of buildings and infrastructure to a normal or improved state after a setback or loss.
Relief:	Private or public help in the form of money, food, clothing, shelter, or medicine, provided to people who are temporarily suffering from the effects of disaster and are at the time completely helpless.
Remittance:	Sending of money to pay for resources or services to help people in need after a disaster.
Reconstruction:	A community or structure that has been reorganized, reformed, or restored after being impacted by a disaster or other hazard.
Rehabilitation:	To restore buildings, or parts of towns, to their former condition or better.
Response:	Actions taken in reaction to a disaster or similar hazards.
Security:	Safety measures that provide a sense of protection against loss or harm from disaster or uncertain circumstances.
Volunteerism:	The practice of using volunteer workers, especially in community service or disaster organizations and programmes.
Warning:	Advice given to somebody or persons to be careful of impending danger.

Disaster Response

The aim of emergency response is to provide immediate assistance to maintain life, improve health, and to support the morale of the affected population. Such assistance may range from providing specific but limited aid, such as assisting refugees with transportation, temporary shelter, and food, to establishing semi-permanent settlement in camps and other locations. It also may involve initial repairs to damaged infrastructure. The focus in the response phase is on meeting the basic needs of the people until more permanent and sustainable solutions can be found. Humanitarian organizations are often strongly present in this phase of the disaster management cycle.

During a disaster, humanitarian agencies are often called upon to deal with immediate response and recovery. To be able to respond effectively, these agencies must have experienced leaders, trained personnel, adequate transportation and logistic support, appropriate communications, and guidelines for working in emergencies. If the necessary preparations have not been made, the humanitarian agencies will not be able to meet the immediate needs of the people.

This section identifies the principal activities of disaster response. Each activity is (formally or informally) governed by a set of policies and procedures, typically under the auspices of a lead agency. In the end, disaster response activities are implemented by multiple government organizations, international and national agencies, local entities and individuals, each with their roles and responsibilities.

Aims of disaster response

The overall aims of disaster response are:

- To ensure the survival of the maximum possible number of victims, keeping them in the best possible health in the circumstances.
- To re-establish self-sufficiency and essential services as quickly as possible for all population groups, with special attention to those whose needs are greatest: the most vulnerable and underprivileged.
- To repair or replace damaged infrastructure and regenerate viable economic activities. To do this in a manner that contributes to long-term development goals and reduces vulnerability to any future recurrence of potentially damaging hazards.
- In situations of civil or international conflict, the aim is to protect and assist the civilian population, in close collaboration with the International Committee of the Red Cross (ICRC) and in compliance with international conventions.
- In cases involving population displacements (due to any type of disaster) the aim is to find durable solutions as quickly as possible, while ensuring protection and assistance as necessary in the meantime.

Disaster Response Activities

The following are typical activities of emergency response:

1 Warning

Warning refers to information concerning the nature of the danger and imminent disaster threats. Warnings must be rapidly disseminated to government officials, institutions and the population at large in the areas at immediate risk so that appropriate actions may be taken, namely, either to evacuate or secure property and prevent further damage. The warning could be disseminated via radio, television, the written press, telephone system and cell phone.

2 Evacuation and migration

Evacuation involves the relocation of a population from zones at risk of an imminent disaster to a safer location. The primary concern is the protection of life of the community and immediate treatment of those who may be injured.

Evacuation is most commonly associated with tropical storms but is also a frequent requirement with technological or industrial hazards. For evacuation to work there must be:

- A timely and accurate warning system,
- Clear identification of escape routes,
- An established policy that requires everyone to evacuate when an order is given,
- A public education programme to make the community aware of the plan.

In the case of a slow onset of a disaster, for example severe drought, the movement of people from the zone where they are at risk to a safer site is not, in fact, evacuation, but crisis-induced migration. This movement is usually not organized and coordinated by authorities but is a spontaneous response to the perception by the migrants that food and/or security can be obtained elsewhere.

3 Search and rescue (SAR)

Search and rescue (SAR) is the process of identifying the location of disaster victims that may be trapped or isolated and bringing them to safety and medical attention. In the aftermath of tropical storms and floods, SAR usually includes locating stranded flood victims, who may be threatened by rising water, and either bringing them to safety or providing them with food and first aid until they can be evacuated or returned to their homes. In the aftermath of earthquakes, SAR normally focuses on locating people who are trapped and/ or injured in collapsed buildings.

4 Post-disaster assessment

The primary objective of assessment is to provide a clear, concise picture of the post-disaster situation, to identify relief needs and to develop strategies for recovery. It determines options for humanitarian assistance, how best to utilize existing resources, or to develop requests for further assistance.

5 Response and relief

When a disaster has occurred response and relief have to take place immediately; there can be no delays. It is therefore important to have contingency plans in place.

Relief is the provision on a humanitarian basis of material aid and emergency medical care necessary to save and preserve human lives. It also enables families to meet their basic needs for medical and health care, shelter, clothing, water, and food (including the means to prepare food). Relief supplies or services are typically provided, free of charge, in the days and weeks immediately following a sudden disaster. In the case of deteriorating slow-onset emergency situations and population displacements (refugees, internally and externally displaced people), emergency relief may be needed for extended periods.

6 Logistics and supply

The delivery of emergency relief will require logistical facilities and capacity. A well-organized supply service is crucial for handling the procurement or receipt, storage, and dispatch of relief supplies for distribution to disaster victims.

7 Communication and information management

All of the above activities are dependent on communication. There are two aspects to communications in disasters. One is the equipment that is essential for information flow, such as radios, telephones and their supporting systems of repeaters, satellites, and transmission lines. The other is information management: the protocol of knowing who communicates what information to whom, what priority is given to it, and how it is disseminated and interpreted.

8 Survivor response and coping

In the rush to plan and execute a relief operation it is easy to overlook the real needs and resources of the survivors. The assessment must take into account existing social coping mechanisms that negate the need to bring in outside assistance. On the other hand, disaster survivors may have new and special needs for social services to help adjust to the trauma and disruption caused by the disaster. Participation in the disaster response process by individuals to community organizations is critical to healthy recovery. Through these appropriate coping mechanisms will be most successfully developed.

9 Security

Security is not always a priority issue after a sudden onset of disasters. It is typically handled by civil defence or police departments. However, the protection of the human rights and safety of displaced populations and

refugees can be of paramount importance requiring international monitoring.

10 Emergency operations management

None of the above activities can be implemented without some degree of emergency operations management. Policies and procedures for management requirements need to be established well in advance of the disaster.

11 Rehabilitation

Rehabilitation consists of actions taken in the aftermath of a disaster to enable basic services to resume functioning, assist victims' self-help efforts to repair dwellings and community facilities, and to facilitate the revival of economic activities (including agriculture). Rehabilitation focuses on enabling the affected populations (families and local communities) to resume more-or-less normal (pre-disaster) patterns of life. It may be considered as a transitional phase between (i) immediate relief and (ii) more major, long-term reconstruction and the pursuit of ongoing development.

12 Reconstruction

Reconstruction is the permanent construction or replacement of severely damaged physical structures, the full restoration of all services and local infrastructure, and the revitalization of the economy (including agriculture). Reconstruction must be fully integrated into ongoing long-term development plans, taking account of future disaster risks. It must also consider the possibilities of reducing those risks by the incorporation of appropriate mitigation measures. Damaged structures and services may not necessarily be restored in their previous form or locations. It may include the replacement of any temporary arrangements established as a part of the emergency response or rehabilitation. Under conditions of conflict, however, rehabilitation and reconstruction may not be feasible. For obvious reasons of safety and security, activities in rehabilitation and reconstruction may need to wait until peace allows them.

Modern and traditional responses to disasters

The responses to disasters may employ a mix of approaches from traditional to modern with these approaches moving back and forth depending on the nature of disaster in term of their scope. The scope of disasters has influenced responses in the following ways:

- Humanitarian (aid to relieve pain and suffering),
- Remittance (Cash sent to victims),
- Relief assistance (food, medication, tents),
- Networking (contacting organizations),

- Volunteerism (internal and external groups of people volunteering help or community- based approach) and

- Mutual aid agreements (pre-drawn up agreements to provide resources)

As disasters continue to occur, people affected by them sometimes need external assistance in order to survive and recover. Response can be either modern or traditional to the extent that assistance is transferred to individuals in the disaster. The assistance can either be provided in-kind, in the form of food aid, shelter materials, seeds or blankets, or it can be provided in cash, enabling people to decide for themselves what they most need, and to buy in local markets.

A striking means of response to disasters has been remittances where people residing outside the disaster area channel sums of money or goods over long distances to those affected. The terms used to describe this response are most commonly understood to refer to transfers between migrants and their places of origin.

In many countries the community-based approach to emergency response has been the Community Emergency Response Team (CERT), organized in communities to work closely with the local government and the community members themselves to identify community needs and priorities for any disaster situation.

Other examples of response are:

Local Partnerships: One charitable organization, (World Vision) has a rich network of local partnerships with churches, community organizations and government agencies that come to us when families in their community suffer a disaster. Local police precincts and politicians' offices often call on World Vision to assist them after an emergency.

Gifts-in-Kind: Charitable organisations actively solicit corporate partners to donate needed new products to assist disaster survivors in their recovery and supervise the distribution of these products. Their goal is for every Storehouse to have a constant supply of emergency resources to be distributed at a moment's notice. Products will include such things as water, blankets, medical supplies, latex gloves, and kits containing enough hygiene and paper products, and other necessities to supply a family of four for up to four days.

Civil Service: World Vision as one of the charitable organisations works to be a voice in the community by serving on planning committees such as National and State Volunteer Organizations Active in Disasters (VOAD), Office of Emergency Management (OEM), FEMA, Red Cross, Salvation Army and Habitat for Humanity (H4H). These relationships allow organisations to serve as a liaison to the community and be a voice for the children and families they serve.

Specific Needs: In the aftermath of an emergency, families have many needs. Because of the large variety of donations that are received and distributed, World Vision is able to meet these special needs. New clothes, shoes, furniture, mattresses, school supplies, building materials and

cleaning supplies are only a few of the unique offerings that it is able to offer.

Modern methods of disaster response

New technologies can be very useful and powerful tool in disaster response, namely:

1 Cell phones: cell phones as warning devices can be very useful. Short messages can be sent to recipients warning of imminent threat of tropical storms, wind storms or any severe weather likely to cause damage.

2 Spatial information – use of satellite imagery. The emergency management community is keenly aware of the potential of mapping technologies such as geographic information systems (GIS), remote sensing (satellite imagery), and global positioning systems (GPS) in support of emergency response operations.

   Increasingly, geographic technologies are being utilized for hazard mitigation as well as response efforts. These range from damage assessments mapping the event and affected areas to search and rescue, risk assessment, risk perception (Hodgson and Palm, 1992), and risk communication (Hodgson and Cutter 2001). There is more information on the role of technology for managing disasters in *Unit 8*.

3 Social media and social networking – social media and social networking can be used as a tool to emergency response communications. Text messaging such as Twitter and the social networking system such as Face book can be used as a channel of communication in disaster response.

   Examples of suggested applications of social media and social networking include:

   - Use blogs to rapidly publicize the need for assistance grants.
   - Create geo-tagged photo groups to document damage.
   - Publicize volunteers willing to share recovery-relevant expertise.
   - Use map-based mashups (combinations of data in webpages) to display relevant local information.
   - Immediately share “lessons learned.”
   - Integrate volunteer directories with social networks to simplify information sharing.
   - Distribute weather information via methods that support geographic targeting.
   - Encourage sharing of resource information among corporations that will most likely be involved in recovery work.
   - Use the assistance application process as basis for voluntary sharing of information among affected populations.

Disaster Recovery

As the emergency is brought under control, the affected population is capable of undertaking a growing number of activities aimed at restoring their lives and the infrastructure that supports them. There is no distinct point at which immediate relief changes into recovery and then into long-term sustainable development. There will be many opportunities during the recovery period to enhance prevention and increase preparedness, thus reducing vulnerability. Ideally, there should be a smooth transition from recovery to on-going development.

Recovery activities continue until all systems return to normal or better. Recovery measures, both short and long term, include returning vital life-support systems to minimum operating standards; temporary housing; public information; health and safety education; reconstruction; counselling programmes; and economic impact studies. Information resources and services include data collection related to rebuilding, and documentation of lessons learned. Additionally, there may be a need to provide food and shelter for those displaced by the disaster.

Recovery activities are classified as short-term and long-term.

During response, emergency action was taken to restore vital functions while carrying out protective measures against further damage or injury.

a Short-term recovery is immediate and tends to overlap with response. The authorities restore interrupted utility services, clear roads, and either fix or demolish severely damaged buildings. Additionally, there may be a need to provide food and shelter for those displaced by the disaster. Although called short-term, some of these activities may last for weeks

b Long-term recovery may involve some of the same activities, but it may continue for a number of months, sometimes years, depending on the severity and extent of the damage sustained. For example, it may include the complete redevelopment of damaged areas. The goal is for the community to return to a state that is even better than before the emergency.

This is an ideal time to implement new mitigation measures so that the community is better prepared to deal with future threats and does not leave itself vulnerable to the same setbacks as before. Helping the community to take new mitigation steps is one of the most important roles during the recovery phase.

The Recovery Plan

The recovery process should be understood clearly and it is important to have a general plan for recovery which should be appended to emergency operation plans.

The primary purpose of the plan is to spell out the major steps for managing successful recovery. For each step you will also designate key

partners and their roles and steps to mobilize them. The plan should have at least the following seven steps:

1 Gathering basic information

2 Organizing recovery

3 Mobilizing resources for recovery

4 Administering recovery

5 Regulating recovery

6 Coordinating recovery activities

7 Evaluating recovery

For the majority of disasters, local communities are able to provide the assistance needed for recovery. However, for a major disaster, it may be necessary to obtain assistance from the government and other sources. Therefore, preparations must be made to request outside aid if a major disaster occurs. This will mean informing and convincing decision makers, especially those outside the affected area. Documenting the effects of the disaster is the best way to carry this out.

Documentation involves providing evidence of what happened. Photographs of the damage provide irrefutable evidence. Take pictures of the damage, the repair work, and completed restorations. You cannot take too many pictures.

There can be a good documentation if the following five simple steps are followed:

1 Take pictures of damages and repairs. More is better than too little. Private citizens may have excellent shots to supplement your own.

2 Take notes on damages and repairs. Again, more is better than too little. If there is too much to write at one time, dictate your notes into a tape recorder for later transcription.

3 Clip and file newspaper reports and stories. If you can get video footage from the television stations, do that also.

4 Record all expenditures carefully and keep all receipts and invoices.

5 Make sure anyone acting on behalf of the jurisdiction does the same.

Disasters as opportunities for development initiatives

Disasters can be a vehicle for major development programmes. The political impact of damage and disruption can be a real catalyst for change. Disaster inspired development initiatives are influenced in a number of ways, but two aspects are especially important. First, disasters can highlight particular areas of vulnerability, for example where serious loss of life has occurred, or where the economic damage is disproportionate to the strength of the impact. The outcome of this is usually to highlight the general level of underdevelopment. Second, for a few weeks or months, the political environment may favour a much higher

rate of economic and social change than before, in areas such as land reform, new job training, housing improvements, and restructuring of the economic base (note however that this may involve a transfer of resources from other areas and sectors). The value of direct international assistance given after disasters may partially compensate for economic losses, although the amounts are usually rather small in relation to the total loss.

There may also be longer-term benefits from a drastic restructuring of the economy as a result of a disaster. For example, small island economies which were previously dependent on a single crop may expand their economic base, often with international assistance. The extent to which development opportunities can be followed up after a disaster will usually be constrained or otherwise influenced by donor investment policy for emergency loans. It is illustrative to review the current World Bank criteria for emergency lending for post-disaster investment. (Stephenson and DuFranc, 2002)

Unit summary

Summary

Unit 4 provides information on disaster response and recovery likely to be made by institutions or agencies and residents during the management of disasters. The focus of the disaster response is shown to be the survival and medical assistance to disaster victims in a timely fashion to save lives. Disaster response is a sub-division of disaster management that takes into consideration acts of recovery and self-sufficiency; reconstruction and rehabilitation that can be carried out in the short and long term in the best interest of people involved before, during and after disasters.

Mitigative strategies such as evacuation, early warning, search and rescue have been methods of disaster response aimed at reducing the impact of disasters on people. They have been highlighted with the view to show the importance of their use in disaster management. Relationships between the disaster response and resources, security and communication in disaster management are highlighted to demonstrate the ways that people cope and survive disasters.

The modern versus traditional methods of responding to disasters are described to show distinctions and commonalities between the methods of humanitarian, remittance, networking, volunteerism and mutual aid agreements that disaster responders may choose to use, depending on the scope and magnitude of disasters experience by communities and the resource assessment made.

Assignment

Assignment

Research the disaster management response and recovery components of the disaster plan in your country. You are expected to discuss with appropriate resource people to answer this assignment.

Self-Assessment

Assessment

1. Protection of life and treatment of persons are reasons for evacuation. True or False
2. The traditional response to disaster can in some cases contribute to the modern method. True or False
3. Reconstructions after a disaster should be carried out so that they are better than before a disaster. True or False
4. Recovery measures are short term only. True or False.

Solutions:

1 True

2 True

3 True

4 False

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Unit 5

Education and Public Awareness – Part I: Community-based Initiatives

Introduction

Every country is at the risk of exposure to some type of disaster, whether natural or man-made. In order for each country to prepare for any kind of disaster, it must inform its citizens about the different types of disasters. The local residents must also be aware of how they can effectively participate in preparing for a disaster, mitigating potential impacts of a disaster and the recovery process after a disaster.

One of the most effective mechanisms for a country to prepare for a disaster is by conducting education and public awareness programmes at the local community level. Public awareness in disaster management is a process of educating and empowering the population through sharing knowledge and information about the various types of disasters and their potential risks as widely as possible so that people act appropriately when a disaster happens.

Outcomes

Upon completion of this unit you will be able to:

- *State and explain* the importance of the Community-Based Approach to Education and Public Awareness.
- *Identify* the different stakeholders involved in the Community-based Approach.
- *Categorise* the stakeholders according to their roles and responsibilities.
- *Identify and explain* the different methods that can be used to assist communities in reducing disaster risks.
- *Describe* how a community-based action plan for disaster management can be implemented actively.
- *Identify and compare* the advantages and disadvantages of the Community-based Approach.

Terminology

Public awareness:	the process of transmitting information to the general population to increase their levels of consciousness about disaster risks so they can prepare appropriately to cope with a disaster
Community-based approach:	a method of education and public awareness in disaster management in which community members are involved in the planning and implementation of the awareness programmes
Hazard Map:	a map which shows areas that are vulnerable to particular hazards such earthquakes, cyclones, flooding, volcanic activity
Community Disaster Management Organisation :	a national organisation which ensures that planned activities for disaster management are implemented within a given timeframe

Rationale for a Community-Based Approach

All governments are responsible for protecting their citizens and endorsing the 2005 Hyogo Declaration which states that: "strengthening community level capacities to reduce disaster risk at the local level is especially needed, considering that appropriate disaster reduction measures at that level enable the communities and individuals to reduce significantly their vulnerability to hazards."

Members of a community are the immediate victims of adverse effects of a disaster. They have the best knowledge about their local surrounding in terms of the most disaster-prone areas, the demography of their community and their social and traditional organisation. It is important that they have the capacity to cope with the impacts of a disaster and are involved in the development of disaster management activities right from the initial planning stages. Community participation can also make them more confident in their capabilities to act in the event of a disaster leading to a self-reliant community (Newport & Jawahar, 2003).

Every community has members who can be ignorant of events around them especially when these events do not affect them directly or more frequently. This type of attitude can also be gradually changed by involving members of the local community in decision-making processes such as planning national disaster management plans or even designing awareness programmes. This bottom-up, participatory approach can make community members more receptive of new knowledge and information presented to them. Local residents who speak or understand their native language only may be hesitant to accept non-native people conducting education and awareness programmes for them.

Stakeholders' Roles and Responsibilities

An effective and successful community-based approach in reducing disaster risks is often attributed to the spontaneous participation and involvement of the following stakeholders:

- Government
- Non-governments (NGOs)
- Regional and International Organisations/Donor Agencies
- Island council (Local government)
- National/Local Organisations (women committees, youth groups, schools, etc)
- Community workers
- Trainers
- Disaster Managers (Local and National)
- Policy Makers
- Grass-roots people
- Religious Denominations

There is a need for coordination in the Community-Based Approach among all the stakeholders. The parameters for participation by each of the stakeholders need to be clearly outlined at the national level to avoid overlap and confusion. The focus for all of the stakeholders should be the local people, who are at risk of being potential victims and who should also assume responsibility in managing that risk. The stakeholders must:

- develop a strong governance framework through legislation and policies;
- mainstream disaster risk management and capacity building into decision making, the budget process, and sector, provincial and community development plans;
- strengthen, empower and support local and national structures; and
- understand and recognize that disaster management and disaster risk reduction are environmental, humanitarian and developmental issues, so there is a need to coordinate the implementation, monitoring and evaluation of the approach.

Categories of stakeholders

Government

To have an effective and sustainable impact on the community-based disaster programmes, policy makers should consider incorporating community- based disaster programmes into their drafting of appropriate acts and regulations in order to implement them effectively. The governments have a prime responsibility for managing disasters and for taking into consideration the roles taken by different people in the community in terms of developing and providing approaches and strategic actions which can be used to manage the consequences of disaster within the community. Community-based disaster initiatives produce results so long as there is also government support.

Non Government Organisations (NGOs)

NGOs are the appropriate organisations to conduct community-based disaster activities at the different communities and with different stakeholders. They consist of professionals, activists and grass-roots people who have wide networks which facilitate their capacity in programme development.

Regional and International Organisations / Donor Agencies

Selected donor agencies, regional and international organisations assist the communities in terms of initiating the community-based disaster programmes and providing financial assistance and sometimes resource people for the programmes.

Island Councils / Local Government

The most common elements of the community-based disaster involvement are partnership, participation, empowerment and ownership by the local people. Thus, it is the responsibility of the local government and/or island council to ensure there is an effective partnership in place, plus participation, empowerment and ownership by local people in their communities towards disaster reducing initiatives and programmes.

Community Workers

Community workers are the most reliable arms of the local government/island council in the implementation stage of the disaster policy and reduction initiatives. They have experience in handling disasters, hazards, emotional problems and coping mechanism and uncertainties. They assist the local government/island council in establishing a strong cooperation and understanding among diverse stakeholders including the local government, local NGOs, government, regional and international organisations. If this cooperation is effective, every person involved in all community-based disaster programmes is benefited, but the actual ownership still remains with the concerned community. This will be considered as a successful model for sustainable community-based disaster recovery, especially when the regional and

international agencies leave. The community workers should also know that the timing of any activity is important. Therefore their responsibility is to make sure the timeframe of any community-based disaster reduction activity is followed otherwise the involvement of the people in the community will be reduced.

National/Local Organisations

National and local organisations such as women's committees, youth groups, schools, religious groups, etc. should consider adapting the community-based disaster initiatives provided by the government, regional and international organisations as part of their overall disaster risks management. They are the main bodies in the community that can assist in the implementation of the community-based disaster programmes effectively.

National and Local Disaster Managers

Disaster Managers are the disaster professionals and technical people in the national government, who are responsible for the implementation of the disaster management initiatives of the country. Since the communities are important parts of the national government, these disaster professionals and managers should be aware that the key aspect of community-based disaster initiatives is its sustainability. Therefore, it is the trainers, local managers and/or national managers' roles and responsibilities to train people in the community to understand the basic community-based disaster mitigation practices. While people in the community should own the problems, consequences, challenges of disaster mitigations and preparedness initiatives, it is still necessary for the trainers, local disaster managers and /or national disaster managers to take people's involvement further by training them to be aware of disaster policy and strategy. One of the roles and responsibilities is to empower all concerned stakeholders through awareness training to involve them in decision making. They work together with local government on the development of schemes to ensure the sustainability of disaster initiatives is always in place at the individual, community and island levels. They are responsible for the implementation of local disaster management initiatives. These include island, city, province, department officers and practitioners.

Trainers

Trainers provide training to the community leaders and agents. Through the facilitation process, the trainers provide awareness training which includes activities that aim at assessing the people's capacity and vulnerability in relation to community-based disaster happenings. Trainers' responsibility is also to develop and provide proposals about possible awareness activities aimed at the improving the assessed capacity and decreasing the vulnerability rate of the community residents. The other important responsibility for the trainers is to make sure that their training content is visible within the community and through the daily contacts with the residents. Training is a very important channel for the community, and ensuring that the whole community can better react to future disaster happenings.

Policy Makers

The policy makers are the ministers, permanent secretaries of the ministries and heads of the national disaster management units. There are also policy makers at the local government level, including island council presidents, city mayors and local politicians who prepare the island and/or city policies.

Grass-roots people

People at the grass-roots should understand their own disaster risks and be well versed in taking actions against such risks.

Methods of Dissemination

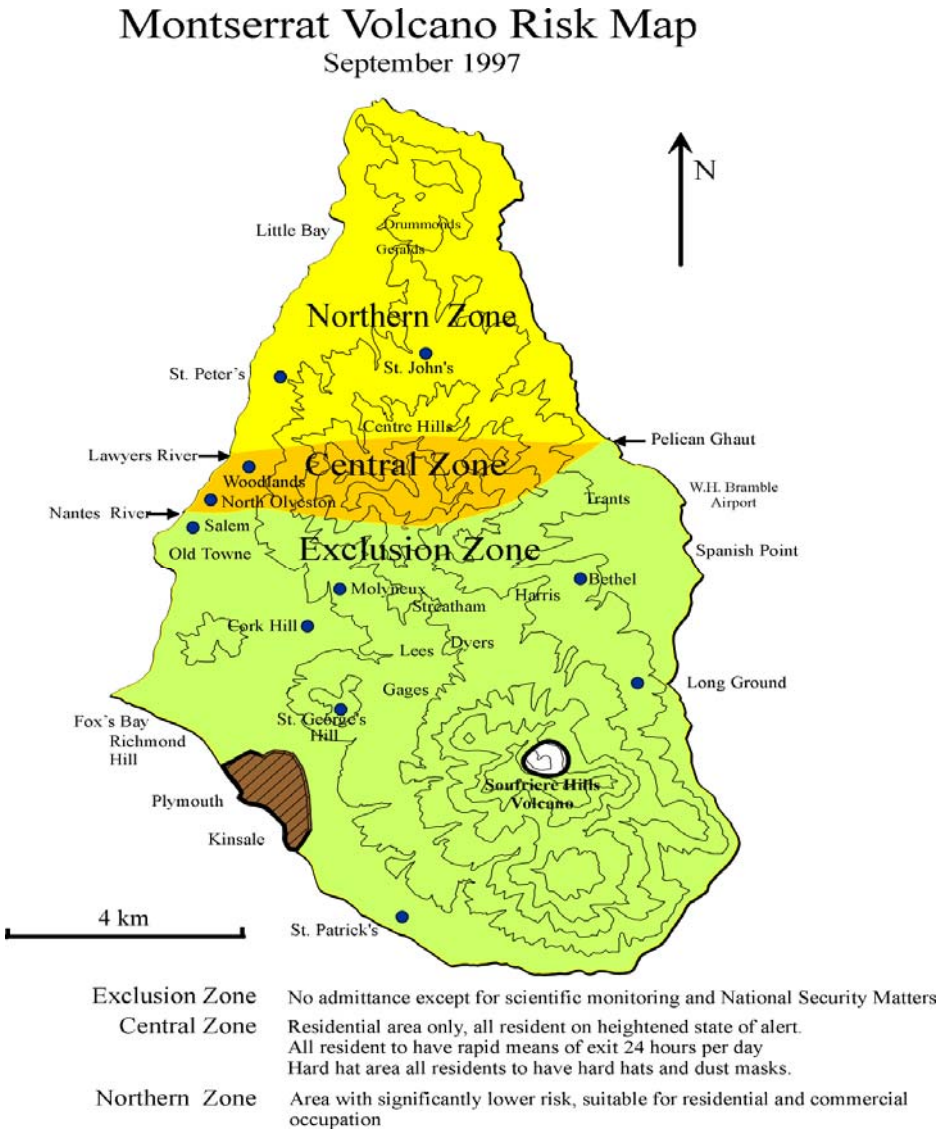
The methods of dissemination that can be utilized in the Community-Based Approach are varied and depend entirely on the needs of the community and the resources available on hand. As you go through this section, you may think of other methods more relevant or applicable for use in your community. This section focuses on the most common methods that can be utilized in almost any community.

The use of audiovisuals is one method of creating awareness and education at the community-based level. Audiovisuals typically used in developing countries are print based because of the unavailability of more highly advanced technically based mediums of delivery (e.g. television or the internet). Discussed here are the used of hazard maps and posters. The use of community theatre or drama is another method of communicating messages to the community on disaster preparedness and response.

The Simple Hazard Map

A common visual aid utilized in the Community Based Approach is the Simple Hazard Map. It is basically a map of the local community which points out safe escape routes and safe refuges as a guide to where people can run and where they can gather if there is a hazard event (Disaster! 94). Simple hazard maps generally map out areas of risk and lead to action to reduce risk in those areas. It enables people to take the correct escape routes and gather at safe places when disaster strikes. It helps save many lives, homes and belongings which would otherwise be lost in a disaster.

You must also be aware that there is another kind of a hazard map which is more detailed than the simple hazard map. This is the complex hazard map. The complex hazard map is not discussed here because it is used at a level higher than the community level by trained planners and disaster managers.



Source:
http://www.juicygeography.co.uk/downloads/Montserrat%20resources/montserrat%20MVO%20risk%20map%201997.doc

Figure 4: Simple Hazard Map

Posters and Videos

Posters and leaflets on natural, technical and manmade disasters and their impacts can be produced and distributed or put up on community notice boards. The production and viewing of videos on past disasters can also be shown to communities to highlight important issues in preparation for or in response to disaster.

Community Theatre (Drama)

A different but exciting method used in the dissemination of information that you may have heard of is community theatre. The delight of theatre groups to dramatize disaster management awareness message is a medium that is very powerful. During the awareness meetings a mobile travelling theatre group or a local group can highlight the event with classical important messages. This is also a highly effective means of creating awareness in developing countries as the majority of people often have no access to newspapers and television. Local theatre groups therefore provide entertainment for the local community to which they belong and simultaneously present issues that directly affect the people as themes for their drama. Community theatre groups from a disaster prone area can produce drama relevant to the kind of disaster their community is prone to. People watching the drama are not only entertained but also gain a great deal of information and are made more aware of preparedness for and prevention of disaster in their community.

Informal Training

The Community Based Approach to Education and Awareness in Disaster Management also uses informal training as an efficient tool to prepare communities in the event that disaster strikes. This training takes place not only outside of the formal curriculum but often even outside the setting of a formal learning or training institution. Informal training is sponsored by the government, NGOs or other donor funding agencies. It targets community leaders and covers important information for people in disaster prone communities.

The existing government and the local structures should form the basis for the facilitation and implementing of the awareness training programme, progress and process. It is imperative that whole process of awareness is mainstreamed across sectors. The integration and involvement of disaster management is everybody's business but the crucial focus should be within the communities. There should be a gradual shift from disaster response to disaster management. The awareness training based in the communities is geared towards supporting them to understand and manage their hazard to reduce and mitigate their risks. The responsibilities should not only rest on the communities as such but that the public and private sectors should cooperate and be partners to discourage risk contributing activities and factors.

Workshops

Workshops are excellent examples of informal training provided to the community. A week long workshop facilitated by experts in disaster management for community leaders covers enough information, examples, activities and discussion to adequately prepare them in the event that disaster strikes. In this situation, the Education Officers, teachers and schools will be involved within their own structure. The Government Officers which includes education staff, in the divisions form teams to organize the workshops to the communities. You see then that the dissemination of knowledge and awareness to community leaders is in turn transferred to other members of the community. This is done by gathering all the members of the community at a communal meeting place

(e.g. a community hall, church or other traditional meeting place) and imparting this information to the rest of the community. In so doing, the community at large is then aware and better prepared to cope in the event that disaster strikes in their community.

Mass Campaigns

The mass campaign is a huge undertaking whereby the entire Islands, countries and international donor agencies will be participating. The governments, the donor funding agencies, the non-government organizations (NGOs), the communities and other possible stakeholders need to cooperate fully by pooling resources. The outcomes must meet the objectives of the process so the planning of the entire operation is crucial.

- Church groups, meetings and gathering are also effective avenues to inform and advice their congregation to further the impact disaster have on and the importance of awareness messages of preparedness, response and recovery

- Women's groups: It is imperative that women's group should also play a leading role in the dissemination of information amongst their structures either within church women's organization or Ministry and Department responsible for Woman's Affairs and other sub women's groups.

- Youth Groups. Youth holds the future of disaster management in their hands. They are resourceful people who need guidance to display leadership skills to be spearheading the implementation stage.

Mock Exercises

Another kind of informal training given at the community level is the use of mock exercises in reducing disaster risks. Community leaders from high risk communities are encouraged to organize occasional mock exercises so as to familiarize their communities with escape routes, safe areas to gather, etc.

The Community Based Action Plan

Community leaders can also create Community Based Action Plans specific to their needs. This action plan incorporates the hazard map, mock exercises and other important methods, skills and information needed in preparation for a disaster. The implementation of a community-based action plan involves a long process. The following describes how a community-based action plan (referred to here as a 'disaster management plan') can be actively implemented.

Implementation Actions

Through participatory planning a Disaster Management Plan can be formulated. In most cases it may include a few small scale activities whereas in other communities it may entail a comprehensive disaster management project. To oversee and monitor progress of implemented activities, there is a need for the establishment of a central management body. This body or organization will have numerous roles from planning, implementation, monitoring and review phases of planned activities.

Such a body or organization may differ from country to country or community to community and may have different names but its roles and responsibilities are essentially the same. For the purpose of this course this central management body will be referred to as the Community Disaster Management Organization (CDMO) and its primary role is to ensure the planned activities are implemented on time within the given resources.

The success of activities of the disaster management plan will depend on the successful operation of the CDMO and will include various tasks and processes e.g. tasking, mobilizing community resources, capacity building, monitoring and review and making necessary adjustments.

Tasking

The CDMO should be responsible for setting up appropriate committees to implement the various necessary risk reduction measures such as risk communication, health, evacuation, early warning, agricultural etc. The CDMO should ensure that committees responsible for risk reduction measure are clear on the roles assigned to them and each has access to individuals and groups with necessary skills and expertise to implement the tasks assigned to them.

To ensure that these activities can be carried out, the CDMO could mobilize the broader community and its resources. The CDMO should also assign at least one person to carry out each of the following roles

- Leadership role – have overall responsibility for activities of the committee
- Management role – ensure implementation of agreed activities
- Administrative role – assist in management
- Technical role – provides inputs
- Financial management role – provides proper accounting
- Social mobilization – to mobilize community resources

Capacity Building

To implement their respective tasks it is imperative that responsible individuals and committee members have the technical capability. Without capacity building, the quality of risk reduction measures will be compromised.

Depending on the local situation and the existence or non existence of a CDMO, capacity building can be done either before the start of participatory risk assessment and planning or during the implementation process. The CDMO once formed can get assistance from partner NGOs and government organizations or ministries.

Mobilising Resources

During the participatory disaster risk assessment and planning stages is when resource mobilization commences. To ensure the availability of resources at all times it should continue through to the implementation phase. Should there be a lack of required technical skills within the community, it is the responsibility of the CDMO to mobilize external partners and stakeholders e.g. relevant government departments and ministries, NGOs and local business organizations to meet the needs. It should also involve mobilization of resources to build capacity of the CDMO members and committees and mobilization of appropriate range of resources e.g. human, physical/material, natural and financial.

Monitoring

It should be a vital role of the CDMO to arrange participatory monitoring activities in order to track progress on implementation of the risk reduction measures. This includes monitoring of progress on activities, time frames, budgets, indicators, outputs and objectives and the impact of risk reduction measures. The CDMO should also monitor those who would be negatively affected and those who have dropped out and if so find out why. All stakeholders should be involved in the participatory monitoring system to ensure their particular needs are met in relation to what they would like to monitor, how and when data can be collected. This monitoring system will involve data collection, review meeting and reporting. It is essential that periodical review of the progress being achieved in the implementation of risk reduction measures.

Periodical reviews of progress should include all stakeholders and depending on the duration of the project reviews could be weekly, fortnightly, monthly etc. The requirements of the disaster reduction plan and concerns of stakeholders should be addressed. Reports from all implementing individuals and groups should be presented during this review. In addition to participatory review activities written reports can be used to monitor and document progress and these reports can be prepared to meet demands of donors and partners. Depending on the kind of information the stakeholders would like to report, the format can be designed to meet this need.

Such a report should cover the following:

- Date of report preparation
- Agency preparing the report
- Period covered by the report
- Progress on activities

- Achievements on indicators
- Achievements on objectives
- Problems faced
- Actions taken to address the problems
- Recommendations
- Financial Report

Advantages and Disadvantages of the Community-Based Approach

As with any other approach, the community-based approach has its pros and cons. The following are some that you should be aware of:

Advantages

The following are advantages of using the Community-Based Approach:

i Ownership and Sustainability

The Community Based-Approach involves people and gives them a sense of ownership of the materials created or methods incorporated in education and public awareness. Through ownership comes sustainability. The projects used as tools at this level become ongoing projects that can then be modified whenever the need arises.

ii Addresses the Immediate Needs of Communities

The Community-Based Approach is targeted specifically at particular communities and it addresses their immediate needs. This is because at the community based level, immediate needs are better identified.

iii User Friendly

Information is presented in such a way that people can easily understand or relate to, for example, the use of the language that people in a community are most familiar with.

iv Provides Knowledge and Skills

Finally the Community Based Approach empowers or equips people with the necessary knowledge and skills to help themselves in the first seventy-two (72) hours of a disaster. This is the most crucial time at the onset of a disaster when outside help is still on its way.

Disadvantages

These are some of its disadvantages:

i Fear

Communities are sometimes reluctant to expose the vulnerabilities of their localities to outsiders. This is because they fear that they will lose potential investors in their communities, e.g. tourists.

ii Lack of Resources

At the community based level, the lack or unavailability of resources required to effectively carry out awareness is also a disadvantage. Without the necessary resources, people have to improvise with what limited resources they have and this not only makes it very difficult for them but also impacts on the quality of work they have produced.

iii Misleading Information

When public awareness and education is not carried out properly at the community level, misleading information is disseminated to the rest of the community. This can lead to a chaotic situation and ultimately loss of lives at the onset of a disaster.

iv Lack of Proper Training

A further problem with this approach is also the fact that those utilizing the tools of the communicative approach may not have had proper training in what they are doing. This can also lead to distortion of information, thus misleading the rest of the community.

v Gender Bias

Last but not the least, there is a tendency in many developing countries not to involve women and young people in the creation of the tools of the Community Based Approach due to religious and cultural influences. Observation shows that too often those involved in public awareness and education at the community based level are males (middle aged and older). There are certain needs of communities that are overlooked by males (middle aged and older) but easily identified by women or youth.

Unit summary

Summary

In this unit you learned about the importance of a community-based approach in education and public awareness programmes in disaster management and the stakeholders involved. Community members should be involved in the planning and implementation phases of these awareness programmes as it makes them more receptive to new ideas and appropriate responses to a disaster. You also learned about various methods which communities can use to actively implement community-based action plans to reduce disaster risks as well as identifying and comparing the advantages and disadvantages of a community-based approach to education and public awareness.

Assignment

Assignment

Critique

Go to your nearest Disaster Centre/Office and have a look at a Community-Based Action Plan for your community (or for other communities). Provide a critique of this action plan highlighting the presence or absence of the following major components:

1. The assigned tasks of individuals or groups within the community.
2. Risk reduction measures or activities. (What strategies have been put in place for risk reduction?)
3. Does the plan include training for education and public awareness at the community level?
4. Identify and describe any pros and cons of the Community-Based Action Plan.

Self-Assessment

Assessment

Provide short answers to the following questions.

1 Why do you think it is important for education and public awareness to be carried out at the community level?

2 In two paragraphs describe the roles and responsibilities of disaster managers and community workers in education and public awareness.

3 Explain why the community-based approach needs to take into consideration the availability of resources.

Solutions

Key concepts that should be included in your answers:

1 Community members are the potential victims, and know their region best, including its terrain, hazards and vulnerabilities. They are also the experts in their language and culture. Involving them increases "buy-in", and enhances their self-reliance and confidence.

2 Policy-making input, leadership and organisational roles; fundraising and resource gathering; management at the local level; and dissemination of information.

3 Avoid promising more than can be delivered; know how to make best use of available resources and what outside aid may be required; know what capacity building and training may be needed.

References

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Unit 6

Education and Public Awareness – Part II

Introduction

Disaster management is everybody's business. The impact on the lives and livelihood of peoples as well as damage to infrastructure are huge. The communities must be more proactive towards preparedness and reduction of risks during disasters whether it is natural or man-made. We will depend a lot on the resources and the traditional knowledge we have to prepare in terms of subsistence, like planting the root crops three months before the cyclone seasons. The cutting down of branches of wood, pulling down flimsy constructions, constructing buildings that can withstand cyclones and following simple instructions are measures that if we take seriously will greatly reduce unfortunate tolls and damages. The design of risk reduction strategies is imperative. Therefore, personnel training and volunteer assistance, school-based programmes and hazardous materials on disaster management are main issues discussed in this unit.

Personnel training and volunteer assistance prepare people to improve and strengthen their capacity towards managing and reducing the impact of disasters. The preparation should begin with the assessing and identifying of the capacity needs of the communities. The hazards and vulnerability of the communities at risk should be assessed on how they will be affected technically, economically and socially.

Linking school activities and plans to the work of country coalition and local community networks reinforces the goal of creating of an environment and local norms of supportive attitudes towards disaster risks. In planning school-based programmes on disaster management, schools must reach out and link with the community and include work with the local coalition in the community in the work plan. Also schools must identify all the partners in disaster prevention, within as well as beyond the school system, and define their roles and responsibilities in the programmes. For example, parents play a very important role in providing social and environmental support for the school programmes on disaster management.

Public awareness of hazardous materials is also vital for disaster prevention. A hazardous material is a substance that on release or contact has the potential of causing harm to people (physical or health effects), property or the environment. Harmful physical effects include fire, sudden release of pressure, explosion, and other violent reactions. Harmful health effects include acute conditions and chronic conditions. Acute conditions

develop soon after over-exposure to hazardous materials and include burns, rashes, respiratory distress, convulsions, and possibly even death.

Outcomes

Upon completion of this unit you will be able to:

- *Describe* how and why personnel training to acquire skills and knowledge are essential in mitigating the impact of disasters.
- *Recognise* the contribution and participation of volunteer agencies assistance.
- *Define* the contents of a school-based programme on disaster management.
- *Identify* some appropriate school-based programmes on disaster management.
- *Discuss and implement* a school-based programme on disaster management effectively.
- *Identify and discuss* some types of hazardous materials.

Terminology

Hazard identification: The process of identifying what hazards have threatened a community, how often specified hazards have occurred in the past, and with what intensity (i.e., damage-generating attributes measured by various scales) they have struck; the first level of hazard analysis sophistication.

Hazardous materials:

1. Any material that is dangerous to life, health, or property due to its chemical nature or properties. This group of chemicals is used in industry, agriculture, medicine, research, and consumer goods. Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. These substances are most often released as a result of transportation accidents or because of accidents in chemical plants.

Hazardous waste: A solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may:

i cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible serious illness, or

ii pose a substantial presence or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Flammable liquid: Any liquid that produces enough vapours to ignite if exposed to an ignition source.

Flammable solid: A substance when ignited, will burn so vigorously that it creates a hazard.

Corrosive: Something that will destroy or irreversibly damage a substance, including living tissue, by chemical action. The main hazards to people include damage to eyes, skin and tissue under the skin, but inhalation or ingestion of a corrosive can damage the respiratory and gastrointestinal tracts.

Poison: A substance that is toxic to life or health.

Duties of Response Personnel

Each duty involves a series of tasks and steps that must be considered and resolved by decisions and actions. These duties when supported by the response communities are the framework of an appropriate, survival oriented response to hazardous materials incidents. Reasoned decisions based on this approach will minimize the harm resulting from a hazardous material incident and reduce the risk to responders.

Community Mitigation Goals

Hazardous materials are usually transported on the roads and railroad networks throughout countries. Some of these hazardous materials are stored and consumed by the community, in particular, gasoline for vehicles, propane for heating, and anhydrous ammonia for fertilizers. During disasters, the potential is high for release or spill of hazardous material into residential areas or areas frequented by communities. It is important therefore to raise and promote awareness of communities in the safeguard, handling, use and disposal of hazardous materials.

Pre-Disaster Mitigation Plan

To increase the public's awareness of the full range of man-made or technological hazards, it is recommended that education and outreach programmes are developed and implemented. Actions to take include:

1 Educating the public about the hazardous materials to which they are most frequently exposed.

2 Help homeowners identify Hazardous Materials from which they are at risk.

3 Identify, publish and disseminate a procedures manual on the disposal of hazardous materials.

Personnel Training

Training personnel is the preparation of resource people to provide basic information on appropriate targeted goals. It provides premier world-class training, products and services through innovative methods and technologies that contribute to the protection of life and property in the environment. It is a training that develops resources based on the needs of people.

Purpose

The reason for disseminating quality information in the informal mode is very important to the communities. The obvious reason is to integrate the local skills and knowledge with modern technologies with the immediate resources that are available especially with regards to disaster risk management. The resource people in the government, NGOs and communities within the local government structure are driving the personnel training programmes.

Some types of Personnel Training

- Legislation, convention, policy framework and planning
- Health
- Rehabilitation
- Disasters, hazards and quarantine
- Organizational structure
- Establishment of disaster committee
- Resource personnel
- Leadership and discipline

i Legislation, convention and policy training

The communities need to know about legislations passed through the legislative body of the nation on how to mitigate not only in disasters but also related by products like hazards and quarantine. They also need to be informed of the conventions the government has signed to be part of the global and regional drive to manage disasters better. The importance of knowing these legislations and conventions are not only for their understanding but to take the necessary action when the time comes. The policies and plans are documents to guide the communities to be conscious of why disaster management is a developmental issue. It clarifies the government commitment.

ii Health training

There are many health issues affecting communities after events of disasters. The possible outbreak of epidemics caused by rotting animal carcasses, rotten leaves, tree trunks and unhygienic environment is very disturbing. The Health Department has all the relevant information and data to facilitate any training we seek to implement.

iii Rehabilitation training

This type of personnel training is to ensure that skilled personnel are available to serve the rehabilitation needs of individuals with disabilities in the aftermath of a disaster. The programme supports training and related activities to increase qualified personnel trained in providing rehabilitation programmes. The trainings are funded by donors under bilateral or multilateral agreements. This training also may introduce low cost housing packages- for example the one that is recommended by Habitat for Humanity International. However, buildings constructed out of local materials should also be reinforced to meet hurricane force winds.

iv Disasters, hazards and quarantine training

Communities are prone to different kinds of disasters. They take it for granted that whether they like it or not they cannot run away from disaster. What they sometimes do not understand is the impact of the disasters on them. It is better for them to shift their understanding from picking up from the aftermath to preparing for the worst prior to the striking of a disaster. Another point that links directly with disaster reduction is the positive response to warnings that are issued by the National Disaster Management Office or through the Meteorological Departments, especially on tsunami or cyclones. it is important that disaster warnings are taken seriously. Training on hazardous materials should also be integrated into the education of personnel involved in disaster management. Hazardous materials are substances that are potentially harmful and dangerous to living beings, animals and environment. Quarantine is also connected with disaster reduction. This refers to the enforced isolation of people or animals that may have been exposed to contagious or infectious diseases. Quarantine training is a measure to reduce risk. There are three things to know about quarantine measures.

- The enforced isolation of people and animals are kept at a safe place to prevent the spread of disease.
- A calculated period of time must be spent in the secluded area to ensure the prevention of the spread of the disease.
- The isolation may result in communities and government in avoiding another unnecessary disaster and expenditure.

v Organizational structure training

The communities that cooperate well in any event of disaster are ones that will recovery more quickly. This means that they have a disaster management committee in the communities. Not only do they have a disaster committee but that it is well constituted, in operational and fully functional. There is a continuous flow of information and communication as the structure to create human resource development is addressing

disaster as a developmental issue shifting from the concept of rebuilding in the recovery stage to a more managerial commitment. The committee networks with the wider structures in the province and the national level to put in place a response and recovery plan and carry it out. In the event of a volcanic eruption, the evacuation of people out of the disaster area within the islands or crossing to other islands and emergency centres to coordinate relief is ready. The structure of providing personnel training is established to facilitate the accessing and channelling of funding and services that are available before, during and after the disaster strikes.

vi Resource personnel in communities training

The capacity needs visibility study so as to assess how to maintain, sustain and support continuous human resource. Each disaster is different in any given situation, however, the skills, tools, and technical expertise that is available needs to be supported and equipped. There are resource and skilful people in the communities who can be singled out to lead in areas or field they are experienced to facilitate in the training.

vii Leadership and discipline training

The type of personnel training in leadership and discipline is crucial. Quality leaders with sound discipline are needed to sustain and maintain the process and progress of disaster management. The chiefs and their communities must show responsibility, ownership and commitment. At the end of the day, the communities must have a livelihood to live for. So the establishment of disaster committees is essential to produce a set of relevant indicators as a monitoring and evaluation process to report progress, effectiveness and efficiency for relief supplies. It is essential to discourage politicized propaganda in the overall disseminating of information and relief supplies.

From here we can move to outside assistance to meet whatever means there are through the regular structure. It is also diagram is a sample and is subjected to be modified to suit the different situation and location. To facilitate the training, donors/Partners and volunteer assistance during relief, the structure needs to be established by legislation or Council of Ministers' (COM) approval. This is appropriate to the different situation in the region so as to facilitate not only the training programme but also the channelling of relief aid after the event of a disaster. The children need to know how, what, where and when to seek assistance before a disaster strikes.

Volunteer Assistance

A volunteer assistance is a group of people or organizations that are willing to give assistance on voluntary basis. This group of people or organization provide predictable, safe and sanitary environment in the aftermath of a disaster in the communities. They participate in the community organs and provide and liaise relief from the wider community. For example, the cultural values play an important role in assisting families receives materials and utensils if they have lost most or all of their well-being. The next level where volunteer assistance comes from is organizations from outside but within the national boundaries.

Volunteer assistance comes from organizations like in country Red Cross Society that also have networks within the communities and government through the standing military forces. Donor countries like France, Australia, New Zealand and China and others provide volunteer assistance in assessing the situation through surveillance. For this kind of assistance to be continuous, the recipient countries and the donor agencies need to be bonded by some form of agreements or convention through becoming members of the global forum.

School-based Programmes

School-based programmes on disaster management are sets of activities that are dealing with disaster prevention strategies for the school. The development of all school-based programmes on disaster management should begin with a determination of which natural and technological disasters are possible in the school area. Make sure all the school communities do not assume they know all the disaster risks. School stakeholders may be surprised to learn that their school areas are subject to natural disasters they had not anticipated. Also, remember that disasters can have a cascading effect. For example, think about how transportation routes or other external factors may also affect the schools by asking "Are we near a major highway where hazardous chemicals are transported, putting our school in danger of a chemical spill?"

Once schools find out what disasters are possible in their areas, assess their structures. For example, falling objects, fires, and the release of hazardous materials, flying debris and roof collapse, cause most of the injuries and deaths related to disasters. Be sure, then, to look for such hazards when doing their assessment.

School-based programmes on disaster management consist of conducting survey in a systematic manner, making an inventory of all items that require attention. It may be possible to enlist volunteers from among their parents or emergency management community. Since prevention of disaster risks is everybody business, all school stakeholders must personally walk the school halls and classrooms to determine what risks exist. Before a disaster, schools should document their property, something that can be done as part of the hazard assessment. Schools that take photos and videos prior are far ahead in recovery with less hassle and more quickly restored than the schools where files are missing and records were not kept.

School-based preparedness disaster programmes for those with special needs

Schools should be prepared to deal with the special needs of physically and mentally challenged students in an emergency. Special needs of students and staff should be a consideration in all school safety plans. Local schools should identify their particular needs and how best to address these needs. Some schools will need to communicate with transport students and staff with mobility impairments while others must address the needs of blind or deaf students, or those with language barriers. The Ministry of Education should develop a model school

safety plan, and this plan will contain a section on students and staff with special needs.

School-based drill programmes

Ideally, schools should conduct quarterly. At a minimum, drills should be conducted each term or semester, both trop remind the school community the appropriate procedures and to teach the students and staff. Drills can help the schools test their plan and identify their strengths and weaknesses.

Law enforcement in school-based programmes on disaster

Law enforcement and school-based security must have a relationship in place that has, at its core, the safety and welfare of students. In conjunction with other key players (e.g., education, emergency management, public health), law enforcement should be involved in every aspect of crisis plan development and implementation. They need to be at the table as the plan is developed; active participants in drills and practices; and part of the team that regularly reviews and makes changes to the plan.

Sufficient school supplies

School programmes should focus on such issues as where students will sleep and which rooms are the safest. It is also important that each school has sufficient supplies for use during an emergency including:

- food
- stored water
- flashlights with batteries
- first aid kits
- blankets
- battery-powered radio
- other appropriate supplies.

After a disaster, schools may serve as the gathering place for hundreds of people who live or work nearby. Thus, schools' plans should address how school personnel are released and in what order. Some staff, for example, may live nearby and may be able to stay while others have small children and will need to get home in the case of an emergency. All staff, however, must have back-up family plans in case they cannot return home or must remain at the school following a major disaster.

While planning school-based plans on disaster prevention can be an overwhelming process, it may help to sketch out a chronology of what to do immediately following a disaster. Often the first decision will be to evacuate or to stay put. School plans will address both options. Their plan

must then address the following actions to take if there are people who will remain in the buildings:

i Damage must be assessed and damaged portions of the building sealed off.

ii Location of the school to be far from the coast where most disaster risks happen

iii Injured students and staff must be attended to.

iv All people in the buildings must be accounted for

v Searches initiated for the missing.

vi Small fires must be extinguished and utilities assessed and shut off, if necessary.

vii Hazardous spills must be contained and sealed off.

viii Of course, students need to be kept calm and reassured.

ix Staff must be responsible for establishing contact with the outside and for handling media questions.

x Someone – the principal or designee, should be identified as the Incident Commander and in charge of the disaster scene

xi Individual schools may use the term campus commander to differentiate from the top school district level incident commander.

Schools have to make sure that there are keys to ensure access to the supplies during an emergency, including access by programmes such as day-care and after-school events. Plan an annual inventory, replacing water and other items with limited shelf life as necessary.

Individual disaster kits

Some schools ask students to bring in their own kits. Student-assembled "comfort kits" typically include the following:

- a little food;
- some water;
- a space blanket or large plastic trash bag;
- a non-toxic chemical emergency light stick; and
- a letter or photograph from home.

These kits can be helpful, but require a great deal of time and supervision to assemble and check when they are brought to school. Sometimes parents include perishable items by mistake, and some parents do not send anything at all. The school will need a plan to make sure that each student has a kit. Vendors sell expensive individual kits as well, with much of the value in the packaging

Hazardous Materials

A hazardous material is a substance that on release or contact has the potential of causing harm to people (physical or health effects), property or the environment. Harmful physical effects include fire, sudden release of pressure, explosion, and other violent reactions. Harmful health effects include acute conditions and chronic conditions. Acute conditions develop soon after over-exposure to hazardous materials and include burns, rashes, respiratory distress, convulsions, and possibly even death. There are many types of hazardous materials; however, only the following types of hazardous materials can be discussed in the unit.

Ways of storing and safely handling hazardous materials

Hazardous materials must be stored based on their compatibility, not simply in alphabetical order. Materials of the same hazard should be stored together i.e. flammables with flammables and oxidizers with oxidizers. Hazardous substances should be stored in an orderly manner with older products most accessible and the newer products least accessible. Good housekeeping must be practiced in areas where hazardous products are stored. All hazardous materials must be properly labelled including their exact contents, hazardous properties, date of receipt, and if appropriate, date of expiration. Hazardous substances should be stored in original containers in which they were packaged at the manufacturing plant. If this is not practical, these products should be transferred according to manufacturers' recommendations into containers that are constructed to withstand the effects of the product over the maximum storage time. Incompatible materials must not be stored such that they may come in contact with each other. Chemicals shall be stored separately from non-compatible hazard classes. The following are some recommended storage schemes to minimize incompatibility of chemicals:

- metals, hydrides.
- hydroxides, oxides, silicates, carbonates, carbon.
- sulphides, selenide, phophides, carbides, nitrides.
- acids, anhydrides, peracids
- alcohols, glycols, amines, amides, imines, imides.
- hydrocarbons, esters, aldehydes.

Liquids should be stored in unbreakable or double-contained packaging, or the storage cabinet should have the capacity to hold the contents if the container breaks. Avoid floor chemical storage (even temporary).Chemicals should be stored no higher than eye level and never on the top shelf of a storage unit. Shelf assemblies should be firmly secured to the walls. Avoid island shelves. Each shelf should have an anti-roll lip. Store acids in a dedicated acid cabinet. Nitric acid may be stored there also, if it is kept isolated from the others. Store severe poisons in a

dedicated poison cabinet. All chemicals should be labelled and dated. Look for unusual conditions in chemical storage areas, such as:

- improper storage of chemicals
- leaking or deteriorating containers
- spilled chemicals
- temperature extremes (too hot or cold in storage area)
- lack of or low lighting levels
- blocked exits or aisles
- doors blocked open, lack of security
- smoking or open lights or matches
- fire equipment blocked, broken or missing
- lack of information or warning signs such as “No Smoking”, “Flammable Liquids”, “Acids”, “Corrosives”, “Poisons”, etc.

Coping with Exposure to Hazardous Materials

1. Do not purchase these compounds in quantities greater than can be used in the specified storage time period.
2. Ethers should be stored in the dark and under nitrogen if possible.
3. Always check for the presence of peroxides before distilling any peroxide former.
4. Consult safety references before working with peroxidizable compounds.

Whenever it is feasible, engineering controls must be used to reduce personal exposure to hazardous materials. The two most common engineering controls are the use of local exhaust and general ventilation. These measures limit a person’s exposure to airborne contaminants.

When engineering controls are not available, or they fail to adequately reduce hazards, other personal protective equipment is required. Examples of personal protective equipment include: safety glasses, hearing protection, gloves, respirators, etc.

Personal protection devices must be provided and worn in accordance with the manufacturer’s recommendations indicated on the label of the product or as stated in the Material Safety Data Sheet for the product.

Hazardous chemical spills can be handled effectively when plans of action have been developed. Spill procedures should include the following:

- the potential location of possible spills
- the quantities of material that might be released
- chemical and physical properties of the material. This information may be obtained from the Material Safety Data Sheet or label
- hazardous properties of the material
- the types of personal protection equipment that may be needed for cleanup
- location and contents of spill kits that should be made available where possible.

The following general procedure may be used, but should be tailored to the individual needs of the handlers and the specific hazard associated with the hazardous material:

- If the spilled material is flammable, turn off ignition and heat sources.
- Attend to any person who may have been contaminated.
- Notify individuals in the area about the spill.
- Evacuate nonessential personnel.
- Avoid breathing vapours of spilled material. Establish an exhaust or ventilation, if it is safe to do so. Air handling units are not to be used because they re-circulate the hazardous vapours.
- If a spill is relatively large, or involves a highly toxic material, a carcinogen or flammable material, contact appropriate authorities for assistance in cleaning up the spill and disposing of the hazardous waste resulting from the cleanup.

Waste products must be clearly labelled with the complete names of the contents and they must be stored in non-leaking, safe containers. Local authorities may be contacted for pickup and giving the name of the products to be picked up, the location, the person in charge of the area, his phone number and the approximate quantity of the materials to be picked up. To minimize the risk of exposure to Hazardous Materials several steps can be implemented such as i) Buy only those amounts of hazardous materials which can be used before the expiration date of the material ii) Use up the hazardous material by using it for the purpose for which it is intended iii) Some Materials can have more than one usage. These materials can then be safely shared without stockpiling them and iv) Safe handling, storage and disposal procedures must be employed and within guidelines of manufacturers and governments. In the case of an accident e.g. spillage during a disaster the proper response (according to the nature of both exposure and hazardous Material) procedures must be employed.

Unit summary

Summary

In this unit you learned that through the education and public awareness programmes on disaster management, people recognize the need for specific attention to be given to planning ahead for the disasters and to reducing long term impacts in our countries that are prone to disasters. Many people from our disaster vulnerable countries have experienced that poverty and disaster vulnerabilities are intrinsically linked and that sustainable poverty and disaster reduction approaches must therefore incorporate risk reduction as one of the integral elements. The stakeholders in Disaster Management are conscious that natural hazards risks are predictable and foreseeable in many countries; therefore, each country's programmes, sectoral project resources and funding should give adequate consideration to managing and reducing disaster risks. The best way of doing this is to have education and public awareness through personnel training and volunteer assistance, school-based programmes on disaster management and awareness workshops on hazardous materials.□

Assignment

Assignment

Describe a hazardous material that should be covered in personnel training for community and school?

Self - Assessment

Assessment

1 Describe how volunteer organizations have assisted your country in the latest disaster

2 Name the different voluntary organizations that operate in your country

3 Can you add more phases in the recovery stages?

4 Does your community have a disaster committee?

5 Find out and describe how the disaster management office works in your country or province.

6 How do you identify a potential disaster event?

7 Once a threat has been identified, who do you contact, and in what order? This includes law enforcement, public health, other school officials, and the superintendent's office.

8 How will you contact students, parents or guardians?

9 How will you evacuate students or get them to safety?

10 How does the school's plan interact with the larger community emergency response plan?

Unit 7

Education and Public Awareness – Part III

Introduction

This unit completes the theme of education and public awareness for disaster management. We concentrate here on the role and influence of culture in Education and Public Awareness. Culture can be a useful resource for education and public awareness programmes on disaster management. It can also be a barrier to the development and effective implementation of these programmes. Local people know best about common and new diseases in their community, about the types of damage caused by previous disasters and about culturally accepted beliefs, rituals and desires which must be respected. A community response to education and awareness programmes can depend on their perspective of a disaster - whether they consider it as an event or a process. If disaster is perceived as an event, a community tends to respond quickly by going through the stages of the disaster management cycle (Bankoff, 2002). Some of the most pertinent issues on the role of culture in preparedness for and response to a disaster are identified and described in this unit.

Outcomes

Upon completion of this unit you will be able to:

- *Define and explain* how culture contributes to people's response to education and public awareness programmes.
- *Discuss* important issues in relation to societal norms and values during education and public awareness.
- *Identify and compare* the roles that people play in preparation for a potential disaster as defined by their culture.
- *Compare* the importance of indigenous knowledge in education and public awareness on disaster management.

Terminology

Culture:	The behaviours and beliefs characteristic of a particular social, ethnic or age group and transmitted from one generation to another.
Taboo Word:	A word that is forbidden or not acceptable to use in everyday language.

Ostracise:	To expel from a community.
Backlash:	A strong unsympathetic reaction due to fear of a threatening situation.
Indigenous knowledge:	Generally refers to the matured long-standing traditions and practices of certain regional, indigenous or local communities.
Protocol:	A set of formal rules on which a community's way of living and operating is based.
Norms:	Standard patterns of behaviour of members of a community.
Ethnic Group:	A group of people identified as a specific class as they share common unique features such as culture, language, ancestry and nationality.
Oral Traditions:	Verbal dissemination of community knowledge on cultural history and ancestry from one generation to the next.

Understanding Culture

Culture is the way of life of a people. It is characterised by the people's language, beliefs, behaviour, norms and values. These cultural features are instilled in a society from generation to generation through learning. They have also enabled members of a society to cope with each other and with changes in their local surrounding.

Most countries have only one ethnic group and one language. However, there are some countries which have different ethnic groups with different languages and cultures. It is important to be aware of the different cultures in our communities so that we can predict or avoid potential cultural disputes before, during or after a disaster. Cultural understanding also enhances interaction and cooperation between all individuals affected by a disaster.

Appreciating Culture and its Contribution to Education and Public Awareness

Before carrying out education and public awareness, it is vital that agents carrying out the awareness are familiar with and appreciate the culture and protocol of the people they are addressing. When carrying out education and public awareness, they must be sensitive to cultural norms and values and they must incorporate this in the awareness. The role of culture in education and public awareness is seen here as being very significant. An outsider can not carry out education and public awareness campaigns without considering these cultural aspects of communities.

Culture becomes a barrier when training and awareness programmes are insensitive to beliefs, societal values and inappropriate use of language.

People may be reluctant to incorporate information and actions into their daily routines if they do not understand the language of communication or if translators are not provided during the training.

i Roles of different people

People's roles in preparation for a disaster can be determined by their culture. As mentioned earlier, if a culture perceives disaster as an event, the society will be more receptive of education and training programmes. Some cultural or ethnic groups place more value on certain members of their immediate community. These people must be knowledgeable about awareness programmes and should be part of the implementing delegation.

Indigenous community leaders (e.g. village mayors) – as these members know their community well, they may offer valuable opinions on the community needs, capabilities, and limitations. They may also be able to provide suggestions on ways of reaching out to their community. They can assist in the promotion of education and awareness programmes within their ethnic and lingual community as members may by more willing to listen to them and take up their advice compared to responses to strangers.

Religious leaders – most communities place religious leaders in high regard and are usually the most respected members of the community. Developers of education and public awareness programmes should include these leaders in the delivery of their programmes as community members will listen to them.

Teachers in local schools – as local schools communicate mostly in their native language, involving teachers in awareness programmes ensure that the essential information and actions are transmitted effectively to students. By educating students, they can also pass on important information to their families.

Extended families – Living in extended families is a norm in many countries especially those in developing regions. This communal setting has a hierarchical structure which persons at different levels being given certain responsibilities and roles within their family. It is therefore an obligation of planners of education and awareness programmes to understand the roles of the different members of an extended family so that adequate and suitable programmes are supported, promoted and implemented effectively.

The role of individuals according to gender and age – In the education and public awareness for disaster management, it is also essential that the roles of males, females, young people, children and old people are defined clearly according to the culture of the society.

In certain societies, the role of men and women are precisely defined. Men are given the freedom of education while women are denied this privilege. Hence, the women are deprived of crucial information to respond effectively to disasters. If they do receive the necessary information, it would be useless to them without a translator as they would be illiterate due to preferential treatment of the males. Also in

some societies, it is taboo for women to associate with strange men or strangers, let alone touch them. It is taboo for them to expose body parts except for their face. For example, in some societies, the culture may be that women are only allowed to listen at important meetings. As such, the awareness campaigns should only be carried out by males. Such cultural restrictions can hinder their participation in education and public awareness programmes.

Another example can be seen in the fact that children, the youngest members of a community, are not involved in decision-making but are mainly the receivers of advice and implementers of instructions. Children can also play a role in education and public awareness through musical performances and drama.

ii Language

During education and public awareness campaigns, language has a great influence on community response. The local residents may be more receptive of training programmes if the training is conducted in their native language and appropriate terms/expressions are used. Accessible information must also be translated into their language and the trainers understand most, if not all aspects of their culture.

Which language do I use in my campaign?

It is advised that the language being used must be one that the targeted audience is very familiar with. As much as possible, the use of the community's mother tongue is advisable as the message will definitely be communicated effectively when presented in the mother tongue

Use of appropriate terms and expressions

The choice of words, terms or expressions must also be appropriate and structured in a manner acceptable to the people. People carrying out awareness campaigns need to be especially aware of the use of 'taboo' words. Taboo words or expressions are not openly used in day to day speech or in public. An example of this is seen in the anti HIV/ AIDS Awareness Campaigns in Papua New Guinea by the National Aids Council where the first line of the message is in Tok *Pisin* 'No ken kuap' (Do not have sex). The word for 'sex' that is being used here *(kuap)* is an extremely offensive or taboo word in Tok Pisin. As such, whenever that advertisement is aired on Papua New Guinean television or radio, parents are quick to turn their televisions or radios off because they do not want their children to be exposed to or using this word in their everyday language. A report entitled "HIV/ AIDS and Australia's International Approach" (2004) states the following about this awareness campaign:

> *In addition to promoting the questionable message of abstinence, the advertisement made HIV/AIDS a "dirty" topic in the community due to its associations with sex and bad language. This in turn has contributed to a social backlash which sees many carriers of the disease ostracised from their communities.*

You can see that it is thus important to consult with the local community to ensure that the use of taboo words is avoided. Upon consultation

campaigners or educators can then be advised on how best to express themselves using a better choice of words. If taboo words are not used, people will accept the messages presented in the campaigns and respond positively towards them.

iii Accurate Translations

It is also important, especially when translating messages from one language to another that the translation is accurate and that the message is being accurately relayed to the people. Sometimes, an interpreter may not be quite proficient in either the source language or the target language. In this case, he/ she may not be communicating the intended message accurately, the meaning of the message becomes distorted or it is not received by the target audience.

Attire (Dress)

Another important cultural concern that must always be considered in education and public awareness is the presentation of agents involved in carrying out the awareness. They must be attired or dressed in a manner appropriate and acceptable to the society's culture so as not to offend people or cause them to lose interest in the message being given. For example, in some cultures women would be expected to dress modestly covering up most of their bodies. Females carrying out awareness campaigns in areas like this should dress in a similar way during the campaigns.

Medium of dissemination

The medium or tool chosen for education and public awareness can incorporate cultural methods that people are familiar with. For example, a traditional drum is beaten or a conch shell blown to bring together people for a meeting. In this way, more people are gathered because they are all familiar with this traditional signal. This ensures the success of awareness campaigns because more people are in attendance.

Indigenous knowledge systems

We can also discuss the importance of indigenous knowledge systems in preparation for or in response to a disaster. Societies have over time developed their own ways of preparing for and responding to disasters. Indigenous knowledge may also be integrated into an awareness programme to ensure that the locals are considered in training tools. The preservation and handing down of these knowledge systems can also be stressed and encouraged during education and public awareness.

The encouragement of Oral Traditions can also be stressed in relation to indigenous knowledge systems. In many developing countries, writing is an introduced concept used for documenting information. In the past, oral traditions ensured that indigenous knowledge was passed on from one generation to the next and this ensured its preservation for years on end.

Indigenous preventive knowledge of disasters

Communities have been exposed to disasters time and time again. Through this exposure, many have developed traditional strategies or preventive measures to prepare and deal with disasters.

For example, people in some mountainous areas of Papua New Guinea do not completely clear away fallen trees and logs before gardening. This is because their culture has adapted this strategy to prevent erosion and land slides.

Indigenous knowledge of edible fruits, nuts, plants and water sources

Indigenous knowledge of edible plants and the location of far away water sources can also prove very helpful in the time of a disaster. People must be encouraged to be aware of these traditional knowledge systems in education and public awareness.

Traditional Healing and Herbal Medicine

Traditional healing methods and herbal medicine are very useful forms of indigenous knowledge. Such traditional practices are worth holding on to and their practice must be encouraged during education and public awareness. For example, the locals know better about common traditional healing methods in their society, they can combine their traditional methods with modern medicinal knowledge to construct an effective training programme In cases when disaster strikes and outside help is delayed, the use of traditional healing methods and herbal medicine can help save lives.

Knowledge of the presence of indigenous sites and their protection

Finally, the knowledge of the presence of indigenous sites and their protection is also worth mentioning in education and public awareness. There are some sites within communities that are sacred and need to be protected. Communities must be made aware of this and take appropriate actions to protect their cultural heritage.

Unit summary

Summary

In this unit you learned about culture and how cultural beliefs and values determine people's responses to education and public awareness programmes on disaster management. Every society has unique cultural values, practices, social organisation and knowledge which can influence their perception of events, processes and concepts and which in turn determines how they respond to information presented to them. Agents conducting education and awareness programmes need to be sensitive to a society's culture especially if they are not members of the society. This can ensure that members of a society are more receptive of these programmes and are readily prepared to accept and implement them effectively.

Assignment

Assignment

Imagine you are part of a team carrying out awareness campaigns on disaster management. You are going to present an informative talk at your local community hall.

Task: Prepare a write-up of a short speech (800-1000 words long) highlighting at least three cultural issues for people to be aware of in preparation for a disaster.

The following marking criterion shows you how to organise and what to include in your write-up. It also shows how marks are distributed for your work.

Content/Mark

Introduction: Introduce the term/ idea of 'disaster management'. Give examples of disasters that audience is familiar with. State what your talk will be about. (4 marks)

Body: Cultural Issue 1 (Include elaboration and relevant examples) -(6 marks)

Cultural Issue 2 (Include elaboration and relevant examples) (6 marks) ,

Cultural Issue 3 (Include elaboration and relevant examples (6 marks)

Conclusion: Reiterate main points in a brief summary. (4 marks)

References and Visual Aids: Include references that you have consulted and attach copies of posters, leaflets or other informative aids you plan to distribute to your audience. (4 marks)

Total: 30 marks

Self-Assessment

Assessment

State whether the following statements are True or False.

1 Education and Public Awareness programmes are based entirely on people's cultures.

2 English must always be used to conduct effective education and public awareness campaigns.

3 People should be encouraged to preserve indigenous knowledge systems during education and public awareness campaigns.

4 At Education and Public Awareness campaigns the use of herbal medicine during disasters needs to be discouraged.

5 A person's culture greatly influences the way he/ she responds to a message in an education and public awareness campaign.

Answers

1 T; 2 F; 3 T; 4 F; 5 T.

References

"HIV/ AIDS and Australia's International Approach" (2004) Accessed on 26/01/08 at: http://www.aidwatch.org.au/assets/aw00616/HIV%20Final.pdf

Bankoff, G., (2002) Cultures of Disaster: Society and Natural Hazards in the Philippines. Routledge, London

Unit 8

The Role of Technology in Disaster Management

Introduction

While the role of technology could easily be integrated into various subtopics on emergency and disaster management (EDM) we present it as a stand alone unit. Quite often the role of technology in EDM is presented as an afterthought or simply omitted. In this unit we have tried to be as basic as possible. If you wish to delve deeper into this subject matter we have provided links for suggested reading and further study.

We start with a discussion of emergency management systems (EMS). EMS are merely technological tools that are expertly used to improve and enhance the EDM process. We will examine specifically the role that Geographical Information Systems (GIS), Global Positioning Systems (GPS) and Remote Sensing Technologies play in disaster management. While these subjects are presented individually, it is important to note that in reality these technologies are usually deployed in an integrated manner.

Outcomes

Upon completion of this unit you will be able to:

- *Define* Emergency Management Systems (EMS);
- *Identify* how the EMS assists in hazard materials management, emergency medical services, and response and recovery operations;
- *Identify* a key strategy that aids continuous improvements of emergency management systems;
- *Define* Global Information Systems (GIS);
- *Identify* four disaster-related activities to which a GIS application is useful;
- *State* the advantages and challenges of using GIS in disaster management;
- *Explain* how GIS is utilised within all phases of the disaster management cycle;
- *Define* Global Positioning Systems (GPS);

- *Explain* how GPS technology can be useful in disaster management;
- *Define* Remote Sensing Systems (RSS);
- *Distinguish* between passive and active RSS;
- *Explain* how RSS technology can be useful in disaster management;
- *State* the advantages and disadvantages of using RSS in disaster management.

Terminology

Emergency Management:	The management of emergencies concerning all-hazards, including all activities and risk management measures related to prevention and mitigation, preparedness, response and recovery.
Blackbody radiation:	Refers to an object or system which absorbs all of the electromagnetic radiation that falls onto it; the object or system then re-radiates this energy. The energy that is re-radiated is characteristic of the radiating system from which it is emitted, not its original source.
Electro magnetic spectrum	The electromagnetic (EM) spectrum is the range of all possible electromagnetic radiation.
Electromagnetic wave	Method of travel for radiant energy, so called because radiant energy has both magnetic and electrical properties.
Infrared radiation	Electromagnetic radiation whose wavelengths lie in the range from 0.75 micrometer to 1000 micrometers.
Infrared sensors	This is an electronic device which measures infrared light radiating from objects in its field of view.
LandSat	A series of satellites that produce images of the earth.
Microwave radiation	Electromagnetic radiation composed of photons carrying less energy than infrared photons but more energy than radio photons.
Radiation	Energy that is radiated or transmitted in the form of rays or waves or particles.
Sensor	An electronic device used to measure a physical quantity such as temperature, pressure or loudness and convert it into an electronic signal of some kind.

Wavelength	The distance between identical points in the adjacent cycles of a waveform signal propagated in space or along a wire.

Emergency Management Systems

What is Emergency Management?

Emergency management is a discipline that involves the avoidance of risks, while simultaneously putting plans in place to deal with disasters and emergency situations if and when they do occur with a view to re-build and restore society to a functional level in as short a time as possible after a disaster. Emergency management is therefore a shared responsibility between government and citizens of a country towards building a sustainable, disaster-resilient society.

The ultimate purpose of emergency management is to:

- save lives
- preserve the environment
- protect property
- protect the economy

What are Emergency Management Systems (EMS)?

Emergency management systems are technological aids that facilitate the effective management of disasters. EMS technology can assist in several areas that are critical to effective disaster management, such as:

- Drafting and testing of evacuation and general disaster plans *(Evacuation Plans)*.
- Establishment of shelters as well as informing the public of shelter locations, items that should be taken to the shelter and general "shelter behaviour".
- Training personnel in effective shelter management, basic first aid and other "response" skills *(Manpower)*.
- Establish a national warehouse and ensure that it is stocked with items for national survival in the immediate aftermath of the disaster, before the arrival of overseas help *(Materials)*.
- Setting-up reliable communication systems, such as, the traditional two-way CB-type radios *(Communication)*.

- Putting transportation plans in place, which should include air transportation to facilitate air-lifts and rescues, delivery of food supplies to severely affected areas cut-off from vehicular traffic and comprehensive damage assessment activity *(Transportation)*.

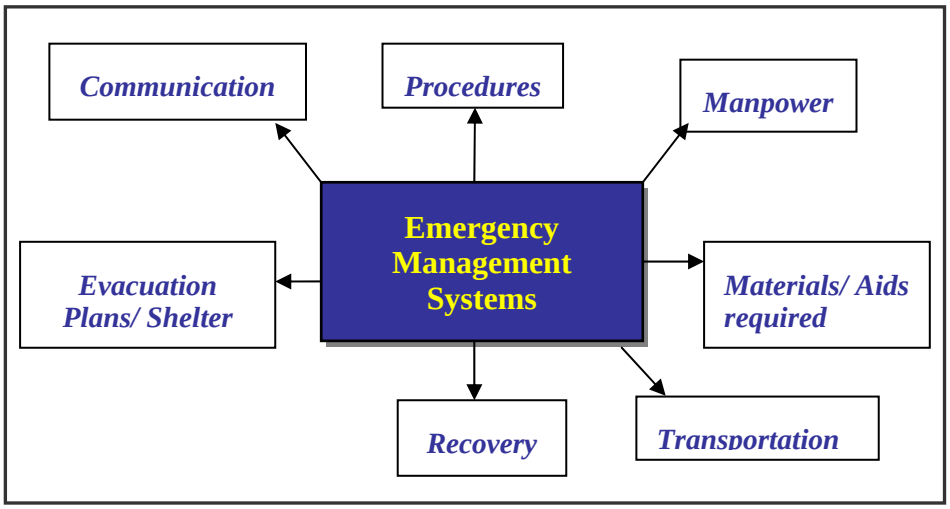

Figure 5: Diagram showing several disaster-related areas impacted by EMS

How useful is EMS?

EMS can also add tremendous value to disaster management in the following generic areas:

- Hazardous Materials Management
- Emergency Medical Services
- Response and Recovery

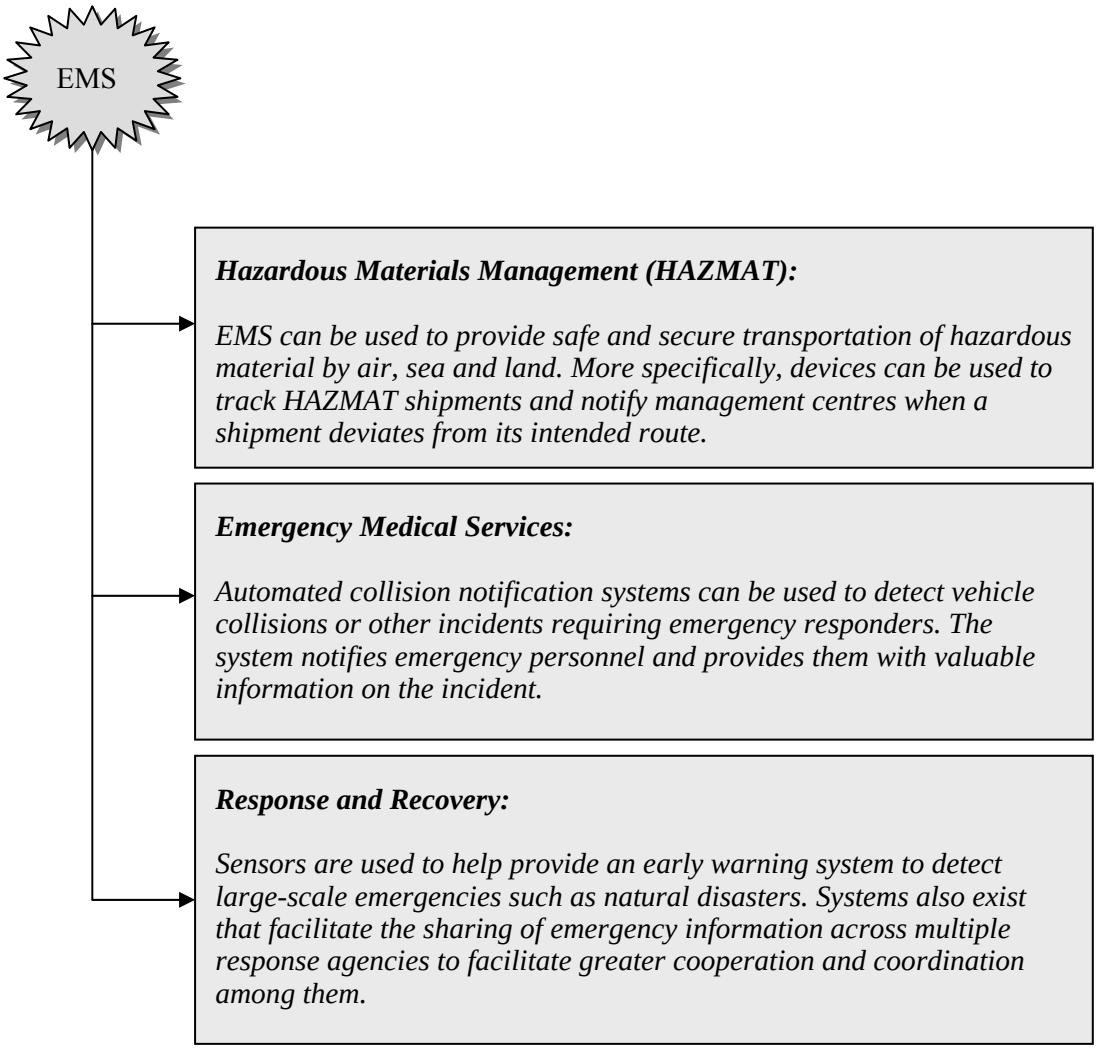

Figure 6: Diagram giving specific examples of EMS at work

EMS and the Disaster Management Cycle:

It is important to note that the proper usage of technology can improve the effectiveness of disaster management systems to aid the process of prevention, mitigation, preparedness, response and recovery.

Prevention and Mitigation

Effective disaster management seeks to prevent hazards from developing into "full-blown" disasters and further reduce the impact of disasters if and when they occur. Inventory systems, Tracking, Detection, Driver authentication and Route planning software are technological tools that can be used to aid in the process of disaster prevention and mitigation.

i *Inventory systems:*

Databases exist to help monitor inventory levels of critical supplies and equipment on a continuous basis to ensure that adequate supplies are available to cover the upward surge in demand that generally accompany disaster and emergency situations.

ii Tracking systems:

Vehicle-mounted hardware provide the capability to track Hazard Management (HAZMAT) cargo and support the notification of management centres when a shipment deviates from its intended route.

iii Detection:

Roadside detectors can monitor for the presence of hazardous cargo in sensitive areas and confirm that the cargo is on the expected route.

iv Driver Authentication:

Driver authentication technology can confirm that the individual operating a HAZMAT vehicle is authorized to do so and report operation by unexpected drivers to public safety entities.

v Route Planning:

EMS can provide assistance to commercial vehicle operators via electronic route planning services, ensuring compliance with HAZMAT shipment restrictions along planned travel routes.

Preparedness

The Preparedness component emphasizes the development of plans well in advance of the disastrous situation (or event), to reduce confusion and restore order in as short a time as possible when the disaster does happen. EMS can aid the preparedness process via technological systems such as Advanced Automated Collision notification systems (Advanced ACN) and Telemedicine.

- Advanced ACN: Advanced automated collision notification systems use vehicle-mounted sensors and wireless communication to notify emergency personnel and provide them with valuable information on incidents such as crashes or collisions, including the exact location and characteristics of the incident and possibly relevant medical information regarding the vehicle occupants in the case of a vehicular collision.

- Telemedicine: Telemedicine systems provide a link between responding ambulances and nearby emergency medical facilities, enabling doctors to advise emergency medical personnel regarding the treatment of patients en route to the hospital.

Response and Recovery

The Response Phase of the Disaster Management Cycle involves mobilization of emergency services to provide immediate assistance to people affected by disasters. Recovery, by extension, is concerned with issues and decisions that must be made after the initial needs resulting from the disaster are addressed. EMS technology can aid the response and recovery effort through the installation and utilization of Scheduling and Coordination software, Early Warning Systems, Evacuation and Re-entry Management, Response Management and Emergency Traveller Information systems.

- Scheduling and Coordination software: Intricate scheduling systems can simultaneously monitor and coordinate various response activities (such as search and rescue operations, emergency medical assistance,

evacuation and emergency public communication) to make the response process more efficient structured and organized.

- Early Warning Systems: The variety of sensors deployed on the transportation infrastructure can help provide an early warning system to detect large-scale emergencies including natural disasters (hurricanes, earthquakes, floods, winter storms, tsunamis, etc.) and technological and man-made disasters (HAZMAT incidents, nuclear power plant accidents, and acts of terrorism including nuclear, chemical, biological, and radiological weapons attacks). Early warning systems monitor alerting and advisory systems, ITS sensors and surveillance systems, field reports, and emergency call-taking systems to identify emergencies and notify all responding agencies of detected emergencies.

- Response Management: Response management may include the tracking of emergency vehicle fleets using automated vehicle location (AVL) technology and two-way communications between emergency vehicles and dispatchers. Integration with traffic and transit management systems enables emergency information to be shared between public and private agencies and the travelling public.

- Evacuation and Re-entry Management: Evacuation operations often require a coordinated emergency response involving multiple agencies, various emergency centres, and numerous response plans. Various communication technologies can support the management of evacuations, which may also include a variety of traffic and transit management activities.

- Emergency Traveller Information: Integration with traffic and transit management systems enables emergency information to be shared between public and private agencies and the travelling public. This communication and cooperation also enables the use of the variety of ITS information dissemination capabilities to provide emergency traveller information.

Who is responsible for EMS?

Emergency Management is a shared responsibility between government and citizens of a country towards building a sustainable, disaster-resilient society.

The Government usually exercises leadership at the national level. However, in an emergency, the first response is almost always by the municipalities or the local-governing authorities for the simple reason that disasters usually involve specific localized areas. However, should the local government require additional resources in an emergency or disaster response, then the federal government would respond quickly to any request for assistance from the local governing bodies.

The importance of partnerships

All levels of society should be involved in emergency management. Individual citizens, communities, municipalities, federal governments, emergency response personnel such as fire prevention and health workers, the private sector, volunteers, academia and international allies should all be involved in emergency management. Good partnerships based on effective collaboration, coordination and communication are a key component of emergency management systems.

Of tremendous importance, Emergency Management requires collaboration, coordination and integration to facilitate complementary action by all partners to facilitate timely and effective prevention and mitigation, preparedness, response and recovery measures to effectively deal with disasters.

EMS and Community Resilience

EMS aims to strengthen the resiliency of communities and nations by helping them to minimize the occurrence of disasters, reduce the impact and recover relatively quickly if and when disasters do occur. Resiliency minimizes susceptibility to damage from disasters by strengthening the capacity of the country to cope with, adapt to, respond, recover and learn from disasters.

Continuous Improvement

After emergencies or disasters occur, it is very important to take time to identify and document the lessons learnt from the experience. Doing so will increase future effectiveness and improve emergency management practises and processes. Recovery from any major disaster should be completed by documenting and internalizing the lessons learnt. If this is done, continuous improvement and a reduction in the recurrence of problems should result.

Geographic Information Systems (GIS) and Disaster Management

What does GIS mean?

Geographic Information Systems are information systems capable of integrating, storing, editing, analyzing, sharing, and displaying geographically-referenced information. In a more generic sense, GIS is a tool that allows users to create interactive queries (user created searches), analyze the spatial information, edit data, maps, and present the results of all these operations.

GIS Applications

GIS applications can be useful in the following activities:

1. To create hazard inventory maps: At this level GIS can be used for the pre-feasibility study of developmental projects, at all inter-municipal or district level.
2. Locate critical facilities: The GIS system is quite useful in providing information on the physical location of shelters, drains and other physical facilities. The use of GIS for disaster management is intended for planners in the early phase of regional development projects or large engineering projects. It is used to investigate where hazards can be a constraint on the development of rural, urban or infrastructural projects.
3. Create and manage associated database: The use of GIS at this level is intended for planners to formulate projects at feasibility levels, but it is also used to generate hazard and risk maps for existing settlements and cities, and in the planning of disaster preparedness and disaster relief activities.
4. Vulnerability assessment: GIS can provide useful information to boost disaster awareness with government and the public, so that (on a national level) decisions can be taken to establish or expand disaster management organisations. At such a general level, the objective is to give an inventory of disasters and simultaneously identify "high-risk" or vulnerable areas within the country.

GIS and the Disaster Management Cycle

Planning

The most critical stage of disaster management is the realization that there is a need for planning based on the risk that is present. The extent to which lives and properties will be spared the adverse effects of a disaster is dependent on the level of planning that takes place and the extent to which technology has been incorporated in planning efforts. GIS is useful in helping with forward planning. It provides the framework for planners and disaster managers to view spatial data by way of computer based maps.

Mitigation

The use of GIS in disaster management can help with structural and non-structural mitigation. GIS allows you to spatially represent areas at risk and the level of risk associated with a particular hazard, which can be a guide in decision making. It will facilitate the implementation of necessary mechanisms to lessen the impact of a potential emergency. With GIS, disaster managers are in a better position to determine the level of mitigative structures that should be in place given the vulnerability of an area or population.

Preparedness

As a tool, GIS can help with the identification and location of resources and "at risk" areas. It establishes a link between partners and critical agencies, which allow disaster managers to know where relevant partner agencies are stationed. In the context of disaster management, GIS maps can provide information on the human resources present in an Emergency Operation Centre as well as on the ground personnel such as security, health providers and other key responders. This is particularly useful since the technology can help with strategic placement of emergency personnel where it matters most. GIS helps to answer the question of who is to be based where and at what phase during the emergency. It can help to determine whether or not road infrastructure and communications networks are capable of handling the effects of disaster and, if necessary, guide in the placement of resources.

Response

GIS technology can provide the user with accurate information on the exact location of an emergency situation. This would prove useful as less time is spent trying to determine where the trouble areas are. Ideally, GIS technology can help to provide quick response to an affected area once issues (such as routes to the area) are known. In the case of a chlorine explosion for example, GIS can indicate the unsafe area as well as point rescue workers to resources that are closest to the affected areas. GIS can be used as a floor guide for emergency response to point out evacuation routes, assembly points and other evacuation matters.

Recovery

Mapping and geo-spatial data will provide a comprehensive display on the level of damage or disruption that was sustained as a result of the emergency. GIS can provide a synopsis of what has been damaged, where, and the number of persons or institutions that were affected. This kind of information is quite useful to the recovery process.

GIS and Emergency Shelters

GIS technology can be used by shelter operators to capture specific personal details of persons being housed at the shelter. It would also facilitate the process of stock demands and distribution. The technology would capture information on the general makeup of the shelter, that is, the number of children, adults, disabled or any other special occupants.

GIS and Distribution of Relief

"Food drops" in affected areas after a disaster is always likely to take place. The process can be helped with the use of GIS, as maps can be generated which identify the specific areas where clusters of victims are located and the unique needs of persons within these clusters.

GIS and Data Gathering

- *Special populations*

With GIS, disaster managers are placed in a position where they have diagrammatic presentations of the specific location of disabled or elderly persons (for example) that reside within a community. This will make organized assistance on their behalf more efficient and time saving.

- *Most vulnerable areas*

Maps can be produced to highlight more "high risk" areas that are particularly prone to disasters. This kind of information helps with planning (before the occurrence of the disaster) and also facilitates the coordination of efforts during and after the event.

Advantages of GIS

GIS as an innovative and interactive technology tool has more advantages than there are challenges.

1. GIS has the ability to represent spatial information over a wide geographic area. GIS accommodates 3-dimensional graphics which will provide a more detailed viewed of its contents.
2. GIS technology facilitates the integration of different geo-spatial information; which can include models, maps and other graphic forms.
3. GIS effectively analyzes, collects, manages and distributes up-to-date information.
4. GIS is versatile and easy to use – this requires little training to get individuals involved in the process.
5. Attribute table which forms a database- Given that information from GIS can be easily tabulated, it provides a comprehensive pictorial overview of what is happening in the country. For example, GIS can show the exact location of shelters across the country, or the sites where search and rescue operations have taken place.

Challenges of using GIS in Disaster Management

1. Major impacts on life of people, economy and environment. In the context of emergency management, GIS can impact people's lives in a significant way as it reveals sometimes personal and people-specific information.
2. Crucial decisions- Based on the information obtained from GIS mapping, it may require taking critical (sometimes hard) decisions in the best interest of the affected area.
3. GIS being a technological tool can be complex and a bit difficult to grasp initially.

4 Large amounts of information (input) is usually required to get useful output from the system.

5 Time is critical during an Emergency- The decision-making process may be stalled during an emergency due to:

- the large volume of information required by the GIS system; and
- the vast amount of time require to analyze the information before a decision is finally made.

Who can use GIS?

GIS can be used in any area of disaster management. Among the professionals within the disaster management discipline who would find GIS useful are:

- Emergency Planners
- Meteorologists
- Geologists
- Telecommunications personnel
- Security personnel
- Health practitioners

Global Positioning System (GPS) and Disaster Management

What is GPS?

The term global positioning system (GPS) is used to refer to the Global Navigation Satellite System (GNSS) developed by the United States Department of Defence. The proper name is The Navigation System with Timing And Ranging Global Positioning System (NAVSTAR GPS) however the acronym GPS is typically used. Though initially intended solely for US military purposes the GPS system was extended for civilian use in the 1980's. Popular applications include automobile and marine navigation, tracking, farming and research.

GPS is a grouping of 24 well-spaced satellites that orbit the earth and make it possible for people with ground receivers to pin-point their exact geographic location with great accuracy. GPS equipment is widely used across the globe and is sufficiently "low-cost" so that anyone can own a GPS receiver.

Application of GPS to Disaster Management

GPS is particularly useful during disasters because it operates in any weather, anywhere and at all times. While it functions simply to give the location of the receiver, the level of precision of GPS makes it quite useful in disaster management. In many instances GPS data is integrated with

GIS to overlay real-time activity during emergency. GPS find its greatest utility during the response and recovery phases; however it can also be utilized during preparedness and mitigation phases.

An important application of GPS in EDM is tracking of emergency vehicles or supplies. In this application the GPS receiver attached to the vehicle and the location is overlaid onto a map. Other applications include the monitoring the height of waves. GPS units are fixed to buoys and the height of the units are can be determined to within centimetres any significant change in wave height or velocity can trigger an alarm for a tsunami or sea surge. Volcanoes can also be monitored using GPS. By measuring the deformation of the ground, inferences about volcanic activity can be made.

Remote Sensing and Disaster Management

What is Remote Sensing?

Remote sensing is the use of electromagnetic (EM) wave radiation to acquire information about an object or phenomenon, by a recording device that is not in physical or intimate contact with the object. In other words, Remote Sensing is the acquisition of information about an object by a recording device that is NOT in physical or intimate contact with the object.

As you read this material you are actually engaging in remote sensing; we do this so naturally that we seldom realize it. We could take this a step further - we use telescopes to view distant planets. We are definitely sensing objects remotely. In both cases the sensor is our eyes and the EM wave is light. If the term EM waves seems new to you it shouldn't. Everyday light, radio waves and microwaves and x-rays are examples of EM waves. EM waves transport energy and information from one place to another. They are used in cellular networks, microwave ovens, portable radios, x-ray machines and satellites systems.

Remote sensing in the context of disaster management usually refers to the technology that includes man-made sensors that are attached to aircrafts, or satellites. Instead of viewing a far away planet from earth, the sensing equipment is usually high above looking down at our 'distant' planet - earth. Distant in this context can mean just a few hundred feet overhead or miles above the earth's surface *(see Figure 7)*.

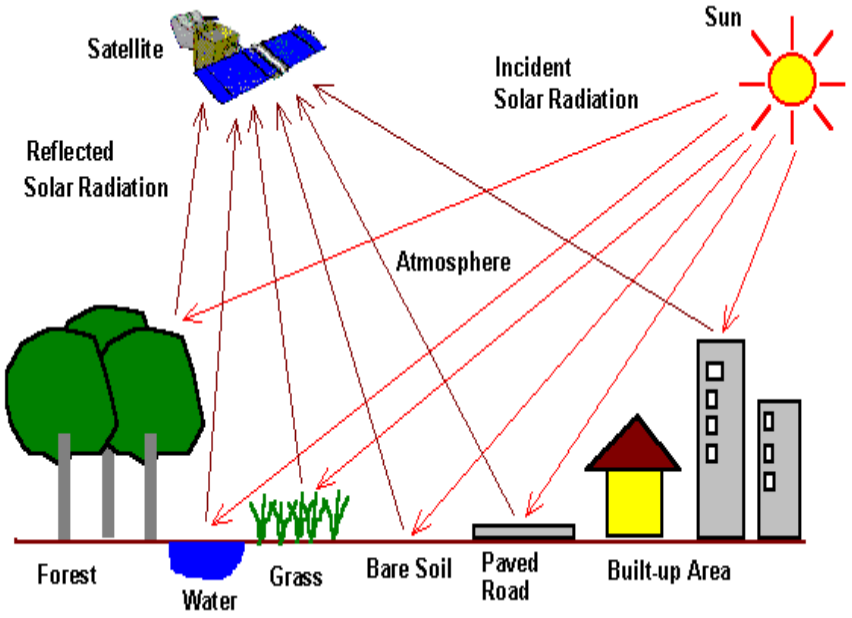

Figure 7: Diagram showing how Remote Sensing is operated and utilized

Returning to our first example, what happens when we turn off the light and it is "completely" dark? We can no longer sense with our eyes. However, if we were to look through a pair of night vision goggles we would be able to see. We will explain why this is possible in the next sections.

Wavelength classification in Remote Sensing

Remote Sensing is classified by three wavelength regions:

i Visible and Reflective Infrared Remote Sensing.

ii Thermal Infrared Remote Sensing.

iii Microwave Remote Sensing.

Visible and Reflective Infrared Remote Sensing

Visible and reflective infrared remote sensing uses 'everyday' light and infrared lasers, with wavelength ranging from approximately 0.4 to .0.8 micrometers. Usually 'regular' cameras or video recorders are attached to airplanes to provide aerial photos. This is the most common and inexpensive form of remote sensing. Visible remote sensing allows us to make before and after comparisons in the event of a disaster.

Thermal Infrared Remote Sensing

Night goggles are a made from a type of infrared sensor. Infrared sensors allow us to image temperature differences, such as thermal pollution in rivers which we cannot see with our naked eyes or to gauge the temperature differences near volcanoes. Infrared sensors exploit the fact that all objects emit a type of EM radiation called "blackbody radiation" at

a wavelength proportional to their surface temperature. These sensors allow us to see a particular part of the electromagnetic spectrum that we would not be able to see with our naked eyes. The term electromagnetic spectrum refers to the range of EM waves with different wavelengths. In terms of wavelength, EM waves range from Gamma Rays to radio waves.

Microwave Remote Sensing

Another type of remote sensing uses microwave radiation. An important property of microwaves is that they are seldom affected by atmospheric conditions. Another useful property of microwave radiation is that it can often image beneath or through objects (just like an X-ray – another type of EM wave that we use in everyday lives). Microwaves can also image differences in the earth's surface due to the absorption level of water or chemicals.

Passive versus Active Remote Sensing

Remote sensing can also be categorized into two broad categories: passive or active. Passive remote sensing makes use of sensors that detect the reflected or emitted EM radiation from natural sources (usually sunlight). Active remote sensing makes use of sensors that detect reflected responses from objects that are irradiated from artificially-generated energy sources, such as radars *(see Figure 8 below)*.

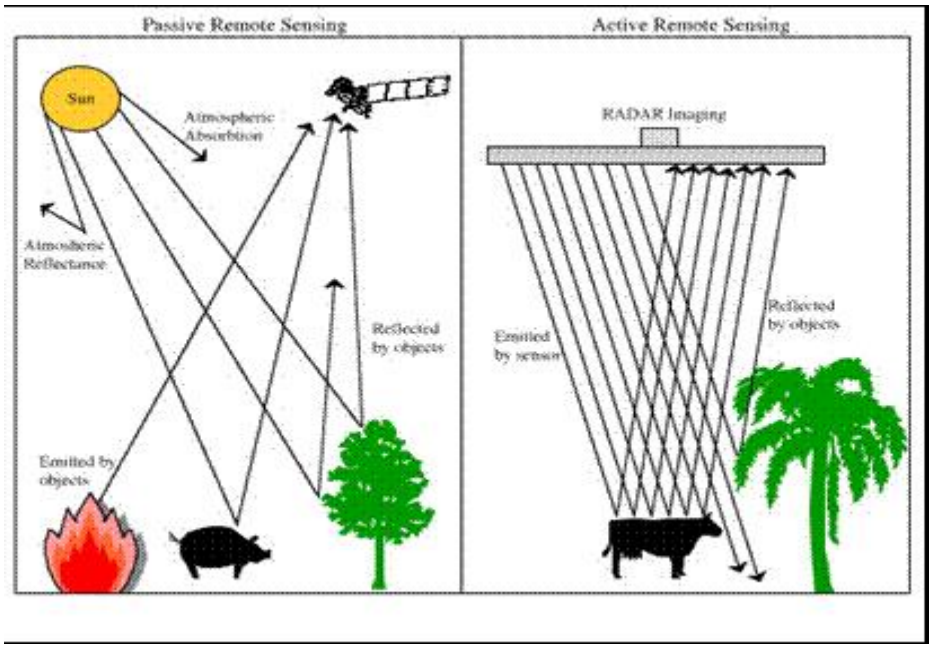

Figure 8: Comparison of Active and Passive Remote Sensing

Remote Sensing Satellites

Many satellites are fitted with several sensors that can measure over two or three of the wavelength regions. An example of such a satellite is the LandSat 7 satellite, which is a part of the US Government's NASA

LandSat Program. You are encouraged to visit http://en.wikipedia.org/wiki/Category:Earth_observation_satellites and read about other earth observing satellites.

Remote Sensing in Disaster Management

The data gathered from remote sensing can be used in a variety of ways to accomplish several objectives. It is usually combined with information from other data sources, and with information from on-the ground observations to get a full picture of water, land or ground activities. Remote sensing data is often integrated with GIS. There exist a wide variety of commercial and free software that allow users to view data collected from the many observing satellites referenced above.

As new technologies emerge, and with the increased incidents of natural and man-made disasters, it is necessary to employ as many of these technological advancements as possible to mitigate against the effects of disasters.

Remote Sensing and Flooding

Flooding is one of the most frequently occurring hazards. With flooding comes the risk of damage or disruption to normal living including communication, transportation, the environment and infrastructure. Given the magnitude of disruption that can take place, it may be difficult for disaster managers to gain access to remote areas or areas that have been cut off as a result of the disaster. Remote sensing as a technological tool would greatly assist this process as it would allow users of the technology the opportunity to view what is taking place in an affected area, without jeopardizing the safety of the user, since they will not actually be at the site.

It is always going to be difficult, if not impossible, for planners to identify all the areas likely to experience flooding in any location. The use of technology however, in determining flood potential could highlight features of the geography that could make the community susceptible to the hazard. Types of flooding such as flash flooding, which usually take place in a relatively short time, with little or no warning could prove potentially dangerous for disaster managers if they attempt to physically go into an area that has been experiencing continuous rainfall. While the task of providing assistance to victims is critical and time dependent, a physical presence in the affected area could increase the persons at risk. Using remote technology however, would allow response workers to stay away from danger zones while at the same time gather pertinent information to facilitate timely response, rescue and relief efforts.

Floodplain mapping is a useful indication of flood possibilities in an area and remote sensing can aid the process of identifying flood plains. The technology would generate satellite imagery of the area in question, which would allow for proper planning and timely rescue efforts should the need arise. The detailed photography produced from remote sensing provides accurate information and can restrict efforts to the affected area. Other characteristics that could be identified about a geographic region using

remote sensing include land-use classification, historical data, soil coverage, and soil moisture.

Remote sensing and Hurricanes

Hurricane forecasting over the last century has improved dramatically, with experts being able to estimate the likely number of storms for a given year, intensity and possible levels of destruction. Today, this process is made even easier with the use of remote sensing technology. Trackers are able, even while the storm is in progress, to go to the core of the system in search of information. This tool, at any stage of the hurricane threat is useful in mitigating against the deadly effects that could take place. Remote sensing can allow planners to ascertain data about the features of watersheds to include drainage and density. Once obtained, this is useful information as it provides information on the capacity of the watershed to deal with the volume of water-flow that could result from rains associated with the storm.

High resolution technology, a feature of remote sensing, is useful in providing spatial data on hurricanes. Because the scales of geographic areas in remote sensing can be manipulated, users will be in a position to zoom in on specific areas for study. Storm surges and coastal flooding, which often accompany hurricanes can be better mapped using remote sensing and provide information on the level of flooding that has been experienced.

Remote sensing and Earthquakes

Development in any area with high seismic risk is always going to be problematic. Given the high volume of fault lines that extend across the breadth of geographic areas, it is inevitable that there are going to be human settlements in these areas. Considering also that there is no early warning system in place for earthquakes, emphasis must be placed on hazard mitigation to reduce the likely impact from earthquakes on lives or properties. Extensive use of remote sensing (and especially the use of satellite imaging) is critical to the planning process for earthquake preparedness. This technology will help in identifying the structural and non-structural earthquake hazards that are present and employ the most appropriate tool for minimizing these risks. LandSat imagery is one tool that is effective for this purpose given availability and cost.

After an earthquake has taken place, visibility with the naked eye, as well as access to worst affected areas may be restricted. When this happens, it becomes difficult for emergency personnel to gain access to survivors in a short period of time. Using remote sensing technology, however, would significantly improve the timeliness and quality of aid that can be provided. Activities, such as search and rescue, are best affected after major earthquakes using remote sensing. Since there will be considerable amount of debris from collapsed structures, it would be advantageous to employ the service of remote sensing for deep searching.

Remote Sensing and Volcanic Eruptions

On-the-spot seismic monitoring of volcanoes is the most effective way to monitor volcanic activity. However, it may not be practical or safe to be on-site at all times. In light of this, remote sensing is crucial to the monitoring process. Remote sensing technology can allow disaster managers to observe volcanic activities on a continuous basis without being physically on site especially at times when it would be dangerous.

Remote sensing and Landslides

Landslides usually occur with other hazards, such as flooding, hurricanes and earthquakes, but can also happen independently. Once major portions of land shift out of place, access to and general visibility of the affected area is usually severely restricted. Remotely sensed images under these conditions are useful tools in assisting planners. It presents a picture of what has taken place, and aids in the decision making process regarding the future of the affected area.

Where assessment of an area is limited due to debris and mudflow from a landslide, remote sensing could penetrate dense areas to provide critical information.

Advantages of Remote Sensing

- Saves time
- Users of the technology do not have to be in direct contact with danger zones.
- Shows image of very large areas of land or space.
- Detect features at wavelengths not visible to the human eye.
- Data can be regularly and routinely acquired and archived.
- The most cost-effective dataset for monitoring change over large areas.
- Can assist with damage assessment monitoring.
- The imagery obtained, using remote sensing, can be useful for forward planning and reconstruction of an affected area.
- Helps to prevent the recurrence of the same disaster in the future.

Challenges faced using Remote Sensing

- It can be costly to build and operate a remote sensing system
- Small size activities cannot be delineated on remote sensing imagery or through aerial photography
- Data can be difficult to interpret and may require expert skills.
- Resolution is often coarse.

Reading

Additional reading material:

http://www.gisdevelopment.net/tutorials/tuman008.htm

http://en.wikipedia.org/wiki/Thermal_radiation

http://www.geog.ucsb.edu/~jeff/115a/remote_sensing/thermal/thermalirinfo.html

http://landsat.gsfc.nasa.gov/

http://en.wikipedia.org/wiki/Category:Earth_observation_satellites

http://worldwind.arc.nasa.gov/

http://en.wikipedia.org/wiki/Remote_sensing

Unit summary

Summary

In this unit you learned about the role of technology in disaster management and we examined the usefulness of Emergency Management Systems (EMS). In addition, we looked at the unique contributions of Geographic Information Systems (GIS), Global Positioning Systems (GPS) and Remote Sensing Systems (RSS) to aid in the effective management of disasters.

Self - Assessment

Assessment

Instructions: *Select the best answer:*

1 Select the option which best defines Emergency Management Systems?

a Disaster-based work systems

b Any technical or technological aid that facilitates information sharing, coordination of critical resources and the effective management of disasters.

c Emergency policies that help governments to manage disasters by organizing the flow of work from one department to another.

d Technology-based systems that make the work of disaster management officials easier, by routing all information to a centrally controlled government computer.

2 EMS can assist in managing which of the following areas:

(I) Hazardous Materials Management
(II) Emergency Medical Services
(III) Response and recovery
(IV) Firemen, medical workers and other response officials
(V) The building of an intricate national stadium to strict international safety standards.

a I &111

b III & 1V

c I , II &V

d I , II & III

3 How can EMS help *prevent and mitigate* against disasters?

a Through Advanced Automated Collision Notification Systems (Advanced ACN)

b Through effective usage of Detection, Route planning and Tracking systems.

c Through Scheduling and Coordination software.

d All of the above

4 Which of the following strategies is the most important in helping to continuously improve the EMS system?

a Appoint the brightest and best talent to operate the system.

b Routinely debug the system to keep it free from dangerous viruses.

c Document the lessons learnt from each experience to reduce the recurrence of problems.

d Keep abreast with cutting-edge global technology as much as possible, without fail.

5 The GIS application is particularly useful for:

a The creation of hazard inventory maps, location of critical facilities and conducting vulnerability assessments.

b The creation of hazard inventory maps, building community resilience and providing critical disaster management information to emergency travellers.

c Policemen, firemen and disaster management officials to coordinate distribution of relief items after a disaster.

d The creation of an intricate disaster plan that is collaboratively drafted and supported by all response agencies.

6 GIS can be applied to the Disaster Management Cycle in the following ways:

a GIS can help broadcast critical post-disaster information to the public.

b GIS technology can be used to build flood warning systems at the community level to warn the residents whenever the river overflows its banks.

c GIS can assist in preparedness by identifying and locating important resources and by providing accurate information on the exact location of an emergency situation.

d GIS technology can aid recovery after a disaster by automatically posting requests for much needed international assistance on the internet.

7 Which of the following conditions interfere with GPS functions?

a Dense cloud

b Volcanic eruption

c Low fog

d Darkness

e None of the above

8 Electromagnetic waves are NOT involved in;

a Radio

b X-rays

c Microwave ovens

d The sense of touch

e Seeing things

Instructions: *Answer **True or False** in response to the following statements.*

a GIS is able to represent spatial information over a wide geographic area. _____

b GIS technology integrates models, maps and other graphic forms of information. _____

c GIS effectively accommodates three dimensional graphics to give a more detailed and comprehensive view of its contents. _____

d GIS technology does not facilitate maps and other forms of graphic information and must be supported by GPS to be complete. _____

e GIS is not very versatile and easy to use. _____

f Emergency planners, meteorologists, geologists, film makers, chefs and small farmers will ALL find GIS useful in their specific areas of work. _____

g Passive remote sensing makes use of sensors that detect reflected responses from objects that are irradiated from artificially-generated energy sources, such as radars._____

h Remote sensing is the most cost-effective method for monitoring changes over large areas._____

i Electromagnetic waves transport energy and matter from one place to another_____

Answers

Best answer:
1 (b); 2 (d); 3 (b); 4 (c); 5 (a); 6 (c); 7 (e); 8 (d).

True or False:
a T; b T; c T; d F; e F; f F; g F; h T; i F.

References

Thomas, Nikolai *"GIS and Disaster Management: A case of Jamaica"*. Accessed on 2/02/08 at: http://www.cuso.org/_files/Jamaica_Risk_GIS_Ngignac_e.pdf

Unit 9

Media and Disaster Management

Introduction

The media forges a direct link between the public and emergency organizations and plays a very important role in disseminating vital information to the public before, during and after disasters. The media assists in the management of disasters by educating the public about disasters; warning of hazards; gathering and transmitting information about affected areas; alerting government officials, relief organizations and the public to specific needs; and facilitating discussions about disaster preparedness and response for continuous improvement. To help the media fulfil these roles, direct working relationships between the media and disaster management organizations should be established and maintained. Experience shows that regular interactions with the media before a disaster strikes, aids the effective flow of information and lays the groundwork for effective working relationships in the aftermath of a disaster.

Outcomes

Upon completion of this unit you will be able to:

- *Identify* the types of mass media..
- *Explain* the role of media in disaster management.
- *Describe/discuss* the positive and negative effects of managing media in disaster management...

Terminology

Mass Media:	Communication channels used for mass dissemination of information to the public.
Electronic Media:	Channels that broadcast information to mass audiences by electronic means, through radio and television for example.
Print media:	Channels that disseminate information to the public in print format, such as newspapers, journals and magazines.
Satellite Radio:	A more sophisticated kind of radio that utilizes satellite technology to broadcast audio information from orbiting satellites directly to the receiver.

The Role of Media in Disaster Management

Types of Media

Two main types of mass media exist, namely, the electronic and print media.

1 The Electronic Media:

The Radio:

The radio is the most popular and widespread information tool used in disaster management due to its affordability and widespread reach. Radios are more readily available in homes, cars, schools and at the workplace and can quickly and easily transmit information to the public through disaster preparedness documentaries, commercials designed to build awareness, discussion groups and interviews, radio dramas and call-in programmes. The radio takes information directly to people from all walks of life, quickly and easily, even the very poor in the most remote rural village.

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

The Television:

The Television is a powerful tool in broadcasting disaster warnings, and is widely used in many countries, with growing popularity. The visual impact of the television provides tremendous opportunity for disseminating messages with great impact on the viewing public because of the realistic combination of picture and sound.

2 The Print Media:

The Newspaper:

The Newspaper is one of the oldest means of communication that can still be relied on. It can be used for both early warnings as well as for recovery messages. The good thing is that the newspaper is widely circulated and can be made to reach the most remote areas by using helicopters to aid the distribution process.

Other Printed Material:

Magazines and journals target a specific audience, for example contractors/builders, academics or farmers. It is therefore an effective way to reach targeted populations with specific disaster-related information.

Does the media play a special role in disaster management?

The media plays an integral and vital role in the management of disasters. Usage of satellite imagery facilitates speedy transmission of information around the globe, and this has put tremendous power in the hands of news reporters to influence global public opinion. Since disasters are a significant source of news and capture the attention of populations worldwide, the media provides tremendous visibility for disaster-related issues and, if used properly, can aid the process of disaster management in the following ways:

i Increased lobbying:

The media can increase lobbying for political commitment, to make national leaders more responsive to the unique needs of vulnerable communities and special populations (such as the elderly and disabled) by increasing visibility of related issues through consistent reporting. By applying pressure on public officials, the media can help effect positive change when for unique areas that would otherwise have been ignored.

ii Aid prioritization of Disaster Risk Issues:

The media can influence the government to prioritize disaster risk issues, thereby ensuring that "self serving" political interests are not emphasized at the expense of the wider population. For example, the media may expose excessive and inefficient expenditure to relocate persons from vulnerable areas just before a general election with a view to secure votes, while little or no attention is given to replenishing the stock of relief supplies in the national warehouse for distribution in the event of a disaster. This kind of exposure facilitates more prudent and balanced prioritization of disaster risk issues.

iii Facilitate creation of Early Warning Systems:

The media can help disaster mitigation experts create Early Warning Systems by providing information on risks and existing technologies that can aid the development of useful concepts and systems.

iv Increase international donations:

The media can trigger donations from the international community subsequent to the occurrence of national disasters, as well as push the government to increase budgetary allocations for disaster response programmes.

v Improve coordination of risk assessment activities:

The media can improve the coordination of risk-assessment activities between policymakers and donor communities. This integration of effort should result in increased availability of resources and improved work programmes geared towards saving lives of affected populations and vulnerable communities.

Impact of the media

The media is a mere tool in the hands of the disaster management professional and can, therefore, yield positive or negative results depending on how it is used.

Positive effects of the media:

1 The media is usually the first to define the event as an official disaster. They inform the public about it and therefore heighten awareness. This resulting awareness influences public opinion about how the disaster is being managed and often determines the level of attention that relief agencies pay to the particular disaster.

2 The media provides instantaneous information and are considered to be trusted sources especially at the local level, where the news media have a "vested interest" in the home town. The network's continuous and factual coverage of incidents and post-disaster events can aid decision making and response immediately after a disaster, thereby saving lives and property.

3 The media is an invaluable asset in times of a disaster by disseminating information about public safety, giving details useful details on areas such as impassable roadways and downed utility lines. Other important public health concerns are usually addressed by issuing water safety advisories and providing information about sites where medical help is available for the public.

4 In the absence of telephones and other mechanisms for communicating with the world outside an affected area, the news media provides:

- the affected population with much needed information and
- the outside world with a glimpse of what that affected community is dealing with.

Negative effects of the media:

By developing an awareness of both the positive and negative aspects of disaster coverage, you can be better prepared to view both the print and electronic media in a more realistic manner.

1 The media may exaggerate some elements of the disaster and create unnecessary panic.

2 The media's inaccurate portrayal of human behaviour during and after disasters may create a very dramatic and exciting, but only partially truthful story. For instance, it is not uncommon to see footage of people looting after a disaster on all news networks, but most viewers may not realize that all the networks were covering the same store being looted.

   As a result, people may feel that widespread and uncontrollable looting is taking place in the affected area(s) which may not be true at all.

3 Influential politicians may manipulate the media for personal or

political gains. For example, Hurricane Dean significantly affected the island of Jamaica a few weeks before the 2007 general elections. The electronic media consistently showed members of a particular political party issuing relief items to the poor, which sent a subliminal message that the political party in question was more responsive to the needs of the people than the other. Incidentally, the political party (that was portrayed in a positive light by the media) won the elections and now forms the new government of Jamaica.

4 News reporters may provide biased coverage for purposes of sensationalism by capturing horrific devastation on a street, choosing to ignore that on the opposite side of the street all the houses are intact with minor damage. This kind of "irresponsible journalism" may lead to the deployment of unnecessary and inappropriate resources to moderately affected areas thereby depriving the more severely affected areas of well needed aid.

5 Media representatives often converge on a high-profile event creating tremendous "congestion" in the affected area. This influx of individuals with needs into an already burdened area can be overwhelming, which may hinder or compromise search and rescue operations, jeopardize rescuer safety and hamper the provision of care needed by the critically ill and injured.

We see from the above discussion that the media can play a very positive and important role in times of disaster, but can likewise hinder the response and recovery process. With this in mind, it is important to recognize that convergence of the media generally occurs after national disasters and, as such, a plan to effectively manage the media should be part of every disaster plan and standard operating procedures.

For more information on the relationship between the media and the disaster management team, see Burkholder-Allen (1999), and, for a journalist's view, see Otieno (2006).

An overview of the topic by Stephen Rattien can be found at the Annenberg Northwestern University's website (see reference list).

Unit summary

Summary

The media plays a unique role in disaster management. Humankind is not powerless when faced with the fury of nature. They can find means to reduce the impact of disasters and safe lives. Communication technology and media are essential means of saving lives, reducing property damage, and increasing public understanding, irrespective of location, population, or level of economic development. Such communication can educate, warn, inform, and empower people to take practical steps to protect themselves from natural hazards.

Assignment

Assignment

Identify a recent national disaster in your country *(natural or man-made)* and discuss specific ways that the media helped and/or detracted from the:

a Preparation and public education process before the disaster

b Response and recovery effort after the occurrence of the event.

Self Assessment

Assessment

1 Select the two major types of mass media from the choices below:

a Television and radio

b Radio and satellite radio

c Electronic and print

d Television and print

2 Select the least accurate statement about the role of the media in disaster management.

a The media can influence the government to prioritize disaster risk issues

b The media can represent the unique needs of vulnerable communities and special populations and effect positive change.

c The media can help in the creation of early warning systems.

d The media can play a direct role in drafting emergency plans and standard operating procedures for Emergency Operations Centres.

Instructions: Answer True or False in response to the following statements.

3 The media is always a trusted source for disaster related information _____

4 The media hardly influences the social climate in a country, since people are too intelligent to be swayed by the personal opinions of reporters _____

5 The media usually converges on important, high-profile events, such as national disasters_____

6 The media hardly ever exposes excessive and inefficient expenditure by government since it is a merely a mouth piece for rich and influential people_____

Answers:

Multiple Choice:
1 C; 2 D;

True/ False
3 F; 4 F; 5 T; 6 F.

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Unit 10

Disaster Associated Health Issues – Part I: Emergency Health Services and Communicable Diseases.

Introduction

This unit briefly considers what is involved in Emergency Medicine. It identifies and describes risk factors for communicable diseases. When a disaster occurs, the general population expects the government and international agencies to rapidly mobilize the needed services with urgency. Preservation of life and health are of paramount importance to casualties. Immediately, medical professionals, First Aid and Emergency Medicine must be made available. As a consequence of disasters, it is also important to identify risk factors for communicable diseases and determine ways of minimizing these risks.

Outcomes

Upon completion of this unit you will be able to:

- *Identify* the components involved in emergency medicine.
- *Describe* a suitable infrastructure and procedures in accessing emergency medicine services. .
- *Identify* the main communicable diseases common in disaster situations.
- *Discuss* the risk factors that increase the likelihood of an outbreak of communicable diseases.
- *Identify* ways of preventing/minimising outbreaks of communicable diseases

Terminology

Acute Respiratory Infections (ARI):	Severe adenovirus infection of the respiratory tract characterized by fever, sore throat, and cough. such as bronchitis.
Agent:	An infections disease agent is constantly searching for opportunities to multiply since their genes can transform rapidly, enabling it to be spread quickly to new locations, and infecting more vulnerable populations.

Communicable diseases:	An illness that arises from transmission of an infectious agent or its toxic product from an infected person, animal, or reservoir to a susceptible host, either directly or indirectly. These include acute respiratory infections, diarrhoeal diseases, sexually transmitted diseases and vaccine-preventable diseases that can cause serious outbreaks.
Diarrhoeal diseases:	Occurs when the stool weight is above 300g per day. This is mainly due to excess water, which normally makes up 60–85% of faecal matter. In this way, true diarrhoea is distinguished from diseases that cause only an increase in the number of bowel movements (*hyperdefecation*), or incontinence (*involuntary loss of bowel contents*). Diarrhoea is also classified by physicians into acute, which lasts one to two weeks, and chronic, which continues for longer than 23 weeks. Viral and bacterial infections are the most common causes of acute diarrhoea, such as cholera and dysentery.
Endemic diseases:	Diseases that are prevalent in or peculiar to a particular locality, region, or people
Epidemic:	The occurrence of cases of a particular disease in excess of the expected. (Therefore, demanding that emergency control measures be implemented.)
Vaccine-preventable diseases:	Diseases such as measles, malaria and meningitis are able to be prevented through vaccinations

Emergency Health Services in Disasters

During the first few days following a disaster, the priority is usually to treat casualties and the sick or injured. Disasters like earthquakes often involve the management of mass casualties which normally requires the following activities: Search, rescue and first aid; Transport of health facilities and treatment; Triage; Tagging; and redistribution of patients between hospitals when necessary. Usually within 30 minutes of a disaster, up to 75% of the healthy survivors are actually engaged in urgent rescue activities.

The demand for curative care is highest during the acute emergency stage, when the affected population is most vulnerable to their new environment and before basic public health measures (e.g., water, sanitation and shelter) have been implemented. Thereafter, the priority should shift toward preventive measures, which can dramatically improve the overall health of the affected population. Otherwise, any prolonged

interruption in routine immunisations and other disease-control measures may result in serious outbreaks of measles, cholera etc.

Disasters call for a co-ordinated response between curative and preventive health services, including food supply, water and sanitation, etc. In order to minimise mortality and morbidity it is also necessary to organize the relief response according to three levels of preventive health measures; namely primary, secondary and tertiary prevention (discussed in more detail further on).

Infrastructure and procedures in accessing emergency situations

i Managing a Mass Casualty Incident (MCI)

A mass casualty incident (MCI) is any event producing a large number of victims such that the normal capacity of local health services is disrupted. Common causes of an MCI include floods, fires, explosions, industrial accidents, or conflict situations.

The response may be delayed after a MCI due to poor communication. Valuable resources at the disaster site are used up in attempts to save the most gravely injured victims who cannot survive, while those who are more likely to survive receive little attention. Inadequate transportation may decrease the survival of victims in critical condition. The following patients will frequently reach the health facility first:

- those nearest to the arriving ambulances;
- those who are first to be rescued; and
- those who are the most gravely injured.

If there is only one first referral health facility, it may quickly become overwhelmed. Limited resources are used to care for victims arriving first, even though most of them may have minor injuries. As a result, they tie up the personnel, examining rooms, supplies, etc. increasing the risk of death for critically ill victims whose survival depends on receiving prompt medical attention.

Understanding Triage

Triage is defined simply as sorting and prioritising patients for medical attention according to the degree of injury or illness and expectations for survival. Triage is carried out to reduce the burden on health facilities and it is normally done by the most experienced health worker assisted by competent staff on the triage team.

See also Wikipedia's article on triage (in references).

Triage is a continuous process that begins when patients arrive at the medical post and continues as their condition evolves until they are evacuated to the hospital.

By providing care to victims with minor or localised injuries, health facilities are freed to attend to more critical tasks. Triage is necessary where health facilities cannot meet the needs of all victims immediately, particularly following an MCI.

The goal of managing a mass casualty incident is to minimise the loss of life or disability of disaster victims by first meeting the needs of those most likely to benefit from services.

This goal can be achieved by setting the following priorities for triage:

Priority for transportation to the hospital is based upon referrals of priority needs of patients.

Priorities for care in the field are often identified by visible colour-coded tags that categorise patient needs. However it is important to note that different jurisdictions use varying systems and the use of colour-coded tags may cause some confusion. (See Nocera and Garner, 1999).

Management of MCI begins with being prepared to mobilise resources and follow standard procedures in the field and at the hospital. Hospitals with a limited number of emergency workers may find it difficult to hold regular training sessions on MCI management. Countries with limited resources should focus on the following:

- improving routine emergency services for sudden-impact, small-scale incidents (e.g., car accidents or accidents in the home). To avoid confusion, the same procedures that are necessary to save lives during an MCI should be performed as routine emergency services;

- co-ordinating activities that involve more than an emergency medical unit (police, fire fighters, ambulances, hospitals, etc.); and

- ensuring a quick transition from routine emergency services to mass casualty management establishing standard procedures for managing all incidents (small or large scale) — search and rescue, first aid, triage, transfer to hospital and hospital care.

Minimum Requirements for a Standard Kit

List of Basic Needs	
Maps, stationery	Medical disaster kit: oxygen, airway, intubation set, ventilation bag, suction device, chest tube set, tracheotomy set, etc.
Means for communication and transportation	IV fluids, drugs for shock, tourniquet
Area lighting, flashlights	Dressing/splint kit: compresses, antiseptics, suture ser, splints, gloves
Identification devices for area, staff and victims, : flags, arm bands, triage tags	Blood pressure cuff, stethoscope
Stretchers, boards, blankets	Scissors, adhesive tape
Protective devices: gloves, masks, etc.	

Figure 9

In addition to the basic supplies provided through such kits, an MCI situation requires the immediate arrival of appropriate personnel which will comprise of the following: the command post team, the evacuation team, the incident commander, the search and rescue team, the security team the Triage officer and the triage team.

Basic MCI management is composed of a series of steps that collectively meet the immediate health needs of disaster victims. It begins with search and rescue from the disaster site and ends with referral to the health facility or release for home care. A possible organisation of an MCI management centre is illustrated in the following figure:

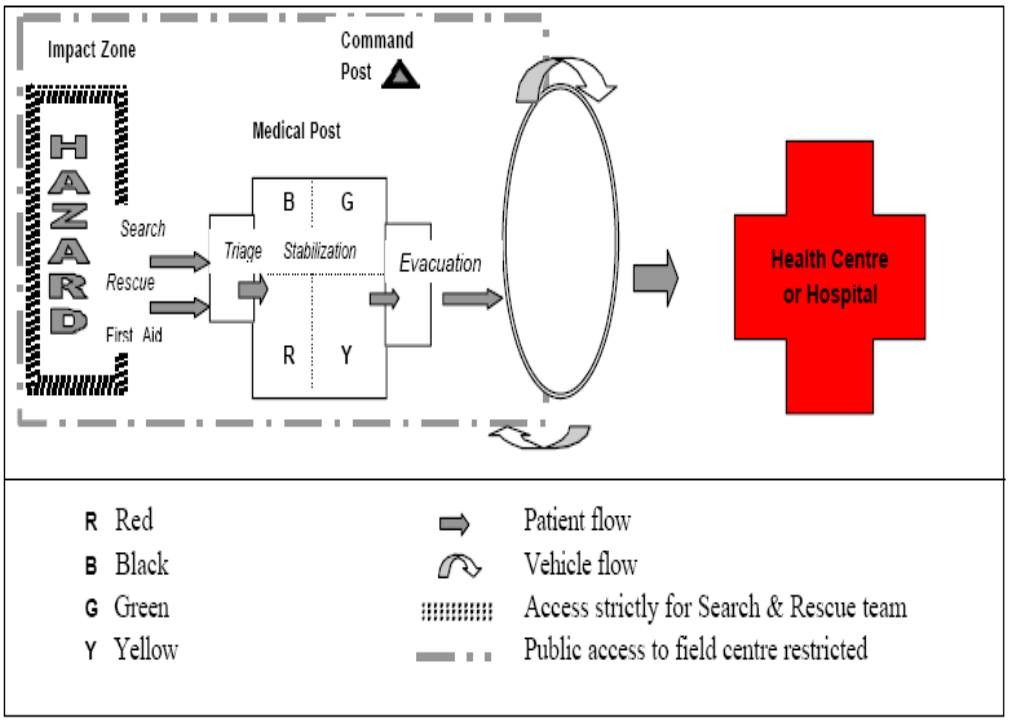

Figure 10: Possible organisation of an MCI management centre

Each team operates within a specific area, aiming to remove all victims away from the disaster site, and to transport the critical cases to health facilities.

Procedures for transportation

Casualties should be treated near their own homes whenever possible to avoid social dislocation and the added drain on resources of transporting them to central facilities. If there are significant medical reasons for such evacuation, the relief authority should make provision to return the patient to his or her home.

Providing proper treatment to casualties requires that the health service resources be redirected to this new priority. Bed capacity and surgical services must be expanded by selectively discharging routine inpatients, rescheduling non priority admissions and surgery, and using available space and personnel fully. A centre, manned 24 hours a day to respond to inquiries from patients' relatives and friends, should be established and could be staffed by able lay people.

Transportation of Casualties

Evacuations of casualties may be organized when they are gathered at a First Aid post, a dispensary or any facility of the casualty-care chain, in which case they would have already been triaged and a priority category for evacuation has been assigned to each.

i Evacuation is contemplated when means are available and reliable, routes and time-frames are known and security has been ensured. Prior to the moving of casualties it is imperative that personnel at destinations have been informed and are ready to receive the casualty(ies).

ii Evacuation vehicles assigned for medical purposes must be used exclusively for the latter. Their availability and hygiene should be respected. Other vehicles should preferably be used to transport the dead bodies if at all possible. In all cases priority should be given to the living casualties.

iii Proper lifting techniques are used to ensure comfort of the casualty and personnel responsible for lifting should be in good physical condition.

iv All departures of evacuation vehicles should be reported to supervisors in charge of managing evacuations providing the following information: departure time, number and condition of casualties, destination, estimated travel time and route, number of first aiders aboard.

v The means of transport should ideally be such that emergency and stabilization measures can continue and should be as safe as possible as it is important that the trip is not traumatic for the casualties.

vi It should also be such that casualty can be accommodated in different lying or sitting positions depending on their condition. Furthermore it should be able to accommodate for a provider of care or a first-aider to accompany the casualty

vii The means of transport should provide adequate protection against the elements (extreme temperatures, sun, rain, wind, etc.).

viii Driving needs to be smooth and safe. Once a casualty has been stabilized it is unnecessary to drive at high speed and risk a road traffic accident. Extra care should be taken especially if the roads are bumpy or have potholes as hitting into them causes more pain to the casualty, may increase bleeding and displace traumatized limbs hence causing more complications.

ix Casualties found on the roadside should be taken on board only if there is adequate space and no other alternative. If possible inform your team leader or the dispatch or command centre of the casualty care chain and ask for instructions. Occasionally “opportunistic casualties” i.e. people who, according to their triage priority, do not need to be evacuated at a given time, may be allowed on board an evacuation vehicle because space happens to be available.

x On arrival at the hospital, every injured person should be reassessed, stabilised, and given definitive care. The colour-coded

tags are strictly for field triage and field use. They should not be used for documenting health care in the hospital.

xi Hospitals should also regularly advise the Incident Commander about their health care capability and capacity so that the transfer of MCI victims is well organised. If the hospital's capacity or capability is low, patients and victims may have to wait a long time for treatment in surgical or intensive care units.

Communicable diseases common in disaster situations

The main communicable diseases are:

1 Diseases transmitted by contact – Acute respiratory infections (ARI) which are common among people after a disaster especially among the children. These are spread through personal contact or being around people who are infected already. These include the common cold, influenza, bronchitis, diphtheria and pneumonia.

2 Vector transmitted diseases are caused by mosquitoes and these include, malaria, yellow fever, dengue, leptospirosis and chikungunya (common in the Seychelles). These infections become prominent when the balance of nature is disturbed as is the case in a disaster.

3 Disease can also be transmitted through faecal matter ingested orally as a result of drinking contaminated water or eating food and fruits that are contaminated. These diseases include cholera, typhoid fever, diarrhoea diseases, and leptospirosis. They can also be transmitted through poor personal hygiene or from a contaminated environment.

4 Diseases transmitted through breathing contaminated air or from germs that are airborne can be problematic after a disaster. These diseases include tuberculosis, measles, meningococcal meningitis and whooping cough.

5 Sexually transmitted diseases are on the rise in peaceful times let alone being in disaster mode. These diseases are transmitted through sexual contact with people who are contaminated with the different germs that are responsible such as HIV/AIDS, gonorrhoea, syphilis, Chlamydia and trichomonas.

Risk factors contributing to the spread of communicable diseases and outbreaks

Research has found that amongst developing countries there are patterns of communicable disease outbreaks that are similar. By studying these patterns we can begin to isolate and identify the risk factors that can lead to outbreaks of disease. Understanding the risk factors associated is essential in helping us to predict and prepare ourselves for combating communicable disease outbreaks.

Risk factors interact with each other in a variety of ways depending on the case and situation. Before appropriate intervention can be determined,

the risk factors must be identified. Five key factors are discussed however, it should be understood that there are many other risk factors.

Pathogenic Agents (bacteria, parasites, fungi)

Everyone everywhere has pathogenic agents and usually our bodies and environment learn to balance these out: however, under disaster situations, natural or man made (for example tsunamis and war), populations often need to migrate and find a new place to settle. When this happens, a health disaster is imminent as pathogenic agents too, find themselves in new environments and different populations. The primary victims of such incidents are often the displaced people given that they may have no immunity to new pathogenic agents they may confront. The local population may also be affected given that their susceptibility could be higher to new pathogenic agents.

Susceptibility of the Population

Populations can be understood by looking at 2 areas: the individual population and, the community population.

When disaster strikes, as in a war, the make-up or profile of community populations will change, for example post war populations always show a baby boom. When this happens, infectious agents who thrive better on the young and the very old, are likely to increase and can lead to an outbreak of disease.

Community populations are very much ‘context sensitive’ for example endemic populations where there is malaria, the at risk age level are infants less than two years. For non-endemic populations, everyone is susceptible to all forms of malaria.

For individual populations it is not feasible to determine each person’s level of immunity however, it is possible to look at groups of individuals at risk i.e. those who are naturally most vulnerable to specific pathogenic agents. For example, in developing countries most children from 2-3 years of age will have been vaccinated or have had measles and therefore their immunity would be high. The children at risk or susceptible to measles would be the 4-5 years olds.

It is very useful to look at groups at risk or those specific populations who are naturally vulnerable to certain pathogenic agents for when these agents are identified then intervention can be planned and processed.

Increased transmission

Pathogenic agents are easily transmitted particularly in situations where there is overcrowding and hygiene conditions are poor. These conditions easily occur when there is lack of water, unsatisfactory waste disposal and all factors resulting in an absence of sanitation measures.

Deterioration of the Health Service

All levels are affected when there is an obvious lack of health services. For example, no vaccinations are given and little or no care is provided for the sick.

Climatic Events

The increased frequency and intensity of extreme climatic events is recognized as a key vulnerability issue associated with climate change. This climate change may pose threats such as:

- Flooding which can lead to increases in mosquito populations that transmit human diseases such as dengue fever.
- Extreme rainfall events resulting in overflow of sewerage systems leading to further spread of pathogenic agents.

The factors discussed in this section, contribute in varying degrees to communicable disease outbreaks. The importance of identifying the risk factors is therefore critical if effective intervention is to prevail.

Practical and effective disease control measures need to be developed collaboratively between relief agencies and local health authorities. These measures should be based on the national diseases control policies.

Preventing and reducing outbreaks of communicable disease in emergency/disaster settings

- Preventing communicable diseases outbreaks
- Intervention at the source to prevent the development of infectious agents that can attack susceptible individuals.
- Intervention to modify immune status (vaccination, general health status)
- Intervention at the biological stage (minimize opportunities to exposure)
- Intervention at the aftermath of a disease (managing communicable diseases outbreak).

1 Levels of intervention

a Primary Prevention – can be defined as the biological and clinical manifestations of an infection. For example immunization and sanitation as well as awareness education on basic hygiene and sanitation methods.

b Secondary Prevention – means preventing a harmless form of a disease from developing into a more serious form liable to cause death or complications. The use of oral rehydration salts (ORS) at

the beginning of a diarrhoeal attack, for example, prevents the development of dehydration. There are also indigenous medicines that can be given to the infected people to treat these conditions, in the absence of pharmaceutical provisions.

c Tertiary Prevention – covers rehabilitation following the illness (social re-integration, nutritional rehabilitation after measles, etc.)

2 Curative Actions

The following is a list of measures for communicable-disease control:

- The use of interviews for rapid assessment of communicable diseases in emergencies
- Immunization
- Tests carried out in the field
- Chemoprophylaxis
- Therapeutic
- Health education

The classic model of the natural cycle of communicable diseases involves:

- risk/exposure factors
- population's susceptibility to the disease
- biological manifestations of the disease
- clinical manifestations of the disease
- progression of the disease
- return to a non-disease state

Communicable Diseases Control

Before, during and after disasters, the government disaster management teams and the communities must work hand in hand to prevent the transmission of communicable diseases. In the event that the diseases has started there must be efforts put in place to control. A number of diseases must be prepared for; this section focuses on some common issues in the small states of the Commonwealth. You may develop a list of disease specific to your area. *(Please refer to table below)*

Diseases	Description/Cause	Signs and Symptoms	Treatment
Tuberculosis (TB)	Bacterial infection that attacks the lungs	Cough-more than 3 weeks; coughing up blood; weight loss; night sweats	Several medicines including strong antibiotics must be taken for a long time. It is curable.
Leptospirosis	Caused by Leptospira agent. Enters the body through the mucous membranes; through exposure to water contaminated with urine of infected animals	Does not spread from person to person. Abrupt Fever. Flu-like Mimics dengue. Jaundice is common	Anti-microbial agents (e.g. penicillin, amoxicillin or doxycycline)
Acute Respiratory Illness (ARI)	Most common is pneumonia. Very dangerous in disaster because of overcrowding. Any series of infections involved in the upper and lower respiratory region.	Cough. Severe difficulty breathing. Fast breathing. Chest in drawing in	Supportive Care Antimicrobial treatment
Conjunctivitis	Bacterial or Viral infection or allergic reaction to dust and pollen etc. Persons can become infected with their hands, contaminated towels etc. after rubbing their eyes.	White yellowish discharge. Eyes stuck together. Watery eyes. Red and sore eyes. Burning and itching eyes	Keep hands clean to avoid spreading. Prescribed eye drop must be administered. In some countries local herbs might be used to treat the infection
Rashes	Caused by a number of pathogens, toxins etc. autoimmune conditions can cause rash in disaster evacuees.	Variety of rashes: Chicken Pox Measles Rubella Human papilloma virus Adenoviruses	Demonstration of topical creams. Supportive care. Calamine lotion, corn starch. Severe cases require antibiotics.
Diarrhoeal Disease	Caused by bacteria (e.g. salmonella, E-	Last several days, bowel weeps fluid.	Diarrhoea should be left to take its

Diseases	Description/Cause	Signs and Symptoms	Treatment
	Coli.) Can also be caused viruses (rotavirus) and parasites. Chronic diarrhoea can cause under nutrition	Fluid in the bowel leads to liquid stools. Inflammation Cramping, abdominal pain, Nausea, and vomiting.	course. No medication only the use of oral rehydration salts (ORS)
Cholera	Acute intestinal infection that is spread through contaminated water and food.	Copious, painless, watery diarrhoea and vomiting. Severe dehydration	Oral rehydration salts and Intravenous fluids
Hepatitis	Five types: A, B, C, D, and E. Type A and E – transmitted through contaminated food and water. Type B, C, D - by blood or serous fluids.	Fever. Persistent vomiting. Jaundice-longer than 10 days Bleeding Dehydration Anorexia	No specific treatment. Maintain hydration, nutrition and adequate rest. Avoid Paracetamol, salicylates, and antihistamines
Malaria	Vector disease caused by various malaria blood parasites. The host is the Anopheles mosquito	Spontaneous night chills Fever at nights. Pain in the joints, nausea, vomiting, anaemia. Enlarged spleen	A combination of two anti-malarial drugs- it is more effective and if one does not work the other will. Patients who have severe P. falciparum malaria or who cannot take oral medications should be given the treatment by continuous intravenous infusion.
Typhoid Fever	Caused by salmonella, ingested in food and water contaminated with faeces.	Malaise, headache. Aching limbs. Cough, constipation or diarrhoea. Bronchitis and	Prevention: vaccination. Several antibiotics can be used

Diseases	Description/Cause	Signs and Symptoms	Treatment
		delirium may develop	
Gonorrhoea	Sexually Transmitted Disease (STD) caused by a bacterium and flourishes in warm moist areas of the reproductive system.	Burning when urinating. White, yellow or green discharge. Men-swollen testicles. Some women get no symptoms	Gonorrhoea is treated with antibiotics (e.g. ciprofloxacin). Single injection, a single pill, or a week-long course of pills.
HIV	HIV (human immunodeficiency virus) is the virus that causes AIDS. This virus may be passed from one person to another when infected blood, semen, or vaginal secretions come in contact with an uninfected person's broken skin or mucous membranes	There are no specific symptoms as a person can live with this for years without knowing. As the immune system weakens, any series of opportunistic infections can develop.	No cure. Antiretroviral drugs slow the progression of the virus and once started, they must be taken everyday for the rest of your life. (numerous side effects)

Figure 11

Monitoring and Evaluation of Communicable Diseases Control Programme

Emergencies are unstable and dynamic situations. Simply carrying out disease control measures after an initial assessment does not mean that communicable diseases will not cause problems among an affected population. Disease surveillance is useful for monitoring the incidence of communicable diseases as well as the effectiveness of disease control measures. This will determine whether selected control measures are appropriate and resources are adequate for preventing disease and preserving the health of the affected population.

Evaluation of the disease control program is vital because it measures effectiveness, identifies lessons for future programs, and promotes accountability. Communicable disease control programs can be evaluated in two ways:

a *Internal Program Evaluation* — This is normally carried out by program staff who regularly analyse and review monitoring information. They must also evaluate the effectiveness of all

control measures or compare these measures across different situations.

b *External Program Evaluation* — This may be part of a wider evaluation exercise by agencies and donors. It may be planned, for example, after the acute phase of the emergency.

The Sphere Project proposes minimum standards and key indicators that can be used to evaluate a communicable diseases control programme in emergencies.

The following minimum standards and key indicators of the Sphere Project may be used to evaluate a communicable diseases control program in emergencies. Minimum standards and key indicators of the Sphere Project for the following components may be used to evaluate the following control programme:

i Measles Control

ii Monitoring of communicable diseases

iii Investigation and control of communicable diseases

iv Human Resource capacity and training

i Measles Control

The following indicators are used to evaluate if a systematic response is mounted for each outbreak of measles within the disaster-affected population and the host population, and whether all children who contract measles receive adequate care:

- A single case (suspected or confirmed) warrants immediate on-site investigation which includes looking at the age and vaccination status of the suspected or confirmed case.
- Control measures include the vaccination of all children 6 months to 12 years of age (or higher if older ages are affected) and the provision of an appropriate dose of vitamin A.
- A community-wide system for active case detection using the standard case definition and referral of suspected or confirmed measles case is operational.
- Each measles case receives vitamin A and appropriate treatment for complications such as:
  - pneumonia, diarrhoea, and severe malnutrition, which cause the most mortality.
- The nutritional status of children with measles is monitored, and if necessary, children are enrolled in a supplementary feeding program.

ii Monitoring Communicable Diseases

The following indicators are used to evaluate the monitoring of communicable diseases:

- The responsible surveillance and disease control unit or agency is clearly identified and all participants in the emergency know where to send reports of suspected or confirmed communicable diseases.
- Staff experienced in epidemiology and disease control are part of the surveillance and disease control unit or agency.
- Surveillance is maintained at all times to rapidly detect communicable diseases and to trigger outbreak response.

iii Investigation and Control of Communicable Diseases

The following indicators are used to evaluate whether diseases of epidemic potential are investigated and controlled according to internationally accepted norms and standards:

- Diseases of epidemic potential are identified by the initial assessment; standard protocols for prevention, diagnosis, and treatment are in place and appropriately shared with health facilities and community health workers/home visitors.
- Case reports and rumours of disease occurrence are investigated by qualified staff.
- There is confirmation of the diagnosis.
- Outbreak control measures are instituted, which include attacking the source, protecting susceptible groups, and interrupting transmission of the disease.
- Qualified outreach personnel participate in the control measures at the community level by providing both prevention messages and proper case management according to agreed guidelines.
- Public information and health promotion messages on disease prevention are part of control activities.
- Community leaders and outreach personnel facilitate access to population groups and disseminate key prevention messages.
- Only drugs from WHO's Essential Drugs List (1998) are used.

iv Human Resource Capacity and Training

The following indicators can help evaluate whether the staff are suitably experienced and trained and that they are adequately managed and supported by their agency:

- Staff and volunteers involved in surveillance (as part of assessment, monitoring, or review process)are thoroughly briefed and regularly supervised.

- Staff responsible for communicable disease control have previous experience or training and are regularly supervised in the use of recommended treatment protocols, guidelines, and procedures.

- Carers are informed about priority prevention activities such as the need for vaccination, use of soap, bed nets, latrines and good health seeking behaviours.

The techniques and resources used for monitoring or evaluating must be consistent with the scale and nature of the disease control program. At the end of the evaluation, a report must be written which describes the methodology used and how conclusions were reached. This report should be shared with all concerned, e.g., the affected population, host authorities, donors, and other humanitarian agencies.

Rapid Assessment

Assessment undertaken after a major change, such as an earthquake or sudden refugee displacement. It provides information about the needs, possible intervention types and resource requirements. A rapid assessment normally takes one week or less. It is then followed by detailed assessments.

The use of interview as a rapid assessment method

Very often those involved in relief in emergencies may not always have access to sources of information which can allow them to determine the main communicable disease that are affecting the population. It is not uncommon that at the outset of a disaster, the only available source of information is the population itself.

Opportunities for direct investigation with a population are limited, and it is usually difficult to start off by running biological tests in order to diagnose the main communicable diseases. Initially relief workers will have to content themselves with the information they can collect through interviews with community members.

Such interview may prove adequate to indicate which measures need to be taken, depending on the data sought. For example, a relatively simple questionnaire permits a rapid assessment of the main causes of death among the children of the affected population. The procedure to follow can be summarized as follows:

- Draw up a list of syndromes which appear to be the main causes of death. In the case of communicable diseases, these would consist primarily of measles, diarrhoeal diseases, malaria, and meningitis.

- Describe the symptoms used to identify the communicable disease/s in question; the medical personnel and the individuals questioned may have markedly different interpretations of the same clinical manifestation. A minimal knowledge of local terminology is essential.

- Verify the information, this is difficult in the case of mortality, since the data receive cannot be confirmed except by information from other sources e.g. the cause of death for hospitalized children.

Health Education

Health education is not limited to the problem of communicable diseases. However, communicable diseases are a useful starting point for initiating health education in a disaster situation. The risks involved in communicable diseases must be well understood by the affected community, and the need for their participation in controlling them.

Health education should take into consideration other components that influences behaviour. For example, the place where people live, the people around them, the work they do; hence telling people what they can do to be healthy is insufficient

In emergency situations, relief workers rarely have much influence over the causes of the crisis. Unfortunately, they must settle for modifying or adapting the victims' behaviour to conform to their new living conditions- which will be temporary, at best – without exercising any real impact on the social environment.

The problems that confront an affected population may not be new to them, but present themselves in a different form. Moreover, the urgency of certain situations necessitates immediate action, before the population has a chance to understand its purpose.

A population confronted with an emergency in itself is obliged to change its behaviour quickly. Such changes, however, cannot be dictated by outsiders; they must be formulated by the people concerned, and disseminated by them as well, in their own words and should reflect the local cultural context.

Developing a Health Education Programme

On the basis of this principle, the following sequence might be proposed to begin the process of health education:

i Identification of health problems by the community.

ii Study of behaviours adopted to cope with these problems: should they be modified?

iii Determination of the objectives of health education programme.

iv Identification of practical measures acceptable to the community, to modify these behaviours.

v Implementation of the measures.

vi Evaluation of results.

Unit summary

Summary

This unit provides material which teaches the following areas: – Emergency Medicine – Risk Factors For Communicable Diseases – Coping With Communicable Diseases.

The unit outlines the important factors which contribute the spread of communicable diseases associated with disaster situations. It outlines and discusses risk factors associated with the management of communicable diseases in a disaster setting. The unit can inform those who enrol in this programme on the important factors that managers of disaster situations should expect in dealing with communicable diseases during times of disasters.

Self - Assessment

Assessment

1. Describe all components involved in emergency medicine and write small notes on each giving examples where possible?
2. Draw a flow chart describing the different types of triage in emergency medicine.
3. What are the minimum requirements of a standard emergency kit? Provide pictures or illustrations of the kit.
4. What are the main signs and symptoms of the different communicable diseases commonly found in disaster situation?
5. Write a short essay on risk factors common in disaster situation and how these can be prevented and or treated.

References

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Unit 11

Disaster Associated Health Issues – Part II

Introduction

This unit discusses vector-related diseases and their control, and the safe handling of pesticides as well as discussions of challenges and constraints faced by disaster management personnel dealing with environmental health awareness during and after a disaster. The unit finishes with an outline of a sanitation programme to ensure the promotion of health and hygiene. The maintenance and monitoring of water quality and quantity as well as vector control measures and environmental health programmes in emergency situations.

Outcomes

Upon completion of this unit you will be able to:

- *Identify* potential vector-related species.
- *Describe* appropriate strategies for controlling vector species.
- *Promote awareness* on the safe use of pesticides.
- *List* the challenges & constraints of environmental health management in emergencies.
- *Promote* health & hygiene through implementing a sanitation programme.
- *Explain* the importance of water sources and the minimum standards for water quality and quantity.
- *Describe* processes to monitor and evaluate vector control measures and environmental health programs in emergencies.

Terminology

Contamination:	Becoming impure or unusable due to contact or mixture with certain pathogens that are transmitted through faeces or urine.
Faecal coliforms	A category of bacteria that match the characteristics of bacteria found in the stool of warm blooded animals. Finding these bacteria in

	water indicates faecal pollution and the water sample potentially dangerous.
Minimum standards	A set of standards developed by international humanitarian agencies (e.g. Sphere Project) in response to concerns about the quality and impact of humanitarian assistance. It aims to govern the implementation of relief programmes. The minimum standards can be found in the Sphere handbook which can be viewed on the web at: http://www.sphereproject.org.
Pathogen:	Anything that causes disease, especially micro-organisms
Pesticide:	Any substance used to kill or control organisms which are considered to be pests
Water born diseases:	Diseases acquired by drinking contaminated water (e.g. diarrhoea, cholera, amoebiasis,)
Vector:	Any animal or arthropod capable of carrying disease pathogens from one host to another either mechanically or through its body functions

Potential vector-related species

In general the most potential vector-related species is the mosquito. There are different species of mosquitoes causing various diseases such as elephantitis, malaria, yellow fever, dengue, leptospirosis, and chikungunya (common in the Seychelles). Mosquitoes use a variety of different hosts such as small mammals as in rodents, human beings, monkeys and pigs.

There are also a number of different types of flies, such as, household flies (dysentery), sand flies (skin infections), black flies (river blindness) and tsetse flies (sleeping sickness).

Rodents can also be vectors for disease themselves – leptospirosis is spread in the urine of small mammals.

Appropriate strategies for controlling vector-related diseases

Strategies to control the infestations by rodents and insects are of paramount importance. The following are some of the possible control strategies:

- To identify and distinguish between potential vector-related species

- To develop and implement an appropriate plan for controlling vector species.
- To promote awareness on the safe use of pesticides.
- To recognise the challenges & constraints of environmental health management in emergencies.
- To promote health & hygiene through implementing a sanitation programme.
- To explain the importance of water sources and the minimum standards for water quality and quantity.
- To monitor and evaluate vector control measures and environmental health programs in emergencies.

Promoting the safe use of pesticides

Vector control measures should address two principle concerns: efficacy and safety. They should be carried out according to internationally agreed methods and ensure that staff and the affected population are adequately protected.

There are three points about pesticide safety that should be emphasized in disaster settings, especially where evacuees are housed.

1 Safe Use and Storage of Pesticides: Extra precautions should be taken in choosing insecticides and deciding when, how, and for how long to apply them. Strict procedures must be followed when handling insecticides and other related equipment. Pesticides and the spray machines should never be transported in vehicles that are also used for carrying food. They must be stored in locked and ventilated buildings. There is an increased danger of pesticide poisoning among displaced populations. Poisoning may be unintentional, but the danger exists because of the lack of toys for children to play with, the novelty of the situation, and the traumatic experience of being displaced.

2 Safe Storage and Disposal of Used Insecticide Containers: Strict guidelines have been developed for this and they should be implemented to ensure that the displaced community cannot obtain used pesticide containers.

3 Safe Use of Sprayers: Prior training in the safe use of pesticides is essential, and operators must have access to protective clothing (uniforms, gloves, masks, etc). They must never smoke, drink, or eat during the job, and they should have access to good washing facilities after the job is done. There has also been the recommended discontinuance of the use of certain pesticides. It is suggested that each country follows the WHO guidelines provided for the Safe Use of Pesticides in Disasters.

Environmental health: challenges and main constraints

Environmental Health has its origins in the last century, when bad housing, poor water supplies, inadequate drainage and contaminated food caused disease and death. To recognize the challenges and addressing the main constraints of environmental health in relation to disaster management can present several challenges and constraints.

These challenges and constraints are as follows:

- Recognizing and responding to uncertainties, especially prioritizing treatment of different conditions.
- The different tasks involved that are performed by various personnel during a disaster and identifying those responsible for carrying out these tasks successfully and efficiently.
- Establishing baseline relationships between the various players, so each one knows their sphere of responsibility.
- Seeking evidence for early health effects and detection.
- The level of development of a country can either be a challenge or a constraint. Wealthy countries face disasters with a wealth of human and material resources, a well developed medical and health infrastructure, highly structured emergency planning, efficient transportation and communication systems. The presence of these factors facilitates responses to disaster, whereas by contrast poor countries lack these resources and constrained disaster response.
- Cultural variations within the countries are important and can present challenges and constraints to disaster management. This is due to each community evolving traditional ways of understanding and responding to disaster and these processes must be managed properly to facilitate high survival rates.
- Different cultural groups may respond in unexpected ways to medical and health professional personnel in times of disasters and these professional people should be empowered to handle these different situations.

Promoting health and hygiene through implementing a sanitation programme

The quantity and quality of the water that we drink is directly linked to health. If the water is contaminated with germs or chemicals, health will be affected. Outbreaks of diseases transmitted by water have a major impact on human health. This is a major concern after a disaster. When people defecate in the open, flies will feed on the excreta and can carry small amounts of the excreta away on their bodies and feet. When they touch food, the excreta and the germs in the excreta are passed onto the food, which may later be eaten by another person. During the rainy season, excreta may be washed away by rain-water and can run into wells

and streams. The disposal of excreta alone is, however, not enough to control the spread of cholera and other diarrhoea1 diseases. Personal hygiene is very important, particularly washing hands after defecation and before eating and cooking.

Here are some rules for basic sanitations in public places:

- There should be sufficient toilet facilities for the maximum number of people using the area during the day. This normally means one toilet compartment for every 25 users. The toilet facilities should be arranged in separate blocks for men and women.
- Toilet facilities should not be connected directly to kitchens. This is in order to reduce the number of flies entering the kitchen and to reduce odours reaching the kitchen.
- There must be a hand washing basin with clean water and soap close to the toilet facilities. There should be separate, similar facilities near to kitchens or where food is handled.
- There must be a clean and reliable water supply for hand washing, personal hygiene and flushing of toilet facilities.
- Refuse must be disposed of properly and not allowed to build up, as it will attract flies and vermin.

It is important to make sure that information about health is available in public places. Such information should be displayed in an eye-catching, simple and accurate way. Where appropriate, large posters with bright colours and well chosen messages, put up in obvious places, are effective.

Health and hygiene messages may be passed on to the public using such posters in public places. These messages should include the promotion of:

- Hand washing
- Use of refuse bins
- Care of toilet facilities
- Protection of water supplies

Importance of water sources and the minimum standards for water quality and quantity

Sources of Water

Water sources fall into three general categories:

1. Rainwater: In general, rainwater, though pure, is not reliable or a sufficient source to provide for a large affected population and is rarely considered during emergencies.
2. Surface water: Surface water from lakes, ponds, streams, and rivers have the advantage of being accessible (water easily collected) and are predictably reliable and plentiful. They have the disadvantage of

generally being microbiologically unsafe, and therefore, requiring treatment.

3 Groundwater: Groundwater from wells, springs, etc. tends to be of higher microbiological quality (having undergone natural soil filtration underground). However, it is relatively difficult to extract. More technology and energy is needed (compared with other water sources) to bring water from within the earth up to the surface.

The following factors are important when selecting the type of water sources for a displaced population:

- The *reliability* of available water sources.
- The *water needs* in relation to population size.
- The intended *length of time* that the source will be required.
- The locally available *skills and resources.*
- The *capacity* of the implementing agency.

Water Quantity

The minimum standards of the Sphere Project states that at least 15 to 20 litres per person per day (l/p/d) is needed to maintain human health. While the availability of water is influenced by the situation, more water can almost always be obtained with more resources (more wells, trucks, or pipes). Because obtaining water in arid areas is expensive and the relationship between water quantity and health is not well understood, there is a tendency not to invest enough in water infrastructure when other demands seem more serious. This makes monitoring the availability of water during emergency situations an essential component of a public health program.

During the acute emergency phase, water consumption should be estimated weekly. Often, the utility company or relief organisation providing water to the affected population is aware of these estimates. It is important to realise that water consumption means what people receive not what the water team produces.

Disagreements may arise between “production” and “consumption” estimates because:

- Water can be lost or wasted during pumping and transport.
- Lack of water containers can prevent people from collecting enough water.
- Surveys or household interviews that document the amount of water collected at watering points or people’s actual use of water are preferable to simply dividing the amount of water produced at a well or a plant by the number of people served. Cholera outbreak investigations have repeatedly shown that not owning a bucket puts families at increased risk of illness or death. Thus, not only should the average water consumption be 15 l/p/d or more, but there should not

be anyone in the population with very low water consumption (<7 l/p/d).

In addition, all families should be provided with suitable water containers for daily collection and storage of water. Special drainage pits should be constructed to manage runoff water at distribution points.

Water Quality

Water quality is usually measured by the presence of specific groups of micro-organisms. This indicates the possible presence of faeces. Because human faeces typically contain tens of millions of bacteria per gram, even the smallest trace of faeces in water is often detectable by bacterial monitoring. Faecal coliforms are a category of bacteria that match the characteristics of bacteria found in the stool of warm-blooded mammals. Other indicator bacteria, such as E. coli, faecal streptococci, or total coliforms, are maintained by the same premise — absence implies safe water.

The following table shows the recommended guidelines for assessing water quality.

Guidelines for Water Quality (UNHCR)

Faecal Coliforms (per 100 mLs of water)	Interpretation	Recommendation
0-10	Reasonable quality	Acceptable
10-100	Polluted	Better protection and simple treatment
100-1,000	Very polluted	Treatable, but look for alternative source
Over 1,000	Grossly polluted	Source to be avoided

Figure 12

Note: Water quality testing may be performed by a competent local laboratory (must be done within 6 hours of sampling), or by using field testing kits, e.g., the Oxfam/Del Agua Kit or Milliflex Kit from Millipore. However, these kits are expensive and require trained people to use them and interpret results.

The above table shows that no faecal coliforms in water is a good indication that there are no faecal-oral bacterial pathogens present, whereas finding low levels of faecal coliforms in water does not mean that the water is dangerous.

Note: Contaminated water sources should not be closed until equally more favourable sources become available.

While water sources may differ in water quality, it is how water is handled and stored by consumers that will finally determine whether the

water is safe for drinking. Studies have shown that dipping hands into household storage buckets causes considerable contamination and that water quality declines over time after the water is initially collected. The best way to keep water safe in the household is to add a chlorine residual to the water. This means that in unsanitary settings, or during times of outbreaks, it may be necessary to chlorinate otherwise safe groundwater.

Monitoring and evaluation of vector control measures and environmental health programmes in emergencies

To determine the effectiveness, efficiency and the extent of achievement of any implementation, a mechanism for monitoring and evaluation is essential. In general, an evaluation measures the performance/progress of an intervention program as well as serving as a steering device for the intervention itself. There are two levels of evaluation:

i Monitoring and Impact Evaluation

ii Monitoring Vector Control Measures

Suitable monitoring tools are developed and made available. A monitoring form will include the type of control measure for a particular vector-related species, the timeframe for monitoring and someone pinpointed to perform the monitoring. Immediate analysis of the data obtained will indicate if the controls provided were actually reaching and utilized by the target community as scheduled.

Humanitarian agencies would ensure that assistance they finance/provide does indeed get to the victims who need them. By virtue of its specific mandate, an agency will set three conditions before undertaking any relief action:

- Access to the persons requiring assistance, to observe their situation and to evaluate their needs;
- That it be present when the assistance is brought in; and
- That it be allowed to exercise administrative supervision in order to prepare reports on distributions made.

If authorities do not yield advance consent to the conditions set out above, humanitarian agencies may withhold assistance. The crucial point here is how urgent the victims' needs are. If the situation is critical, postponing humanitarian assistance is ethically questionable. In the time taken to negotiate with the authorities, the victims' conditions may deteriorate dramatically, the humanitarian agency is compounded by the accusation that it did not act early enough to prevent the crisis.

Impact Evaluation

Evaluation is a means of verifying whether the services provided correspond to what had been anticipated quantitatively and qualitatively. Accordingly, the quantity and quality of the services must be assessed. This involves making a value judgment concerning the quality of medical

and other needed service activities. For health-care professionals, the issue becomes one of medical ethics.

Impact evaluation is essential when evaluating the impact of an intervention. A humanitarian agency will seek authorisation to return to the scene in order to assess the impact of its work on the condition of the population in relation to the targets set.

Humanitarian agencies have a responsibility to carry out evaluations on a systematic basis. Objections may arise on the grounds that:

- It is too difficult (The institution of a surveillance system is certainly not easy, but it is not impossible)
- It is not a priority (first priority is feeding, treatment, etc., – any time left over, then evaluate). The priority of analyzing the impact of an intervention is not to satisfy the intellectual curiosity of the program managers. It is an essential tool for orienting the operation.
- It is better not to know the impact of the intervention (Fear of value judgment).

All these arguments can be refuted.

Unit summary

Summary

In this unit you learned how to identify and distinguish between potential vector-related species, plan appropriate strategies for controlling vector species and promote awareness on the safe use of pesticides. In addition you learnt how to recognise the challenges & constraints of environmental health management in emergencies and promote health & hygiene through implementing a sanitation programme. Furthermore you will be able to explain the importance of water sources, the minimum standards for water quality and quantity, monitor and to evaluate vector control measures, and lastly environmental health programmes in emergencies.

Self - Assessment

Assessment

1. Prepare a 10 min presentation in which you explain what is meant by vector-related species and their potential danger for bringing about natural disasters.
2. Design a plan of strategy for controlling vector species. Clearly identify the key areas for enabling good control of vector species.
3. List 3 key challenges & constraints of environmental health management in emergencies.
4. How would you go about monitoring and evaluating vector control measures and environmental health programs? Make a list of the important areas you would need to consider.
5. Put together a poster promoting either the safe use of pesticides OR promoting a sanitation programme.

References

The Sphere Project: Humanitarian Charter and Minimum Standards in Disaster Response (2004). Accessed on 2/02/08 at: http://www.sphereproject.org/content/view/27/84

Unit 12

Physical and Socio-economic Impacts of Disasters

Introduction

Disasters are no respecter of persons and the trail of destruction that they leave behind is a common occurrence. Their effect or impact, is usually felt across all sectors in society, at the community or individual level, which has led to push a for the more multi-sectoral approach to prepare and respond to disasters! The impact of a disaster may either be a direct or indirect one, its effect trickling into most homes and families in the community. The more obvious physical impact leads to the socioeconomic and emotional impact felt by the community. The intensity of the impact of any disaster is dependant on the preparedness level of the community or nation. Factors that increase the intensity of the effect of a disaster are poverty, environmental degradation, population growth, and lack of information and awareness about the hazards that exist in the area, and the potential risk they pose to the community at large.

In this unit we will look at the physical and social impact of disasters on society. One emerging issue that we will also touch on is that of animals in the time of disaster.

Outcomes

Upon completion of this unit you will be able to:

- *State* the types of impacts of disasters on society.
- *Identify* what different sectors in society are affected by disasters.
- *Describe* the impacts of disasters on the different sectors of society.
- *Develop* contingency plans to minimise food distribution problems in the post disaster period.
- *Assess* the impacts of disaster on people's income earning capacity and overall social welfare.
- *Compare and contrast* the extent of economic impacts caused by natural and man made disasters in any region of their choice.

Terminology

Physical impact	death and injury of people and damage to built environment.
Rapid Assessment	a quick assessment of a disaster site immediately after a disaster, to determine immediate needs of people in impacted area
Social impact	disruption to essential goods and services
Built environment	includes things such as buildings, infrastructure, houses etc in an area.

Types of impacts

Disasters impact heavily on the basic needs of people, and their livelihood, thus governments need to be prepared so that they can deal with the disaster promptly and effectively. Usually, immediately after a disaster has occurred, a team made up of government and non – government agencies is sent into the disaster site to carry out what is known as a Rapid Assessment exercise. The information collected from this quick initial assessment on the damage done from the hazard, is used by the leaders of the community or nation to determine whether any external assistance is needed. It is also used to determine the "what and how much relief" needs to be brought in immediately, and also what specific segments of society have been affected heavily by the hazard.

The impact intensity felt by a community from a disaster is dependent upon the vulnerability of the community before the hazard struck (e.g. proximity to hazard, any education and awareness done etc) and thus their preparedness level. In any community the most obvious impact is the physical impact. The physical impacts in turn lead to the social impacts felt by the community. These are described in further detail below.

Physical Impacts

The physical impacts of a disaster are the deaths and injuries, and the damage to property and the built environment. The built environment can be classified as infrastructure and service sectors such as electricity, water etc. The amount of deaths can lead to a reduction in the population, and thus the workforce, which will in turn have an impact on the socio economic sector of the community. It should be noted here that the amount of physical damage caused by a hazard can affect the speed at which the response to the area can occur. If roads are cut off, this means alternative means need to be looked at to bring relief in to the disaster zone.

1 Infrastructure

Infrastructure includes the basic facilities, services and installations required for the functioning of a community or a society. Since these facilities, services and installations are spread throughout the community and country, they are normally impacted to some degree when disasters strike. Of the many components of a country's infrastructure, a select few are vital to both disaster response and to overall safety and security of the effected population. These components are referred to as "critical infrastructure,"

While all infrastructures damaged or destroyed in the disaster will eventually require rebuilding or repair, critical infrastructure problems must be addressed in the short term, while the disaster response is ongoing. The repair and reconstruction of critical infrastructure requires not only specialized expertise but also equipment and parts that may not be easily obtained during the emergency period. However, without the benefit of certain infrastructure components, performing other response functions may be impossible. Examples of critical infrastructure components include:

i Transport system (land, sea and air)

This system is important because at the time of disasters there needs to be an evacuation route available so as to get people out of the danger zone and or bring relief in. Transport is also important when a team needs to be sent in to the disaster zone to do a Rapid Assessment exercise. Transport mediums also need to be available, so that if one transport system is cut off, another mode of transport can still be used.

ii Gas and oil storage and transportation

Connected to transportation above, there needs to be a store of the above to enable transportation of people out of the danger zone. Evacuation may take a couple of days to a week, and so extra fuel and oil is needed for the cars, boats, or helicopters etc that will be transporting people out.

iii Communication

This is a critical because before a disaster and in the event of a disaster communication is needed. It is needed to get information out so that the outside "world" know what is needed and can respond appropriately.

iv Electricity, Water supply system, and Public health

Damage to critical infrastructure which provide the above basic services needed by the community can affect the lives of people in the short term. In great need immediately after any disaster are water and sanitation, as well as the health of the disaster victims. Again, this is assessed in the Rapid Assessment exercise so that it is dealt with immediately.

v Security

The management of past disasters was done on an *ad hoc* basis. As a result one of the many components overlooked was that of security, partly due to the fact that most of the resources were used for the immediate

evacuation of people and saving lives! Today however security has become and important factor that has been mainstreamed into the action plans of many disaster planning offices.

Security is the condition of being safe from harm, danger or loss. Security can be either emotional or physical security.

vi Physical Security

Physical security is any and all necessary requirements that once implemented are designed to prevent, deter, inhibit or mitigate threats that face the safety and security of persons and/or property. Safety and Security in disasters differ by the fact that safety provides for the reduction of the risk of occurrence of injury, loss or death from accidental or natural causes. Security on the other hand provides for the reduction of the risk of occurrence of injury, loss or death from the deliberate or intentional actions of man and natural causes.

Usually when disasters or an emergency situation arises, the following security issues arise:

a Looting of retail outlets and business houses

Disasters or emergency situations provide an ideal opportunity for people to go on a looting spree. Looting arises especially when it has not been factored into the disaster emergency response plan or action plan. If no preparedness in this area has been done, when the hazard strikes to cause a disaster, most of the resources are being used to evacuate people. This leaves business houses and retail shops left unattended and vulnerable to looting by those looking for an opportunity for "free stuff".

Looting may also take place after the immediate hazard has struck. This will usually happen when people have been waiting for some kind of response or assistance (recovery), and authorities have not been forthcoming with the needed aid. It is here that people say "Well we do not have any more jobs because everything was destroyed in the disaster, and so we do not have any money so how can we buy food?" As a result, looting takes place because of the fear that authorities will not take care of their needs, and so people find ways to take care of themselves and their families!

b Security of women and children

Again if there is no preparedness, women and children are vulnerable to attacks of violence or rape by others, or even to the exposure to the primary hazard (fleeing to a danger zone) or secondary hazards; maybe because the lack of knowledge or panic. Violence or rape is more likely to arise if in the evacuation process, families have been separated from each other, and thus women and or children isolated from that security of their families. It is also more likely to arise in care centres where it is usually overcrowded.

c Security of aid workers

There is now also the concern of the humanitarian workers who are flown into the disaster site to assist in the response of the disaster. Many humanitarian workers are foreigners to the site and so need to be aware of

the hazards (human or natural) in the area and take necessary precaution. For women, there is also the security against violence or rape, especially in a war situation!

vii Emotional security

People have different emotional needs that when faced with disaster, will act differently depending on how serious the disaster is.

Possible emotional reaction to a disaster situation is described in further detail in Unit 14. When the physical needs of security, whether it is food security, physical security etc are not met, coupled with the fear of uncertainties, this can lead to stress and trauma, thus lack of emotional security.

Social Impacts

i Welfare

Welfare falls into the socioeconomic and socio-political category. On the socioeconomic front this is represented by significant losses to Gross Domestic Product of the affected country or region. The local and national economy can experience low productivity, price slump, high unemployment and inflation. Small island states are more vulnerable compared to the larger developed nations when confronted with disasters of a large magnitude.

Disaster Type	Country	Damage (US$'000)
Hurricane (Ivan) 2004	Cayman Islands	3,340,080
Tsunami 2004	Indonesia	4,451,600
Flood 1998	Bangladesh	7,000,000

Figure 13: Estimated monetary loss due to three disasters

Figure13 indicates monetary loss estimated at US$'000 which translates into income loss that impacts directly on welfare delivery in the post disaster period.

There are overall financial impacts on the household and individuals that adversely impact on people's welfare for example dwellings, homes, property, and other assets can be damaged, sentimental value of assets can be lost forever which imply investment loss and reduction in the quality of life for the communities affected. For example people whose livelihoods depend on crops and livestock will face income loss that may impact on their welfare and overall wellbeing. For the business community (retailing, services, industries, wholesaling), their loss of income is represented by 'operational vulnerability' that is, the estimated time any business can operate without infrastructure support. For instance a business cannot operate without electric power (which is 0 hours), but it can operate for a maximum of 4 hours without phones. For time periods

exceeding the above, the business ought to suspend operations indefinitely. (Lindell and Prater, 2003).

Directly related to the immediate welfare needs of the victims/survivors are their food requirements. In this respect food assembling and distribution points have to be coordinated in such a way that is effective and efficient given the prevailing circumstances.

Perhaps the welfare impacts of disasters can best be summed up by differentiating between the direct effects on property, the indirect effects brought about by the decline in factors of production, and secondary effects in the post disaster period such as economic decline manifested in balance of payments problems.

ii Economic Impacts

Economic costs of disasters vary across space and time. Evidence suggests a strong correlation between a country's level of development and disaster risk. On average, 22.5 people die per disaster in highly developed countries, 145 people die per disaster in countries with medium human development and 1,052 people die per disaster in countries with low levels of development (UNEP). Sometimes the economic impacts can be difficult to calculate. The Western Indian Ocean islands experience more than ten cyclones a year between November and May: huge costs are incurred due to the destruction of income-generating activities including tourism revenues.

To illustrate the financial loss to an economy, a study by SOPAC and the USP on the impacts of cyclone Ami on Fiji's agriculture sector estimated that 60-80% of subsistence crops were damaged at a cost of F$921,000, direct damage to commercial crops was estimated at FJ$39.2m, the sugar industry lost 150,000 tonnes in lost production, and FJ$6m was lost in damaged infrastructure and equipment.

In Bangladesh, floods during the Monsoon season destroyed crops and disrupted the non-farm economy of the country even after the flood waters receded. For instance, the average monthly working days fell in the period of the floods for farm workers. Day labourers for example were severely affected, their employment fell sharply from 19 days per month to 11 days per month, and as such, wage earnings also fell by almost 46%.

Another example is the great Hanshin earthquake in Japan in 1995 that caused $US 100 billion dollars damage which was equivalent to 2.1% of Japan's GDP. Extensive damage to buildings, transportation facilities and utilities (gas, sewage, power) makes up 80% of this cost. Recovery and reconstruction activities may start immediately after the event beginning with the most damaged sectors, whilst services sectors such as manufacturing may take up to twelve months or more for full recovery.

It is understood by everyone that a community is referred to as the people who live in it. Out of the varieties of impacts, economic impacts are one of the major areas that need attention from the moment of any disaster.

Just like food and shelter, education also needs to be included in the list of areas that contribute to the economic impacts. Due to the loss of

household belongings and perhaps the parents, there will be a loss of the family income. In these situations most people tend to ignore the importance of education for all ages. This also happens as a result of evacuating from the home land to different regions.
However, to get education, either the students need to be admitted to other schools, or should be provided with housing to come back. Whatever the conditions, education should not be interrupted as it is central to creating a new level of public awareness and preparedness. Attending school also keeps children away from parental issues back at home. Similarly, they will get opportunities to share their own situation with friends and elders at school which brings more liveliness for them. In addition to this, parents will find that their children are safe, and they too will have time to attend other activities. Hence, this is possible only if the community gets prepared to use the resources available in the community beforehand.

Evacuation planning by using the available resources is a critical component of safety, including for people with disabilities. This is applicable for all buildings, including those that are new and fully accessible. Evacuation planning should include a need of assessment to determine who may need what in responding to an emergency and evacuating a facility. Also, this will inculcate the understanding of best use of the resources in the situation. In most places, during natural disasters and terrorism, in the development of preparedness plans school buildings will be the target of evacuation. In evacuation drills like fire in school buildings, the nearby parks and sports fields are allocated. In preparedness it is also very important for every member of the community to be familiar with the contact numbers during an emergency. This may include the numbers of Fire Station, Police Station etc. In this way the community will be aware of the use of the available resources rather than depending on the special resources provided during an emergency.

Just like losing the household, death of children and adults also means the loss of future labour force, thus loss of future productivity. Hence, the regional economy and labour force is required to be maintained. This means for the recovery a labour force is needed to rebuild the infrastructure to replace places like houses, schools, utilities, etc. Whereas in severe disasters; there will be a higher unemployment rate than employment as the schools, factories offices are completely destroyed. This results in people having to attend to more than one job.

Animals in Disasters

Introduction

In this course you have learnt much about the tragic impacts of disasters on human life; but the often-forgotten victims are the animals that share the planet's wild places, our farms and our homes. They are entitled to physical and emotional safety just like their owners – in fact they have millions of years more experience at surviving disasters than we have. And those that did not survive – the dinosaurs – can still warn us of the dangers of unpreparedness!

In spite of the evident negative consequences of disasters on animals in modern times, public and government concern in the wake of a disaster continues to be largely focused on its impact on humans. Reports in the daily press too are often restricted to whimsical accounts about the miraculous escapes of an occasional animal.

The more serious effects on animals arise from their extreme vulnerability. Animals are often confined by their human masters to a field, pen or cage – they can't get away from a flood or fire unless we help them. At the other extreme, some animals normally kept in captivity are themselves a hazard if they suddenly find themselves roaming free in an unfamiliar situation. Another example that could constitute an economic disaster is an outbreak of an exotic disease in economically valuable livestock; it is estimated that an outbreak of Foot and Mouth Disease in New Zealand could cost the country far more than an earthquake or tsunami, although not in loss of human life.

The relationship between animals and humans varies hugely across the globe, and is very dependent on cultural and religious factors. In developed countries, pet animals are very important to their owners. This is less so in developing countries, where human life may be dependent on production animals such as sheep and goats, or reliant on animals like horses for transport. As well, some religions affect our relationship with animals – in India, the wellbeing of the cow is vital to the Hindu population, while handling of dogs and pigs during a disaster would not be possible for a Muslim.

Hazards associated with animals

The same spectrum of hazards that you have already learnt about will, of course, affect animals; but there are some hazard factors concerning animals which we will discuss here. For example, animals may themselves create hazards for people, making an already bad situation worse. Animals that are used to confinement, suddenly finding themselves free in unfamiliar surroundings, can be terrified and dangerous – even animals which we usually regard as harmless can knock children over or cause vehicle accidents.

A zoonosis (plural zoonoses) is a disease of animals which is transmissible to humans. Zoonotic diseases can be increased during disasters because the normal protective measures are absent. A common example in developing countries is rabies, spread by dog bites – and a frightened dog is more likely to bite anyone in its surroundings.
Animal carcasses are a very common source of water contamination after disasters, and a viable plan to minimise animal deaths during a disaster will greatly reduce human infections during the recovery period.
Some disasters occur in remote areas and may not directly affect the human population greatly. A forest fire on an inaccessible mountain-side may not be very serious to the local community; but it may destroy the habitat of a rare species, or drive out large numbers of poisonous snakes into nearby villages.

The ownership of animals can increase the vulnerability of their human owners to disaster. Research has shown (Heath, 1999) that, in the United States, people with no children, but with one or more pets, are less likely

to obey an evacuation order. In the developing world, this may apply to livestock owners – recently, during the severe flooding in Bangladesh, farmers refused to abandon their goats and cows by boarding rescue boats (World Society for the Protection of Animals, 2007). Occasionally, the media will highlight cases of animals helping to save humans in disaster situations: the recent New Zealand case of a woman farmer clinging to one of her dairy cows during a flash flood, dogs alerting owners to imminent earthquakes and the like. The most remarkable cases are associated with properly trained and expertly handled Search and Rescue dogs, with units at the ready in most areas of the world. They can be particularly valuable where people are trapped under collapsed buildings; the dogs can differentiate the living person from those already deceased, enabling frantic efforts to be prioritised.

Planning for disaster management in relation to animals

Very few countries currently (2007) have a disaster plan for animals. The United States Federal Government has decreed that all states must include companion (pet) animals and "service" animals (e.g. guide dogs) in their overall EDM plans, but the only examples available online were that of New Mexico and California (see references) which are brief but adequate. The Humane Society of the United States has an excellent guide to drawing up such plans on their website, suggesting the following steps:

1 Nominate a lead agency – often a government ministry such as the Ministry of Agriculture.

2 Make sure that all relevant bodies are included in planning, especially the local EOS and veterinarians' organisation, and that clear communication channels are established and that roles and responsibilities are defined.

3 The community and its context should be evaluated in order to identify likely natural and man-made hazards and human resources available.

4 The animal population in the community (companion animals, production animals, captive animals and wildlife) must be assessed for numbers, species, likely condition, farms and containment facilities, and estimated wildlife populations, as well as animal-related resources such as feed stocks, shelters, water supplies, and veterinary supplies.

5 Operational activities throughout the disaster cycle must be identified and allocated, with timelines if appropriate.

Factors to consider in a possible EDM plan for animals

i Mitigation

Location of farmed animals, and housed animals in zoos and laboratories, will need to be planned to avoid areas of increased hazard from flooding, tsunami, bushfires and other predictable disasters. Many older zoos are in built-up areas, and for these and other reasons it makes sense for their relocation to rural sites to occur as soon as possible.

Choice of species, breed and farming practices can help to alleviate some potential problems. Exotic breeds may not be readily adaptable to local extremes such as cold snaps, or drought. In farming, a choice of species or farming methods for maximum economic return may contribute to

erosion, pollution of waterways, or global warming e.g. by methane production. Insurance of production animals should be considered where possible.

Vaccinations: Domestic pets and farm animals should be vaccinated against the most common infectious animal diseases in the region, and stocks kept of additional vaccines for diseases more commonly seen in emergencies – for example, Leptospirosis, a zoonotic disease, is more prevalent in flood situations, and some pneumonias and enteric (gut) infections increase dramatically during the stress of confinement and disruption to feeding schedules.

Identification of animals, especially in relation to ownership, is very important. In a small community, owners may be able to recognise individual animals, but usually a system involving numbered ear tags, registration tags, or similar will be necessary.

Wildlife under threat: The general mitigation principles for global warming are important to us all, but many wildlife populations are particularly at risk from habitat destruction. It could be argued that human "business as usual" is a disaster for wildlife – but, even if we do not agree with that view, planning can mitigate or exacerbate the effects on wildlife. Here is an example from The Times Online of November 7, 2007:

> *Sir David Attenborough has joined environmentalists in condemning a $250 million plan by Tata, the Indian conglomerate, to build a soda ash plant on a lake in eastern Africa that is home to a million endangered Lesser Flamingos.*
>
> *The naturalist and broadcaster said the development, due to be considered by Tanzania's environment minister today, would be "an ecological disaster" and would deliver a "huge blow" to the $2bn-a-year tourism industry in the region.*

ii Preparedness

Education, not only of the general public, but of other EDM organisations, is vitally important to mitigate the effects of a disaster on animals. At one level this will include informing householders of their responsibilities towards pets, and farmers to their livestock. School visits to raise the students' awareness of how they can be involved will be helpful.

Educational materials would need to include practical steps that animal owners must consider and for which they need to prepare themselves and their animals. Assisting institutions like zoos with their own EDM plans, and provision of formal training programmes for volunteers would be the next step.

Evacuation plans. Small pet animals will require carry cages or boxes lined with layers of newspaper. There should be one per animal, and they need to be sufficiently sturdy to contain the animal for several days, rather than made of thin cardboard. Dogs will need to be restrained with a collar and lead. Horses should have a halter or head-collar already on, or available quickly. Sheep and goats in small numbers may be led by ropes, but larger numbers of farm animals will need to be moved in the farmer's usual

manner. He or she will need to plan where the animals should be moved to, whether high ground in the case of a flood, or bare ground away from trees in the case of fire. Delivery of emergency food, or complete relocation, should be considered – the animals are best confined close to a road if possible. The availability of horse trailers or trucks may need to be planned. Zoos and other facilities may need help to prepare their own evacuation plans. Wildlife can be very unpredictable during disasters, and planning may need to consider protection for the human population.

Emergency kits for pet animals and horses could include vaccination certificates, medications, and a photograph to assist in identification if the owner becomes separated from the animal.

Livestock feed supplies will need to be stockpiled in a location that will be protected from likely natural disasters.

iii Response

People can be a hazard to animals in disasters. Human safety is paramount during disaster and emergency situations, but sometimes decisions can be taken which are not favourable to animals due to lack of knowledge or training – for example, abandonment, seizing, confinement in unsuitable conditions, or even unnecessary destruction.

Communication is vital, using all human resources with animal-related skills identified during the planning process. In particular, the deployment of trained veterinary, paraveterinary and animal control staff where they are most needed is the controller's priority. Volunteers should only be used to the limits of their knowledge, and the responsibility of the general public is to alert trained staff of animals in need.

Veterinary response, whether at organised centres or individually, is to co-ordinate activities of less trained staff, such as animal handling, triage, first aid, euthanasia, disposal of carcasses, and advice on risk to humans. Record-keeping is a vital task that lesser trained staff can help with, to facilitate returning animals to their owners.

iv Recovery

Economic loss due to reduced animal products may have a huge impact on human recovery after a disaster, both as direct loss of human food supplies and as a loss in income. There may also be a loss in animal food supplies which can result in reduced production for prolonged periods.

Re-unification with owners is particularly important for pet animals, and, understandably, often takes a back seat to the re-unification of people. However, the recovery of traumatised people can often be greatly assisted by re-unification with their pets – this is especially so for children.

Rehabilitation of animals may be an issue after traumatic experiences, and may require behaviour management techniques which can be supplied by specialists.

Unit summary

Summary

In this unit you learned about what kind of impacts disasters can have on the community. Impacts of a disaster can be either physical or social. Usually the physical impacts of a disaster lead to the social impacts of disaster. So if the physical impacts of a disaster can be reduced so too can the social impacts. The impact of any disaster can be reduced by being prepared for the hazard.

One impact that is not often mentioned is the impact on the animal population of a community. The economic effects of the loss of production animals will be huge in some societies, and the loss of companion animals may add to the trauma of disaster.

Self Assessment Activities

Assessment

1 Search the internet for a case study of a disaster that has occurred in your area or within your region. A report or newspaper report may also be another source. The disaster may either be a man made or natural disaster. After reading your case study, do the following:

   a identify the type of impacts

   b state two sectors that were impacted by the disaster.

   c describe what effect the disaster had on the above sectors in (b).

2 This is an internet based student self assessment task. With reference to the Boxing Day Tsunami disaster, map out an emergency food distribution plan that you and your family would have pre-planned and would like to see adopted and implemented by aid relief workers in the event of similar disasters. Consider factors such as short and long term impacts on personal and family income and how it affects your family's overall welfare.

Model Answers for Self Assessment Activities.

1 Your answer should state:

- What type of impact there was, whether physical, social, economic, emotional, or all of the above or just two of them, etc.
- Any two sectors that were affected by the disaster – can be any two of the following education sector, health sector, built environment, power, water, transport, etc.
- The kind of impact the disaster had on the sectors you stated in (b) – e.g. if education, school halls were used as shelters, classes were disrupted, how long before students could resume classes, if parents had lost their offices in the disaster, they no longer had jobs to go back

to, thus was payment of child's school fee affected, etc.

2 The student's personal food distribution plan should primarily focus on their village and immediate surroundings. Reference to the Boxing Day Tsunami will give the student an insight into the problems and lessons learned to help the student map out or plan his/her own food distribution plan. Note there is no right or wrong answer, the purpose is to make the student think and appreciate the difficulties of coordinating and delivering food aid on a massive scale.

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Unit 13

Emotional Impacts of Disasters

Introduction

In Unit 1 you would have looked at the different types of disasters that occur. Whether it is a natural or a man-made disaster, the impact disasters have on the affected community, either collectively or individually, varies. All too often it is much easier to see the physical consequences of a disaster – injuries, death, and displacement. The immediate response to alleviate the pain and suffering is easily measured in terms of shelter, food, medicine, water and other things alike. Many victims of disasters have the ability to adapt to the sudden changes in their environment and daily routine more than others, and thus, are more resilient. The more prepared communities are before a disaster occurs, the more resilient they are.

Today across the small island states, we are seeing the need to consider more the psychosocial effects that the disaster has on the affected communities; something that is less obvious. As research has shown disasters are expected to increase in the future. As a result, more people are expected to be emotionally and mentally affected, testing their resilience. There is a need for trauma counselling services in high risk areas, as well as the need to consider or put in place welfare services for those severely impacted by disasters! Programs to put in place trained counsellors at the community or village level have already been established in some areas.

In this unit we will look at trauma, counselling, welfare and security as psychosocial effects of disasters on communities.

Outcomes

Upon completion of this unit you will be able to:

- *Define* trauma;
- *Identify* the stages of disaster recovery and their associated problems;
- *State and explain* at least three factors that make a person vulnerable to trauma;
- *State* at least three symptoms of trauma;
- *Define* counselling briefly using your own words;

- *State* at least three different types of counselling;
- *State and identify* at least four symptoms of people who need counselling;
- *State* briefly in your own words how to find a counsellor.

Terminology

Trauma:	experience in which powerful and dangerous events overwhelm a person's capacity to cope.
Counselling:	short-term, interpersonal, theory-based process of helping persons who are psychologically healthy resolve to developmental and situational issues.
Recovery stages:	Stages of recovery immediately after the impact of a hazard

Trauma

What is Trauma?

Anyone who goes through a disaster experiences some kind of trauma. For the less resilient communities or individuals, trauma can destroy them in that they cannot cope with the sudden event of a disaster and so they may suffer from a developing disease, lead to substance abuse, mental disorders and eventually destroy relationships, and the very fabric of society which are families themselves. Trauma is an exceptional experience in which powerful and dangerous events overwhelm a person's capacity to cope. When an adult or child is traumatized, they are experiencing reactions to the trauma that affect their ability to function. You must remember that when we talk about trauma, it is not only the survivors of a disaster that can be traumatized – there are also the relatives and friends of survivors, or emergency workers, and even seeing and hearing about disasters through the media (especially children!).

Emotional Stages of Disaster Recovery

Before we go on, it is important to note as well that there are several stages that a community will go through during and immediately after the disaster, in the recovery stage. These may in one way or the other, contribute to the effect on a person after the disaster is over as noted in the diagram below.

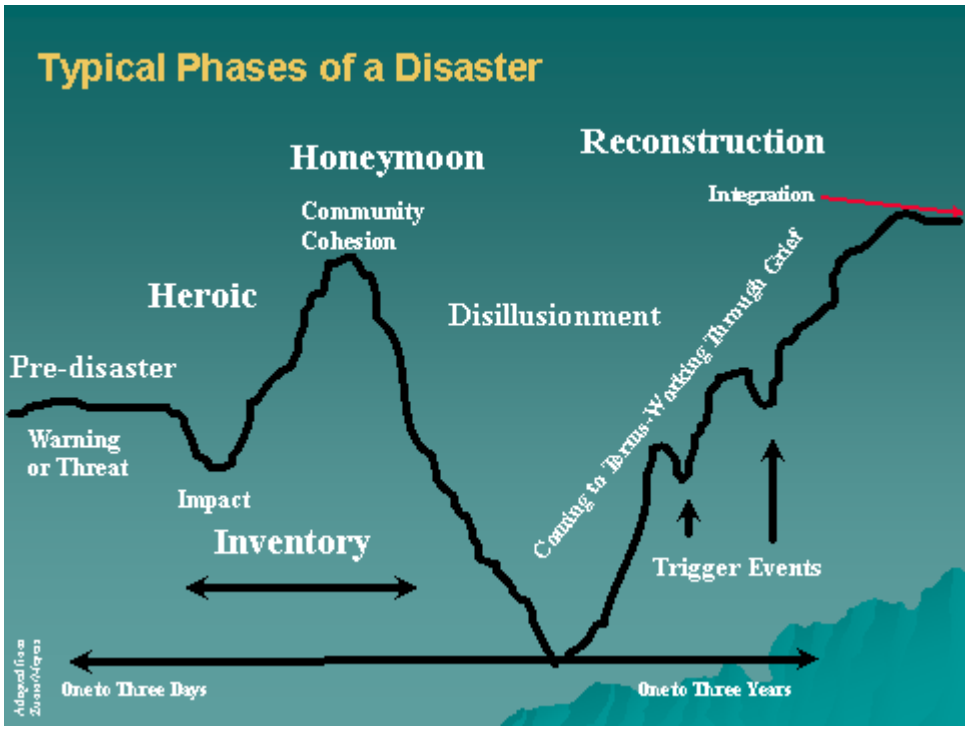

Figure 14: Typical Phases of a Disaster

These stages are described briefly below:

1 Pre-disaster

This is the stage just before the hazard strikes. Education and awareness is carried out in this stage. If it is a slow onset disaster then enough warning and awareness is given to the community on the risks posed by the hazard, thus giving the community enough time to prepare.

2 Heroic Stage

This is the stage usually at the onset or impact of disaster and immediately after the disaster. At this stage many people in the community are strong and focused, and use most of their energy in saving themselves as well as others. There is a strong sense of sharing, people helping one another, and treating even a stranger as “family”. People are so busy responding and helping out when and where they can, and so the activity level is high and people usually really do not have time to stop and ponder over what has just happened.

3 Honeymoon

The honeymoon stage follows immediately after the heroic stage and may take several weeks. It is during this stage that there is cohesion in the community, in the care centres, where the immediate needs of food and water are being attended to. People meet together and are relieved that they are safe, and alive, and that they have a place to stay until they can return back home. Some begin the clean up process in anticipation of moving on and returning to their homes, and also with the encouragement from government and relief agencies that they will be supported, when

trying to rebuild their lives and return to normal. Sometimes expectations of those in care centres become too high of government and relief agencies. When this happens the victims of disaster begin to get frustrated from the congested living in care centres, anger, restlessness, survival guilt, and anxiety begins to set in.

4 Disillusionment

This stage is also termed the "second disaster" stage in that people have now been in care centres for more than a month. They find that their request for assistance to get their lives back to normal seems to be taking forever by the authorities! It is also at this stage that many of the relief agencies have left the scene. People realize that they cannot wait on the government forever and some take it into their own hands to start to rebuild a normal life to get out of the stress they are going through while living at the care centre. This stage lasts a month or two to a year or two.

5 Reconstruction

This stage lasts for several years following the disaster. In this stage people have already assumed the responsibility of recovery and work together to develop reconstruction plans and programs. Reconstruction and rebuilding may be going on around them but the community has already returned to its normal routine; with some adaptation.

The above stages will assist you as a disaster officer to understand what people in disasters go through. Why? As a disaster officer, you will be able to make better informed decisions, to be able to meet the emotional needs that may arise during and after a disaster.

Factors of vulnerability to trauma

There are many factors which contribute towards one person experiencing trauma and not the other person. Many times it may not be just one particular factor that may be the sole cause or contributor, but more than one factor. In most cases people do get over the experience of surviving a disaster and move on with their lives. For others, it is easier said than done! Also, factors which contribute towards a child experiencing trauma may differ from that of an adult.

Generally, factors that may contribute towards trauma are:

a Exposure or proximity to disaster site – Those who are closer to the disaster site are also going to feel more intense impacts and suffer more, than those who live further away from the disaster site.

b Repeated images of terror on TV - this is especially true for children.

c Relationships – Those whose relatives have been lost or injured in the disaster are at higher risk compared to those who have not lost anyone.

d Age; older people are often less adaptable than younger community members.

e History of previous traumatic events – If a person has gone through previous stressful events, whether it is violence, child abuse, etc,

they are more likely to suffer trauma after a disaster has taken place as opposed to someone who has not.

f Socio economic factors – generally, people who struggled to make a living before the disaster occurred, are more likely to be at more risk to trauma now that they may have lost everything, compared to someone who is more financially stable.

Can you think of any other factors?

Some Common Responses to trauma

Common reactions to trauma may be any of the following:

- Shock
- Anxiety
- Fear
- Increased anxiety
- Guilt at surviving
- Sadness
- Confusion and
- Regret.

A trauma patient may also experience nightmares, lack of sleep, and flashbacks of the event. Physical reactions to trauma may be nausea, sweating, tiredness, loss of concentration, breathlessness, and aches and pains.

In further response to all of the above symptoms, people may start to drink or smoke, substance abuse, throw themselves into work and or become anti social, avoid talking about what happened, as well as avoid any situation that may remind them of the disaster!

Recovery from trauma

The length of time it will take for someone to recover from a traumatic experience varies. It will depend on the nature of the event and the situation and circumstances surrounding the individual. Another important factor is the degree of loss the individual has suffered and the ease of accessibility of support systems available to the individual or family to get through the trauma. For those especially stuck in a state of depression it may take longer. One of the strategies used to deal with trauma is counselling, referred to as trauma counselling. This can happen at different levels as described below.

Counselling

What is counselling?

The word counselling comes from the Middle English *counseil*, from Old French *conseil*, from Latin *cōnsilium*; akin to *cōnsulere*, to take counsel, consult. The definitions of counselling may vary in descriptions as different people see counselling in different perspectives. However, counselling can be defined as a relatively short-term, interpersonal, theory-based process of helping persons who are fundamentally, psychologically healthy resolve to developmental and situational issues. There are many different types of counselling which include disaster counselling, trauma counselling, cross cultural counselling, etc.

A good counsellor does the following:

- Listens effectively to what you are saying
- Works with you to define your goals with respect to your values and culture
- Facilitates your untangling of thoughts, feelings and worries about a situation
- Helps you gain your own insight into how you act, think and feel
- Teaches, shows and helps you express your emotions in your own way
- Teaches, shows and helps you work out your own solutions to problems
- Teaches, shows and helps you accept what cannot be changed
- Helps you become empowered to act in ways that are in your best interest
- Uses a variety of different techniques to help you explore what is important to you

Who needs counselling after a disaster?

After a disaster most people go through a stressful time. Parents, children, heads of both the government and private sectors, and basically the whole community suffer some kind of trauma.

i Children

In the early aftermath of disastrous events, many children encounter problems that are not easily resolved or their usual ways of handling problems are not working well for some reason. They may have found, for example, that talking to friends or relatives about their concerns is impossible or unsatisfying. Some of the concerns confronted by children include puzzling distressing feelings, low self confidence, getting along with others, self-defeating behaviours, academic problems, sexual identity

concerns, and decision- making dilemmas. The Counselling Services can provide assistance for these concerns through counselling.

Post-traumatic Stress Disorder (PTSD) is a psychological damage that can result from experiencing, witnessing, or participating in an overwhelmingly traumatic (frightening) event. Children often relive the trauma through repetitive play. In young children, upsetting dreams of the traumatic event may change into nightmares of monsters, of rescuing others, or of threats to self or others. PTSD rarely appears during the trauma itself. Though its symptoms can occur soon after the event, the disorder may appear months or even years later.

Some of these changes might appear in a child having PTSD.

- Refusal to return to school and "clinging" behaviour, including shadowing the mother or father around the house
- Persistent fears related to the catastrophe (such as fears about being permanently separated from parents)
- Sleep disturbances such as nightmares, screaming during sleep and bedwetting, persisting more than several days after the event
- Loss of concentration and irritability
- Startled easily, jumpy
- Increase in behavioural problems, in school or at home in ways that are not typical for the child
- Physical complaints (stomach-aches, headaches, dizziness) for which a physical cause cannot be found
- Distance from family and friends, sadness, listlessness, less active, and preoccupation with the events of the disaster.

Professional advice or treatment for children affected by a disaster— especially those who have witnessed destruction, injury or death— can help prevent or minimize PTSD. Parents who identify any of the above changes in their children should take their children for a check-up.

ii Adults

Usually adults do not hesitate to go to a professional counsellor because many adults and children find it helpful to talk to a counsellor specialized in post-traumatic reactions. Also it can be a cultural feature whereby it's not really a norm to talk about your problems in public or to confide to strangers. It is also important to consider that there might be severe cases among adults who might need assistance in getting to a counsellor to get diagnosed.

Soon after a disaster it is important to have a group of counsellors available for the victims to talk or attend to. However, if the number of counsellors is few compared to the population a selection of adult volunteers need to be trained, like teachers, council members, and parents.

Being adults, teachers and trainers can play a wide role in helping their students by giving opportunities to come up with their experiences. Similarly, they can guide parents to help their children as well as themselves in the overcome of the trauma. Other than the people involved in schooling, counselling methods differ from culture to culture. How different cultural groups handle stress and deal with stressors, their abilities, needs and desires for certain types of assistance, their motivations, their sense of honour and pride, their religious orientations and beliefs, their political systems and leadership, and their ways of handling and dealing with grief and loss are just some of the variables which are affected by cultural differences. Therefore, it is important for the counsellors who are going to assist internationally in another culture to identify the important issues that will bring relief to the culture.

How counselling can help a disaster victim

Counselling gives the understanding of the actual situation in the perspective of the disaster victim. Hence different methods of counselling aid in adjusting to the environment. Counselling facilitates personal and interpersonal functioning with a focus on emotional, social, vocational, educational, health-related, developmental, and organizational concerns.

Some problems that can be helped by counselling:

- Coping with your relations to disaster.(fear, anger, coping with the changes in the environment)
- Exploring personal issues.(spirituality, sexuality relationships, your goals and ambitions)
- Family and relationship issues.(how to talk to the other person, intimacy with your partner)
- Dealing with practical issues(financial support , transport problems)

Populations served by counselling psychologists include persons of all ages and cultural backgrounds. Examples of those populations would include late adolescents or adults with career/educational concerns and children or adults facing severe personal difficulties. However, there is a lot of evidence that counselling can help you cope better with the many difficulties you face during and after a disaster.

How to find a counsellor after a disaster

When we say counselling, we are talking about the counselling people need just after an unusual occurrence such as the tsunami of 2004, severe hurricanes, cyclones and volcanic eruptions. Unlike the normal conditions (where anyone in very great distress can consult a doctor) after a disaster, anyone who is ready to listen to you is considered as a counsellor. The degree of medical knowledge of the counsellors or psychotherapists can be limited as it varies. Most counsellors work hand in hand along with the health facilitators.

Unit summary

Summary

When it comes to natural disasters, often people tend to understand and accept easily what has happened, and so are able to recover quickly; they are resilient. On the other hand for some people it might take months, perhaps years to come to terms with what has happened. These are people who might have lost parents, relatives, household, etc. This includes both children and adults of different ages. Experts specify these people as traumatic patients. With evidence, such patients can be helped by specialists called counsellors. Professional counsellors can be trusted and are known to be found working with emergency health departments, in the aftermath of disasters in almost all the places.

Self Assessment Activities

Assessment

1 In your own words, briefly explain what is trauma.

2 What are the stages of recovery in a disaster and how will that help you as a disaster officer in the time of a disaster?

3 In a disaster, why can one person may not be affected by a disaster, and another person be traumatized by the event?

4 Interview ten people who have experienced a disaster recently. This disaster might have impacted people leaving them with traumatic memories – for instance, the tsunami of 2004.

5 Prepare questions in such a way that they tell you about counsellors and their contribution in the aftermath of the disaster.

Model Answers:

1 Your answer should be something to the effect of: trauma patients are those who cannot use their own problem solving and coping capabilities to overcome a sudden adverse event in their lives.

2 State the stages of disaster recovery as given in the text, and it will assist in knowing how to assist disaster victims as well as prepare oneself as a relief worker or disaster officer when responding to disaster sites.

3 You should state in your answer the factors that make some people more vulnerable to trauma than others.

4 Most of the people were not aware of counselling.

- Those affected were mostly children.
- Those who got the help from counsellors would have found themselves getting themselves adjusted slowly.

Individual Assignment

Explore the situation of Jenny and describe how Jenny could be helped to overcome what she is going through. The word limit is 1000- 1500.

"Jenny of nine years old refuses to go any where without her mother being by her side. In Tsunami 2004 Jenny's father disappeared and never returned. If somebody talks about Tsunami she makes sure that she covers her ears so that she does not hear that."

Hints:

- Highlight what you would do at first.
- Would you convince her mother first?
- To whom will you go for help?
- Would you like to try different methods?
- Would you like to include a small scale survey?

Note: You must include all the references. Make sure that you can include any related material in the appendices and label them in accordance.

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Unit 14

Vulnerable Groups in Disasters

Introduction

In the event of a disaster we expect that the needs of everyone are catered for in the response and recovery stage. Sometimes this is not so. It usually happens that if a certain group of people were marginalized during normal times, it is most likely that they will not be catered for during disaster times. Vulnerable groups also refers to those who do not feel safe enough during response and recovery stage, and those who cannot safely and comfortably access and use the resources provided in the preparedness, response and recovery stages of a disaster.

Outcomes

Upon completion of this unit you will be able to:

- *Identify and list* the most vulnerable groups in disaster and post disaster times.
- *Explain* briefly, at least three factors that isolate these groups to consider them more vulnerable than the rest of society.
- *Describe* briefly how we can reduce the effect of disasters on the vulnerable groups.

Terminology

IDP:	Internally Displaced Person (IDP) may have been forced to flee their home for the same reasons as a refugee, but has not crossed an internationally recognised border.
Refugee:	A person who has fled from and/or cannot return to their country due to a well-founded fear of persecution, including war or civil conflict
Asylum seeker:	Includes persons who had fled war or other violence in their home country. A person who is seeking to be recognized as a refugee is an asylum seeker.

People with Disabilities

Have you ever known someone who is physically challenged? Even before you answer that question, let us ask ourselves another question – what does physically challenged mean? Physically challenged people are those who have difficulty moving, hearing, seeing, communicating, and or learning. Physically challenged people are also referred to as People with Disabilities (PWDs).

Physically challenged people have the same needs as everyone else in the community, however, they have more of a task because of their disability. In normal times, PWDs are marginalized, and so are worse off during disaster times.

In any disaster it is important that we address the needs of PWDs. Because of their disabilities, they have additional needs to the usual needs which everyone else has. For example someone with visual and hearing impairment would not be able to hear the warning siren in the event of a tsunami and so would also need assistance in getting to the safe areas.

From a rights based approach, it is important to include PWDs in all phases of disaster management as their needs have to be considered before, during and after a disaster.

When considering all the sectors in the planning of different phases of disaster management, it is equally important to also consider the needs of PWDs. A pre-disaster activity that is carried out is the risk mapping exercise. This exercise can identify barriers or obstacles that PWDs can face when trying to evacuate people out of the danger zone at the time the hazard has struck.

It is wise that in the pre-disaster phase, a database is developed that identifies PWDs in the community, the disability they face, and what their needs will be during and after the disaster. This may be extremely helpful because in the event of a disaster, special equipment might be needed to transport PWDs out.

In the immediate response to a disaster it is equally important that a person trained in assisting PWDs is included in every search and rescue team. Personnel and staff at camps or care centres should also have had some prior training in working with PWDs so that it is easy for them to identify the needs of PWDs in their care centre. Shelters or care centres will have to be made PWD friendly. For example there will be ramps for easy access, and latrines may have to be fitted with wider doors to allow easier access for wheel chairs.

Elderly People

Reuters posted photos of elderly men and women who survived the Boxing Day Tsunami, and the Bangladesh floods. A picture is worth more than a thousand words, and is sufficient to describe the hopelessness and desperation faced by the elderly population during and after disaster strikes.

The literature differs in terms of defining the 'elderly' groups. The disparities arise because elderly can be defined as those over 55-60 years, and studies have excluded those in long term nursing care but in the event of a disaster every person regardless of age is affected. Increased vulnerability of the elderly is derived from their impaired physical mobility, poor sensory awareness and pre-existing medical conditions.

The 2004 Indian Ocean tsunami left thousands of elderly people homeless and displaced, according to IPS news the elderly were very much sidelined in the initial relief efforts. Many were crowded into camps where they had to stand in long queues for food and in most cases had to compete with younger survivors for food, water and medical assistance. To make matters worse, the lack of data availability on disaster-related deaths by age, gender and disability implies the specific vulnerability of the needs of the elderly remain unknown. This could be a problem for relief workers when it comes to relief delivery work to the worst affected areas. Evidence suggests that the elderly receive less proportionate aid in the post-disaster period than do their younger counterparts. The explanations for this disparity point to the elderly not registering for disaster assistance because of the difficulty in going through the processes of filling in application forms and other related procedures to prove that they qualify for assistance. Younger age groups are better able to recover financially from a disaster compared to the elderly, reinforcing the vulnerability of the latter population age group to future disasters. A study of those affected by tornadoes in Texas showed 32.2% of the elderly reported a drop in their standard of living as compared to 12.5% of the non-elderly.

The dilemma facing the elderly is further compounded by the negative images of ageing. For example, there is a prevailing misconception amongst the developed world that older people are difficult to train, they are not open to new ideas, and considered a burden to welfare issues of society. The lack of public awareness and information about the needs of the elderly and their contribution to social growth has marginalised this group when allocating resources in the aftermath of disasters.

In addition, the elderly are at an increased risk of emotional distress especially those who live alone. Ehrenreich (2001) noted that the special needs of the elderly may take on a lower priority due to their age which aggravates mental stress and disorientation.

Internally Displaced People and Refugees

The events which result in internally displaced people are common throughout the world.

For the internally displaced people, there is little hope for any kind of future. Groups of internally displaced people band together and form camps in an effort to share resources and support themselves, to create a sense of community, and to provide themselves with some semblance of security. It is common among many African cultures, and other parts of the world, for the people in a community or a village to share resources. What one person has is shared with the rest of the villagers so that all may

have their needs met. There is no reason for one person to hoard supplies because what one has is shared by all.

This sense of continuity is disrupted by the destruction of communities by rebel groups. When people band together in an internally displaced persons camp, it is difficult to continue any kind of schooling for there are no buildings, no materials, and often no people to teach. Even among the elders there is a sense of futility and depression about their situation. In some camps there are few adults left to raise the children, so the children run wild and are not taught the ways of the community. This problem is of great concern to many adult, not just those in the camps.

Why do people in internally displaced camps receive little to no aid?

Why do they not receive medical supplies or food from organizations such as the Red Cross or the United Nations?

The answers to these questions form the core of the problem of internally displaced people. When people flee destruction yet stay within their own country, they become internally displaced people. If they had crossed a border to another country, they would automatically become refugees. As refugees, they would have become eligible for aid from international organizations. As long as they stay within their country of origin, they do not qualify for aid from international organizations unless the government of the country requests it.

Internally displaced people are at the mercy of the forms of aid available to them from their own country. In many countries in Africa, the governments are too poor to have a system in place to deal with such dire social needs. It isn't that the governments do not care; they simply lack the resources to help those in need.

Non-government organizations (NGOs) are non-profit groups with a goal to provide help to people in developing countries. Depending on the area of focus, an NGO might contribute to the social, religious, educational, agricultural, or cultural needs of a particular group of people or an entire country. Since governments has so few resources, countries rely heavily on the financial contributions and personnel of NGOs to help build the country.

An Internally Displaced Person (IDP) may have been forced to flee their home for the same reasons as a refugee, but has not crossed an internationally recognised border. Many IDPs are in refugee-like situations and face the same problems as refugees. There are more IDPs in the world than refugees. Globally, there are an estimated 20-25 million so-called internally displaced persons (IDPs) and UNHCR helps 6.3 million of these.

The involuntary displacement of people is a long-standing phenomenon. Throughout history, forces and factors have driven people from their normal and secure environments in search of more favourable locations that would support their survival. Although this is still a dynamic instigation, involuntary population displacement currently involves a wider range of concerns.

Today, people are forced to uproot from their physical, economic, social, cultural, and psychological homes as a consequence of social disorder, political instability, and economic impoverishment. While traditionally, displacement of people in Africa has resulted from life threatening circumstances, the process has evolved to reflect the challenges of the 21st century, becoming more of a concern than ever before.

The general concept of displacement has come to encompass all forms of disruptions, usually caused by natural disasters, development projects, conservation and preservation activities, planned resettlement programs, violence and conflict. As a consequence of displacement, a person is forced to leave his or her native place, a phenomenon known as forced migration. This is opposed to voluntary migration, a movement in which individuals and groups willingly decide to migrate in the complete absence of economic, political, cultural, and environmentally based `push' factors.

It is important for young people to understand the repercussions of events on local, regional, and global scales. Much of this knowledge is centred on political figures and the actions of those in power. The voices of people without power are rarely heard or understood.

Internally displaced people and refugees are two groups of people who do not have a voice or much power, and yet the human condition demands that society understands their needs and what can be done to meet them. Most IDPs and refugees are poor people caught in circumstances beyond their control. Civil unrest and natural disasters know no boundaries, either economic or cultural, and the destruction of a community through these means could happen to anyone.

Examples of NGO Work

Roger is a naturalized American and the brother of an Irish priest who worked in Uganda. When the priest died, Roger went to visit the nuns with whom his brother had worked. A resourceful man, Roger started working with the nuns and created a computer school filled with old computers that were donated from friends in the United States. Through the Aprovecho Institute in Oregon, he helped the nuns build an enormous clay oven so the nuns could bake rolls and sell them to nearby stores. When I met him, Roger had recently arrived with twelve suitcases full of dismantled generators and lawnmowers which he put back together for the nuns to use.

A Catholic nun worked with the women in internally displaced persons camps in Western Uganda. She encouraged the women to make crafts using the natural materials found around them in the camps. The nun then arranged for the women to sell their crafts to make money and rebuild their lives.

Two Dutch women from an organization called ISIS worked with a group of Ugandan women to create a woman-owned radio station and to gather the stories of women whose lives had been disrupted by the civil strife around them.

The Kabarrole Research Center, funded by a German education organization, works with women in internally displaced persons camps. One goal is to educate the women on their rights to retrieve ownership of lands they lost when their husbands were killed by rebel groups. A group of Ugandans working with the Kabarrole Research Center created a puppet show, designed to educate, which they took to IDP camps.

Medecins sans Frontieres (MSF) or Doctors without Borders, recently opened a health clinic in Northwestern Uganda to help those in IDP camps.

The plight of internally displaced people hit home in the United States in fall 2005 when Hurricanes Katrina and Rita caused devastating damage in New Orleans and Texas. An event, in these cases, a natural disaster, destroyed not only the places where people lived but also the social structure of the communities. Within a day or couple of days hundreds of thousands of people lost everything they owned. The scenes of distress from the people living in the Super Dome in New Orleans created an indelible mark in the memories of Americans not caught in the turmoil. When the Super Dome became an unfit place to live and the people living there were moved to the Astrodome in Houston, Texas, several newscasters reported them as refugees. This was a misnomer. While the people crossed a state line, they were still living within the United States. They had become internally displaced people.

Who is a refugee?

International law uses the following definition:

- a person who has fled from and/or cannot return to their country due to a well-founded fear of persecution, including war or civil conflict;
- "owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion, is outside the country of his nationality, and is unable to or, owing to such fear, is unwilling to avail himself of the protection of that country…"; and
- is forced to leave their country due to natural disasters or war and conflict. *(According to the 1951 United Nations Convention Relating to the Status of Refugees).*

The concept of a refugee was expanded by the Conventions' 1967 Protocol and by regional conventions in Africa and Latin America to include persons who had fled war or other violence in their home country. A person who is seeking to be recognized as a refugee is an asylum seeker. In the United States a recognized asylum seeker is known as an *asylee*.

The most important parts of the refugee definition are:

i Refugees have to be outside their country of origin;

ii The reason for their flight has to be a fear of persecution;

iii The fear of persecution has to be well-founded i.e. they have to have experienced persecution or be likely to experience it if they return;

iv The persecution has to result from one or more of the 5 grounds listed in the definition;

v They have to be unwilling or unable to seek the protection of their country.

How is the term 'refugee' misused?

The term has slipped into common usage to cover a range of people, including those displaced by natural disaster or environmental change. Refugees are often confused with other migrants.

What makes a refugee different?

Refugees are forced to leave their countries because they have been persecuted or have a well-founded fear of persecution. Refugees run away. They often do not know where they will end up. Refugees rarely have the chance to make plans for their departure such as packing their personal belongings or saying farewell to loved ones. Many refugees have experienced sever trauma or have been tortured.

Women and Children

Most research done on disasters has come up with the conclusion that those who are most vulnerable are the women and children. As it is human nature, living conditions and responsibilities of women subject many to risk before, during, and after disasters. Women also exercise formal and informal leadership roles and are central actors in family preparation for, and recovery from, disaster.

According to Wood (2005), experience show that without the deliberate involvement of women in the planning and implementation of preparedness, response and recovery programs the overall national performance will suffer. In spite of this, it has to be taken into account that due to rape and abuse of young girls and women, their vulnerability increases. This leads to the spread of HIV/AIDS and other communicable diseases. The following are some of the major areas that need to be considered in the preparation of disasters.

1 Prioritise protection of human rights irrespective of nationality, sex, age, with/without disabilities.

2 Include measures to prevent violence against women (domestic and sexual violence) in disaster management planning.

3 Make sure that women are included in the management of shelter and temporary housing.

4 Provide special support to new born babies and their mothers and prevent child abuse by counselling, support and frequent medical check-ups for both mothers and children.

5 Ensure that both men and women get the opportunity to take "disaster leave" to care for children and elders.

6 Provide adequate support (financial, information), for marginalized women.

Source: Asia-Pacific Forum on Women, Law and Development (2005)

Children

Children who lose their caregivers during disasters get psychologically affected as they get more exposed to violence, especially gender based violence. Mostly this leads older children to wind up their education and get into the labour force to support the younger. Children are also vulnerable to:

- inhaled chemicals as they breath more times than adults;
- agents that act on or through the skin because their skin is thinner and they have a larger surface-to-mass ratio than adults;
- they do not have the cognitive ability to understand how to flee from danger or to follow directions from others; and
- the effects of agents that produce vomiting or diarrhoea because they have less fluid reserve than adults, increasing the risk of rapid dehydration.

Therefore, in the aftermath of disasters, children's rights must be protected and promoted. Support children who are exposed to violence and prevent the recruitment of children into the armed forces and, equally, to help those who already have direct experience of fighting. Prioritize children to be the first to get assistance in healthcare, protection and shelter.

Unit summary

Summary

This unit set out to identify and describe the most vulnerable groups in times of disasters. There are five types of groups – the elderly, refugees, women, children and the internally displaced persons. It is important for any community vulnerable to disasters to identify the most vulnerable groups in the community in the disaster preparedness stages so that relief efforts can be planned and delivered effectively in the aftermath to reduce adverse impacts on these vulnerable groups..

Self Assessment Activities

Assessment

1 Identify at least two places in the world which have had civil unrest or natural disasters such as earthquakes, hurricanes, tornadoes, or tsunamis in the last decade.

2 How have these events impacted communities in these areas?

3 What is civil unrest?

4 What happened to the people caught in civil unrest or natural disasters? Where did they go?

Model Answers

1 Fiji/ Solomon civil unrest and Indonesia tsunami in 2004.

2 All sectors of the community were displaced. Uncertainties will develop in the mind of the community.

3 Civil disorder is a broad term that is typically used by law enforcement to describe one or more forms of disturbance caused by a group of people. Civil disturbance is typically a symptom of, and a form of protest against, major socio-political problems. Typically, the severity of the action coincides with public outrage. Examples of civil disorder include, but are not necessarily limited to: illegal parades; sit-ins and other forms of obstructions; riots; sabotage; and other forms of crime. It is intended to be a demonstration to the public and the government, but can escalate into general chaos.

4 People moved out of the country, taking with them their wealth. People starving, the adults emaciated, the children with distended stomachs.

People lost everything they owned. The scenes of distress showing recurring attacks on infrastructure and extensive closures of services due to civil unrest and destruction of related property.

Citizens not directly involved in a civil disorder may have their lives significantly disrupted. Their ability to work, enjoy recreation and in some cases, obtain necessities may be jeopardized. Disruption of infrastructure may occur during very severe events. Public utilities such as water, fuel and electricity may be temporarily unavailable, as well as public infrastructure for communication. They will move to a country where they will be able to live safely.

Assignment

Assessment

The following are noticed to be the most vulnerable groups in disasters.

a Elderly

b Refugees

c Women

d Children

e IDPs

- In a group of not more than four select a topic from the vulnerable groups mentioned above.
- It is recommended that you highlight why the group you have chosen becomes vulnerable and how to handle them in the terms of a disaster.
- You can use power point, charts, leaflets, magazines, activities, model, etc. in the presentation.
- Your presentation must not be more 15 minutes.
- You will not be awarded with marks for extra time.
- References must be included.

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